

Long-Term Determinants of the Stock Return in the Banking Sector:
Empirical Evidence from the Stock Exchange of Thailand

Mr. Michael Dela Cruz

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Business Administration in Finance

Graduate School of Business

Assumption University

Academic Year 2013

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Abstract

This study utilized the Pair-wise Granger Causality test and monthly time-series data from a ten-year period (from January 2003 to December 2012) to explore the long-term unidirectional causal relationships from major economic indicators, namely commodity prices, consumer confidence, foreign exchange rates, foreign stock market indices, inflation, interest rates, money supply, and real estate price and sales value to the return of the Banking Sector Index of the Stock Exchange of Thailand. The objective of this exercise was twofold: to determine whether or not the Banking Sector Index of the Stock Exchange of Thailand is a market inefficient sector of the Stock Exchange of Thailand, and to determine the factors that predict the long-term value of the Banking Sector Index of the Stock Exchange of Thailand, so that abnormal market returns could be achieved if market inefficiency existed.

The findings of this study revealed that the Banking Sector Index of the Stock Exchange of Thailand is market inefficient to commodity prices, consumer confidence, foreign exchange rates, foreign stock market indices, inflation, interest rates, and real estate price and sales value. As such, the specific variables: Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Real Estate Price, Thai Retail Real Estate Sales Value and WTI Price, which all exhibited significant long-term causal relationships to the return of the Banking Sector Index of the Stock Exchange of Thailand, may be used to target excess returns from the Banking Sector of the Stock Exchange of Thailand.

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Table of Contents

Contents	Page No.
Abstract	ii
Acknowledgements	iii
List of Tables	vii
Chapter 1: Generalities of the Study	1
1.1 Introduction of the study	1
1.2 Statement of the Problem	11
1.3 Research Objectives	12
1.4 Scope of the Research	13
1.5 Limitations of the Research	14
1.6 Significance of the Study	15
1.7 Definitions of the Terms	17
1.8 Abbreviations	19
Chapter 2: Review of Related Literature and Empirical Studies	20
2.1 Theory	20
Capital Asset Pricing Model	20
Arbitrage Pricing Theory	21

Contents	Page No.
2.2 Related Literature Review	22
Commodities	23
Consumer Confidence	27
Exchange Rates	28
Foreign Stock Markets	34
Inflation	39
Interest Rates	43
Money Supply	50
Real Estate	54
2.3 Previous Studies	57
Chapter 3: Research Frameworks	61
3.1 Theoretical Framework	61
Commodities	62
Consumer Confidence	63
Exchange Rates	64
Foreign Stock Markets	65
Inflation	66
Interest Rates	67
Money Supply	68

Real Estate	68
Contents	Page No.
3.2 Conceptual Framework	71
3.3 Research Hypotheses	73
3.4 Operationalization of the Variables	77
Chapter 4: Research Methodology	81
4.1 Method of Research Used	81
4.2 Collection of the Data	82
4.3 Statistical Treatment of the Data	83
Chapter 5: Presentation of Data and Critical Discussion of Results	87
5.1 Augmented Dickey-Fuller Unit Root Test	87
5.2 Pair-wise Granger Causality Test	105
Chapter 6: Conclusions and Recommendations	140
6.1 Summary and Conclusions	140
6.2 Implications and Recommendations	145
6.3 Further Research	148
Bibliography	150
Appendix A. Raw Data from Bloomberg	157

List of Tables

Table	Page No.
Chapter 1: Generalities of the Study	1
1.1: Industries and Sectors of the Stock Exchange of Thailand	8
1.2: Important Terms and Definitions	18
1.3: Abbreviations and Full Forms	19
Chapter 2: Review of Related Literature and Empirical Studies	20
2.1: Summary of Literature of Commodities	26
2.2: Summary of Literature of Exchange Rates	33
2.3: Summary of Literature of Foreign Stock Markets	38
2.4: Summary of Literature of Inflation	42
2.5: Summary of Literature of Interest Rates	48
2.6: Summary of Literature of Money Supply	53
2.7: Summary of Literature of Real Estate	55
2.8: Summary of Related Literature	56
2.9: Summary of Previous Studies	60
Chapter 3: Research Frameworks	61

Table	Page No.
3.1: Summary of Theoretical Framework for Banking Sector of Stock Exchange of Thailand	70
3.2: Operationalization of Dependent Variable and Independent Variables	79
Chapter 5: Presentation of Data and Critical Discussion of Results	87
5.1: Banking Sector of the Stock Exchange of Thailand (Results of Augmented Dickey-Fuller Unit Root Test)	88
5.2: Australian Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	89
5.3: Brent (Results of Augmented Dickey-Fuller Unit Root Test)	89
5.4: British Pound/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	89
5.5: Chinese Yuan/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	90
5.6: Commodities Index (Results of Augmented Dickey-Fuller Unit Root Test)	90
5.7: Euro/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	91
5.8: German Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)	91
5.9: Heating Oil (Results of Augmented Dickey-Fuller Unit Root Test)	92
5.10: Hong Kong Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test)	92

