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TESTING THE CAPITAL ASSET PRICING MODEL (CAPM) IN THE VIETNAMESE STOCK MARKET:

An analysis of two sub-periods from 2006 to 2016

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International Business
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Supervisor: Roman Stepanov
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ABSTRACT OF BACHELOR'S THESIS

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Objectives

The main objective of this study was to explore the relationship between the beta values of stocks and its actual returns in order to investigate CAPM validity in Vietnamese stock market in the last 10 years. The study also aims to provide investors with fundamental knowledge of this basic financial modelling technique therefore to contribute in helping them evaluate investments effectively. Moreover, the research attempts to provide some beneficial contributions to the study of the application of the CAPM.

Summary

To achieve the purpose of the study, the researcher collected historical daily/weekly/monthly stock prices in order to estimate the correlative beta values over two five-year periods in Vietnamese security market. The linear relationship of these rate of returns with betas was tested by conducting the simple regression analysis. The research implications were disclosed relying not only on previous literature but also on empirical findings.

Conclusions

The results of the thesis reject the positive linear relationship between beta and returns. That means, based on the main findings of the research, the CAPM model is not valid in the Vietnamese market from 2006 to 2016.

Key words: Finance, Stock, Vietnamese Stock Market, CAPM, capital asset pricing model, systematic risk, beta, rate of return.

Language: English

Grade:

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1. INTRODUCTION

Starting with the background and the research problem, this chapter attends as the preamble of the study paper. After that, this commencement part presents one research question and three main objectives that guide the research. Finally, in order to help readers follow the thesis easier, the introduction also elucidates the structure of the research paper.

1.1. Background

In the stock market, which is an essential part of the financial system and performs significant roles in evolving an economy, pricing securities is the core issue. In particularly, the relationship between risks and expected returns of a security plays an important role in pricing that asset, and thus in making decisions in choosing portfolios (Choudhary & Choudhary, 2010).The Capital Asset Pricing Model (CAPM) is the first asset pricing model that helps investors and financial managers evaluate stocks as well as select efficient portfolios.

This model has been widely used for more than five decades. However, the accuracy of the CAPM and especially the linear relationship that it established are prevalent themes that have provoked heated dispute over a long period of time in finance literature. Equally relevant to this issue is the fundamental question concerning whether or not the correlation of rate of returns and risks could be represented as a positive linear. Although there were various empirical studies supporting and denying this implication of the CAPM as well as the validity of this model, CAPM's accuracy still remains questionable since results of these studies are distinct. Therefore, examining the efficiency of this financial model still proves to be conducive to investors and researchers in understanding and applying the CAPM not only in stock evaluation but also in portfolio selection.

In order to answer above question, this study attempt to examine the risk-return relationship by focusing on a specific market: Vietnamese stock market in recent

years. By analysing data in two five-year periods from 2006 to 2016, this empirical study hopefully will produce remarkable contributions to the study of the application of the CAPM model in financial investment field. In addition, this research could support previous examinations by confirming whether the CAPM model is valid or not, so that further studies could produce more profound results.

1.2. Research Problem

Because of the high significance of the accuracy of the CAPM model, various numbers of researches of this model were established, including examinations of relationship between risks and returns. In which, most of these studies were conducted in other stock markets instead of Vietnamese security market so that here were rarely empirical testing of the CAPM's efficiency in the Vietnamese stock market. One of the main reasons for this issue is considered that Vietnam has a young stock market due to the fact that its first stock was traded in 2005. Besides the scanty quantity of studies in Vietnamese stock market, these previous tests have been mostly runned before the year 2012. This proves to be impractical to investors in applying the CAPM in Vietnam since the results of these examinations could not certify the efficiency of this model in recent years. It is needed to conduct examinations of CAPM that using data from 2012 up to now. According to these reasons, this paper endeavors to specify the validity of the CAPM in nowadays context by determining the return-risk of Vietnamese stocks in the period from 2006 to 2016.

1.3. Research Questions

To address the research problem stated in the previous section, this paper aspires to achieve two objectives: firstly, exploring how rate of returns and risks on stocks affect each other and secondly, giving an overview about the basic financial model, the CAPM. Hence, this research can serve as a fundamental guidance for investors to help them evaluate securities effectively by applying this model. In order to achieve those two objectives, regarding issues discussed above, this thesis aspires to answer the following research questions:

1. Is the relationship between daily actual returns and daily risks of an individual stock represented as a linear?
2. Is the relationship between weekly actual returns and weekly risks of an individual stock represented as a linear?
3. Is the relationship between monthly actual returns and monthly risks of an individual stock represented as a linear?

1.4. Research Objectives

In order to answer above question, three main objectives that conducting this research are:

1. To calculate daily/weekly/monthly returns of stocks, VN-Index and HNX-Index.
2. To estimate daily/weekly/monthly beta values.

To explore the relationship between beta values and returns of stocks.

1.5. Structure of the study

This research paper is divided into six main parts, which is also separated into subsections if needed. Beginning with the introduction as the first section, the thesis will continue with the inclusive review of previous literature. After that, the explanation of the data selection and the use of quantitative method will be clarified in the methodology part. Following this, the paper will present and discuss the main findings of the research. Finally, the conclusion section will summarize entire thesis with the implication for international business, some limitations as well as exhortations for ensuing research in the future.

2. LITERATURE REVIEW

The literature review aims to provide a comprehensive view of existing studies that have been examined the validity of the CAPM model.

2.1. Introduction

In the field of financial investments, the Capital Asset Pricing Model (CAPM) is one of the foundation models that has been broadly used for over fifty years since it was introduced by Sharpe (1965) and Lintner (1964). This model establishes a positive linear relationship between expected returns and risks of a stock, which enables investors and financial managers evaluating stocks and portfolios efficiently.

While the CAPM model is of paramount significance, its veracity remains highly debatable. Such controversy has been exemplified by a number of prominent instances in preceding studies. The main findings of this body of research are diverse. Particularly, some previous studies supported the assumptions of CAMP by attempting to demonstrate the linearly risk-return relationship (Black, Jensen & Scholes, 1972; Fama & MacBeth, 1973), while posterior tests produced varying results that negated the CAPM by showing that this model overly simplified the 'financial world' since it merely assumed the market beta had effects on expected returns (Banz, 1981; Basu, 1983; Rosenberg, Reid & Lanstein, 1985). Because of such divergent evidences relating to the aptness of the CAPM, equally relevant to this issue is the fundamental question concerning whether or not this financial model is truly valid, especially in the context of Vietnam stock market.

To eliminate any confusion, this chapter will first attempt to introduce the Capital Asset Pricing Model in terms of its origin as well as its brief history, the traditional formula and main assumptions; and those will be followed by main arguments for and against the accuracy of this one-factor model. This literature review will also consider various previous tests of the CAPM with multiple approaches, which produced divergent results, not only in broad markets like U.S. market but also in some smaller stock markets such as Singapore, India, Hong Kong and China security markets. The subsequent parts are the conceptual framework, which summaries all key terms, and

the hypotheses. Finally, this literature review will finish with the summary, which also includes the importance as well as the purpose of the thesis.

2.2. The definition of the Capital Asset Pricing Model (CAPM)

The objective of this section is to discuss the origin of the CAPM by starting to provide the basic information about this model, especially its brief history. Furthermore, the assumptions as well as traditional formula are also mentioned after that.

2.2.1. Brief history:

The Capital Asset Pricing Model (CAPM) is one of the most popular and essential financial pricing models that is often used to define the relationship between specific security's rate of return and its related risks. Being built on the previous finding of 'diversification and portfolio theory' of Markowitz (1952), the Capital Asset Pricing Model had an abundant restrictions on estimating the asset prices; thus it was further independently developed and introduced by Sharpe (1964), Treynor (1962), Lintner (1965) and Mossin (1966), providing a simpler way of determining as well as selecting efficient stocks in a portfolio (Sullivan, 2006; Džaja and Aljinović, 2013).

2.2.2. Main assumptions and the traditional formula:

To provide a clear understanding of this model, it is essential to further construe the CAPM in terms of its theory, assumptions, implications and also its formula. The CAPM is established on an assumption that asset prices should not be influenced by all risks. Risks having effects on expected returns of assets are segregated into two

types. One type is specific risk or unsystematic risk, which could be reduced through diversification when an investor holds a portfolio. Another category is systematic risk or market risk, which is dependent on the volatility of the overall market and could not be mitigated by diversification. The CAPM measures the systematic risk by using a quantity called beta value, which reflects the responsiveness of excess security return in relation to the changes of market returns (Peroid, 2004). Džaja and Aljinović (2013) stated that the value of market beta fluctuated and, in addition, was conditional on the structures of the capitals and securities as well as on circumferences of companies and industries. This beta value is one variable that influences required return, based on the Capital Asset Pricing Model. This explains the reason that the CAPM is considered as 'single factor model' (Bajpai & Sharma, 2015). According to Easton & Monahan (2005) and Besley & Brigham (2015), the required rate of return on securities is calculated by totalizing the returns with no risk and the risk premium, also called 'the asset's non-diversifiable risk', and thus is subsidiary to the security's beta, the risk-free rate of return and risk premium of the market.

