

**THE PERFORMANCE OF INITIAL PUBLIC OFFERINGS:  
THE THAI STOCK MARKETS EVIDENCE**

By

**WISARUT WIKYANONT**

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Assumption University  
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# TABLE OF CONTENTS

<b>TABLE OF CONTENTS .....</b>	<b>i</b>
<b>LIST OF TABLES .....</b>	<b>iii</b>
<b>CHAPTER I – GENERALITIES OF THE STUDY .....</b>	<b>1</b>
1.1 Background of the Study .....	1
1.2 Statement of the Problem .....	2
1.3 Research Objectives .....	3
1.4 Research Questions.....	3
1.5 Scope of the Research.....	4
1.6 Limitations of the Research.....	4
1.7 Significance of the Study.....	4
1.8 Definition of Terms .....	5
<b>CHAPTER II - REVIEW OF RELATED LITERATURE AND STUDIES.....</b>	<b>7</b>
2.1 Theories Related to Initial Public Offerings (IPOs) .....	7
2.1.1 The Efficient Market Theory.....	7
2.1.2 The Adverse Selection Theory and Winner’s Curse.....	8
2.2 Empirical Evidences on the Performance of IPOs .....	8
2.3 Empirical Evidences on the Factors Related to the IPOs Performance.....	12
2.3.1 Age of the Company .....	12
2.3.2 Size of the Company .....	12
<b>CHAPTER III – RESEARCH METHODOLOGY .....</b>	<b>14</b>
3.1 Research Hypotheses.....	14
3.2 Data Collection .....	15
3.3 Methodology.....	16
3.3.1 Underpricing.....	16
3.3.2 Long-Term Performances .....	16
3.3.3 Cross-Sectional Analysis .....	18

<b>CHAPTER IV – PRESENTATION AND DISCUSSION OF RESULTS .....</b>	<b>20</b>
4.1 Data Description and Characteristic .....	20
4.2 Underpricing .....	22
4.3 Long-Term Performances .....	24
4.4 Cross-Sectional Analysis .....	27
<b>CHAPTER V – SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>32</b>
5.1 Summary of Results and Conclusions .....	32
5.2 Implications .....	33
5.3 Further Study .....	34
<b>BIBLIOGRAPHY .....</b>	<b>35</b>
<b>APPENDICES .....</b>	<b>37</b>

## LIST OF TABLES

Tables	Page No.
2.2	Empirical Evidences for Short- and Long-Terms Returns ..... 11
2.3	Empirical Evidences on the Factors Related to the IPOs Performance ..... 13
3.1	Lists of Research Hypotheses ..... 15
3.3	Summary of Explanatory and Measures of Variables ..... 19
4.1	Number of IPOs Listed on SET and MAI During 2004-2012 & Issued Size ..... 20
4.2	Number of IPOs Categorized by Age of the Company Before Listing ..... 21
4.3	Characteristic of Independent Variables ..... 22
4.4	Initial Returns for IPOs Listed on SET and MAI in 2004-2012 Categorized by Issuance Year ..... 23
4.5	Summary of Hypotheses Testing for Underpricing during 2004-2012 ..... 23
4.6	Buy-and-Hold Adjusted Returns for IPOs Listed on SET and MAI in 2004-2012 ..... 25
4.7	Summary of Hypotheses Testing for Long-Term Performances ..... 26
4.8	Pearson Correlation Matrix of Independent Variables ..... 28
4.9	Results of Multiple Regression between Long-Term Performances of IPOs and Age & Issue Size ..... 29
4.10	Summary of Hypotheses Testing for Cross-Sectional Analysis ..... 30

# CHAPTER I – GENERALITIES OF THE STUDY

## 1.1 Background of the Study

The economic growth of the many countries mostly related to the development of the financial markets. Many companies can take advantages from various types of financial instrument in the financial market, such as bonds, stocks, or derivatives, in order to explore their business opportunities or to raise additional fund from both domestic and international investor for their future growth. Capital market, one type of financial market, plays a significant role in supporting economic growth of the countries. A very interesting and famous activity for the company to achieve these is to issue its stock for the first time in the capital market or what is called “Initial Public Offerings” (IPOs).

There are numerous international researches and studies about the performance of IPOs both in developed countries such as the United States of America (Ritter, 1991), Spain (Alvarez & Gonzalez, 2001), and the United Kingdom (Levis, 1993; Brennan & Franks, 1997), or even in emerging and developing countries such as China (Chan, Wang & Wei, 2004), Sri Lanka (Peter, 2007), countries in most of South East Asia (Lee, Taylor & Walter, 1996; Connelly, Limpaphayom & Siraprasiri, 2004; Kim, Kitsabunnarat & Nofsinger, 2004; Chorruk & Worthington, 2009), countries in Eastern Europe, the Middle East (Ewing & Ozfidan, 2003), and Latin America (Aggarwal, Leal & Hernandez, 1993). These international evidences have focused on two anomalies, the underpricing of the stock in the short-run and the underperformance of the stock in the long-run. (Ritter, 1991). Regarding the underpricing of the stock, the IPOs are set to offer at lower price in order to create the higher initial returns on the first trading day, that is outperformed the market. For the long-run underperformance, the returns of the IPOs seems to be decreased significantly, or giving negative returns, after holding for longer period of one to three years. These previous studies are mainly concerned in the U.S., European countries, and even some of emerging countries such as China or Latin America. This paper could shed some light on the underpricing and long-term performance of IPOs in Thailand along with the relationship between different variables and the abnormal returns of IPOs.

## **History of Thai Stock Markets**

In Thailand, there are two secondary markets for Thai companies to raise additional funds by launching IPOs i.e. the Stock Exchange of Thailand (SET) and the Market for Alternative Investment (MAI).

Initially, the inception of Thai stock market was established as limited partnership in July 1962 by a private group. Such group then transformed to be a limited company and changed the name of Thai stock market to be the Bangkok Stock Exchange Co., Ltd. (BSE) in 1963. Out of luck, the BSE ceased its operation in the early of 1970s because of no official support from the government together with a limited number of investor recognizing about the capital market.

Subsequently in 1972, Thai government had recognized a fair and disciplinary of the securities market and would like to take controls and regulations against the operation of finance and securities companies. Additionally, they would like to raise funds in order to support industrialization and economic development. Thus, they had established the Securities Exchange of Thailand in May 1974 started trading on April 30, 1975, and changed its name to the Stock Exchange of Thailand (SET) on January 1, 1991 onwards.

For the Market for Alternative Investment (MAI), it was established on November 11, 1998, with operations officially commencing on June 21, 1999 and started trading on September 17, 2011. The establishment of MAI is another step in the development of Thai capital market. The companies in MAI mainly are young, high-growth, innovative and knowledge-based small-and-medium enterprises (SMEs). The purposes of incepting MAI market are to provide opportunities for the companies with innovation or high growth potential to raise funds for their business expansion, along with provide a wide range of investment choices to investors.

### **1.2 Statement of the Problem**

In the year 2015, the ASEAN Economic Community (AEC) will be fully established. The countries in the AEC are composed of ten countries in the South East Asian region including Thailand, Indonesia, Malaysia, Singapore, Philippines, Brunei, Vietnam, Laos, Myanmar, and Cambodia. Thailand, as an emerging market, can take benefits from trading among these countries as it was located in the center of the region. This can significantly lead to the country's

economy development. Therefore, many firms have to prepare themselves for the business expansion once the AEC is fully established. Consequently, they need to finance their companies through the capital markets by issuing their stocks to the public in order to acquire additional funds to support their business expansion. This makes the IPOs activities become more popular.

However, the concern about the IPOs activities is how the performances of those stocks are after become public and are there any factors that could influence its performances. The availability study about performance of IPOs listed on MAI market is also limited. Hence, this study will provide the latest evidence about the performance of Thai IPOs firms both listed on SET and MAI. Additionally, this study does not only seek to answer whether the underpricing exist in Thailand and it could be served as a potential short- or long-term investment, but also tries to enlighten on any possible factors that could influence the IPOs performances.

### **1.3 Research Objectives**

The purposes of this study are:

1. To analyze whether the underpricing exist in Thai stock markets.
2. To analyze the performances of 196 IPOs of firms listed on SET and MAI markets during the year 2004-2012 applying buy-and-hold strategy for two years after listing.  
The year 2012 is the ending period of the study in order to achieve two years performance in 2014, in which provides the recent results to the current date.
3. To determine the relationship using cross-sectional analysis between the performances of IPOs with respect to two different variables including the age of the company and the IPOs size, and then compare the result between stocks listed on SET and MAI markets.

### **1.4 Research Questions**

The research questions are:

1. Does the underpricing exist for IPOs during the period 2004-2012?
2. Does the underperformance of IPOs exist after listing on the markets for 6, 12, 18, and 24 months?

3. Do the factors including age of the company and size affect the buy-and-hold performance of IPOs?

### **1.5 Scope of the Research**

This study seeks to determine the underpricing scheme as well as the performance of the IPOs listed on SET and MAI markets along with the relationship between its performances with respect to two different variables as mentioned above. The scope of this study is to focus on IPOs listed on Thai stock markets during the year 2004-2012. The methodology of Thomadakis, Nounis, and Gounopoulos (2007), in which studied the performance of Greek IPOs during the period 1994-2002, was applied in order to achieve this study.

### **1.6 Limitations of the Research**

There are some limitations in this study. Firstly, some factors are excluded from this study such as corporate condition of the company (whether it is private-owned firms or state-owned-enterprises), market conditions, ownership concentration, and underwriters' reputation. The reason for excluding corporate condition is that most of the companies in Thailand are privately-owned firms. The number of state-owned-enterprises in Thailand during the period of study is relatively low. The available information about market conditions, ownership concentration as well as the underwriters' reputation are also limited, thereby, they have been excluded from this study. Secondly, the period of this study might reflect different results when compared to the other study of IPOs in Thailand at different period of time.