5.11: Indian Rupee/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	92
--	----

Table	Page No.
-------	----------

5.12: Japanese Yen/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	93
--	----

5.13: New York Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test)	93
---	----

5.14: New Zealand Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	94
--	----

5.15: Russian Ruble/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	94
---	----

5.16: Singapore Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	94
--	----

5.17: Swedish Krona/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	95
---	----

5.18: Swiss Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)	95
--	----

5.19: Taiwan Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)	96
---	----

5.20: Thai Consumer Confidence (Results of Augmented Dickey-Fuller Unit Root Test)	96
--	----

5.21: Thai Consumer Price Index (Results of Augmented Dickey-Fuller Unit Root Test)	96
---	----

5.22: Thai Gold Bar (Buying) Price (Results of Augmented Dickey-Fuller Unit Root Test)	97
--	----

5.23: Thai Interest Rate from the Top 4 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test)	97
--	----

5.24: Thai Interest Rate from the Top 5 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test)	98
--	----

Table	Page No.
--------------	-----------------

5.25: Thai Money Supply (M1) (Results of Augmented Dickey-Fuller Unit Root Test)	98
--	----

5.26: Thai Money Supply (M2) (Results of Augmented Dickey-Fuller Unit Root Test)	99
--	----

5.27: Thai Real Estate Price (Results of Augmented Dickey-Fuller Unit Root Test)	99
--	----

5.28: Thai Retail Real Estate Sales Value (Results of Augmented Dickey-Fuller Unit Root Test)	99
---	----

5.29: Tokyo Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)	100
--	-----

5.30: US Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)	100
---	-----

5.31: WTI (Results of Augmented Dickey-Fuller Unit Root Test)	101
---	-----

5.32: Summary of Augmented Dickey-Fuller Unit Root Test	103
---	-----

5.33: Australian Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	106
--	-----

5.34: Brent (Results of Pair-wise Granger Causality Tests)	107
--	-----

5.35: British Pound/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	108
--	-----

5.36: Chinese Yuan/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	109
---	-----

5.37: Commodities Index (Results of Pair-wise Granger Causality Tests)	110
--	-----

5.38: Euro/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	111
---	-----

5.39: German Stock Market (Results of Pair-wise Granger Causality Tests)	112
--	-----

Table	Page No.
--------------	-----------------

5.40: Heating Oil (Results of Pair-wise Granger Causality Tests)	113
--	-----

5.41: Hong Kong Stock Exchange (Results of Pair-wise Granger Causality Tests)	114
---	-----

5.42: Indian Rupee/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	115
---	-----

5.43: Japanese Yen/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	116
---	-----

5.44: New York Stock Exchange (Results of Pair-wise Granger Causality Tests)	117
--	-----

5.45: New Zealand Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	118
---	-----

5.46: Russian Ruble/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	119
--	-----

5.47: Singapore Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	120
---	-----

5.48: Swedish Krona/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	121
--	-----

5.49: Swiss Stock Market (Results of Pair-wise Granger Causality Tests)	122
---	-----

5.50: Taiwan Stock Market (Results of Pair-wise Granger Causality Tests)	123
--	-----

5.51: Thai Consumer Confidence (Results of Pair-wise Granger Causality Tests)	124
---	-----

5.52: Thai Consumer Price Index (Results of Pair-wise Granger Causality Tests)	125
--	-----

5.53: Thai Gold Bar (Buying) Price (Results of Pair-wise Granger Causality Tests)	126
5.54: Thai Interest Rate from the Top 4 Thai Banks (Results of Pair-wise Granger Causality Tests)	127
Table	Page No.
5.55: Thai Interest Rate from the Top 5 Thai Banks (Results of Pair-wise Granger Causality Tests)	128
5.56: Thai Money Supply (M2) (Results of Pair-wise Granger Causality Tests)	129
5.57: Thai Real Estate Price (Results of Pair-wise Granger Causality Tests)	130
5.58: Thai Retail Real Estate Sales Value (Results of Pair-wise Granger Causality Tests)	131
5.59: Tokyo Stock Market (Results of Pair-wise Granger Causality Tests)	132
5.60: US Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)	133
5.61: WTI (Results of Pair-wise Granger Causality Tests)	134
5.62: Summary of Granger Causality Tests	138

Chapter 1

Generalities of the Study

1.1 Introduction of the study

Information is very often of the utmost importance in decision making. Investment decisions are not exceptions of the importance of information in decision making. Everyday individuals and institutions make financial decisions based on information available to them. For example, institutions and individuals make decisions about how best to procure funding for business and personal activities and decisions about how best to invest funds on hand. Institutions and individuals require adequate and reliable information for optimal decision making. Thus, the goal of this research study is to uncover information that is useful for financial decision making regarding the long-term determinant factors of the stock return of the Banking Sector Index of the Stock Exchange of Thailand (SET).

This research studies thirty probable long-term determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand. They are the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

The long-term determinants of this study fall into eight categories. They are commodity prices, consumer confidence, foreign exchange rates, foreign stock market indices, inflation, interest rates, money supply, and real estate price and sales value.