The traditional formula of the CAPM can be written as:

$R_s = R_f + ß\ (R_m - R_f)$

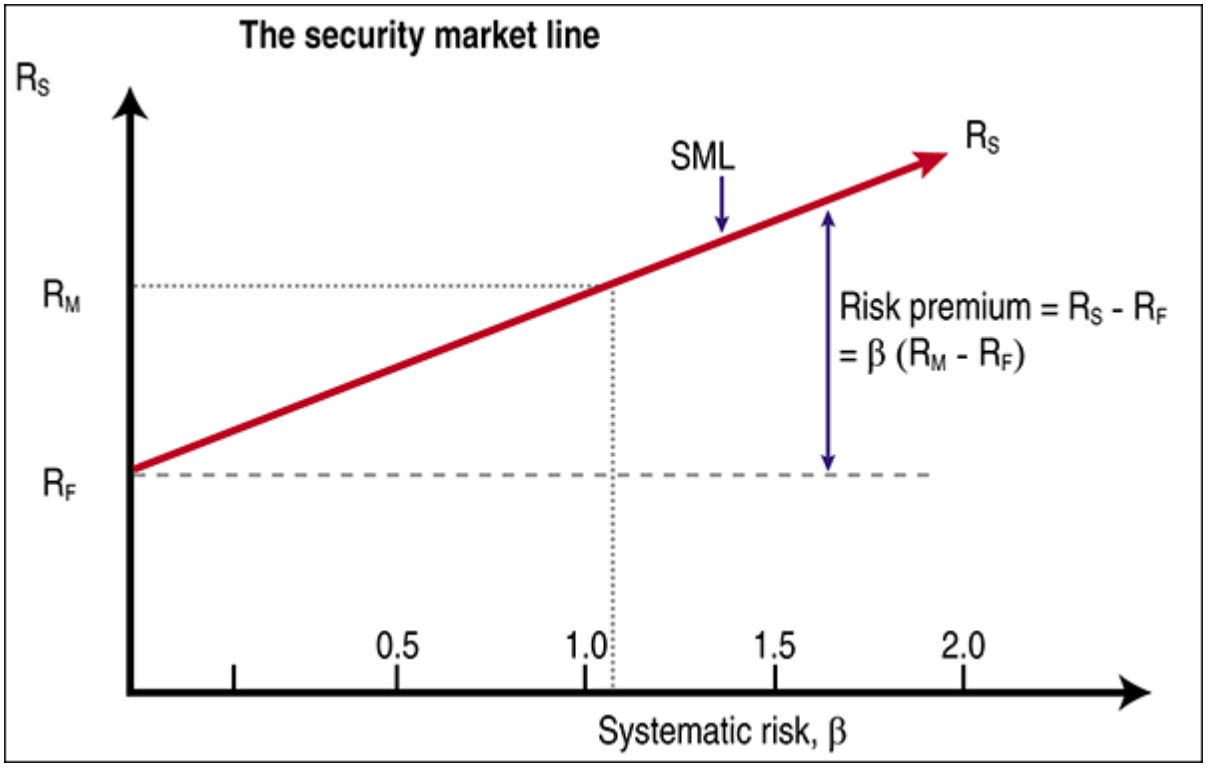
Where:

- R_s: expected return on the capital asset
- R_f: risk-free interest rate
- R_m: expected return on the market
- ß (beta value): market beta of the asset
- $R_m - R_f$: risk premium

The CAPM demonstrates that the difference between the expected market return and the risk-free rate of interest, which is also called risk premium, and the expected return on the capital asset have a positive and equilibrium relationship. This assumption of this fundamentally financial model is based on other hypotheses. One hypothesis is that the market is equilibrium. Another one is that investors' expectations of returns on assets would increase when imminent corporate risks are higher. For instance, in the condition of the riskier asset, which has the greater beta value, risk premium is larger, thus expected rate of return is larger. The linear relationship of returns and risks expresses asset rate of return on the market as a function of the beta and also is

plotted on a line called ‘security market line (SML)’ which, as well as the position of a company showed on it, is affected by elements such as inflation and risk aversion of investors (Besley & Brigham, 2015:138).

Chart 1.1



In this linear graph, which is used for individual asset, the x-axis represents the market beta value (the risk) while the y-axis interprets the expected rate of return on an asset. The value of market risk premium is determined by the slope of the security market line.

2.3. Examinations in some stock markets

According to information mentioned above, because of its simplicity, the CAPM has been widely used in financial investment. Although it is no doubt that the CAPM is one of the most anterior theoretical paradigms that determine the relationship between risks of an investment and its expected return, this simple and rational model still has some significant restrictions that have been mentioned in numerous empirical researches. It also aroused disputations of its validity. This model has been tested in various countries in the world. In old broad markets that have abundant quantities of security dealers, large volumes of stocks traded and numerous commercial transactions, selecting and collecting data such as average daily, monthly or yearly stock prices do not lead to significant problems. However, these are problems for those empirical tests the CAPM in thin markets, which are considered to have lower number of transactions, 'large bid-ask spreads' and large volatilities in stock prices (Solibakke, 2000). In those cases, results of empirical tests of the CAPM are inconsistent.

This section will provide readers more informations about disputes of the CAPM's efficiency. In particular, the following sub-parts will discuss about previous tests of the CAPM in both broad stock markets and thin security markets, especially in Vietnamese context.

2.3.1. Examinations in broad and emerging stock markets:

Conducting the initial tests of the traditional formula of the Capital Asset Model by using basic time-series model, Black, Jensen and Scholes (1972) were the earliests to examine the validity of the CAPM in the United States stock market. By using the monthly rate of returns and 'equally weighted portfolio' of all stocks, which have at least 24-month available returns, on the New York Stock Exchange (NYSE) from 1926 to 1930, that were from the Center for Research in Security Prices, they estimated the beta, computed next 12-month return of each stock, then repeated whole project for the following years, through January, 1965. Finally, they found out that there was a

linear relationship between expected return and risks (the beta) of an asset, which supported for the assumption of the CAPM.

Another empirical study supporting for the CAPM was conducted by Fama and MacBeth (1973). They tested the 'two-parameter' model by using univariate tests and squared returns instead of time series model. Their data were also average monthly returns of all common stocks during the period of January 1926 to June 1968. As a consequence, they could not demonstrate that the relationship between risks of an investment and its expected return was not linear. However, in their subsequent studies, Fama and MacBeth (1992, 1993 and 1995) rejected the fact that systematic risk is the only factor which has effects on the expected returns on assets. Especially beside demonstrating a vanishing relation between the beta and returns on NYSE stocks during 1941-1990 period, Fama and MacBeth (1992) found out that size, P/E, book-to-market' values enabled explaining average stock returns. This negated the efficiency of the CAPM.

The efficiency of the CAPM was not only tested in a broad market like U.S.market but also examined in some emerging markets such as the Central and South-East European securities markets. Collecting monthly returns of '10 most liquid stocks' traded on each of nine European countries' stock markets from January 2006 to December 2010, Džaja and Aljinović (2013) explored the validity of this financial model by using cross-sectional method. After calculating expected return and the beta of each security and creating scatter plots based on these data, they could not find any relation between risks and estimated rate of returns of stocks traded on these markets. Furthermore, when using regression analysis to justify the beta value as a measure of risks, they ascertained that 'higher yields do not mean a higher beta', so they consider the beta as an inefficient assessment of risks. This led to rejecting assumptions of the CAPM. Reinganum (1981) also realized that the beta value are not 'systematically' regarded to average expected returns on assets for daily, weekly as well as monthly data.

2.3.2. Examinations in small stock markets:

The efficiency of the Capital Asset Pricing model is also highly regarded in smaller security markets such as Singapore, India, Hong Kong and China stock markets.

Using the same time-series method with Black, Jensen and Scholes (1972) to expose whether or not the CAPM works in Singapore security market, Hoe (2002) selected stocks traded on the Singapore Stock Exchange Main Board (SESMB) from December 1985 to December 1993. As the result, this research has confirmed the validity of the asset pricing model by successfully forecasting returns on securities in Singapore context.

Choudhary & Choudhary (2010) found evidence against the CAPM's assumptions when testing this model for 278 stocks with monthly returns traded on the Indian market from January 1996 to December. Their tests reported a nonlinearly risk-return relationship while the CAPM's hypothesis stated that this relationship was linearly positive. They also found out that the systematic risk had no influence on the estimated rate of returns. Furthermore, Bajpaia & Sharmab (2015) focused on daily data for a period of 10 years from January 2004 to December 2013 and used the rolling regression methodology to test the CAPM. They also proved the failure of this financial model in the Indian equity market.

When using the daily data of 132 stocks which listed on Pacific Basin Capital Markets (PACAP) for the period from January 1980 to December 1995, Lam (2001) published results of his empirical tests for the Hong Kong stock market. Test results attested that the CAPM is still practically a useful equilibrium pricing model in the Hong Kong stock market.

The validity of the Capital Asset Pricing Model was also tested in the Shanghai Stock Exchange market (SSE), which is one of the fastest developing financial market in the world. Guo (2011) collected daily data of securities from January 2005 to December 2009, then divided them into group of ten portfolios sorted into the beta value order to test the risk-return relation. The results did not support to the CAPM's validity in the SSE.

2.3.3. Examinations in Vietnamese stock markets:

There are scarce empirical studies of the CAPM in Vietnamese security market. One of those studies was conducted by Vo & Pham (2012). They estimated monthly beta values of 39 individual stocks in Ho Chi Minh Stock Exchange (HOSE) from December 2006 to December 2012 by using Jarque bera test then examined the validity of the CAPM by applying General Method of Moments (GMM). All results justified the efficiency of this financial model in Vietnam stock market. That means beta value can be used as a measurement of systematic risk. Another empirical test of the CAPM in Vietnam was conducted by Hoang (2013). She collected daily prices of 20 stocks traded on HOSE from January 2005 to August 2011. Because of the small quantity of stocks traded, she grouped stocks into four sets then sorted them into book-to-market ratio order. After using correlation analysis and linear analysis to test those data, she had the same results as Vo & Pham (2012) did.

2.4. Hypotheses

Based on the issues related to the accuracy of the CAPM model that has been discussed in sub-chapters above, the empirical study attempts to examine these following hypotheses:

H_1: Daily beta value and daily actual return of individual stocks traded on Vietnamese stock market during period of 2006 to 2016 have a linear relationship.

H_2: Weekly beta value and weekly actual return of individual stocks traded on Vietnamese stock market during period of 2006 to 2016 have a linear relationship.