### **1.7 Significance of the Study**

The significance of this study is to provide information about IPOs in Thailand in many aspects e.g. academic and business aspects, in which it could be exemplified for future empirical studies about Thai IPOs and could be replicated for the real business.

For the academic aspect, this study provides fresh evidence whether the underpricing and the underperformance of IPOs exist in Thailand as well as analyzes the relationship between IPOs



performance with respect to two different variables. Additionally, this study also enlightens on the evidence for IPOs listed on MAI because most of the previous study in Thailand focused mainly about IPOs listed on SET market.

In the business aspect, this study provides information significantly to the investors when deciding to invest in Thai IPOs for a short- or long-term period. Furthermore, the investors can make decision to invest in Thai IPOs by considering the relationship between the two different factors and IPOs' returns.

Additionally, the issuers can also benefit from this study. They can see the performance of Thai IPOs affected by the two different factors and then make decision based on such results when they need to finance their companies through the capital markets.

## **1.8 Definition of Terms**

*Age of the company* is one of two independent variables used to test the relationship with respect to the IPOs performance in this study, in which measured by the difference between the company's offering year and the establishing year (Ritter, 1991; Kim et al., 2004).

*Buy-and-hold* is a strategy that the investor buys a stock on the first trading day and holds it until another specific point of time e.g. at the end of the sixth month. It reflects the long-term performance of the stock (Thomadakis et al., 2007).

*Information Asymmetry* is the situation where two groups of investor have unequal information, that is one group of investors has privilege over the other group of investors by having superior information (Rock, 1986).

*Initial Public Offering (IPO)* is the process in which the private company sells its share to the public for the first time. The main purpose is to increase its capital in order to expand its business.

*Performance* is the comparison between the stock return with respect to the market return for the same specific period. If the stock return is lower than the market return, this means the stock is underperform the market. In contrast, if the stock return is greater than the market, this means the stock is outperform the market.

*Size of the company* is one of two independent variables used to test the relationship with respect to the IPOs performance in this study, in which computed by multiplied the number of shares sold with the offer price, that is the issue size in million baht (Thomadakis et al., 2007; Chorruck and Worthington, 2009).

*Underpricing* is the measurement of the stocks initial return, in which calculated by the different between the offering price (the price that offer to the investors for the first time) and the closing price on the first trading day in the secondary market (Ljungqvist, 2006).

The remainder of this paper is organized in five chapters and it proceeds as follows. Following chapter one, the generalities of the study, it will be the review of the literatures about the theories relevant to IPOs as well as the evidences on the performance of IPOs in chapter two. Chapter three presents the research hypothesis, the characteristic of data and discusses the research methodology. The discussion of results will be presented in chapter four and finally conclusion will be in chapter five.

## **CHAPTER II - REVIEW OF RELATED LITERATURE AND STUDIES**

This chapter provides the review of the related literatures regarding the performance of IPOs.

### **2.1 Theories Related to Initial Public Offerings (IPOs)**

There are also many theories relevant to the performance of IPOs. In this paper, the reasons for IPOs underpricing can be explained by the following theories; the efficient market and the adverse selection theories.

#### **2.1.1 The Efficient Market Theory**

The theory of efficient market has been introduced by Fama (1970). The theory states that the current stock prices have fully reflected all available information including historical, public as well as inside information, in other words the appropriate price of the stocks is its current prices. Fama (1970) has explained three categories of the market efficiency based on the available information: weak, semi-strong, and strong forms.

Weak form is concerned about the historical information (e.g. price and volume). This means the current price of the stocks have reflected all historical information already. The result showed that the historical information has no relationship with the future stock price. Thereby, the excess returns cannot be achieved using the technical analysis.

Semi-strong form is concerned that the stock prices have fully reflected all historical information as well as the available public information. This means the current stock prices have already reflected all historical and public information. The result showed that the excess returns cannot be achieved using both technical and fundamental analysis.

Strong form is concerned that the stock prices have fully reflected historical, public and inside information. The result showed that nobody can get excess return from knowing these information.

### **2.1.2 The Adverse Selection Theory and Winner's Curse**

Rock (1986) mentioned about the adverse selection to describe the underpricing from information asymmetry in which categorized the investors into two groups; informed and uninformed investors. The assumption was the informed investors knew all information about the IPOs so they perceived to realize of good companies, avoid bad companies, and invest when the newly issued firms are underpriced. In contrast, uninformed investors cannot distinguish between good and bad companies because they had no or less of information about the companies. So, they randomly invested in the newly issued firms and especially those firms that were overpriced. The informed investors became the winners whilst the uninformed investors became the losers. This caused the problem of adverse selection between these two groups. Underpricing tended to absorb the risk of loss for the uninformed investors, in which also beneficial to those informed investors as well.

However, the winners sometime seem to be the losers, or be cursed. Thaler (1988) explained about the 'winner's curse' as the scenario that all bidders had the same information about the object they were bidding while their estimations about the bidding price were different. However, the winner of the bidding, that was the one that placed the highest price, tended to be a loser, in other words 'be cursed' because the winner paid a higher amount than the worth of the object.

### **2.2 Empirical Evidences on the Performance of IPOs**

There are a lot of researches that studied and explained about the performance of the initial public offering over times. Ritter (1991) studied the IPOs performance in U.S. by sampling 1,526 IPOs issued during 1975-1984. The study concluded that IPOs generated an average initial return of approximately 16.4%. For the long-term performance, the study measured from the first day of trading and holds the stock for three years. The result showed that these firms with similar size and industry were significantly underperformed by as much as 29.1% at the end of the third year after their listing.

Levis (1993) examined the performance of 712 newly issued stocks in United Kingdom during 1980 to 1988 by doing the same methodology as Ritter (1991) has done. The results on the initial returns and performances were also corresponded with the result done by Ritter (1991). The

consequence appeared an average positive initial return of 14.3% and whereas underperformed the market by almost 30.6% at the end of year-three after their listing.

Aggarwal, Leal, and Hernandez (1993) analyzed IPOs performances in three emerging countries in Latin American including Brazil, Mexico, and Chile, whereabouts capital markets play an significant role. The sampling consisted of 62 Brazilian IPOs issued during 1980 to 1990, 36 Chilean IPOs issued during 1982 to 1990, and 44 Mexican IPOs issued during 1987 to 1990. The results were similar to those studies in U.S and the United Kingdom. It showed that IPOs generated average initial returns of 78.5% in Brazil, 16.7% in Chile, and 2.8% in Mexico. It also showed that IPOs became underperformed by 47.0% in Brazil after three years, 23.7% in Chile after three years, and 19.6% in Mexico after one year.

Hensler, Herrera, and Lockwood (2000) also investigated differences in the performance of 68 IPOs in the Mexican market. The sample categorized into two groups, 14 bank stocks and 54 non-bank stocks. The performances outcome on day-300 after listing pointed out that the non-bank stocks underperformed the market by 21% whereas the bank stocks outperformed the market by 56%.

Some small developing market has been tested about the IPOs performance. Thomadakis, Nounis, and Gounopoulos (2007) analyzed the performance of 254 IPOs listed on Athens Stock Exchange during the period 1994-2002. The short-run performances were measured on the first trading day while the long-run performances were measured by investing in the IPOs on the offering day and on the first trading day and hold them for three years. The result showed that the average adjusted initial returns on the first trading day were 29.26%. Additionally, IPOs became underperformed the market by 1.24% if invested from the offering day while underperformed by 17.44% if invested from the end of first trading day.

There is also a study of IPOs performance in a developing country. Peter (2007) tried to investigate the returns of 30 IPOs in Sri Lanka during the period 1996-2000. The result showed that IPOs generated an average return of 14.2% in six-month period and 11.7% in 12-month period. However, if the IPOs have been bought at the first trading day and hold for three years, they became underperformed of 13.0% by the end of third years.

In Thailand, there are researches available both the evidence for the underpricing and the performance of IPOs using buy-and-hold strategy. Vithessonthi (2008) studied the performances

of 123 IPOs listed on SET during the period 2000-2005. The study concluded that the underpricing existed as the average initial returns on the first trading day was 19.97%. Moreover, the performance using buy-and-hold strategy showed that the IPOs firms underperformed the markets by 38.74% at the end of year three.

Another study from Chorruck and Worthington (2009) has also showing the consistent outcome. Chorruck and Worthington (2009) studied 136 IPOs listed on SET during the period 1997-2007 for underpricing along with its aftermarket performance. The result showed that the average initial returns were approximately 17.6%, in other words, underpricing was existed in Thai stock markets. For the aftermarket testing, the buy-and-hold strategy was applied to achieve these. The result showed that the average buy-and-hold returns were dropped to 25.39% after three years, in other words, underperformed the market. Based on these studies of Thai evidence, the underpricing was existed and the IPOs firm became underperformed the markets in the long-run.

For summary, it seems that the consequence of these previous studies appear that the IPOs are set underprice, that is outperform the market in short-run. In addition, the studies bring an insight about holding the IPOs from the first trading day until the different point of time will underperform the markets for a period one to several years, in other words, provide negative long-run returns.

Table 2.2 below is a summary of empirical evidences regarding short-term and long-term returns of IPOs.