This study proposes, based on previous literature, that in the Thai context commodity prices, consumer confidence, foreign exchange rates, foreign stock market indices, inflation, interest rates, money supply and real estate prices may be important influencers of stock market return.

The relationship between commodity prices and the return of stock market indices is examined in this study for a causal relationship from commodity prices to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Büyükşalvarcı (2010), French and Li (2012), Saeed (2012), and Samad and Bhat (2009) provide empirical evidence of significant relationships between commodity prices and stock market return.

The relationship between consumer confidence and stock market indices is examined in this study for a causal relationship from consumer confidence to the return of the Banking Sector Index of the Stock Exchange of Thailand. As the relationship between consumer confidence and stock market return has not received much attention in previous studies, this relationship was hypothesized for this study and examined for the psychological effects that consumer confidence has on stock market returns with the theoretical relationship being that greater financial confidence among buyers may lead them to increase their levels of purchasing and investment.

The relationship between foreign exchange rates and stock market indices is examined in this study for a causal relationship from foreign exchange rates to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Adjasi, Biekpe, and Osei (2011), Büyükşalvarcı (2010), Ibrahim and Aziz (2003), Joseph and Vezos (2006), Kuwornu and Owusu-Nantwi (2011), Liu and Shrestha (2008), Maysami, Howe and Hamzah (2004), Osamwonyi and Evbayiro-Osagie (2012), Sabri (2004), Saeed (2012), Tangjitprom (2012), and Wickremasinghe (2011), provide empirical evidence of significant relationships between foreign exchange rates and stock market return.

The relationship between foreign stock markets and local stock market indices is examined in this study for a causal relationship from foreign stock markets to the

return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Chong, Drew and Veeraraghavan (2003), Dhanaraj, Gopalaswamy and Babu (2013), Karim and Majid (2010), Kurihara and Nezu (2006), Mansur (1991), Majid, Meera, Omar and Aziz (2009), Perera and Wickramanayake (2012), Sabri (2004), and Wickremasinghe (2011) provide empirical evidence of significant relationships between foreign stock exchanges and local stock exchanges.

The relationship between inflation and stock market indices is examined in this study for a causal relationship from the inflation rate to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Ibrahim and Aziz (2003), Kuwornu and Owusu-Nantwi (2011), Liu and Shrestha (2008), Maysami, Howe and Hamzah (2004), Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Sabri (2004), and Wickremasinghe (2011) provide empirical evidence of significant relationships between inflation and stock market return.

The relationship between interest rates and stock market indices is examined in this study for a causal relationship from interest rates to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Alam and Uddin (2009), Büyükşalvarcı (2010), Hussainey and Ngoc (2009), Joseph and Vezos (2006), Kuwornu and Owusu-Nantwi (2011), Liow and Huang (2006), Liu and Shrestha (2008), Maysami, Howe and Hamzah (2004), Park and Choi (2011), Rjoub, Türsoy and Günsel (2009), Sabri (2004), Saeed (2012), Samad and Bhat (2009), Tangjitprom (2012), and Wickremasinghe (2011) provide empirical evidence of significant relationships between interest rates and stock market return.

The relationship between money supply and stock market indices is examined in this study for a causal relationship from money supply to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Büyükşalvarcı (2010), Maysami, Howe and Hamzah (2004), Ibrahim and Aziz (2003), Liu and Shrestha (2008), and Wickremasinghe (2011) provide empirical evidence of significant relationships between money supply and stock market return.

The relationship between real estate and stock market indices is examined in this study for a causal relationship from real estate prices to the return of the Banking Sector Index of the Stock Exchange of Thailand. Studies by Hui and Ng (2012), and

Wilson, Okunev and Ta (1996) provide empirical evidence of significant relationships between real estate prices and stock market return.

The concept of efficient markets is best described in a theory that is called the Efficient Market Hypothesis (EMH). The Efficient Market Hypothesis, a popular and commonly-tested hypothesis, explains how information is an essential determiner of the value of stock market indices.

Proponents of the Efficient Market Hypothesis argue that all information pertinent to the market value of financial assets, such as the stocks of listed companies, affects the market value of the said assets (Fama, 1970). In other words, the value of stocks and other risky assets reflect all available information that may influence their return. The reasoning behind the Efficient Market Hypothesis is that investors and stock markets do not ignore information that can lead to profits. For example, if there is newly available information that leads investors to believe that firm A will be able to achieve a higher return than previously thought, investors will buy shares of that stock, which in turn leads to a higher value of that stock till the point that the higher value of the stock has caused the return of the stock to be in line with its risk level. At which point, the value of the stock of firm A fully incorporates all available information that might impact the return of firm A.

The Efficient Market Hypothesis also proposes that information is so rapidly digested by market players and incorporated into stock prices that it causes the stock values of listed companies in efficient markets to adjust nearly instantaneously (Rose & Marquis 2008). In other words, at any one point in time, the stock values of listed companies reflect all of the most current and relevant information available. The reasoning behind this argument is that modern financial markets consist of such large numbers of intelligent, well-informed, rational, profit-maximizing investors that opportunities for abnormal returns close at approximately the same time as they open, as these investors take actions to incorporate information into stock prices to either earn abnormal profits or to reduce potential losses. Thus systematic mispricing of stocks does not occur, and no individual or institution is able to consistently beat the market or achieve consistent excess returns. This leaves investor returns from a said asset in line with that asset's level of risk.