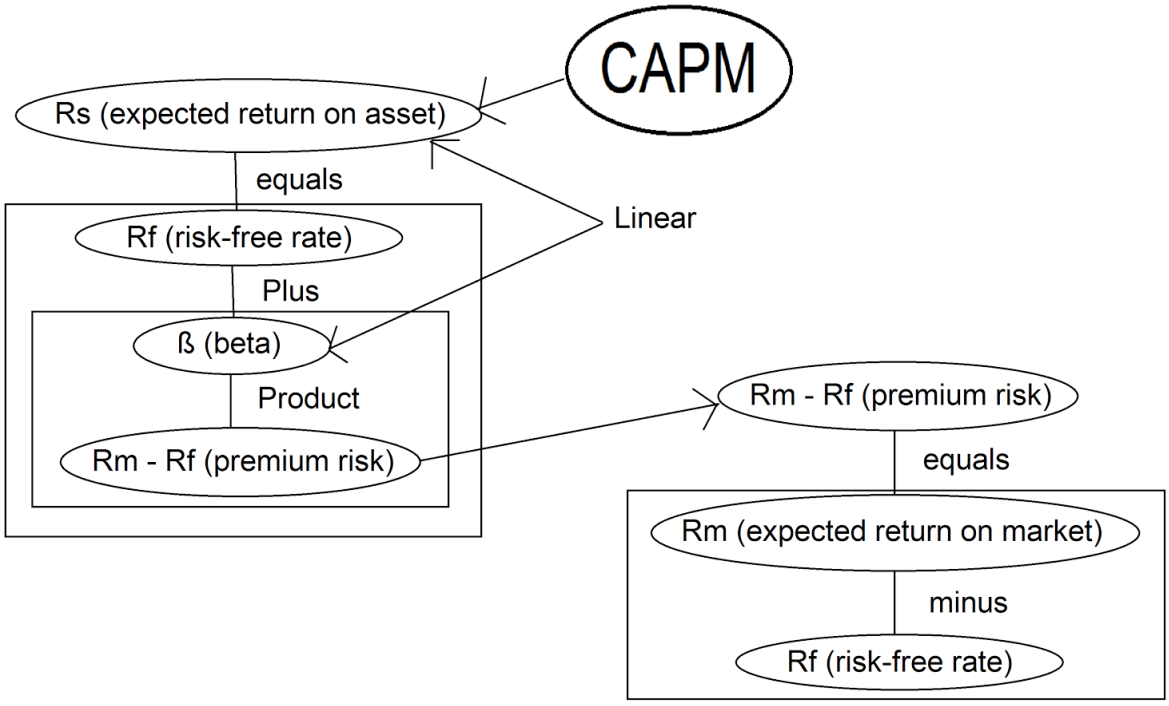
H_3: Monthly beta value and monthly actual return of individual stocks traded on Vietnamese stock market during period of 2006 to 2016 have a linear relationship

2.5. Conceptual framework

The conceptual framework below manifests the research guide of this thesis. The main research objectives are to calculate the rate of return on asset with given historical data and to estimate the beta value in order to determine the relationship between these two variables. Thus, understanding the CAPM's formula and its implications is of great help in finding an appropriate method when testing the validity of this financial model.

Particularly, the conceptual framework attempts to represent the traditional formula of the CAPM model, which is also mentioned in the definition section above. Besides, the interrelationship amongst related terms, such as expected return and beta values, that are established by this model is also performed.

Chart 1.2.



(Hoang, 2013)

2.6. Conclusion

Overall, this literature review has laid the foundation for the research by digesting significant information about the CAPM model, from its origin, its traditional formula, deliberations about its efficiency and previous tests.

The Capital Asset Pricing Model plays significant roles in asset pricing and assessing stocks. However, the validity of this model is still a doubt. There are copious empirical testing of the CAPM, in which the major researches are conducted in developing security markets such as the U.S. stock market. Having distinct viewpoints and using divergent methods, researchers proved varying findings of these empirical studies. In the literature, there are more empirical tests of the CAPM supporting and not having

abilities to reject the linear relationship between the risks and expected rate of returns on assets as well as the CAPM's assumptions than those negating it.

There were rarely empirical testing of the CAPM's efficiency in the Vietnamese stock market due to the fact that Vietnam has a youngly and thinly traded financial market. Ho Chi Minh Stock Exchange (HOSE) began trading in 2000 and Hanoi Stock Exchange (HNX) was launched in 2005. Most of these examinations were conducted before the year 2012 so that the period from 2012 up to now were not mentioned. Now in the 21st century the Vietnamese security market has become a growing market; thus, it is necessary for financial investors to explore whether the CAPM still works well in this market in the recent years. Therefore, testing the accuracy of CAPM nowadays turns into essential. These issues and developments provide inspiration to examine the Capital Asset Pricing Model and its validity in the Vietnamese stock market by testing the relationship between daily, weekly and monthly beta with actual stock returns in Vietnamese security market throughout period from 2006 to 2016. This empirical test of the CAPM hopefully have beneficial contributions to helping investors in evaluating efficient portfolios and selecting securities as well as to supporting other researches of this model in the future.

3. METHODOLOGY

The purpose of this chapter is to gain more insights into the method applied to test the hypotheses. Firstly, the sample selection including selected periods, financial data sources, selected stocks and benchmarks will be clarified. After that, this section will discuss research method by reviewing some mostly used methods when examining CAPM accuracy. The main method of the research, which is the simple linear regression, is also addressed. Lastly, the chapter will conclude with the data analysis.

3.1. Data selection

3.1.1. Selected periods

This research aims to determine the relationship between the beta value and the actual returns of individual stocks traded on the Vietnamese security market from 2006 to 2016. This ten-year period will be splitted up equally into two five-year subperiods: 2006-2011 and 2012-2016. These two specific sub-periods are chosen because of two crucial reasons. One rationale is that there are scant literature researches of the CAPM in Vietnamese security market. Furthermore, most of these empirical studies merely covered the period to the year 2012 while the recent years were not concentrated in those testing in Vietnamese stock market. For instance, both Vo & Pham (2012) and Hoang (2013) collected prices of stocks before 2012 when examining this financial model on HOSE. Hence, it is essential to focus on the duration from 2011 up to now to provide currently relevant results for investors' applications. Moreover, dividing ten-year period into two sub-periods allows researchers to analyse data and observe the outcomes in each specific stage effortlessly and efficiently. Doing so would enable researchers examining data comprehensively by comparing results in each duration, thus, producing more useful findings.

3.1.2. Selected financial data sources

The thesis is based on secondary data selected from three trustworthy financial data sources:

- https://www.hsx.vn/ (The official website of Ho Chi Minh Stock Exchange market).
- http://hnx.vn/ (The official website of Hanoi Stock Exchange market).
- http://cophieu68.vn/ (The reliable financial website that thoroughly updates daily/weekly/monthly historical prices of stocks traded on HOSE and HNX market which were adjusted after companies had paid their dividends.

The subordinate data collected from these three dependable sources could be applied instantaneously in computing.

3.1.3. Selected stocks

Vietnam has two major stock exchanges with the highest trader values: Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX). Both these security markets have established for more than ten years that is appropriate to the period the research attempts to examine. In each stock markets above, the researcher selects traded stocks that are in the top of 100 largest weighted stock. Because the examining period is ten years, solely stocks that have been traded more than 7 years on these markets are accounted for in this empirical research. According to the conditions of selected periods, 50 stocks traded on each markets are selected. The study will collect data with full historical prices data from 1st January 2006 to 31st December 2016 on http://cophieu68.vn/. Daily, weekly and monthly historical prices of these stocks are taken from three above websites in order to estimate the related stocks' returns, which are one of the most elements to test the hypotheses of the research paper.

Table 1: 50 Selected stocks traded on HOSE and HNX

Tickets	50 Selected Stocks Traded on HOSE					50 Selected Stocks Traded on HNX				
	AGR	DPM	HSG	PHR	STB	ACB	HLC	PVE	SDA	TNG
	BCI	DRC	HT1	PNJ	TSC	BCC	HNM	PVG	SDT	VC3
	BHS	DXG	HVG	PPC	TTF	BTS	HOM	PVI	SHB	VCG
	BMI	EIB	ITA	PVD	VCB	BVS	HUT	PVS	SHN	VCS
	BVH	FPT	KBC	PVT	VHC	CTS	NBC	PVX	SHS	VGS
	CII	HAG	LGC	RIC	VHG	DBC	NTP	S99	TC6	VIG
	CSM	HAI	MSN	SBT	VIC	DCS	PGS	SCJ	TCS	VIX
	CTG	HBC	PAN	SGT	VNE	DNP	PLC	SD5	TDN	VNR
	DHG	HCM	PET	SJS	VNM	DST	POT	SD6	THT	VTV

	DIG	HPG	PGD	SSI	VTO	HJS	PVC	SD9	TKU	WSS

3.1.4. Selected benchmarks

Regarding literature review above, estimating the rate of return on the market plays a paramount role in calculating the accurate values of betas. However, using a proxy for the entire market is much more significant and appropriate since the fact that finding the actual market rate of return is arduous. Therefore, a stock index is popularly selected and considered as a proxy, a benchmark for a market. In particular, when investigating the stability of beta value in European market, Nguyen (2015) used the Standard and Poor's 500, also called as S&P 500, as the index. This index contains 500 public 'stocks with the highest market capitalization', which represents around 75% of the U.S. stock market capitalization. In the context of Vietnam, there are two stock indices that are used as representations of security market: VN-Index and HNX-Index. VN-Index is an index that represents trends in price fluctuations of all stocks traded on Ho Chi Minh Stock Exchange (HOSE) and HNX-Index is also used as the benchmark for Hanoi Stock Exchange (HNX). Choosing these two proxies is pertinent with the objective of the research because they contain all stocks traded on Vietnamese security market.

3.2. Research method

In this sub-chapter, the discussion on widely conducted methods using in previous empirical studies will be served as the beginning of the section. After that, this section also attempts to thoroughly clarify the practical procedure that would be applied in this thesis, which helps readers easier to follow the research.

Regarding the deliberation on existing examinations in the literature section above, the method that mostly applied for determining the risk-return relationship is simple regression.

- *Step 1:* Collect daily/weekly/monthly historical prices of 200 individual stocks traded on both HOSE and HNX from 1st January 2006 to 31st December 2016 on http://cophieu68.vn/.
- *Step 2:* Estimate daily/weekly/monthly rate of returns of these stocks

- *Step 3*: Compute values of the beta by using excel

- *Step 4*: Testing hypotheses

3.3. Data Analysis

3.3.1. Return estimation

The daily returns of selected stocks are calculated by using fomular:

$$\mathbf{R_{s,\,t} = (P_{s,\,t} - P_{s,\,t-1}) \times 100 / P_{s,\,t-1}} \quad \mathbf{(1)}$$

Where:

$R_{s,\,t}$: the daily rate of return of stock S in day/week/month t

$P_{s,\,t}$: the average price of stock S in day/week/month t

$P_{s,\,t-1}$: the average price of stock S in day/week/month t - 1

Similarly, the daily/weekly/monthly rate of returns of the proxy market is calculated:

$$\mathbf{R_{m,\,t} = (P_{m,\,t} - P_{m,\,t-1}) \times 100 / P_{m,\,t-1}} \quad \mathbf{(2)}$$

Where:

$R_{m,\,t}$: the daily rate of return of the index in day/week/month t

$P_{m,\,t}$: the average price of the index in day/week/month t

$P_{m,\,t-1}$: the average price of the index in day/week/month t – 1.