**Table 2.2 Empirical Evidences for Short- and Long-Terms Returns**

Countries	Studies	Periods	Sample	Short-term returns	Long-term returns
Australia	Lee, Taylor, and Walter (1996)	1976-1995	381/266	12.1%	-51.0%
Austria	Ausenegg (2000)	1965-2002	83/57	6.3%	-46.5%
Brazil	Aggarwal, Leal, and Hernandez (1993)	1980-1990	62	78.5%	-47.0%
Canada	Loughran, Ritter, and Rydqvist (2006)	1971-2002	540	7.0%	-
	Kooli and Suret (2002)	1991-1998	445	-	-16.86%
Chile	Aggarwal, Leal, and Hernandez (1993)	1982-1990	36	16.7%	-23.7%
France	Loughran, Ritter, and Rydqvist (2006)	1983-2000	571/87	11.6%	-4.8%
Germany	Ljunqvist (1997)	1983-2000	545/145	31.1%	-12.1%
Greece	Thomadakis, Nounis, and Gounopoulos (2007)	1994-2002	254	-	-17.44%
Hong Kong	Loughran, Ritter, and Rydqvist (2006)	1980-2001	857	17.3%	-
	McGuinness (1993)	1980-1990	72	-	-18.3%
Hungary	Lyn and Zychowicz (2003)	1991-1998	33	15.12%	19.59%
Japan	Loughran, Ritter, and Rydqvist (2006)	1970-2001	1,689	28.4%	-
	Cai and Wei (1997)	1971-1990	172	-	-27.0%
Korea	Dhatt, Kim, and Lim (1993)	1980-1990	347	78.01%	4.64%
Malaysia	Isa and Young (2001)	1980-1998	401	104.1%	-
	Ahmad-Zaluki, Campbell, and Goodacre (2004)	1990-2000	454	-	-8.16%
Mexico	Aggarwal, Leal, and Hernandez (1993)	1987-1990	44	2.8%	-19.6%
Poland	Lyn and Zychowicz (2003)	1991-1998	103	54.45%	57.17%
Singapore	Loughran, Ritter, and Rydqvist (2006)	1973-2001	441	27%	-
	Hin and Mahmood (1993)	1976-1984	45	-	-9.2%
Spain	Ansotegui and Fabregat (2000)	1986-1998	99	10.7%	-
	Alvarez and Gonzalez (2001)	1987-1997	41	-	-24.19%
Sri Lanka	Peter (2007)	1996-2000	30	14.2%	-13.0%
Thailand	Vithessonthi (2008)	2000-2005	123	19.97%	-38.74%
	Chorruk and Worthington (2009)	1997-2007	136	17.6%	-25.39%
Turkey	Loughran, Ritter, and Rydqvist (2006)	1990-2004	282	10.8%	-
	Yilmaz and Bildik (2005)	1990-2000	234	-	-84.5%
U.K.	Loughran, Ritter, and Rydqvist (2006)	1959-2001	3,122	17.4%	-
	Levis (1993)	1980-1988	712	14.30%	-30.6%
U.S.	Loughran, Ritter, and Rydqvist (2006)	1960-2001	15,333	18.1%	-
	Loughran and Ritter (1995)	1970-1990	4,753	-	-20.0%
	Ritter (1991)	1975-1984	1,526	16.4%	-29.1%

**Source:** Adapted from Gounopoulos, Nounis and Stylianides (2007)

## **2.3 Empirical Evidences on the Factors Related to the IPOs Performance**

### **2.3.1 Age of the Company**

Age of the company before listing is a variable that could be studied in relation with the performance of the IPOs. Ritter (1991) analyzed long-term performances of 1,526 U.S. IPOs issued during 1975-1984. The study concluded that the younger the companies and the heavier volume during the year, the lower the IPOs performance than average.

Pagano, Panetta, and Zingales (1998) investigated the performance of stocks listed on the Italian Stock Exchange in relation to age of the company. The result can be summarized that the older the companies prior to go public, the better the performance. The reason underlying in their research has been explained that the older companies have more business experience than fresh companies.

Another study between age of the company and the performance was from Kim, Kitsabunnarat, and Nofsinger (2004) in which they examined the performance of 133 IPOs in the Thai Stock Exchange during 1987-1993. The result showed the positive relationship in the same way as Ritter (1991) and Pagano et al. (1998) that the older the companies, the greater the performance.

### **2.3.2 Size of the Company**

There are some evidences that studied the performance of IPOs in relation to size of the companies. Mikkelson, Partch, and Shah (1997) studied the performance of 283 U.S. IPOs during the period of 1980-1983 in relation to total asset size of these companies prior to go public. The results showed that the larger the firms' total assets, the greater the performance of these companies. Charitou and Constantinidis (2004) also examined the performance of the Japanese companies during the period of 1992-2001 in relation to their size measured by market capitalization. The results are consistent with the study done by Mikkelson et al. (1997) that the performance of firms has a strong positive relationship with their size.

In Thailand, Vithessonthi (2008) also studied the relationship of three-year performances of 123 IPOs listed on SET during the year 2000-2005 with the issue size measured by the gross proceeds. The outcome also showed the same positive relationship between the long-term returns and the issue size. Nevertheless, some evidence shows a contrast scheme. Chorrak and



Worthington (2009) studied the three-year returns of 136 IPOs listed on SET during the period 1997-2007 with the issue size of them. The result was contrasted to these aforementioned evidences. The issue size of firms had a negative relationship with the three-year returns.

Table 2.3 below is a summary of empirical evidences on the factors related to the IPOs performance.

**Table 2.3 Empirical Evidences on the Factors Related to the IPOs Performance**

<b>Factors</b>	<b>Relationship to the Adjusted Initial Returns</b>	<b>Literatures</b>
Age of the company prior to go public	Positive	Ritter (1991); Pagano, Panetta, and Zingales (1998); Kim, Kitsabunnarat, and Nofsinger (2004)
Size of the company	Positive	Mikkelson, Partch , and Shah (1997); Charitou and Constantinidis (2004); Vithessonthi (2008)
	Negative	Chorruk and Worthington (2009)

## CHAPTER III – RESEARCH METHODOLOGY

This chapter describes the details of hypotheses developed for this study, measurement of variables, data collection as well as the methodology for determining the performance of IPOs and performing cross sectional analysis between the performance of IPOs with respect to two different variables: age of the company prior to go public and the issue size of IPOs.

### 3.1 Research Hypotheses

According to the empirical evidence on the factors related to the IPOs performance as described in chapter 2, the research hypotheses have been developed in order to achieve this study.

***Underpricing:*** Based on several international and Thai evidences about the underpricing (Ritter (1991); Peter (2007); Vithessonthi (2008); Chorruck and Worthington (2009)), the average initial returns were greater than zero on the first trading day, in other words, underpricing was existed. Consequently, the research assumption regarding the underpricing of IPOs is *Hypothesis 1: The underpricing exists in Thai stock markets (initial return is greater than zero).*

***Long-term performances:*** Based on the study of Ritter (1991), Levis (1993), Aggarwal et al. (1993), Peter (2007), and Thomadakis et al. (2007), the buy-and-hold investing strategy were applied to analyzed the performances of IPOs after several years. The outcome showed that the IPOs had the negative long-term adjusted returns, in other words, underperformed the market. Consequently, the research assumption regarding the performance of IPOs is *Hypothesis 2: The IPOs are underperformed the market in the long-term.*

***Age of the company:*** Based on the examination of Ritter (1991), Pagano et al. (1998) and Kim et al. (2004) about the age of the company in relation to the firms-adjusted return, the result showed that the longer the age of the firm prior to go public, the significantly higher the firms-adjusted return. Therefore, the age of the company prior to go public has a positive relationship with the buy-and-hold performance of IPOs. Accordingly, the assumption regarding age of the company before going public is *Hypothesis 3: The older the firms before listing in the markets, the greater the long-run performance of IPOs.*

**Size of the company:** This factor can be measured in various aspects. Mikkelson et al. (1997) measured the size of the company by total asset size of these companies. Charitou and Constantinidis (2004) measured by market capitalization. Vithessonthi (2008) measured by the gross proceeds. However, all results showed that the long-term performance of those firms has a positive relationship with their sizes. In this study, the size of the company is measure by the number of shares sold multiplied by the offer price. Consequently, the research assumption regarding size of the company is *Hypothesis 4: The larger the size of the firms, the greater the long-run performance of IPOs.*

Table 3.1 below is a summary of the research hypotheses.

**Table 3.1 Lists of Research Hypotheses**

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<b>Lists of Research Hypotheses</b>
<i>Hypothesis 1: The underpricing exists in Thai stock markets (initial return is greater than zero)</i>
<i>Hypothesis 2: The IPOs are underperformed the market in the long-term</i>
<i>Hypothesis 3: The older the firms before listing in the markets, the greater the long-run performance of IPOs</i>
<i>Hypothesis 4: The larger the size of the firms, the greater the long-run performance of IPOs</i>

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### **3.2 Data Collection**

The data collected are from the database of the Stock Exchange of Thailand (SET), SET Market Analysis and Reporting Tool (SETSMART), Efinance Thai and Bualuang Securities Plc. The periods covered in this study are 9 consecutive years from 2004 to 2012. The sample includes only common stocks in the SET and MAI. Infrastructure funds, property funds, and real estate investment trusts (REITs) as well as the stocks that were delisted from the stock markets are not examined in this study.

The total number of newly issued stocks (including infrastructure funds, property funds and REITs) during the period 2004-2012 was 236 stocks which consisted of 158 stocks listed on SET and 78 stocks listed on MAI. The total number of 196 stocks (118 listed on SET while 78 listed on MAI) after deducting infrastructure & property funds and REITs was selected as sample size.

The variables used in this study (including the offering & closing prices at the period 2010-2012 of the stocks, the closing indices at the period 2010-2012 of SET and MAI markets, and the

establishing year & the offering year of the companies) are derived from the database of SETSMART and Efinance Thai, whereas the closing prices and indices for the period 2004-2009 are derived from the database of Bualuang Securities Plc. For the issuing size of the companies, it has been derived from the database of the Stock Exchange of Thailand ([www.set.or.th](http://www.set.or.th)).