The Efficient Market Hypothesis forms the theoretical foundation for this study. This paper tests for market inefficiency in the Banking Sector Index of the Stock

Exchange of Thailand. Market inefficiency occurs when the value of stocks or stock markets are either slow to reflect or never fully reflect all available and relevant information regarding the financial situation of the underlying firms.

One way to test for market inefficiency is to check for statistically significant time-lag relationships between macroeconomic variables and stock market values. When statistically significant relationships exist, we can conclude that the null hypothesis of no relationship between the studied variables is rejected, and one of the variables does affect the other variable. If a time-lag exists in statistically significant relationships, or in other words, if a change in one variable causes a change in the other variable but the value of the two variables do not change at the same time, the dependent variable is not market efficient, as it violates the condition for market efficiency that all relevant and available information is nearly instantaneously reflected in the value of assets.

In this research study, the Pair-wise Granger causality test is used to test for statistically significant time-lag relationships between information and the return of the Banking Sector Index of the Stock Exchange of Thailand. If a large number of statistically significant time-lag relationships are found to exist, the conclusion will be drawn that the Banking Sector Index of the Stock Exchange of Thailand is market inefficient.

If market inefficiency exists in risky assets, there may also exist the opportunity for investors to achieve abnormal returns or returns higher than they should be when compared to the risk level of the asset. To do so, investors may predict how certain independent variables related in the long-term with an asset's market value. Then by including such variables into predictive models of the value of risky assets, investors may have better information about how the value of an index or asset will move. This superior information may lead to investors being able to beat the market and achieve abnormal returns from their investments.

This study aims to discover whether or not any variables from a list of thirty independent variables have significant long-term (time-lag) relationships with the Banking Sector Index of the Stock Exchange of Thailand. If such relationships are found, the recommendation will be that those independent variables that exhibit long-term significant relationships with the Banking Sector Index of the Stock Exchange of Thailand and each one's respective lag be included in predictive models of the value

of the Banking Sector Index of the Stock Exchange of Thailand to maximize investors' potential return from investing in the Banking Sector Index of the Stock Exchange of Thailand.

Stocks and stock markets are of great interest to investors because they are often seen as having the potential to provide investors with a high return on their investments. As such, stock market investment is one of the most popular areas of investment of all the financial assets in capital and money markets. Stock brokers and traders usually keep a close watch on information that might affect stock prices due to the high risk that accompanies stock investments. Some of this information comes from the listed companies themselves and may be about revenue and profit, dividend policies, acquisitions and mergers, products, and management. Other information may come from independent agencies, or agencies under the supervision of local, federal or foreign governments, such as central banks, and may be about macroeconomic conditions, like unemployment and inflation.

Regarding the Thai national stock exchange, it is called the Stock Exchange of Thailand (SET), and it is located in Bangkok, the capital city of Thailand. The Thai national stock market has three indices, namely the SET Index, the SET 100 Index, and the SET 50 Index.

The Stock Exchange of Thailand has a history, comprised of two periods. The first period (from 1962 to the early 1970s) is when the stock market was privately owned and known as the Bangkok Stock Exchange (BSE). The Bangkok Stock Exchange was established by a private group as a limited partnership in 1962. It later changed its ownership structure from a limited partnership to a limited company in 1963. The Bangkok Stock Exchange however did not succeed in attracting much turnover or business. Turnover amounted to 160 million Baht in 1968, 114 million Baht in 1969, 46 million Baht in 1970, and 28 million Baht in 1971. This negative trend led to the closing of the Bangkok Stock Exchange in the early 1970s.

In the second period (from 1975 to the present), the Thai stock market has been operated by the Thai government. Following a recommendation by the second National Economic and Social Development Plan to establish a new Thai stock market, the Securities Exchange of Thailand officially opened on April 30, 1975, and became the Stock Exchange of Thailand on January 1, 1991. The three primary roles of the Stock

Exchange of Thailand are to serve as a center for the trading of listed securities, to undertake business relating to the Securities Exchange, such as a clearing house activities, and to undertake other business approved by the Securities and Exchange Commission.

The Stock Exchange of Thailand is comprised of eight industry groups and a total of 27 sectors. The industry groups of the Stock Exchange of Thailand, the sectors of each industry group and the number of the companies in each sector are presented in the following table, Table 1.1: Industries and Sectors of the Stock Exchange of Thailand.