3.3.2. Beta estimation

In excel, value of individual stock beta is estimated by the simple regression equation: COVARIANCE.S (stock price array, index price array) /VAR.S (index price array)

In order to test the hypotheses, the research uses the simple linear regression, which was invented by Galton (1885). This statistic model has been used to investigate the linear relationship between two variables: one is dependent and another one is independent. In particular, this linear relationship is predicted as a function in which the dependent variable is represented in terms of the independent variable. This formular can be written as:

$$\mathbf{R_{s,t} = \beta_{s,t}\ \beta + \varepsilon_{s,t}} \qquad \mathbf{(3)}$$

Where:

$R_{s,t}$: actual return of stock S at time t

$\beta_{s,t}$: the beta value of the stock S at time t

β: the slope of the equation (3) which represents the relationship between $R_{s,t}$ and $\square_{s,t}$

$\varepsilon_{s,t}$: the error term of stock S at time t (the research assumes the error term to follow the normal distribution)

If there is a significant positive linear relationship between beta and rate of return, the slope of the equation (3) will not equal or less than zero.

The slope of the equation (3) will be computed by using Excel.

3.4. Testing hypotheses

H_1: The daily actual rate of return and the daily beta value of individual stock have a significant linear relationship.

H_2: The weekly actual rate of return and the weekly beta value of individual stock have a significant linear relationship.

H_3: The monthly actual rate of return and the monthly beta value of individual stock have a significant linear relationship.

The study focuses on the values of slopes computed and the P-value when applying linear regression above with the 5% level of significance. For instance, with the hypothesis H_1, the null hypothesis of significant positive relationship between daily beta and actual individual stock returns has a 5% level of significance. If the null hypothesis is true, the P-value which must be equal or less than 5%. Due to that, there is a significant relationship between Daily actual rate of returns and risks. On the other hand, if the P-value of the test is greater than 5%, the null hypothesis will be rejected. The process would be repeated with all the testing hypotheses.

4. FINDINGS

4.1. Results for rate of returns of individual stocks

Tthe rate of returns of 100 different stocks traded on Vietnamese stock markets are computed and addressed in the following tables.

4.1.1. Daily rate of returns

Table 2: Daily average rate of returns of 50 stocks traded on HNX from 2006 to 2016

Daily average actual rate of returns on 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.020%	0.003%	0.013%	**S99**	0.066%	0.205%	0.138%
BCC	0.184%	-0.066%	0.056%	**SCJ**	-0.001%	0.007%	0.003%

BTS	0.095%	-0.034%	0.039%	**SD5**	0.061%	0.192%	0.121%
BVS	0.084%	-0.087%	-0.001%	**SD6**	0.107%	0.105%	0.107%
CTS	0.076%	-0.247%	-0.029%	**SD9**	0.103%	0.038%	0.072%
DBC	0.145%	0.062%	0.108%	**SDA**	0.058%	0.054%	0.056%
DCS	0.024%	-0.085%	-0.027%	**SDT**	0.080%	0.034%	0.058%
DNP	0.223%	0.016%	0.142%	**SHB**	0.031%	-0.032%	0.009%
DST	0.234%	-0.230%	0.117%	**SHN**	0.253%	-0.006%	0.175%
HJS	0.178%	-0.027%	0.079%	**SHS**	0.081%	-0.251%	-0.031%
HLC	0.108%	-0.091%	0.089%	**TC6**	0.094%	0.000%	0.057%
HNM	0.096%	-0.127%	-0.017%	**TCS**	0.065%	0.054%	0.061%
HOM	0.102%	-0.163%	0.019%	**TDN**	0.106%	0.056%	0.088%
HUT	0.124%	0.052%	0.093%	**THT**	0.123%	0.022%	0.089%
NBC	0.101%	0.058%	0.080%	**TKU**	0.155%	-0.113%	0.068%
NTP	0.178%	0.032%	0.107%	**TNG**	0.172%	-0.067%	0.061%
PGS	0.071%	0.017%	0.049%	**VC3**	0.221%	-0.269%	0.104%
PLC	0.146%	0.043%	0.095%	**VCG**	0.093%	-0.059%	0.032%
POT	0.161%	-0.092%	0.040%	**VCS**	0.313%	-0.012%	0.177%
PVC	0.033%	-0.102%	-0.028%	**VGS**	0.144%	0.044%	0.103%
PVE	0.060%	-0.091%	-0.008%	**VIG**	0.063%	-0.368%	-0.064%
PVG	0.027%	0.084%	0.050%	**VIX**	0.100%	-0.344%	0.022%
PVI	0.073%	-0.047%	0.016%	**VNR**	0.157%	0.061%	0.111%
PVS	0.095%	-0.078%	0.017%	**VTV**	0.205%	0.118%	0.163%
PVX	-0.011%	-0.107%	-0.042%	**WSS**	0.082%	-0.279%	-0.027%

From the table 2, the daily rate of returns are within of -0.368% and 0.331%. In the first sub-period, a haft of stocks have negative returns while most of them get positive daily returns in the second periods. This leads to the result that about 20% of 50 stocks traded on HXN have negative rate of returns.

Table 3: Daily average rate of returns of 50 stocks traded on HOSE from 2006 to 2016

Daily average actual rate of returns on 50 stocks traded on HOSE from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
AGR	0.001%	-0.183%	-0.055%	**LGC**	0.173%	0.116%	0.146%
BCI	0.094%	0.018%	0.069%	**MSN**	-0.009%	0.171%	0.046%
BHS	0.045%	0.012%	0.028%	**PAN**	0.174%	-0.058%	0.099%
BMI	0.158%	-0.067%	0.044%	**PET**	0.059%	-0.029%	0.019%
BVH	0.075%	0.048%	0.063%	**PGD**	0.121%	-0.012%	0.083%
CII	0.107%	0.028%	0.066%	**PHR**	0.065%	-0.057%	0.028%
CSM	0.175%	-0.141%	-0.073%	**PNJ**	0.119%	0.139%	0.123%
CTG	0.045%	-0.060%	0.012%	**PPC**	0.128%	-0.058%	0.031%
DHG	0.099%	0.051%	0.074%	**PVD**	0.033%	0.002%	0.019%
DIG	0.053%	-0.154%	-0.015%	**PVT**	0.162%	-0.244%	-0.021%
DPM	0.057%	-0.083%	-0.006%	**RIC**	0.076%	-0.176%	-0.032%
DRC	0.169%	0.046%	0.107%	**SBT**	0.129%	0.012%	0.078%
DXG	0.136%	-0.151%	-0.052%	**SGT**	-0.027%	-0.157%	-0.070%
EIB	-0.003%	-0.037%	-0.014%	**SJS**	0.054%	0.146%	0.102%
FPT	0.078%	0.035%	0.022%	**SSI**	0.087%	-0.032%	0.029%
HAG	-0.046%	0.022%	-0.019%	**STB**	0.013%	0.016%	0.014%
HAI	-0.027%	0.052%	0.010%	**TSC**	0.023%	-0.050%	-0.012%
HBC	0.175%	-0.010%	0.082%	**TTF**	0.068%	-0.123%	-0.016%

HCM	0.123%	0.028%	0.091%	**VCB**	0.113%	-0.080%	0.047%
HPG	0.185%	-0.075%	0.069%	**VHC**	0.160%	0.019%	0.103%
HSG	0.258%	-0.076%	0.131%	**VHG**	0.036%	-0.230%	-0.081%
HT1	0.208%	-0.232%	0.009%	**VIC**	0.056%	0.149%	0.099%
HVG	0.072%	-0.120%	0.014%	**VNE**	0.134%	-0.162%	-0.006%
ITA	0.026%	-0.003%	0.010%	**VNM**	0.128%	0.151%	0.141%
KBC	0.066%	-0.092%	-0.006%	**VTO**	0.109%	-0.194%	-0.030%

The table 3 indicates that stocks in first sub-period the number of negative values of daily returns of HOSE's is lower than that of HNX's stocks. There are 15 stocks that bring negative rate of returns.

4.1.2. Weekly rate of returns

Table 4: Weekly average rate of returns of 50 stocks traded on HNX from 2006 to 2016

Weekly average actual rate of returns on 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.182%	0.325%	0.254%	**S99**	2.005%	8.038%	4.788%
BCC	0.860%	-0.355%	0.249%	**SCJ**	0.132%	-0.069%	0.049%

BTS	0.126%	-0.029%	0.059%	**SD5**	0.483%	0.701%	0.582%
BVS	0.659%	0.128%	0.394%	**SD6**	0.159%	0.084%	0.122%
CTS	0.526%	-0.829%	0.086%	**SD9**	0.330%	0.605%	0.467%
DBC	0.589%	0.729%	0.649%	**SDA**	0.159%	0.347%	0.251%
DCS	0.333%	-0.078%	0.151%	**SDT**	0.112%	0.277%	0.193%
DNP	5.457%	1.221%	3.909%	**SHB**	0.394%	-0.042%	0.241%
DST	1.317%	-0.988%	0.717%	**SHN**	1.217%	0.547%	1.024%
HJS	0.964%	0.201%	0.603%	**SHS**	0.726%	-0.257%	0.398%
HLC	0.615%	0.518%	0.604%	**TC6**	0.397%	0.123%	0.292%
HNM	0.492%	-0.790%	-0.143%	**TCS**	-0.102%	0.019%	-0.066%
HOM	0.058%	-0.448%	-0.101%	**TDN**	0.281%	0.575%	0.364%
HUT	0.933%	0.894%	0.917%	**THT**	0.543%	0.161%	0.416%
NBC	0.176%	0.453%	0.312%	**TKU**	0.511%	-0.163%	0.292%
NTP	0.748%	0.004%	0.391%	**TNG**	0.692%	-0.072%	0.350%
PGS	0.570%	0.193%	0.400%	**VC3**	1.376%	-0.466%	0.942%
PLC	0.766%	-0.155%	0.309%	**VCG**	0.565%	0.067%	0.367%
POT	0.471%	-0.370%	0.072%	**VCS**	1.251%	-0.156%	0.679%
PVC	0.447%	0.047%	0.268%	**VGS**	1.011%	0.159%	0.687%
PVE	-0.033%	-0.396%	-0.191%	**VIG**	0.173%	-0.973%	-0.161%
PVG	0.299%	0.731%	0.459%	**VIX**	0.451%	-1.838%	0.063%
PVI	0.317%	0.118%	0.225%	**VNR**	0.614%	0.327%	0.475%
PVS	0.732%	-0.036%	0.379%	**VTV**	1.052%	0.609%	0.841%
PVX	0.351%	-0.182%	0.180%	**WSS**	0.567%	-0.339%	0.306%