### **3.3 Methodology**

#### **3.3.1 Underpricing**

To answer the first research question whether the underpricing exist for IPOs during the period 2004-2012, the methodology as suggested by Ritter (1991) and other empirical studies of Thomadakis et al. (2007), Peter (2007), and Chorruck and Worthington (2009) has been applied.

The initial stock return, which is the percentage difference between the closing price on the first trading day and the offering price, need to be calculated in order to determine the underpricing. Therefore, it can be formulated below.

$$IR_{i,1} = \frac{P_{i,1} - P_{i,0}}{P_{i,0}} \quad (1)$$

where  $IR_{i,1}$  is the initial return of stock  $i$ ;

$P_{i,1}$  is the closing price of stock  $i$  on the first trading day;

$P_{i,0}$  is the listing or offering price of stock  $i$ ;

Thereafter, the average initial returns have to be calculated and the test of t-statistic is applied to check whether the average initial returns are different from zero significantly at 95 percent level of confidence.

#### **3.3.2 Long-Term Performances**

According to Thomadakis et al. (2007) and most of the international empirical evidences (Ritter (1991); Levis (1993); Aggarwal et al. (1993); Peter (2007)), buy-and-hold strategy will be applied in determining the long-run performances of IPOs. The methodology associates with the calculation of buy-and-hold market-adjusted returns for two consecutive years assuming that IPOs are held from the first trading day until the period two-year after listing.

The period taking into consideration covers 6, 12, 18, and 24 months after listing. Assume 21 trading days per month, thereby, the following points of time will be used in calculation.

- i. The 6-month trading period after listing (126<sup>th</sup> day of trading)
- ii. The 12-month trading period after listing (252<sup>nd</sup> day of trading)
- iii. The 18-month trading period after listing (378<sup>th</sup> day of trading)
- iv. The 24-month trading period after listing (504<sup>th</sup> day of trading)

To determine the long-term performance of IPOs using buy-and-hold strategy, calculate the raw returns from the offering day and the first trading day after their listing as percentage change of price between two points of time. Then, adjust the raw returns with the market returns in order to reflect the special characteristic of the company and the fluctuation trend of the stock market. The formula (2) is used to determine the long-term performance from the offering day while the formula (3) is used to determine the long-term performance from the first trading day.

$$BHAR_{i,n} = \frac{P_{i,n} - P_{i,0}}{P_{i,0}} - \frac{Index_{m,n} - Index_{m,0}}{Index_{m,0}} \quad (2)$$

$$BHAR_{i,n} = \frac{P_{i,n} - P_{i,1}}{P_{i,1}} - \frac{Index_{m,n} - Index_{m,1}}{Index_{m,1}} \quad (3)$$

where  $BHAR_{i,n}$  is the buy-and-hold adjusted return of stock  $i$  on  $n^{\text{th}}$  day of trading;

$P_{i,n}$  is the closing price of stock  $i$  on  $n^{\text{th}}$  day of trading;

$P_{i,0}$  is the listing or offering price of stock  $i$ ;

$P_{i,1}$  is the closing price of stock  $i$  on the first trading day;

$Index_{m,n}$  is the closing index of the market (SET or MAI) on  $n^{\text{th}}$  day of trading;

$Index_{m,0}$  is the closing index of the market (SET or MAI) on the offering day;

$Index_{m,1}$  is the closing index of the market (SET or MAI) on the first trading day.

Thereafter, the test of t-statistic is applied to check whether the buy-and-hold adjusted returns are different from zero significantly at 95 percent level of confidence.

### 3.3.3 Cross-Sectional Analysis

The following step is the test of multiple regression in order to see the differences between three factors that would affect the IPOs after-market performance. The two different factors include the age of the company before listing and the size of IPOs. Details of each variable are explained below.

The after-market or long-run performance of IPOs ( $BHAR_{i,n}$ ) using buy-and-hold strategy is defined as dependent variable. According to the methodology of Thomadakis et al. (2007) and other empirical evidence of Ritter (1991), Vithessonthi (2008), Chorruck and Worthington (2009), long-run performance ( $BHAR_{i,n}$ ) were measured from the offering day and the first trading day after their listing to the two-year anniversary of their listing and then adjusted with the market return for the same period. The formulas (2) and (3) have been used to determine the long-run performance for each different period.

The two different variables that affect the performance of IPOs, the age of the company prior to go public and the size of IPOs, are defined as the independent variables. According to Ritter (1991) and Kim et al. (2004), age of the company prior to go public ( $AGE$ ) is measured by the difference between the companies' offering year and the establishing year. For the size of the IPOs ( $SIZE$ ), it is measured by the issue size in million baht (computed by multiplied the number of shares sold with the offer price) based on the works of Thomadakis et al. (2007) and Chorruck and Worthington (2009).

To determine the cross-sectional analysis, the following model has been applied.

$$BHAR_{i,n} = \beta_0 + \beta_1 AGE + \beta_2 SIZE + \mu_i \quad (4)$$

where  $BHAR_{i,n}$  is the buy-and-hold adjusted return on  $n^{\text{th}}$  day of trading;

$AGE$  is the age of the company prior to go public;

$SIZE$  is the issue size of IPOs.

For the clarification of each variable, table 3.3 below summarizes the explanation along with its measures.

**Table 3.3 Summary of Explanatory and Measures of Variables**

<b>Category</b>	<b>Abbreviation</b>	<b>Definition</b>	<b>Measures</b>
Dependent Variable	<i>BHAR<sub>i,n</sub></i>	Buy-and-hold adjusted return on n <sup>th</sup> day of trading	-
Independent Variable	<i>AGE</i>	Age of the company prior to go public	Calculated by minus the offering year with the establishing year
Independent Variable	<i>SIZE</i>	Issue size of IPOs	Calculated as the number of shares sold multiplied by the offer price

## CHAPTER IV – PRESENTATION AND DISCUSSION OF RESULTS

This chapter details the description of data along with its characteristic. Additionally, it also provides the evidences about the underpricing, the long-term performances as well as the relationship between the age and issue size with respect to the performances.

### 4.1 Data Description and Characteristic

Table 4.1 below displays the number of companies listed on SET and MAI during the period 2004-2012 and their issue size whereas table 4.2 shows the number of these companies categorized by their age prior to go public.

**Table 4.1 Number of IPOs Listed on SET and MAI During 2004-2012 & Issued Size**

Year	SET		MAI		Total	
	No. of IPOs (firms)	Issued Size (million baht)	No. of IPOs (firms)	Issued Size (million baht)	No. of IPOs (firms)	Issued Size (million baht)
2004	36	75,883.46	14	1,457.35	50	77,340.81
2005	35	30,149.31	14	1,490.03	49	31,639.34
2006	12	36,786.88	6	830.20	18	37,617.08
2007	6	10,782.50	6	769.60	12	11,552.10
2008	8	18,389.30	3	375.00	11	18,764.30
2009	6	4,852.40	11	1,316.22	17	6,168.62
2010	4	6,027.60	7	688.96	11	6,716.56
2011	3	3,793.75	7	1,160.24	10	4,953.99
2012	8	17,181.90	10	2,482.17	18	19,664.07
<b>Total</b>	<b>118</b>	<b>203,847.10</b>	<b>78</b>	<b>10,569.77</b>	<b>196</b>	<b>214,416.87</b>
<b>Average</b>	<b>13</b>	<b>22,649.68</b>	<b>9</b>	<b>1,174.42</b>	<b>22</b>	<b>23,824.10</b>
<b>Maximum</b>	<b>36</b>	<b>75,883.46</b>	<b>14</b>	<b>2,482.17</b>	<b>50</b>	<b>77,340.81</b>
<b>Minimum</b>	<b>3</b>	<b>3,793.75</b>	<b>3</b>	<b>375.00</b>	<b>10</b>	<b>4,953.99</b>

Source: Database of the Stock Exchange of Thailand (www.set.or.th)



**Table 4.2 Number of IPOs Categorized by Age of the Company Before Listing**

<b>Age of the Company Before Listing (Years)</b>	<b>SET</b>	<b>MAI</b>	<b>Total</b>
1 – 10	42	28	70
11 – 20	52	28	80
21 – 30	15	19	34
31 and above	9	3	12
<b>Total</b>	<b>118</b>	<b>78</b>	<b>196</b>

The data used in this paper represents newly issued stocks on SET and MAI during the period 2004-2012. Total number of IPOs issued on SET and MAI during such period is 196 companies with the issued size of 214,416.87 million baht. The average number of IPOs during such period is 22 companies per year with average issued size per year of 23,824.10 million baht. The year 2004 is the year with the highest number of IPOs of 50 companies and issued size of 77,340.81 million baht. The lowest number of IPOs is 10 companies, which were issued in the year 2011, with the size of 4,953.99 million baht (refer to table 4.1).

The total number of IPOs listed on SET during the period 2004-2012 is 118 companies with issued size of 203,847.10 million baht. The average IPOs listed on SET per year is 13 companies with average issued size of 22,649.68 million baht. The highest number of IPOs listed on SET is 36 companies in the year 2004 with issued size of 75,883.46 million baht. The year 2011 is the year with lowest number of newly issued stocks of 3 companies with the lowest issued size of 3,793.75 million baht (as shown in table 4.1). Fifty two companies have been established for 11 to 20 years prior to go public, in which represents the most of the IPOs listed on SET (refer to table 4.2).