Table 1.1: Industries and Sectors of the Stock Exchange of Thailand

Industry Groups	Sectors of Industry Groups	Number of Companies
<ul style="list-style-type: none">• Agro and Food• Consumer Products	<ul style="list-style-type: none">• Agribusiness• Food and Beverage• Fashion• Home and Office Products• Personal Products and Pharmaceuticals	<ul style="list-style-type: none">• 15• 26• 23• 10• 6
<ul style="list-style-type: none">• Financials	<ul style="list-style-type: none">• Banking• Finance and Securities• Insurance	<ul style="list-style-type: none">• 11• 29• 17
<ul style="list-style-type: none">• Industrials	<ul style="list-style-type: none">• Automotive• Industrial Materials and Machinery• Packaging• Paper and Printing Materials• Petrochemicals and Chemicals• Steel	<ul style="list-style-type: none">• 19• 7• 13• 2• 12• 27
<ul style="list-style-type: none">• Property and Construction	<ul style="list-style-type: none">• Construction Materials• Property Development• Property Fund	<ul style="list-style-type: none">• 20• 65• 41
<ul style="list-style-type: none">• Resources	<ul style="list-style-type: none">• Energy and Utilities• Mining	<ul style="list-style-type: none">• 26• 2
<ul style="list-style-type: none">• Services	<ul style="list-style-type: none">• Commerce• Health Care Services• Media and Publishing• Professional Services• Tourism and Leisure• Transportation and Logistics	<ul style="list-style-type: none">• 16• 14• 27• 3• 13• 16
<ul style="list-style-type: none">• Technology	<ul style="list-style-type: none">• Electronic Components• Information and Communication Technology	<ul style="list-style-type: none">• 11• 27

Source: Developed by the author based on www.set.or.th

Regarding the Banking Sector of the Stock Exchange of Thailand, 11 Banks comprise this sector. They are Bank of Ayudhya Public Company Limited (BAY) with paid-up capital of common stock of 60,741,437,470.00 Baht and market capitalization of 201,965,280,000 Baht as of June 7, 2013; Bangkok Bank Public Company Limited (BBL) with paid-up capital of common stock of 19,088,428,940.00 Baht and market capitalization of 389,403,950,000 Baht as of June 7, 2013; CIMB Thai Bank Public Company Limited (CIMBT) with paid-up capital of common stock of 10,542,439,012.50 Baht and market capitalization of 43,856,550,000 Baht as of June 7, 2013; Kasikornbank Public Company Limited (KBANK) with paid up capital of common stock of 23,932,601,930.00 Baht and market capitalization of 466,685,740,000 baht as of June 7, 2013; Kiatnakin Bank Public Company Limited (KK) with paid-up capital of common stock of 8,349,100,590.00 Baht and market capitalization of 50,094,600,000 Baht as of June 7, 2013; Krung Thai Bank Public Company Limited (KTB) with paid-up capital of common stock of 71,976,715,437.50 Baht and market capitalization of 287,906,860,000 Baht as of June 7, 2013; LH Financial Group Public Company Limited (LHBANK) with paid-up capital of common stock of 12,688,925,357.00 Baht and market capitalization of 17,510,720,000 Baht as of June 7, 2013; The Siam Commercial Bank Public Company Limited (SCB) with paid-up capital of common stock of 33,938,739,170.00 Baht and market capitalization of 580,352,440,000 Baht as of June 7, 2013; Thanachart Capital Public Company Limited (TCAP) with paid-up capital of common stock of 12,778,163,970.00 Baht and market capitalization of 54,307,200,000 Baht as of June 7, 2013; Tisco Financial Group Public Company Limited (TISCO) with paid-up capital of common stock of 7,278,782,280.00 Baht and market capitalization of 32,936,490,000 Baht as of June 7, 2013; and TMB Bank Public Company Limited (TMB) with paid-up capital of common stock of 41,426,006,152.70 Baht and market capitalization of 98,550,290,000 Baht as of June 7, 2013.

The Thai banking sector was selected for this study for three main reasons. First, the Thai banking sector is one of the most popular sectors among both Thai and non-Thai investors. Second, the researcher and his friends are most interested in investing in this sector. Third, Thai banks are among the largest listed companies on the Stock Exchange of Thailand in terms of paid-up capital and market capitalization, as can be seen from the following picture, which shows the Stock Exchange of Thailand Large

Cap Index. Due to the large capitalization of Thai banks, their stocks are less easy to manipulate than many of the stocks of other companies listed on the Stock Exchange of Thailand. As the stock prices of Thai banks are less easy to manipulate than the stock prices of many other listed companies, the stock prices of Thai banks are quite likely moved by company fundamentals and the overall economic situation, which complements the goals of this research study.