Table 5: Weekly average rate of returns of 50 stocks traded on HOSE from 2006 to 2016

Weekly average actual rate of returns on 50 stocks traded on HOSE from 2006 to 2016

Tickets	Period 2012 - 2016	Period 2006 - 2011	Overall	Tickets	Period 2012 - 2016	Period 2006 - 2011	Overall
AGR	0.081%	-0.678%	-0.139%	LGC	0.776%	0.685%	0.734%
BCI	0.427%	-0.058%	0.258%	MSN	-0.114%	0.883%	0.185%
BHS	0.236%	-0.111%	0.064%	PAN	0.525%	0.032%	0.367%
BMI	0.989%	-0.133%	0.432%	PET	0.470%	-0.068%	0.223%
BVH	0.522%	0.522%	0.522%	PGD	0.533%	-0.240%	0.311%
CII	0.683%	0.288%	0.486%	PHR	0.180%	0.077%	0.148%
CSM	0.914%	-0.727%	0.388%	PNJ	0.745%	0.730%	0.740%
CTG	0.358%	0.119%	0.280%	PPC	0.785%	-0.623%	0.085%
DHG	0.562%	0.072%	0.318%	PVD	0.502%	-0.032%	0.234%
DIG	0.416%	-0.247%	0.203%	PVT	1.026%	-0.783%	0.220%
DPM	0.230%	-0.206%	0.033%	RIC	0.571%	-0.240%	0.228%
DRC	0.714%	0.103%	0.410%	SBT	0.522%	0.177%	0.373%
DXG	0.853%	-0.664%	-0.420%	SGT	-0.117%	-0.563%	0.271%
EIB	0.104%	-0.025%	0.065%	SJS	0.620%	0.679%	0.651%
FPT	0.437%	0.051%	0.244%	SSI	0.576%	-0.261%	0.160%
HAG	0.008%	0.109%	0.046%	STB	0.073%	0.017%	0.044%
HAI	0.007%	-0.398%	-0.175%	TSC	0.477%	-0.222%	0.159%
HBC	0.841%	-0.230%	0.309%	TTF	0.628%	-0.619%	0.086%
HCM	0.636%	0.115%	0.457%	VCB	0.612%	-0.543%	0.229%
HPG	0.965%	-0.144%	0.466%	VHC	0.553%	-0.003%	0.329%
HSG	1.338%	0.173%	0.897%	VHG	0.195%	-0.983%	-0.317%
HT1	0.997%	-1.048%	0.078%	VIC	0.211%	0.776%	0.470%
HVG	0.253%	-0.152%	0.134%	VNE	0.761%	-0.737%	0.065%
ITA	0.541%	0.148%	0.343%	VNM	0.622%	0.587%	0.603%
KBC	0.488%	-0.387%	0.101%	VTO	1.310%	-3.905%	-0.813%

According to the table 4 and table 5 above, in the period from 2006 to 2016, around 50% of selected stocks traded on both HNX and HOSE earn a negative weekly returns while in the second period most of them get a positive weekly returns.

4.1.3. Monthly rate of returns

Table 6: Monthly average rate of returns of 50 stocks traded on HNX from 2006 to 2016

Monthly average actual rate of returns on 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.359%	0.539%	0.457%	**S99**	0.378%	1.257%	0.813%
BCC	2.552%	-1.643%	0.632%	**SCJ**	-1.120%	0.096%	-0.537%
BTS	1.325%	1.382%	1.416%	**SD5**	0.698%	8.662%	4.177%
BVS	0.375%	0.593%	0.617%	**SD6**	1.307%	5.407%	3.288%
CTS	0.863%	-5.137%	-0.781%	**SD9**	1.306%	5.076%	3.320%
DBC	2.742%	0.585%	1.975%	**SDA**	0.795%	4.877%	2.582%
DCS	-1.484%	1.006%	-0.287%	**SDT**	1.694%	2.898%	2.045%
DNP	0.959%	-0.131%	0.526%	**SHB**	0.218%	-0.926%	-0.135%
DST	5.227%	-2.903%	3.273%	**SHN**	8.960%	5.420%	8.428%
HJS	2.980%	0.974%	2.304%	**SHS**	0.738%	-4.206%	-0.527%
HLC	1.520%	-6.675%	1.095%	**TC6**	2.436%	-0.249%	1.588%
HNM	2.180%	-2.349%	-0.008%	**TCS**	0.503%	2.071%	0.927%
HOM	1.962%	-3.846%	0.331%	**TDN**	1.027%	2.191%	1.534%
HUT	1.144%	3.802%	2.301%	**THT**	1.965%	3.414%	2.432%

NBC	2.354%	0.055%	1.357%	**TKU**	2.577%	-1.734%	1.341%
NTP	2.607%	1.648%	2.375%	**TNG**	2.154%	0.353%	1.552%
PGS	0.344%	2.902%	1.510%	**VC3**	4.888%	-5.950%	2.534%
PLC	2.013%	1.995%	2.101%	**VCG**	0.854%	1.886%	1.424%
POT	1.421%	0.201%	1.074%	**VCS**	5.336%	2.777%	4.648%
PVC	-0.263%	-0.350%	-0.173%	**VGS**	1.407%	2.276%	1.855%
PVE	-0.225%	0.516%	0.188%	**VIG**	-0.212%	-4.294%	-0.943%
PVG	0.010%	3.098%	1.306%	**VIX**	2.550%	-12.178%	1.151%
PVI	1.437%	-0.383%	0.753%	**VNR**	2.120%	1.049%	1.599%
PVS	1.586%	-0.936%	0.627%	**VTV**	4.016%	1.775%	3.160%
PVX	-1.267%	-1.493%	-1.201%	**WSS**	-0.174%	-4.881%	-0.964%

Table 7: Monthly average rate of returns of 50 stocks traded on HOSE from 2006 to 2016

Monthly average actual rate of returns on 50 stocks traded on HOSE from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
AGR	-1.198%	-2.020%	-1.394%	**LGC**	2.707%	2.489%	2.734%
BCI	2.339%	1.661%	1.778%	**MSN**	-1.472%	6.194%	0.886%
BHS	0.739%	0.442%	0.557%	**PAN**	3.550%	-1.846%	1.954%
BMI	2.912%	-0.805%	1.210%	**PET**	0.832%	-0.555%	0.321%
BVH	0.876%	2.572%	1.634%	**PGD**	2.168%	-0.605%	1.490%
CII	1.961%	1.221%	1.742%	**PHR**	0.762%	-1.037%	0.259%
CSM	2.718%	-2.944%	1.222%	**PNJ**	2.409%	3.111%	2.368%
CTG	0.242%	-1.149%	-0.007%	**PPC**	2.414%	-0.193%	1.197%

DHG	1.835%	1.638%	1.676%	**PVD**	0.238%	-0.290%	0.054%
DIG	-0.135%	-3.253%	-0.929%	**PVT**	2.298%	-3.949%	-0.212%
DPM	0.648%	-0.774%	0.084%	**RIC**	1.657%	-0.978%	0.513%
DRC	2.827%	2.825%	2.973%	**SBT**	2.466%	1.056%	1.988%
DXG	1.958%	-3.468%	0.719%	**SGT**	-1.210%	-1.383%	-1.278%
EIB	-0.188%	-1.097%	-0.350%	**SJS**	0.502%	4.910%	2.868%
FPT	1.310%	-1.060%	0.243%	**SSI**	0.893%	0.552%	0.865%
HAG	-2.008%	2.476%	-0.301%	**STB**	0.498%	0.794%	0.698%
HAI	0.387%	1.953%	0.896%	**TSC**	0.823%	-1.224%	-0.125%
HBC	3.031%	0.065%	1.714%	**TTF**	1.742%	-1.675%	0.418%
HCM	1.985%	-1.373%	1.084%	**VCB**	1.771%	-0.772%	1.023%
HPG	2.916%	-0.348%	1.619%	**VHC**	2.871%	-1.171%	1.485%
HSG	4.661%	0.869%	3.614%	**VHG**	1.605%	-0.913%	0.616%
HT1	3.784%	-4.289%	0.418%	**VIC**	1.281%	3.452%	2.670%
HVG	1.207%	-1.393%	0.371%	**VNE**	1.107%	-1.219%	0.282%
ITA	0.143%	0.210%	0.316%	**VNM**	2.516%	3.387%	2.983%
KBC	1.192%	-1.195%	0.323%	**VTO**	0.436%	-0.920%	-0.181%

The table 6 and 7 show the results that are similar to what the researcher find out in the previous tables. In the period from 2012 to 2016, most of selected stocks bring positive benefits to investors. On the other hand, in another period, investing in these stocks is not a good decision.

4.2. Results for beta values of individual stocks

4.2.1. Daily beta values of individual stocks

After calculating the rate of returns based on the daily, weekly and monthly data, the researcher also computes the beta value and sorts them by alphabet name in the following tables.