For IPOs listed on MAI, the total number listed during such period is 78 companies with issued size of 10,569.77 million baht. The average IPOs listed on MAI per year is 9 companies with average issued size of 1,174.42 million baht. The year with the highest number of IPOs listed on MAI are the year 2004 and 2005 of 14 companies per year. However, the year with the highest issued size is the year 2012 of 2,482.17 million baht (as shown in table 4.1). The most of the IPOs of which 28 companies have been established for 1 to 10 as well as 11 to 20 years before listed on MAI (refer to table 4.2).

**Table 4.3 Characteristic of Independent Variables**

Variables Characteristics	Age		Issue Size	
	SET	MAI	SET	MAI
Unit of Measurement	Years	Years	Million baht	Million baht
<i>N</i>	118	78	118	78
Minimum	1	2	102.73	32.00
Maximum	58	49	32966.40	600.00
Mean	15.13	15.56	1727.5178	135.5099
Standard Deviation	10.284	8.986	4444.27787	96.58416

The characteristic of independent variables; age and size of the company can be summarized in table 4.3. The age of the company, which is measured by the difference between the establishing year and the offering year, has an average of 16 years for the companies both listed on SET and MAI. Bangkok Life Assurance Plc. (BLA) has the longest year prior to go public of 58 years among 118 IPOs listed on SET, whereas Phol Dhanya Plc. (PHOL) is the oldest company prior to go public of 49 years among 78 IPOs listed on MAI. The youngest companies prior to go public on SET and MAI are Globlex Holding Management Plc. (GBX) of 1 year and C.I. Group Plc. (CIG) of 2 years, respectively.

For the size of the company which represents the issuing size, the average size is 1,727.52 million baht for 118 IPOs listed on SET, while 135.51 million baht is an average size for 78 IPOs listed on MAI. The highest size for these companies listed on SET and MAI during such period are 32,966.40 and 600 million baht, which belong to Thai Oil Plc. (TOP) and Chow Steel Industries Plc. (CHOW). The companies listed on SET and MAI with smallest issued size are Global Connections Plc. (GC) of 102.73 million baht and Vintage Engineering Plc. (VTE) of 32 million baht.

#### **4.2 Underpricing**

To analyze and answer whether the underpricing exists in Thai stock markets, the initial return for each IPO has to be computed per formula (1) and calculated for average value. The t-statistic is then executed to determine whether the average initial returns are different from zero

significantly at 95 percent level of confidence. The following assumptions have been set to determine the t-statistic.

$H_0$ : The underpricing does not exist in Thai stock markets. (Average initial returns  $\leq 0$ )

$H_1$ : The underpricing exists in Thai stock markets. (Average initial returns  $> 0$ )

The result has been summarized in table 4.4 and 4.5 below. Table 4.4 illustrates the average initial returns along with the test of significance at 95 percent level of confidence. Table 4.5 also provides the summary of null hypotheses testing for underpricing during the period 2004-2012.

**Table 4.4 Initial Returns for IPOs Listed on SET and MAI in 2004-2012 Categorized by Issuance Year**

Listing Markets	Issuance Year	<i>N</i>	Average Initial Returns; $IR_{i,t}$ (%)	t-value	Sig. (2-tailed)	Standard Deviation	Minimum Returns (%)	Maximum Returns (%)
SET	2004-2012	118	15.2313*	4.662	.000	.3549224	-23.91	200.00
MAI	2004-2012	78	34.2478*	5.963	.000	.5072462	-25.00	200.00
All	2004-2012	196	22.7991*	7.403	.000	.4311503	-25.00	200.00

Average initial returns are calculated as total initial returns of IPOs divided by the sample size.

\*Significance level at 5%

**Table 4.5 Summary of Hypotheses Testing for Underpricing during 2004-2012**

Null Hypotheses	Results	t-value	Sig.
The underpricing does not exist in SET.	Rejected	4.662	.000
The underpricing does not exist in MAI.	Rejected	5.963	.000
The underpricing does not exist in Thai stock markets.	Rejected	7.403	.000

For 118 IPOs listed on SET, the average initial returns are 15.23%, that is significantly greater than zero (*p-value* of 0.000 which less than 0.05 as shown in table 4.5) or the underpricing exists for IPOs listed on SET. Furthermore, the result for 78 IPOs listed on MAI also presents the same result with the average initial returns of 34.25% significantly greater than zero (*p-value* of 0.000 which less than 0.05 as shown in table 4.5). In conclusion, the result of 196 IPOs listed on SET and MAI during the period 2004-2012 shows the total average initial returns of 22.80%, in which significantly greater than zero at 95 percent level of confidence (*p-value* of 0.000 which less than 0.05 as shown in table 4.5). Thereby, the null hypothesis has been rejected. This can confirm that the underpricing exists in Thai stock markets in consistent with many previous researches (Ritter

(1991); Levis (1993); Aggarwal et al. (1993); Thomadakis et al. (2007); Vithessonthi (2008); Chorruck and Worthington (2009)).

### **4.3 Long-Term Performances**

To analyze and answer whether the IPOs are underperformed the market in the long-term, the average buy-and-hold adjusted returns for 6, 12, 18 and 24 months have to be calculated using formulas (2) and (3). Thereafter, the t-statistic is applied to determine whether the average buy-and-hold adjusted returns are different from zero significantly at 95 percent level of confidence. The following assumptions have been set to determine the t-statistic.

$H_0$ : The IPOs are underperformed the market in the long-term.

(Buy-and-hold adjusted returns  $\leq 0$ )

$H_1$ : The IPOs are not underperformed the market in the long-term.

(Buy-and-hold adjusted returns  $> 0$ )

The testing result has been provided in table 4.6 and 4.7. Table 4.6 illustrates the average buy-and-hold adjusted returns along with the test of significance at 95 percent while the table 4.7 summarized the null hypotheses testing for long-term performances of IPOS.

**Table 4.6 Buy-and-Hold Adjusted Returns for IPOs Listed on SET and MAI in 2004-2012**

Listing Markets	Buy-and-Hold Period	<i>N</i>	Average Buy-and-Hold Adjusted Returns; $BHAR_{i,n}$ (%)	t-value	Sig. (2-tailed)	Standard Deviation	Minimum Returns (%)	Maximum Returns (%)
Panel A : Buy-and-Hold Adjusted Returns from the Offering Day								
SET	6-month	118	16.2886 *	2.385	.019	.7418767	-88.86	302.46
	12-month	118	17.4031 *	2.378	.019	.7948201	-71.72	331.14
	18-month	118	17.5860 *	2.105	.037	.9076067	-87.32	342.41
	24-month	118	12.7020	1.449	.150	.9524606	-106.90	373.95
MAI	6-month	78	13.1115 *	1.761	.082	.6575324	-104.83	181.94
	12-month	78	12.3328	1.490	.140	.7312329	-123.14	333.00
	18-month	78	9.8331	.971	.335	.8947638	-163.33	327.53
	24-month	78	20.2113	1.308	.195	1.3650725	-159.39	677.28
Panel B : Buy-and-Hold Adjusted Returns from the First Trading Day								
SET	6-month	118	-0.6858	-.148	.883	.5029595	-90.12	226.87
	12-month	118	1.8416	.299	.766	.6692687	-73.85	338.17
	18-month	118	1.9458	.270	.788	.7824258	-85.22	421.26
	24-month	118	-3.3935	-.467	.641	.7896120	-107.17	456.85
MAI	6-month	78	-18.0469	-3.911	.000	.4075514	-102.18	93.75
	12-month	78	-14.1740	-2.129	.036	.5878661	-122.94	321.80
	18-month	78	-17.1456	-2.043	.044	.7410994	-160.12	319.12
	24-month	78	-15.3763	-1.367	.176	.9933915	-157.04	368.48

Average buy-and-hold adjusted returns are calculated as total buy-and-hold adjusted returns for each period divided by the sample size.

\*Significance level at 5%

**Table 4.7 Summary of Hypotheses Testing for Long-Term Performances**

Null Hypotheses	Results	t-value	Sig.
Panel A : Long-Term Performances Based on the Offering Day			
The IPOs listed on SET are underperformed the market in 6-month period.	Rejected	2.385	.010
The IPOs listed on SET are underperformed the market in 12-month period.	Rejected	2.378	.010
The IPOs listed on SET are underperformed the market in 18-month period.	Rejected	2.105	.019
The IPOs listed on SET are underperformed the market in 24-month period.	Accepted	1.449	.075
The IPOs listed on MAI are underperformed the market in 6-month period.	Rejected	1.761	.041
The IPOs listed on MAI are underperformed the market in 12-month period.	Accepted	1.490	.070
The IPOs listed on MAI are underperformed the market in 18-month period.	Accepted	.971	.168
The IPOs listed on MAI are underperformed the market in 24-month period.	Accepted	1.308	.098
Panel B : Long-Term Performances Based on the First Trading Day			
The IPOs listed on SET are underperformed the market in 6-month period.	Accepted	-.148	.559
The IPOs listed on SET are underperformed the market in 12-month period.	Accepted	.299	.383
The IPOs listed on SET are underperformed the market in 18-month period.	Accepted	.270	.394
The IPOs listed on SET are underperformed the market in 24-month period.	Accepted	-.467	.680
The IPOs listed on MAI are underperformed the market in 6-month period.	Accepted	-3.911	1.000
The IPOs listed on MAI are underperformed the market in 12-month period.	Accepted	-2.129	.982
The IPOs listed on MAI are underperformed the market in 18-month period.	Accepted	-2.043	.978
The IPOs listed on MAI are underperformed the market in 24-month period.	Accepted	-1.367	.912

Table 4.6 panel A, illustrates that the average adjusted returns from buying the IPOs on the offering day and holding for 6, 12, 18 and 24 months are all positive. The average buy-and-hold adjusted returns for 6, 12, 18 and 24 months of IPOs listed on SET are 16.29%, 17.40%, 17.59% and 12.70%, respectively. Whereas, the average buy-and-hold adjusted returns for 6, 12, 18 and 24 months of IPOs listed on MAI are 13.11%, 12.33%, 9.83% and 20.21%, respectively.