FSTHL: FTSE SET Large Cap

Symbol	Sign	Open	High	Low	Last	Change	%Change	Bid	Offer	Volume (Shares)	Value ('000 Baht)
ADVANC		262.00	269.00	261.00	268.00	+5.00	+1.90	267.00	268.00	8,926,649	2,365,404
AOT		156.50	166.00	156.00	163.50	+8.50	+5.48	163.50	164.00	5,396,313	867,894
BANPU		273.00	275.00	270.00	272.00	+1.00	+0.37	271.00	272.00	1,805,254	492,008
BAY		33.25	33.50	32.50	32.75	-0.50	-1.50	32.75	33.00	17,940,384	591,381
BBL		202.00	205.00	201.00	204.00	-	-	203.00	204.00	5,394,279	1,095,518
BEC		63.25	65.00	62.50	65.00	+2.00	+3.17	64.50	65.00	4,150,307	266,632
BGH		162.00	163.50	159.50	160.00	-5.00	-3.03	160.00	161.00	5,633,879	908,390
BIGC		199.50	202.00	198.50	200.00	+0.50	+0.25	199.50	200.00	851,537	170,007
CPALL		40.50	41.50	40.50	41.25	+0.50	+1.23	41.00	41.25	28,663,066	1,173,578
CPF		27.25	28.00	26.75	28.00	+0.75	+2.75	27.75	28.00	14,886,208	407,755
CPN		46.25	48.00	45.75	48.00	+2.25	+4.92	48.00	48.25	9,531,245	446,918
DTAC		114.00	118.00	114.00	117.00	+2.00	+1.74	116.00	117.00	3,232,604	376,543
EGCO		154.00	155.00	152.50	155.00	+1.00	+0.65	155.00	155.50	1,048,403	161,089
GLOW		73.00	74.00	73.00	73.00	-	-	73.00	73.75	1,159,500	85,029
INTUCH		84.00	86.50	83.50	86.00	+2.00	+2.38	85.75	86.00	30,838,449	2,628,911
IRPC		3.50	3.56	3.50	3.54	+0.04	+1.14	3.54	3.56	19,115,723	67,544
IVL		19.90	20.60	19.80	20.20	+0.20	+1.00	20.20	20.30	11,318,723	228,025
KBANK		193.50	195.50	193.50	195.00	-	-	195.00	195.50	10,471,476	2,038,114
KTB		20.60	21.20	20.60	20.90	+0.30	+1.46	20.90	21.00	97,145,309	2,025,906
LH		11.00	11.10	10.70	10.90	-0.10	-0.91	10.80	10.90	29,077,890	317,625
PTT		324.00	335.00	323.00	335.00	+9.00	+2.76	334.00	335.00	4,393,642	1,452,089
PTTEP		153.00	155.50	152.00	155.00	+2.50	+1.64	154.50	155.00	4,845,863	746,170
PTTGC		66.25	70.50	66.00	69.75	+2.75	+4.10	69.75	70.00	22,923,662	1,573,832
RATCH		52.00	52.00	51.00	51.75	-0.25	-0.48	51.50	51.75	1,621,099	83,489
SCB		171.00	175.50	170.00	174.00	+3.00	+1.75	173.50	174.00	9,880,141	1,705,131
SCC		436.00	464.00	436.00	458.00	+18.00	+4.09	458.00	460.00	1,610,804	726,347
SCCC		432.00	444.00	422.00	440.00	+6.00	+1.38	434.00	440.00	249,201	107,464
TMB		2.26	2.34	2.26	2.32	+0.06	+2.65	2.30	2.32	110,153,517	252,973
TOP		63.75	65.75	63.50	65.75	+1.50	+2.33	65.50	65.75	6,906,612	449,099
TUF		59.00	62.25	59.00	62.25	+1.75	+2.89	62.25	62.50	1,851,101	113,321

Source: www.set.or.th accessed on June 7, 2013

The following seven sections of this chapter are organized as follows. The first section discusses the statement of the problem and why research in this area may be beneficial. The second section describes the three specific research objectives of this study. The third section explains the scope of the research in this study. The fourth

section explains the three main limitations of the research conducted in this study. The fifth section presents the significance of this research. The sixth section presents important terminology used in this study and the corresponding definitions. The seventh section presents the abbreviations used in this study along with the long forms of the corresponding abbreviations

1.2 Statement of the Problem

Empirical evidence from numerous research papers over the last 40 years shows that macroeconomic variables can predict stock returns. Studies by Fama and Schwert (1977), Granger (1986), Jaffe and Mandelker (1976), Johansen and Juselius (1990), and Nelson (1976) are some such examples. However, these studies and many more of the earliest studies were primarily concerned with stock markets in the United States or stock markets in other developed countries. Many more recent studies continue to focus on stock markets in developed countries. Some examples are studies by Fifield, Power and Sinclair (2000), who studied the stock markets of 11 European countries; Lovatt and Parikh (2000), who studied the British stock market; Nasseh and Strauss (2000), who studied the stock markets of six European countries; and Hondroyiannis and Papapetrou (2001), who studied the Greek stock market.

Some recent research that studies the relationship between macroeconomic variables and stock market performance has focused on the stock markets of developing countries. Some such examples are studies by Maysami and Koh (2000), who studied the Singapore stock market; and Maysami and Sims (2002), who studied the stock markets of Hong Kong and Singapore. Despite the recent increase in research that focuses on stock markets of developing countries, the research available regarding how macroeconomic variables affect the stock markets of emerging economies still leaves many areas for further studies to be conducted.