Table 8: Daily beta value of 50 stocks traded on HNX from 2006 to 2016

Daily beta values 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.7910	0.8555	0.8428	**S99**	0.7502	0.1395	0.2526
BCC	0.0118	0.1639	0.1383	**SCJ**	0.0733	0.0581	0.0623
BTS	0.1395	-0.0240	0.0178	**SD5**	0.0068	0.0134	0.0097
BVS	1.6665	0.8103	0.9732	**SD6**	-0.0109	-0.0037	-0.0056
CTS	1.4929	1.3066	1.3958	**SD9**	-0.0237	0.1626	0.1268
DBC	0.4173	0.2510	0.2968	**SDA**	0.0280	0.0032	0.0076
DCS	1.7817	0.9432	1.1447	**SDT**	0.0432	0.0072	0.0147
DNP	0.0881	0.0659	0.0725	**SHB**	1.4150	0.9855	1.1522
DST	0.0920	0.1071	0.1014	**SHN**	1.4688	1.5127	1.4985
HJS	0.1087	0.0572	0.0712	**SHS**	1.9652	1.2919	1.5916
HLC	0.0498	-0.0731	0.0242	**TC6**	0.0430	-0.0395	-0.0108
HNM	0.6354	-0.0407	0.0923	**TCS**	0.1077	0.0053	0.0556
HOM	0.0711	0.0506	0.0635	**TDN**	-0.0706	-0.1486	-0.0993
HUT	1.7827	0.7613	1.0449	**THT**	-0.0272	-0.0354	-0.0296
NBC	-0.0860	-0.0392	-0.0482	**TKU**	-0.1113	-0.0073	-0.0511
NTP	0.0436	-0.0125	0.0020	**TNG**	0.6703	-0.0348	0.1375
PGS	1.3041	1.1256	1.1652	**VC3**	0.2960	0.0768	0.2231
PLC	0.9126	0.1308	0.2810	**VCG**	1.8732	1.2809	1.4536
POT	-0.0472	-0.0837	-0.0724	**VCS**	0.7350	-0.0668	0.1630
PVC	1.5113	1.1110	1.2063	**VGS**	1.7335	1.2392	1.4118
PVE	-0.0691	0.0670	0.0378	**VIG**	1.5858	1.3474	1.4752
PVG	0.0000	0.0565	0.0343	**VIX**	0.7257	-0.1231	0.5307
PVI	0.2389	0.0047	0.0596	**VNR**	0.0835	-0.0191	0.0031
PVS	1.4138	1.1063	1.1754	**VTV**	0.0674	-0.0316	-0.0086
PVX	1.9253	1.3587	1.6208	**WSS**	1.4904	1.3673	1.4439

From the table 8, overall, there are about 10% - 15% of daily beta values negative, thus, not all stocks move in the same direction with the HNX market. Moreover, there

are one tenth of stocks with the daily beta values greater than 1 and they are more volatile than this market.

Table 9: Daily beta value of 50 stocks traded on HOSE from 2006 to 2016

Daily beta values 50 stocks traded on HOSE from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
AGR	1.1291	0.9373	1.0549	**LGC**	-0.0237	-0.0228	-0.0222
BCI	-0.0766	-0.0063	-0.0391	**MSN**	0.8550	0.9824	0.9031
BHS	0.5494	0.0365	0.1691	**PAN**	-0.0131	-0.0818	-0.0408
BMI	0.6567	0.0689	0.2208	**PET**	1.1148	1.2129	1.1833
BVH	1.6949	1.2402	1.4715	**PGD**	-0.0675	0.0524	-0.0189
CII	0.8593	1.0164	0.9798	**PHR**	0.0246	-0.0574	-0.0102
CSM	1.1389	1.2677	1.2011	**PNJ**	0.1709	0.0994	0.1320
CTG	1.0121	0.8578	0.9381	**PPC**	1.0887	0.8894	0.9368
DHG	0.5122	0.0147	0.1431	**PVD**	1.3104	0.9918	1.0712
DIG	1.4078	1.2437	1.3337	**PVT**	1.4475	1.1377	1.2336
DPM	0.9027	1.0936	1.0371	**RIC**	0.0242	0.0985	0.0765
DRC	1.0598	0.9644	0.9893	**SBT**	0.6367	0.9236	0.8343
DXG	1.2354	0.0486	0.7882	**SGT**	-0.2165	-0.1024	-0.1558
EIB	0.6234	0.5858	0.6058	**SJS**	0.5715	0.1442	0.2444
FPT	0.8525	1.0609	1.0080	**SSI**	1.3051	1.0253	1.0972
HAG	1.3095	1.0509	1.1568	**STB**	0.7403	0.9418	0.8940
HAI	0.4294	-0.0925	0.0603	**TSC**	0.3599	0.1573	0.2178
HBC	1.0042	0.2076	0.4142	**TTF**	0.7601	0.3714	0.4932
HCM	1.4044	1.3119	1.3557	**VCB**	1.1474	-0.0524	0.5671
HPG	1.2426	1.1046	1.1468	**VHC**	0.3779	0.0858	0.1885
HSG	1.3333	1.2018	1.2560	**VHG**	0.8339	-0.0200	0.2459
HT1	0.5893	0.2948	0.3881	**VIC**	0.6188	0.0756	0.3896
HVG	1.0140	0.9135	0.9744	**VNE**	0.9682	0.0344	0.3086

ITA	1.4184	1.0695	1.1560	**VNM**	0.7204	0.0081	0.1623
KBC	1.4373	0.3487	0.6748	**VTO**	0.8515	0.0430	0.2848

The number of negative daily beta value in the table 9 is smaller than that in the table 8 and there are more stocks with the daily beta value bigger than 1. This means selected stocks traded on HOSE seem to be more volatile than the HOSE market.

4.2.2. Weekly beta values of individual stocks

Table 10: Weekly beta value of 50 stocks traded on HNX from 2006 to 2016

Weekly beta values 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.7975	0.8939	0.8769	**S99**	0.8311	0.0045	0.1320
BCC	0.9724	0.6124	0.6724	**SCJ**	0.2204	0.3040	0.2862
BTS	0.2927	0.0072	0.0628	**SD5**	-0.1069	-0.0813	-0.0874
BVS	1.5764	1.1486	1.2159	**SD6**	0.0996	-0.1251	-0.0880
CTS	1.5774	1.2844	1.4162	**SD9**	0.0505	0.3144	0.2707
DBC	0.7173	0.8806	0.8438	**SDA**	-0.0963	0.1453	0.1041
DCS	1.8632	0.9440	1.1135	**SDT**	-0.0884	0.0611	0.0352
DNP	-0.2210	0.1232	0.0493	**SHB**	1.3883	0.9304	1.0740
DST	-0.1679	-0.0585	-0.0603	**SHN**	1.8096	1.7976	1.7893
HJS	0.2344	0.0604	0.0943	**SHS**	1.9523	1.3618	1.6023
HLC	-0.0442	-0.0533	-0.0447	**TC6**	-0.0839	0.2204	0.1363
HNM	0.6659	0.0688	0.1730	**TCS**	0.0799	0.1603	0.1165
HOM	0.0397	-0.0446	0.0021	**TDN**	-0.0175	-0.3468	-0.1727

HUT	1.7522	0.8825	1.0720	**THT**	-0.0708	0.0121	-0.0159
NBC	0.0156	-0.0417	-0.0343	**TKU**	-0.2893	0.1305	-0.0384
NTP	0.0051	0.0575	0.0536	**TNG**	0.8750	0.2685	0.3849
PGS	1.1230	1.0614	1.0714	**VC3**	0.3881	0.5239	0.4793
PLC	0.8975	0.3621	0.4510	**VCG**	2.0264	1.4677	1.5994
POT	-0.2363	-0.0939	-0.1125	**VCS**	0.4311	-0.1813	-0.0336
PVC	1.4751	1.2218	1.2668	**VGS**	1.6658	1.3367	1.4330
PVE	0.7800	0.3099	0.4005	**VIG**	1.8674	1.5238	1.6870
PVG	-0.1338	0.2234	0.1166	**VIX**	0.7245	-0.1123	0.5268
PVI	0.0830	0.0456	0.0530	**VNR**	0.3120	0.0255	0.0748
PVS	1.3753	1.0364	1.0976	**VTV**	0.1759	-0.0964	-0.0474
PVX	1.9130	1.3193	1.5641	**WSS**	1.5563	1.5137	1.5295

Table 11: Weekly beta value of 50 stocks traded on HOSE from 2006 to 2016

Weekly beta values 50 stocks traded on HOSE from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
AGR	1.1232	0.9704	1.0629	**LGC**	-0.2816	-0.1325	-0.1618
BCI	-0.1561	-0.0258	-0.0755	**MSN**	0.8907	1.0225	0.9313
BHS	0.7131	0.0528	0.1870	**PAN**	0.1743	-0.3870	-0.0996
BMI	0.6927	0.3185	0.4025	**PET**	1.1066	1.2416	1.2112
BVH	1.8417	1.2626	1.5286	**PGD**	-0.0717	-0.0353	-0.0490
CII	0.8334	1.1444	1.0808	**PHR**	0.0392	-0.0607	0.0179
CSM	1.2922	1.2913	1.3054	**PNJ**	0.2324	-0.0045	0.0853
CTG	0.8940	0.7503	0.8192	**PPC**	1.0196	0.9733	0.9918
DHG	0.6257	0.3193	0.3831	**PVD**	1.4178	1.0531	1.1242

DIG	1.6734	1.5700	1.6229	**PVT**	1.5155	1.1017	1.2039
DPM	0.7245	1.0219	0.9557	**RIC**	0.1398	0.2330	0.2151
DRC	1.1210	1.1323	1.1304	**SBT**	0.7850	0.8801	0.8583
DXG	1.3192	0.4805	0.9967	**SGT**	0.0790	-0.1535	-0.0569
EIB	0.6698	0.5100	0.5910	**SJS**	0.2075	0.2385	0.2320
FPT	0.8386	1.0163	0.9806	**SSI**	1.2349	1.2544	1.2525
HAG	1.5318	1.0305	1.2039	**STB**	0.6574	0.8757	0.8344
HAI	0.3317	-0.0729	0.0192	**TSC**	0.4247	0.2517	0.2954
HBC	1.0763	0.6584	0.7487	**TTF**	0.7888	1.0448	0.9946
HCM	1.3521	1.4339	1.4016	**VCB**	1.3006	0.3207	0.9047
HPG	1.2946	1.1213	1.1634	**VHC**	0.3105	0.2418	0.2639
HSG	1.5245	1.4692	1.4889	**VHG**	0.8853	-0.1389	0.1021
HT1	1.0544	0.6912	0.7885	**VIC**	0.6739	0.4948	0.5229
HVG	1.0596	0.8309	0.9613	**VNE**	1.2460	0.5618	0.7194
ITA	1.6781	1.1566	1.2552	**VNM**	0.6410	0.4981	0.5213
KBC	1.8785	0.3453	0.6832	**VTO**	1.0161	0.5037	0.6262

According to the table 10 and 11, almost weekly beta values are positive and about 50% of them greater than 1.