In contrast, buying the IPOs using the closing price on the first trading day and holding for 6, 12, 18 and 24 months provide the different results (as shown in table 4.6 panel B). The average adjusted returns are negative or relatively low. The average buy-and-hold adjusted returns for 6, 12, 18 and 24 months of IPOs listed on SET are -0.69%, 1.84%, 1.95% and -3.39%, respectively. Whereas, the average buy-and-hold adjusted returns for 6, 12, 18 and 24 months of IPOs listed on MAI are in negative amount of 18.05%, 14.17%, 17.15% and 15.38%, respectively.

The outputs of hypotheses testing have been summarized in table 4.7. As shown in table 4.7 panel A, the average adjusted returns from buying the IPOs listed on SET from the offering day

and holding for 6-, 12-, and 18-month (*p-value* of 0.010, 0.010, 0.019) as well as the average adjusted returns from buying the IPOs listed on MAI from the offering day and holding for 6-month (*p-value* of 0.041) are significantly greater than zero at the confident level of 95 percent, and consequently rejected the null hypotheses (*p-value* less than 0.05). The remaining buy-and-hold adjusted returns are not significantly greater than zero, thereby, accepted the null hypotheses.

In table 4.7 panel B, the test of significance from the first trading day of both markets shown that the average buy-and-hold adjusted returns for all period and all markets are not significantly greater than zero at 95 percent level of confidence (*p-value* more than 0.05) and consequently accepted the null hypotheses.

In conclusion, the IPOs listed on SET are underperformed the markets in 24-month if holding from the offering day and underperformed the markets even 6-, 12-, 18-, or 24- month if holding from the first trading day. For IPOs listed on MAI, they underperformed the markets in 12-, 18-, and 24-month if buying on the offering day and underperformed the markets even 6-, 12-, 18-, or 24- month if buying on the first trading day.

#### **4.4 Cross-Sectional Analysis**

This section will test whether age of the company before listing (*AGE*) and its issue size (*SIZE*) affected to the long-term performances of IPOs (*BHAR<sub>i,n</sub>*). Only the long-term performances that are significant at 95 percent level of confidence (referred to table 4.6) have been selected for testing. Then, the multiple regression analysis has been applied per formula (4). However, the collinearity<sup>1</sup> must be identified before testing for multiple regression in order to ensure the reliability of the model.

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<sup>1</sup> The collinearity is the condition where two independent variables are highly correlated (absolute value greater than 0.8) to each other. This also known as multicollinearity when more than two independent variables are correlated. The criteria for applying the multiple regression is that the independent variables must not correlated (or having low correlation) to each other in order to make the model more reliable.

**Table 4.8 Pearson Correlation Matrix of Independent Variables**

Independent Variables	SET		MAI	
	AGE	SIZE	AGE	SIZE
AGE	1		1	
SIZE	.186	1	.122	1

The Pearson Correlation, as shown in table 4.8, illustrates that there is no collinearity problem exists between the independent variables because the correlation values are low (.186 between age and size of IPOs listed on SET and .122 between age and size of IPOs listed on MAI).

Then, the multiple regression has been executed. The dependent variables are the buy-and-hold abnormal returns (from the offering day) for 6, 12, and 18 months of the IPOs listed on SET along with the buy-and-hold abnormal returns (from the offering day) for 6 months of the IPOs listed on MAI. The independent variables are age of the company prior to go public and its issuing size.

The following hypotheses should be verified.

H<sub>0</sub>: The age of the company prior to go public and issue size are not affected to the long-term performances of IPOs.

H<sub>1</sub>: The age of the company prior to go public and issue size are affected to the long-term performances of IPOs.

The results of the multiple regression analysis for IPOs listed on SET and MAI and the independent variables are shown in table 4.9.



**Table 4.9 Results of Multiple Regression between Long-Term Performances of IPOs and Age & Issue Size**

		Dependent Variable : Buy-and-Hold Adjusted Returns			
Independent Variables	Coefficients	6-month (SET)	12-month (SET)	18-month (SET)	6-month (MAI)
Intercept	Coefficient	.119	.176	.126	-.130
	t-stat	.972	1.336	.839	-.765
	Sig.	.333	.184	.403	.447
AGE	Coefficient	.001	-.002	.002	.020
	t-stat	.176	-.251	.200	2.469
	Sig.	.861	.802	.842	.016
SIZE	Coefficient	.00001	.00002	.00001	-.0004
	t-stat	.936	.895	.735	-.517
	Sig.	.351	.373	.464	.607
R <sup>2</sup>		.009	.007	.006	.076
Adjusted R <sup>2</sup>		-.009	-.010	-.012	.051
Std. Error of the Estimate		.7450565	.7988972	.9128548	.6405150
F-statistic		.502	.404	.329	3.073

The correlation between dependent variable and independent variables can be explained in pair using the coefficient number. The results (referred to table 4.9) show that the age of the company before listing have positive coefficients of .001, .002, and .020 in relation to the 6- and 18-month adjusted returns of IPOs listed on SET and 6-month adjusted returns of IPOs listed on MAI, respectively. This indicates that changes in the age of the company before listing might affect the changes in the IPOs long-term performances in the same directions. Though, the age of the company before listing might affect the changes in the 12-month performance of IPOs listed on SET in the opposite direction as it has a negative coefficient of .002.

For the issue size of the companies as shown in table 4.9, it can affect the changes in 6-, 12-, and 18-month adjusted returns of IPOs listed on SET as they have positive coefficients of .00001, .00002, and .00001, in orderly. Whereas, it has a negative coefficient of .0004 with the 6-month adjusted returns of IPOs listed on MAI. This can summarized that changes in the issue size of the companies might affect the long-term performances of IPOs listed on SET in the same directions, and in the opposite direction for the long-term performances of IPOs listed on MAI.

However, the coefficients for both age and issue size of all markets are relatively small which means that the age of the company before listing and the issue size are very slightly correlated, in other words, slightly affect to the long-term performances of IPOs. Additionally, the R-squared and the adjusted R-squared of all models are definitely low (as shown in table 4.9). This explain that the age of the company prior to go public and issue size cannot be used to predict the changes in the long-term performances of IPOs.

**Table 4.10 Summary of Hypotheses Testing for Cross-Sectional Analysis**

Null Hypotheses	Results	t-value	Sig.
Panel A : Long-Term Performances in relation to Age of the Company Before Listing			
The age of the company prior to go public is not affected to the 6-month adjusted returns of IPOs listed on SET.	Accepted	.176	.861
The age of the company prior to go public is not affected to the 12-month adjusted returns of IPOs listed on SET.	Accepted	-.251	.802
The age of the company prior to go public is not affected to the 18-month adjusted returns of IPOs listed on SET.	Accepted	.200	.842
The age of the company prior to go public is not affected to the 6-month adjusted returns of IPOs listed on MAI.	Rejected	2.469	.016
Panel B : Long-Term Performances in relation to Issue Size			
The issue size of the companies is not affected to the 6-month adjusted returns of IPOs listed on SET.	Accepted	.936	.351
The issue size of the companies is not affected to the 12-month adjusted returns of IPOs listed on SET.	Accepted	.895	.373
The issue size of the companies is not affected to the 18-month adjusted returns of IPOs listed on SET.	Accepted	.735	.464
The issue size of the companies is not affected to the 6-month adjusted returns of IPOs listed on MAI.	Accepted	-.517	.607

The hypotheses testing outcomes have been summarized in table 4.10. Referred to panel A in table 4.10, the age of the company prior to go public is not affected to the long-term performances of IPOs listed on SET as the *p-value* (.861, .802, and .842) is greater than 0.05 at 95 percent level of confidence or accepted the null hypotheses. However, it affected to the long-term performances of IPOs listed on MAI because the *p-value* (.016) is less than 0.05 at 95 percent level of confidence or rejected the null hypotheses.

For the issue size of the companies, the results (as shown in table 4.0 panel B) indicate that it is not affected to the long-term performances of IPOs listed on both SET and MAI as the *p-value* (.351, .373, .464, and .607) is greater than 0.05 at 95 percent level of confidence or accepted the null hypotheses.

Overall, it can conclude that the factors including age of the company prior to go public and issue size are not affected to the long-term performances of IPOs listed on SET. Moreover, the issue size is also not affected to the long-term performances of IPOs listed on MAI. Nonetheless, the age of the company prior to go public has little effect to the long-term performances of IPOs listed on MAI.

## **CHAPTER V – SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

This last chapter provides the summary of results along with the conclusions. The implications are also discussed as well as the recommendation for further study.

### **5.1 Summary of Results and Conclusions**

This study aims to answer three research questions regarding the underpricing phenomenon of 196 IPOs listed on SET and MAI during 2004-2012, the long-term performances of these IPOs under buy-and-hold investment strategy, and the factors that could affected to the long-term performances of IPOs.

Initially, the study of underpricing, in which calculated from the difference between the closing price on the first trading day and the offering price, that is the initial returns. If the differences are shown positive, it can explain that the IPOs are issued at underpricing. The average initial return during 2004-2012 of 118 IPOs listed on SET and 78 IPOs listed on MAI are 15.23% and 34.25%, respectively. The total average initial returns for both markets are 22.80%. As a result of the examination, the average initial returns are positive in consistent with many previous studies. The research question can be answered and come to the conclusion that the underpricing exist for IPOs listed on both SET and MAI during the period 2004-2012.