In the Thai context, many published research studies focus on the relationship between macroeconomic variables and the aggregate index of the Stock Exchange of Thailand (SET). However, few published studies deal with the relationship between macroeconomic variables and industry indices or sector indices of the Stock Exchange of Thailand. The study by Tangjitprom (2012) is one of the few papers that

deals with the industries and sectors of the Stock Exchange of Thailand. For the long-term relationship between macroeconomic variables and the Banking Sector of the stock exchange of Thailand, the research available takes into consideration only a limited number of independent variables. As such, as of now it is not yet clear as to what the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand are.

As such, with the focus being the market inefficiency and long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand, it is the sincere hope of the researcher that this study and hopefully many more to follow will provide useful information in the said area. It is expected that with more complete information of the long-term nature and determinants of the banking sector of the Stock Exchange of Thailand, investors of the Banking Sector of the Stock Exchange of Thailand will be able to make more informed investment decisions and utilization of their limited resources.

This study aims to shed light on the following relationships and questions:

- Is the Banking Sector Index of the Stock Exchange of Thailand market inefficient?
- What are the long-term causal determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand?
- What are the time-lags between the causal determinants and the return of the Banking Sector Index of the Stock Exchange of Thailand?

1.3 Research Objectives

Utilizing the Efficient Market Hypothesis (EMH) as the theoretical foundation for this study, the Pair-wise Granger Causality test is conducted to explore the long-term causal relationships that flow from commodity prices, consumer confidence, foreign exchange rates, foreign stock markets, inflation, interest rates, money supply, and real estate to the return of the Banking Sector of the Stock Exchange of Thailand (SET). The 30 independent variables of this study are the Australian Dollar/Thai Baht

Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

This study contains three specific objectives:

- To determine whether or not the Banking Sector Index of the Stock Exchange of Thailand is market inefficient.
- To determine the long-term causal determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand.
- To determine the time-lags between the causal determinants and the return of the Banking Sector Index of the Stock Exchange of Thailand?

1.4 Scope of the Research

To fulfill the three research objectives of this study, as described above, one dependent variable and 30 independent variables are considered in this study of the return of the Banking Sector of the Stock Exchange of Thailand.

The 30 independent variables of this study fall into eight categories: commodity prices, consumer confidence, foreign exchange rates, foreign stock market indices, inflation, interest rates, money supply, and real estate prices and sales value. The 30 independent variables of this study are the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht

Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

The data applied in this study is monthly (end-of-month) time series data from a ten-year period (from January 2003 to December 2012). A ten-year data collection period conforms to the data collection period of many comparable studies. All the data of this study is secondary data obtained from Bloomberg.

1.5 Limitations of the Research

In carrying out this study, the researcher identified three key limitations to the study. However, the following limitations are not believed to compromise the overall results of the findings of this research. Rather, these limitations provide areas where further research may be conducted.

The first limitation of this study was that the Pair-wise Granger Causality statistical technique, which was used in this study, always shows positive relationships between independent variables and dependent variables. A positive relationship may not correspond with economic theory for some of the relationships tested in this and other studies. Thus, this study does not aim to show the directionality of each statistically significant relationship. However, this limitation does not distract from the main aim of this study, which is to identify which variables

significantly Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand in the long-term to prove the existence of market inefficiency.

The second limitation of this study was that no formula is developed and tested to determine the degree of accuracy of the combination of significantly related independent variables in forecasting the return of the Banking Sector Index of the Stock Exchange of Thailand. This limitation is the combined result of the above limitation, the lack of credible directionality, and the additional limitation of the software available to the research being unable to create and use a multiple correlation model with differing time lags for the different variables. However, this limitation does not distract from the main aim of this study, which is to identify which variables significantly Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand in the long-term to prove the existence of market inefficiency. The development and testing of a multiple correlation model with different time lags for the independent variables with statistically significant relationships with the return of the Banking Sector of the Stock Exchange of Thailand is left for subsequent research enthusiasts.

The third limitation of this study was that time for this study was limited. As a part of the requirement for a Master Degree of Business Administration, this study was conducted from 2012 to 2013. Additional research would have been conducted to build an even bigger picture of the determinants of the return of the Banking Sector of the Stock Exchange of Thailand had more time been available.

1.6 Significance of the Study

There is a void in previous research regarding the market efficiency of the Banking Sector of the Stock Exchange of Thailand. This void represents a lack of information for decision making from both the side of investors and from the side of companies listed on the Banking Sector of the Stock Exchange of Thailand. Some studies have tested factors for their long-term causal relationships with the Banking Sector of the Stock Exchange of Thailand. However, these studies have used only a

limited number of independent variables and generally do not conclude whether or not the Banking Sector of the Stock Exchange of Thailand is market efficient or not. This study with 30 independent variables will shed light on whether or not the Banking Sector of the Stock Exchange of Thailand is or is not market efficient and what factors contribute in the long-term to changes in the Banking Sector Index of the Stock Exchange of Thailand to provide investors and companies listed in the Thai Banking Sector with an understanding of their sector.