4.2.3. Monthly beta values of individual stocks

Table 12: Monthly beta value of 50 stocks traded on HNX from 2006 to 2016

Monthly beta values 50 stocks traded on HNX from 2006 to 2016							
Tickets	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**	**Tickets**	**Period 2012 - 2016**	**Period 2006 - 2011**	**Overall**
ACB	0.7892	0.8959	0.8790	**S99**	1.1098	1.6318	1.5166
BCC	1.1963	0.7988	0.8718	**SCJ**	0.2148	1.0292	0.7497

BTS	0.3683	-0.3495	-0.1690	**SD5**	0.5194	-0.3786	-0.2112
BVS	1.5283	1.4061	1.4216	**SD6**	0.6597	1.3701	1.2201
CTS	1.3740	0.8285	1.1305	**SD9**	1.1734	1.6791	1.5742
DBC	0.7112	1.0473	0.9602	**SDA**	0.0180	-0.3661	-0.2969
DCS	1.9288	1.4764	1.5478	**SDT**	0.3843	-0.2040	-0.0703
DNP	0.4069	-0.3962	-0.1163	**SHB**	1.4109	0.9880	1.1691
DST	-0.2939	0.7461	0.1877	**SHN**	3.4049	2.8769	3.0543
HJS	-0.2720	0.1934	0.0837	**SHS**	2.1776	1.1380	1.6609
HLC	0.0394	-1.3991	-0.0788	**TC6**	-0.2596	0.1321	-0.0073
HNM	1.1970	0.3887	0.5567	**TCS**	0.0649	0.6098	0.2829
HOM	0.1711	-0.0304	0.1315	**TDN**	-0.0601	-0.5013	-0.2472
HUT	1.7791	1.2507	1.3980	**THT**	-0.1848	-0.2388	-0.2256
NBC	0.1010	-0.2912	-0.1976	**TKU**	-0.5850	0.2435	-0.1412
NTP	-0.0966	0.0753	0.0283	**TNG**	1.0014	1.0862	1.0529
PGS	1.1538	1.2981	1.2264	**VC3**	0.6031	1.4738	0.9978
PLC	0.7067	0.9688	0.9132	**VCG**	1.9924	1.6374	1.7339
POT	0.1477	-0.1741	-0.1124	**VCS**	0.5429	-0.1064	0.0914
PVC	1.5053	1.5870	1.5409	**VGS**	1.6711	1.5463	1.5836
PVE	1.1319	0.9556	0.9862	**VIG**	1.9701	1.3060	1.6482
PVG	1.0248	1.2525	1.1520	**VIX**	1.3181	0.0508	1.1828
PVI	0.2974	0.6044	0.5347	**VNR**	-0.1682	0.1089	0.0562
PVS	1.3595	1.1146	1.1672	**VTV**	0.1532	-0.0778	-0.0283
PVX	2.1901	0.9121	1.5353	**WSS**	1.5226	1.8606	1.5645

Table 13: Monthly beta value of 50 stocks traded on HOSE from 2006 to 2016

Monthly beta values 50 stocks traded on Hose from 2006 to 2016

Tickets	Period 2012 - 2016	Period 2006 - 2011	Overall	Tickets	Period 2012 - 2016	Period 2006 - 2011	Overall
AGR	1.4509	0.8581	1.2903	**LGC**	0.0295	-0.1584	-0.1349
BCI	-0.3039	-0.0425	-0.0725	**MSN**	0.8170	1.4761	0.9556
BHS	0.4563	0.4657	0.4749	**PAN**	0.0880	-0.2713	-0.0013
BMI	0.8525	1.0481	1.0266	**PET**	1.1094	1.4300	1.3612
BVH	2.3431	1.3552	1.9045	**PGD**	0.4768	-0.0023	0.3507
CII	1.1039	1.1115	1.1056	**PHR**	0.1563	0.0828	0.1212
CSM	1.4310	1.5179	1.5228	**PNJ**	-0.2107	0.1235	0.0486
CTG	0.9067	0.6683	0.7925	**PPC**	1.0158	1.1666	1.1481
DHG	0.4226	0.3208	0.3519	**PVD**	1.1893	1.0084	1.0447
DIG	1.6317	1.7151	1.7179	**PVT**	1.3871	0.8848	1.0229
DPM	0.8376	0.9309	0.9167	**RIC**	0.1157	0.1998	0.2027
DRC	1.3707	1.6294	1.5799	**SBT**	0.6349	0.9454	0.8721
DXG	1.3759	0.5692	1.1608	**SGT**	-0.1050	-0.6537	-0.3664
EIB	0.5898	0.7365	0.6509	**SJS**	1.2660	1.2474	1.2452
FPT	1.0339	0.8403	0.8841	**SSI**	1.4138	1.3546	1.3630
HAG	1.2759	0.8787	1.0236	**STB**	0.7051	0.9088	0.8811
HAI	0.3063	0.1472	0.1954	**TSC**	0.4133	1.0069	0.9001
HBC	1.2741	0.6158	0.7398	**TTF**	1.3341	1.0501	1.1383
HCM	1.5852	1.4196	1.5401	**VCB**	1.1802	0.4484	0.7987
HPG	1.1761	1.1343	1.1555	**VHC**	0.3369	0.3049	0.3087
HSG	1.5497	2.0036	1.8306	**VHG**	1.5148	0.9421	1.1029
HT1	1.2492	0.4896	0.7017	**VIC**	0.6672	0.7152	0.6760
HVG	0.9074	1.1947	1.1281	**VNE**	1.1873	1.2025	1.1911
ITA	1.9288	1.3127	1.4192	**VNM**	0.4679	0.7401	0.7099
KBC	1.8983	0.9253	1.1523	**VTO**	1.1193	0.7015	0.8125

When comparing the results from table 12 and 13, the researcher finds out that in the HNX market, there are more stocks that do not move the same direction with the market while in the HOSE market, selected stocks seem to be more volatile than this market.

4.3. Examination of relationship between individual stocks' beta and actual returns

After calculating the value of rate of returns and beta based on daily, weekly and monthly data, the research explores the relationship between these two variables by testing 18 linear regressions.

The following table address the summary of these tests, including values of the slope of the equation (3) and the P-values.

Table 14. Results of Slopes and P-values

	HNX market				HOSE market			
		Period 2012-2016	Period 2006-2011	Overall		Period 2012-2016	Period 2006-2011	Overall
Daily	Slope	-0.0002	-0.0008	-0.0005	Slope	0.0001	-0.0001	-0.0001
	P-value	9.40%	1.43%	0.05%	P-value	76.91%	76.04%	54.78%
Weekly	Slope	-0.0023	0.0038	-0.0009	Slope	-0.0016	0.0024	-0.0004
	P-value	47.58%	55.24%	77.04%	P-value	63.72%	67.23%	88.43%
Monthly	Slope	-0.0006	-0.0029	-0.0016	Slope	0.0015	0.0004	0.0007
	P-value	69.62%	35.62%	42.78%	P-value	9.43%	82.88%	41.59%

Acccording to the table 14 above, 16 of 18 tests have the P-value greater than 5%. In particular, more than 50% of tests have significant value bigger than 54%. There are only two slope values with the P-value smaller than 5% which are highlighted in the the table (P-value = 1.43% and P-value = 0.05. At 5% level of significance, only two slope are expected to significant. Thus, the researcher is able to reject the Hypothesis

H1, H2 and H3. Moreover, almost values of the slope is negative. This also strengthens that the relationship between risks and returns is not positive linear.

4.4. Discussion

This paper investigates the relationship between actual returns and risk of individual stocks traded on Vietnamese market based on daily, weekly and monthly data. This relation is determined by the application of the simple linear regression tests. Based on the results and previous studies, researcher will be able to explore the implications. This part aims to address and discuss those implications.

At the 5% significance level, the thesis has been able to reject all the hypotheses. Due to this, the researcher has claimed that there is no significant relationship between beta and actual returns of a stocks in Vietnamese context. This means the CAPM model is not valid in Vietnamese stock market. The results seem to support the previous findings of Fama and MacBeth (1992, 1993 and 1995) and Reinganum (1981), who also rejected the validity of the CAPM. And yet, the results of this studies also seem to be in line with those of tests of Guo (2011).

However, the results of this thesis is aftected by many factors such as macroeconomic elements. Those factors could lead to a different results if the researcher uses other methods. Hence, the findings of this paper is only true when researchers using this process, the linear regression and the selected samples.

In particular, one of the factors that affect the results is the fact that Vietnam has a young stock market, which has founded for less than 20 years. This young market are also volatile since the number of stocks traded on are small. Only about 700 stocks traded on this market nowadays. This is a very small number compared to other stock markets such as U.S. market or European security market. Because of this fluctuation, it is more difficult toe estimate the rate of return or/and the relationship between risks and returns (Nguyen, 2012). Therefore, applying the financial model CAPM into Vietnamese market is not easy for both researchers and investors.

5. CONCLUSIONS

5.1. Main Findings

This thesis rejects the null hypothesis and addresses that the relationship between beta and actual returns is not positive linear. In particular, all three testing hypotheses are rejected at the 5% level of significance. Therefore, the research concludes that the CAPM model is not valid in Vietnamese stock market in the period from 1st January 2006 to 31st December 2016.

5.2. Implications for International Business

Nowadays, in the 21st century the Vietnamese security market has become a growing market; thus, applying financial models such as CAPM into selecting and evaluating securities it is still necessary. Examining this model in Vietnam in the future might bring different results. It is necessary for financial investors to explore whether the CAPM still works well in Vietnamese market in the future. Therefore, testing the accuracy of CAPM still turns into essential.

5.3. Limitation and suggesttions for further researches

To ensure readers thoroughly understanding the impact of results in sections above, this part will address certain limitations of the thesis. Then, the suggestions for further researches will also included in order to achieve more useful results in the future.