The subsequent analysis is to determine whether buying IPOs at the offering price as well as the closing price on the first trading day, and holding them until 6, 12, 18, and 24 months period provide negative abnormal returns, in other words, underperformed compare to the markets' returns. In case of buying the IPOs listed on SET from the offering day, the long-term performances are outperformed the markets except for the 24-month adjusted returns (as shown in table 4.7 panel A). In contrast to IPOs listed on MAI, buying them on the offering day and holding for 12-, 18-, and 24-month will provide negative abnormal returns (underperform) except holding them for 6-month period (referred to table 4.7 panel A). In conclusion, the underperformances of IPOs from the offering day exist in all markets but in some holding period.

For the case of buying the IPOs listed on both markets from the first trading day, the long-term adjusted returns are underperformed compare to the markets (as shown in table 4.7 panel B). In

conclusion, the underperformances of IPOs from the first trading day absolutely exist in all markets and holding period.

The final question has been investigated using multiple regression analysis whether age of the company prior to go public and issue size provide effects to the aforementioned long-term performances of IPOs. The condition, where the independent variables shown a correlation to each other, has been verified and resulted that no collinearity problem exist. The results show that all *p-values* for age in relation to the long-term performances of IPOs are greater than 0.05 at 95 percent level of confidence except 6-month performances of IPOs listed on MAI. The *p-values* for issue size in relations to the long-term performances of IPOs are also greater than 0.05 at 95 percent level of confidence. Besides, the R-squared and adjusted R-squared for all models are definitely low, in which implied that age and issue size cannot be used to predict the changes in the long-term performances. In contrast to many previous evidences, this study can be concluded that the age of the company prior to go public along with the issue size provide no effect to the long-term performances of IPOs listed on both SET and MAI.

## **5.2 Implications**

This study can be implied for academic aspect as providing fresh evidences about the IPOs issued during 2004-2012. The study provides evidence that the offering prices of IPOs are lower than the closing prices on the first trading day. Underpricing exist in Thai stock markets both SET and MAI. Furthermore, the IPOs listed on SET and MAI are underperformed the market when buying on the first trading day and holding for the long period. Lastly, the age of the company before listing and the issue size cannot be used as predicted variable as they have no relationship with the long-term performances of IPOs.

On the other hand, for the business world, the investors can get benefits from this study and make decision to invest in Thai IPOs as the initial returns on the first trading day are positive. For the long-term investors, they can decide to invest in IPOs listed on SET and MAI from the offering day rather than the first trading day because it provide positive adjusted returns (outperform the markets) for some period. Finally, the long-term investors should consider other factors rather than age of the company prior to go public and issue size when deciding to invest in Thai IPOs because they are not related to the performances of IPOs.

### **5.3 Further Study**

Future study about underpricing can be conducted at the different period of time in order to determine even if the underpricing phenomenon still exist in Thai stock markets. The underperformance examination can also be studied by expand the longer buy-and-hold period e.g. three years anniversary. Additionally, the study of the correlation between the long-term performances and the factors can be extended by searching for other modern variables that could reflect the changes in the IPOs' performances such as corporate governance evaluation results, or change the dependent variable to other possible variables such as initial returns. These studies could provide benefits to the academicians, the investors, as well as the issuers in the future.

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## APPENDICES

### Appendix A. List of Initial Public Offerings During 2004-2012 in SET Market

(Source: Database of the Stock Exchange of Thailand ([www.set.or.th](http://www.set.or.th)))

No.	Symbol	Name	Industry	Year of Issuance	Issued Size (mil. baht)
1	A	Areeya Property Plc.	Property & Construction	2004	706.50
2	AAV	Asia Aviation Plc.	Services	2012	4,486.25
3	ACD	Asia Corporate Development Plc.	Services	2005	480.00
4	AF-O	Aapico Forging Plc.	Industrials	2005	389.54
5	AI	Asian Insulators Plc.	Resources	2004	960.00
6	AKR	Ekarat Engineering Plc.	Resources	2006	491.40
7	AMC	Asia Metal Plc.	Industrials	2004	175.00
8	ANAN	Ananda Development Plc.	Property & Construction	2012	5,598.60
9	AOT	Airports Of Thailand Plc.	Services	2004	17,489.20
10	APCS	Asia Precision Plc.	Industrials	2011	408.75
11	AQUA	Aqua Corporation Plc.	Services	2004	473.00
12	AS	Asiasoft Corporation Plc.	Services	2008	900.00
13	ASCON	Ascon Construction Plc.	Property & Construction	2005	210.00
14	ASK	Asia Sermkij Leasing Plc.	Financials	2005	235.41
15	BCH	Bangkok Chain Hospital Plc.	Services	2004	1,254.00
16	BEAUTY	Beauty Community Plc.	Services	2012	660.00
17	BLA	Bangkok Life Assurance Plc.	Financials	2009	2,700.00
18	BLISS	Bliss-Tel Plc.	Technology	2004	434.00
19	BLS	Bualuang Securities Plc.	Financials	2005	508.70
20	BMCL	Bangkok Metro Plc.	Services	2006	3,610.94
21	BSBM	Bangsaphan Barmill Plc.	Industrials	2005	988.00
22	BWG	Better World Green Plc.	Services	2007	240.00
23	CAWOW	California Wow Xperience Plc.	Services	2005	300.00
24	CITY	City Steel Plc.	Industrials	2006	264.60
25	CSL	CS Loxinfo Plc.	Technology	2004	1,125.00
26	CSP	CSP Steel Center Plc.	Industrials	2005	300.00
27	DCON	Dcon Products Plc.	Property & Construction	2004	370.00
28	DRT	Diamond Building Products Plc.	Property & Construction	2005	358.80
29	DSGT	DSG International (Thailand) Plc.	Consumer Products	2006	240.64
30	DTAC	Total Access Communication Plc.	Technology	2007	8,880.00
31	EASON	Eason Paint Plc.	Industrials	2005	180.00
32	ECL	Eastern Commercial Leasing Plc.	Financials	2004	125.75
33	ESSO	Esso (Thailand) Plc.	Resources	2008	9,304.00
34	FORTH	Forth Corporation Plc.	Technology	2006	469.50
35	FSS	Finansia Syrus Securities Plc.	Financials	2004	660.00
36	GBX	Globlex Holding Management Plc.	Financials	2004	494.50
37	GC	Global Connections Plc.	Industrials	2005	102.73

No.	Symbol	Name	Industry	Year of Issuance	Issued Size (mil. baht)
38	GL	Group Lease Plc.	Financials	2004	120.00
39	GLOBAL	Siam Global House Plc.	Services	2009	663.00
40	GLOW	Glow Energy Plc.	Resources	2005	12,144.00
41	GRAND	Grande Asset Hotels And Property Plc.	Services	2004	727.50
42	GSTEL	G Steel Plc.	Industrials	2006	2,400.00
43	GUNKUL	Gunkul Engineering Plc.	Resources	2010	540.00
44	IFS	IFS Capital (Thailand) Plc.	Financials	2010	162.00
45	IHL	Interhides Plc.	Industrials	2005	273.75
46	INOX	Posco-Thainox Plc.	Industrials	2004	5,250.00
47	IRP	Indorama Polymers Plc.	Industrials	2005	1,380.00
48	IVL	Indorama Ventures Plc.	Industrials	2010	4,692.00
49	JMART	Jay Mart Plc.	Technology	2009	135.00
50	JMT	JMT Network Services Plc.	Financials	2012	300.00
51	JTS	Jasmine Telecom Systems Plc.	Technology	2006	560.00
52	KBS	Khonburi Sugar Plc.	Agro & Food Industry	2011	1,365.00
53	KCAR	Krungthai Car Rent And Lease Plc.	Financials	2005	220.00
54	KSL	Khon Kaen Sugar Industry Plc.	Agro & Food Industry	2005	1,309.51
55	KTECH	Ktech Construction Plc.	Property & Construction	2004	350.00
56	LHBANK	LH Financial Group Plc.	Financials	2011	2,020.00
57	LHK	Lohakit Metal Plc.	Industrials	2008	220.80
58	MCOT	Mcot Plc.	Services	2004	3,539.50
59	MCS	M.C.S. Steel Plc.	Industrials	2005	336.00
60	MJD	Major Development Plc.	Property & Construction	2007	940.00
61	ML	Mida Leasing Plc.	Financials	2004	255.00
62	MPG	Mangpong 1989 Plc.	Services	2004	509.80
63	NCH	N. C. Housing Plc.	Property & Construction	2004	800.00
64	NNCL	Navanakorn Plc.	Property & Construction	2004	500.00
65	OISHI	Oishi Group Plc.	Agro & Food Industry	2004	706.52
66	PAP	Pacific Pipe Plc.	Industrials	2004	688.50
67	PERM	Permsin Steel Works Plc.	Industrials	2005	350.00
68	PM	Premier Marketing Plc.	Agro & Food Industry	2008	666.50
69	PREB	Pre-Built Plc.	Property & Construction	2005	214.50
70	PRIN	Prinsiri Plc.	Property & Construction	2005	434.00
71	PRINC	Principal Capital Plc.	Property & Construction	2005	525.00
72	PRO	Professional Waste Technology (1999) Plc.	Services	2004	295.00
73	PS	Pruksa Real Estate Plc.	Property & Construction	2005	1,916.75
74	PTL	Polyplex (Thailand) Plc.	Industrials	2004	1,656.00
75	PTSEC	Phatra Securities Plc.	Financials	2005	1,778.56
76	Q-CON	Quality Construction Products Plc.	Property & Construction	2004	640.00
77	RASA	Rasa Property Development Plc.	Property & Construction	2007	130.00
78	RHB OSK	Rhb Osk Securities (Thailand) Plc.	Financials	2006	840.00
79	RICH	Rich Asia Steel Plc.	Industrials	2006	225.00
80	RRC	Rayong Refinery Plc.	Industrials	2006	27,194.40

No.	Symbol	Name	Industry	Year of Issuance	Issued Size (mil. baht)
81	SABINA	Sabina Plc.	Consumer Products	2008	336.00
82	SAM	Samchai Steel Industries Plc.	Industrials	2004	300.00
83	SAT	Somboon Advance Technology Plc.	Industrials	2005	954.60
84	SCG	Sahacogen (Chonburi) Plc.	Resources	2004	432.00
85	SEAFCO	Seafco Plc.	Property & Construction	2004	200.00
86	SECC	S.E.C. Auto Sales And Services Plc.	Industrials	2006	300.00
87	SENA	Sena Development Plc.	Property & Construction	2009	346.50
88	SGP	Siamgas and Petrochemicals Plc.	Resources	2008	2,240.00
89	SIS	SIS Distribution (Thailand) Plc.	Technology	2004	178.45
90	SMIT	Sahamit Machinery Plc.	Industrials	2005	247.50
91	SMM	Siam Inter Multimedia Plc.	Services	2005	245.18
92	SMT	Stars Microelectronics (Thailand) Plc.	Technology	2009	455.40
93	SNC	Snc Former Plc.	Industrials	2004	228.38
94	SOLAR	Solartron Plc.	Resources	2005	640.00
95	SPACK	S. Pack & Print Plc.	Industrials	2004	238.00
96	SPPT	Single Point Parts (Thailand) Plc.	Technology	2005	119.02
97	SRICHA	Sriracha Construction Plc.	Property & Construction	2012	1,173.75
98	SUPER	Superblock Plc.	Property & Construction	2005	507.15
99	SYMC	Symphony Communication Plc.	Technology	2010	633.60
100	SYNEX	Synnex (Thailand) Plc.	Technology	2008	522.00
101	TKT	T.Krungthai Industries Plc.	Industrials	2004	164.00
102	TMT	Thai Metal Trade Plc.	Industrials	2005	505.75
103	TOG	Thai Optical Group Plc.	Consumer Products	2006	190.40
104	TOP	Thai Oil Plc.	Resources	2004	32,966.40
105	TSC	Thai Steel Cable Plc.	Industrials	2005	536.36
106	TTCL	Toyo-Thai Corporation Plc.	Property & Construction	2009	552.50
107	TTW	TTW Plc.	Resources	2008	4,200.00
108	TUCC	Thai Unique Coil Center Plc.	Industrials	2005	229.50
109	TWZ	TWZ Corporation Plc.	Technology	2005	228.00
110	TYM	Thai Yuan Metal Plc.	Industrials	2007	300.00
111	UNIQ	Unique Engineering And Construction Plc.	Property & Construction	2007	292.50
112	UOBKH	UOB Kay Hian Securities (Thailand) Plc.	Financials	2005	465.00
113	UTP	United Paper Plc.	Industrials	2004	291.46
114	VGI	VGI Global Media Plc.	Services	2012	3,080.00
115	VIH	Srivichaivejvivat Plc.	Services	2012	168.75
116	WHA	WHA Corporation Plc.	Property & Construction	2012	1,714.55
117	WORK	Workpoint Entertainment Plc.	Services	2004	580.00
118	YNP	Yarnapund Plc.	Industrials	2005	536.00

## Appendix B. List of Initial Public Offerings During 2004-2012 in MAI Market

(Source: Database of the Stock Exchange of Thailand (www.set.or.th))

No.	Symbol	Name	Industry	Year of Issuance	Issued Size (mil. baht)
1	2S	2S Metal Plc.	Industrials	2009	114.00
2	ACAP	Acap Advisory Plc.	Financials	2005	161.00
3	AF	Aira Factoring Plc.	Financials	2004	57.20
4	AGE	Asia Green Energy Plc.	Resources	2009	227.50
5	APCO	Asian Phytoceuticals Plc.	Consumer Products	2011	140.00
6	ARIP	ARIP Plc.	Services	2010	124.56
7	ARROW	Arrow Syndicate Plc.	Property & Construction	2012	275.00
8	BGT	BGT Corporation Plc.	Consumer Products	2007	94.00
9	BOL	Business Online Plc.	Services	2004	79.13
10	BROCK	Baan Rock Garden Plc.	Property & Construction	2006	240.00
11	BSM	Buildersmart Plc.	Property & Construction	2008	55.00
12	CHOW	Chow Steel Industries Plc.	Industrials	2011	600.00
13	CIG	C.I.Group Plc.	Industrials	2005	123.75
14	CMO	CMO Plc.	Services	2004	125.92
15	COLOR	Salee Colour Plc.	Industrials	2011	86.70
16	CPR	CPR Gomu Industrial Plc.	Industrials	2005	115.50
17	CRANE	Chu Kai Plc.	Industrials	2008	280.00
18	CYBER	Cyberplanet Interactive Plc.	Technology	2010	96.00
19	DEMCO	Demco Plc.	Resources	2006	152.50
20	DIMET	Dimet (Siam) Plc.	Property & Construction	2008	40.00
21	DNA	DNA 2002 Plc.	Services	2012	304.00
22	E	Evolution Capital Plc.	Agro & Food Industry	2005	92.02
23	EFORL	E For L Aim Plc.	Services	2009	88.00
24	ETG	Eternity Grand Logistics Plc.	Industrials	2006	84.32
25	FOCUS	Focus Development And Construction Plc.	Property & Construction	2004	112.00
26	FPI	Fortune Parts Industry Plc.	Industrials	2012	220.50
27	GFM	Goldfine Manufacturers Plc.	Industrials	2004	186.00
28	HOTPOT	Hot Pot Plc.	Agro & Food Industry	2012	285.54
29	HTECH	Halcyon Technology Plc.	Industrials	2009	61.12
30	HYDRO	Hydrotek Plc.	Property & Construction	2011	101.70
31	ILINK	Interlink Communication Plc.	Technology	2004	85.00
32	JUBILE	Jubilee Enterprise Plc.	Consumer Products	2009	98.00
33	KASET	Thai Ha Plc.	Agro & Food Industry	2005	66.00
34	KIAT	Kiattana Transport Plc.	Services	2009	180.00
35	L&E	Lighting & Equipment Plc.	Consumer Products	2004	77.35
36	LVT	L.V. Technology Plc.	Industrials	2004	60.00
37	MBAX	Multibax Plc.	Industrials	2007	175.00
38	MILL	Millcon Steel Plc.	Industrials	2007	290.00
39	MOONG	Moong Pattana International Plc.	Consumer Products	2009	67.90

No.	Symbol	Name	Industry	Year of Issuance	Issued Size (mil. baht)
40	NBC	Nation Broadcasting Corporation Plc.	Services	2009	145.00
41	NINE	Nation International Edutainment Plc.	Services	2010	36.00
42	OFM	Officemate Plc.	Services	2010	98.00
43	PHOL	Phol Dhanya Plc.	Services	2010	144.00
44	PICO	Pico Thailand Plc.	Services	2004	162.50
45	PJW	Panjawattana Plastic Plc.	Industrials	2012	403.20
46	PPM	Porn Prom Metal Plc.	Industrials	2004	122.00
47	PPS	Project Planning Service Plc.	Property & Construction	2012	84.00
48	PYLON	Pylon Plc.	Property & Construction	2005	100.10
49	QLT	Qualitech Plc.	Services	2009	79.20
50	QTC	QTC Energy Plc.	Resources	2011	100.00
51	SALEE	Salee Industry Plc.	Industrials	2005	99.70
52	SIMAT	Simat Technologies Plc.	Technology	2007	71.25
53	SLC	Solution Corner (1998) Plc.	Technology	2004	55.00
54	SPCG	SPCG Plc.	Resources	2005	43.50
55	STAR	Star Sanitaryware Plc.	Property & Construction	2005	122.85
56	SWC	Sherwood Chemicals Plc.	Industrials	2004	120.00
57	TAPAC	Tapaco Plc.	Industrials	2004	56.25
58	THANA	Thanasiri Group Plc.	Property & Construction	2009	87.50
59	TIES	Thai Industrial & Engineering Service Plc.	Property & Construction	2006	95.20
60	TMC	T.M.C. Industrial Plc.	Industrials	2012	347.10
61	TMI	Teera-Mongkol Industry Plc.	Industrials	2010	70.40
62	TMILL	T S Flour Mill Plc.	Agro & Food Industry	2012	263.50
63	TNDT	Thai Nondestructive Testing Plc.	Services	2007	62.00
64	TNH	Thai Nakarin Hospital Plc.	Services	2005	52.50
65	TPAC	Thai Plaspac Plc.	Industrials	2005	56.00
66	TPOLY	Thai Polycons Plc.	Property & Construction	2009	168.00
67	TRC	TRC Construction Plc.	Property & Construction	2005	51.00
68	TRT	Tirathai Plc.	Resources	2006	172.50
69	TSF	Three Sixty Five Plc.	Services	2005	63.90
70	TVD	TV Direct Plc.	Services	2012	120.24
71	UAC	UAC Global Plc.	Industrials	2010	120.00
72	UBIS	Ubis (Asia) Plc.	Industrials	2007	77.35
73	UEC	Unimit Engineering Plc.	Industrials	2005	342.21
74	UIC	Union Intraco Plc.	Industrials	2011	99.84
75	UKEM	Union Petrochemical Plc.	Industrials	2006	85.68
76	UMS	Unique Mining Services Plc.	Resources	2004	159.00
77	UWC	Ua Withya Plc.	Resources	2012	179.09
78	VTE	Vintage Engineering Plc.	Property & Construction	2011	32.00