First and foremost, the sample of the test iss limited of the quantity of stocks and number of years trading. There are only 100 stocks chosen in two Vietnamese stock markets: HOSE and HNX while more 800 potential stocks are traded on these markets nowadays. Regarding to the methodology section, the research aims to focus on merely stocks continually traded from the beginning of 2006 to the end of 2016. However, the sample of 100 stocks is only represent a small fraction of those

stocks that meet these standards. Not only so, the selected periods are considered not to be long because Vietnamese stock market has established founded for the short duration. This leads to the issue that the sample could not represent the whole market in the long run. Thus, in order to depict the target population, future research should collect more representative results by extending there sample.

Secondly, the scope of the test is also restricted since this thesis merely focuses on the relationship between returns and risks when examining the validity of the CAPM, which is one the CAPM's assumptions. Due to this, the test only explore one of the aspects of this model. Hence, future studies can attempt extending their scopes to achieve more comprehensive results.

Lastly, the study's scope is narrowed down because of time limitation. There wasn't enough time to select more stocks and conduct more tests, which would have enhanced the results to a great extent. Thus, future studies, if possible, should spend more time to collect data. Researchers can use more technological tools such as SPSS and Eviews when analysing data. Doing so would help researchers save more times and produce more comprehensive results.

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7. APPENDICES

Appendice 1: Testing relationship between daily returns and beta on HOSE market

a. Period 2012-2016

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.042578
R Square	0.001813
Adjusted R Square	-0.01898
Standard Error	0.000674
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3.97E-08	3.97E-08	0.087178	0.76907
Residual	48	2.18E-05	4.55E-07		
Total	49	2.19E-05			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*
Intercept	0.000855	0.000188	4.552544	3.63E-05	0.000477	0.001232	0.000477
X Variable 1	5.92E-05	0.0002	0.295259	0.76907	-0.00034	0.000462	-0.00034

b. Period 2006-2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.044229
R Square	0.001956
Adjusted R Square	-0.01884
Standard Error	0.001058
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1.05E-07	1.05E-07	0.094084	0.760375
Residual	48	5.38E-05	1.12E-06		
Total	49	5.39E-05			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*

Intercept	-0.00034	0.000218	-1.57239	0.122429	-0.00078	9.54E-05	-0.000
X Variable 1	-9E-05	0.000295	-0.30673	0.760375	-0.00068	0.000503	-0.000

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.087039
R Square	0.007576
Adjusted R Square	-0.0131
Standard Error	0.00055
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1.11E-07	1.11E-07	0.366411	0.547819
Residual	48	1.45E-05	3.03E-07		
Total	49	1.46E-05			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.000434	0.00013	3.333204	0.00166	0.000172	0.000695	0.000172	0.000695
X Variable 1	-1E-04	0.000165	-0.60532	0.547819	-0.00043	0.000231	-0.00043	0.000231

d.

Appendice 2: Testing relationship between monthly returns and beta on HOSE market

a. Period 2012-2016

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.239191
R Square	0.057213
Adjusted R Square	0.037571
Standard Error	0.003268
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*

Regression	1	3.11E-05	3.11E-05	2.912853	0.094339
Residual	48	0.000513	1.07E-05		
Total	49	0.000544			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.004035	0.000888	4.543665	3.74E-05	0.002249	0.00582	0.002249	0.00582
X Variable 1	0.00149	0.000873	1.706708	0.094339	-0.00027	0.003245	-0.00027	0.003245

b. Period 2006-2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.031365
R Square	0.000984
Adjusted R Square	-0.01983
Standard Error	0.007104
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.39E-06	2.39E-06	0.047268	0.82881
Residual	48	0.002422	5.05E-05		
Total	49	0.002425			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.00201	0.001626	-1.23892	0.2214	-0.00528	0.001255	-0.00528	0.001255
X Variable 1	0.000429	0.001975	0.217411	0.82881	-0.00354	0.004401	-0.00354	0.004401

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.117626
R Square	0.013836
Adjusted R Square	-0.00671
Standard Error	0.002882
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	5.6E-06	5.6E-06	0.673441	0.415912
Residual	48	0.000399	8.31E-06		
Total	49	0.000404			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.001882	0.000728	2.584711	0.012842	0.000418	0.003345	0.000418	0.003345
X Variable 1	0.000683	0.000833	0.820634	0.415912	-0.00099	0.002357	-0.00099	0.002357

d.

Appendice 1: Testing relationship between weekly returns and beta on HOSE market

a. Period 2006-2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.061317
R Square	0.00376
Adjusted R Square	-0.017
Standard Error	0.022008
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	8.77E-05	8.77E-05	0.181152	0.672288
Residual	48	0.02325	0.000484		
Total	49	0.023338			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.00237	0.005575	-0.42546	0.672404	-0.01358	0.008838	-0.01358	0.008838
X Variable 1	0.002419	0.005683	0.425619	0.672288	-0.00901	0.013845	-0.00901	0.013845

b. Period 2012-2016

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.068344
R Square	0.004671
Adjusted R Square	-0.01607
Standard Error	0.013885
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	4.34E-05	4.34E-05	0.225256	0.637217
Residual	48	0.009254	0.000193		
Total	49	0.009297			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.015708	0.003734	4.206631	0.000113	0.0082	0.023217	0.0082	0.023217
X Variable 1	-0.0016	0.003382	-0.47461	0.637217	-0.0084	0.005194	-0.0084	0.005194

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.021103
R Square	0.000445
Adjusted R Square	-0.02038
Standard Error	0.011269
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.72E-06	2.72E-06	0.021386	0.884344
Residual	48	0.006095	0.000127		
Total	49	0.006098			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009812	0.003133	3.131495	0.00296	0.003512	0.016111	0.003512	0.016111
X Variable 1	-0.00045	0.003069	-0.14624	0.884344	-0.00662	0.005722	-0.00662	0.005722

d.

Appendice 1: Testing relationship between daily returns and beta on HNX market

a. Period 2012-2016

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.239434
R Square	0.057329
Adjusted R Square	0.03769
Standard Error	0.000664
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1.29E-06	1.29E-06	2.919135	0.093995
Residual	48	2.12E-05	4.41E-07		
Total	49	2.24E-05			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.001252	0.000125	10.02005	2.37E-13	0.001001	0.001503	0.001001	0.001503
X Variable 1	-0.00023	0.000132	-1.70855	0.093995	-0.00049	3.99E-05	-0.00049	3.99E-05

b. Period 2006 – 2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.344522
R Square	0.118695
Adjusted R Square	0.100335
Standard Error	0.001192
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	9.19E-06	9.19E-06	6.464713	0.014284
Residual	48	6.82E-05	1.42E-06		
Total	49	7.74E-05			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.00012	0.000205	-0.60773	0.546231	-0.00054	0.000288	-0.00054	0.000288
X Variable 1	-0.00078	0.000309	-2.54258	0.014284	-0.0014	-0.00016	-0.0014	-0.00016

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.47161
R Square	0.222416
Adjusted R Square	0.206216
Standard Error	0.000528
Observations	50

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3.82E-06	3.82E-06	13.72966	0.000546
Residual	48	1.34E-05	2.78E-07		
Total	49	1.72E-05			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000779	9.5E-05	8.202633	1.09E-10	0.000588	0.00097	0.000588	0.00097
X Variable 1	-0.00047	0.000127	-3.70536	0.000546	-0.00073	-0.00022	-0.00073	-0.00022

d.

Appendice 1: Testing relationship between monthly returns and beta on HNX market

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.056605
R Square	0.003204
Adjusted R Square	-0.01756
Standard Error	0.008094
Observations	50

ANOVA

	df	SS	MS	F	Significance F

Regression	1	1.01E-05	1.01E-05	0.154294	0.696204
Residual	48	0.003145	6.55E-05		
Total	49	0.003155			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.007012	0.001535	4.567407	3.46E-05	0.003925	0.010099	0.003925	0.010099
X Variable 1	-0.00061	0.001548	-0.3928	0.696204	-0.00372	0.002504	-0.00372	0.002504

b. Period 2006-2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.133277
R Square	0.017763
Adjusted R Square	-0.0027
Standard Error	0.012551
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000137	0.000137	0.868034	0.356163
Residual	48	0.007561	0.000158		
Total	49	0.007698			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.003172	0.002283	1.38929	0.171156	-0.00142	0.007763	-0.00142	0.007763
X Variable 1	-0.00286	0.003067	-0.93168	0.356163	-0.00902	0.003309	-0.00902	0.003309

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.114683
R Square	0.013152
Adjusted R Square	-0.00741
Standard Error	0.008489

Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	4.61E-05	4.61E-05	0.639724	0.427751
Residual	48	0.003459	7.21E-05		
Total	49	0.003505			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.005848	0.001583	3.694687	0.000564	0.002666	0.009031	0.002666	0.009031
X Variable 1	-0.00158	0.001969	-0.79983	0.427751	-0.00553	0.002384	-0.00553	0.002384

Appendice 1: Testing relationship between weely returns and beta on HNX market

a. Period 2012-2016

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.103191
R Square	0.010648
Adjusted R Square	-0.00996
Standard Error	0.018287
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000173	0.000173	0.516625	0.475769
Residual	48	0.016052	0.000334		
Total	49	0.016224			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.017689	0.003659	4.833797	1.42E-05	0.010331	0.025047	0.010331	0.025047
X Variable 1	-0.00226	0.00315	-0.71877	0.475769	-0.0086	0.004069	-0.0086	0.004069

b. Period 2006-2012

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.086054
R Square	0.007405
Adjusted R Square	-0.01327
Standard Error	0.036101
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000467	0.000467	0.358103	0.552375
Residual	48	0.062557	0.001303		
Total	49	0.063024			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.00047	0.00668	-0.07091	0.943761	-0.0139	0.012957	-0.0139	0.012957
X Variable 1	0.003785	0.006325	0.598417	0.552375	-0.00893	0.016501	-0.00893	0.016501

c. Overall

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.042317
R Square	0.001791
Adjusted R Square	-0.01901
Standard Error	0.016845
Observations	50

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.44E-05	2.44E-05	0.086109	0.770448
Residual	48	0.01362	0.000284		
Total	49	0.013645			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.014909	0.003363	4.433152	5.39E-05	0.008147	0.021671	0.008147	0.021671
X Variable 1	-0.00093	0.003166	-0.29344	0.770448	-0.00729	0.005437	-0.00729	0.005437