The information from this study is significant for traders and investors because it will provide information that is not yet available. It will answer the questions: is the Banking sector of the Stock Exchange of Thailand market efficient or inefficient and what variables can be used to better predict movements in the Banking Sector of the Stock Exchange of Thailand. Such information will help traders and investors make more optimal investment decisions about how to invest their limited resources in the Banking Sector of the Stock Exchange of Thailand. More specifically, the information from this research will provide as of yet unavailable empirical evidence about whether or not investors can achieve abnormal returns from investing in the Banking Sector of the Stock Exchange of Thailand if they are targeting abnormal returns, what variables may be included into their model to achieve their target.

The information from this study is significant for banks listed on the Stock Exchange of Thailand because it will provide empirical evidence that was not previously available. For Thai banking companies the information from this research will help them to predict with more accuracy the question: when will our sector index be at its highest point. Such information will help banks make more optimal decisions about when to make public offerings of stocks with the goal of optimizing the stock price of the public offerings of stocks. Timing is clearly important in investment decisions, and for banks looking to maximize their funding from public offerings of stock, this is also true.

This research will provide empirical evidence in an area, which has not yet been thoroughly tested with regards to the market inefficiency of the Banking Sector of the Stock Exchange of Thailand in light of information about the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange

Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

1.7 Definitions of the Terms

The important terms of this study and the corresponding definitions are presented in the following table, Table 1.2: Important Terms and Definitions. The eight terms explained in the following table are Commodities, Consumer Confidence, Exchange Rate, Inflation, Interest Rate, Money Supply, Real Estate, and Stock Market.

Table 1.2: Important Terms and Definitions

Terms	Definitions
Commodities	<ul style="list-style-type: none">• “A reasonably homogeneous good or material, bought and sold freely as an article of commerce. Commodities include agricultural products, fuels, and metals and are traded in bulk on a commodity exchange or spot market” (Commodity [Def 1], n.d.)• “A physical substance, such as food, grains, and metals, which is interchangeable with another product of the same type, and which investors buy or sell, usually through futures contracts. The price of the commodity is subject to supply and demand” (Commodity [Def 2], n.d.)
Consumer Confidence	<ul style="list-style-type: none">• “An economic indicator that gauges how consumers interpret the present economic environment and their expectations for the future” (Consumer Confidence [Def 1], n.d.)• “The degree of optimism that consumers are expressing for the state of the economy through their saving and spending activity” (Consumer Confidence [Def 2], n.d.)
Exchange Rate	<ul style="list-style-type: none">• The “price for which the currency of a country can be exchanged for another country's currency” (Exchange Rate [Def 1], n.d.)• The “rate at which one currency may be converted into another” (Exchange Rate [Def 2], n.d.)
Inflation	<ul style="list-style-type: none">• “A sustained, rapid increase in prices, as measured by some broad index (such as Consumer Price Index) over months or years, and mirrored in the correspondingly decreasing purchasing power of the currency” (Inflation [Def 1], n.d.)• “The overall general upward price movement of goods and services in an economy (often caused by a increase in the supply of money), usually as measured by the Consumer Price Index and the Producer Price Index” (Inflation [Def 2], n.d.)
Interest Rate	<ul style="list-style-type: none">• “The annualized cost of credit or debt-capital computed as the percentage ratio of interest to the principal” (Interest Rate [Def 1], n.d.)• “A rate which is charged or paid for the use of money” (Interest Rate [Def 2], n.d.)
Money Supply	<ul style="list-style-type: none">• A “population's spending power represented by the quantity of liquid assets (usually cash) in an economy that can be exchanged for goods and services” (Money Supply [Def 1], n.d.)• “The total supply of money in circulation in a given country's economy at a given time” (Money Supply [Def 2], n.d.)
Real Estate	<ul style="list-style-type: none">• “Land and anything fixed, immovable, or permanently attached to it such as appurtenances, buildings, fences, fixtures, improvements, roads, shrubs and trees (but not growing crops), sewers, structures, utility systems, and walls” (Real Estate [Def 1], n.d.)• “A piece of land, including the air above it and the ground below it, and any buildings or structures on it” (Real Estate [Def 2], n.d.)
Stock Market	<ul style="list-style-type: none">• “A place where shares are bought and sold, i.e. a stock exchange” (Stock Market [Def 1], n.d.)• A “general term for the organized trading of stocks through exchanges and over-the-counter” (Stock Market [Def 2], n.d.)

Source: Developed by the author

1.8 Abbreviations

The important abbreviations used in this study and the corresponding full forms are presented in the following table, Table 1.3: Abbreviations and Full Forms.

Abbreviations	Full Forms
• ADF	• Augmented Dickey-Fuller
• APT	• Arbitrage Pricing Theory
• BAY	• Bank of Ayudhya Public Company Limited
• BBL	• Bangkok Bank Public Company Limited
• BOT	• Bank of Thailand
• BSE	• Bangkok Stock Exchange
• CAPM	• Capital Asset Pricing Model
• CIMBT	• CIMB Thai Bank Public Company Limited
• GDP	• Gross Domestic Product
• EMH	• Efficient Market Hypothesis
• IMF	• International Monetary Fund
• KBANK	• Kasikornbank Public Company Limited
• KK	• Kiatnakin Bank Public Company Limited
• KTB	• Krung Thai Bank Public Company Limited
• LHBANK	• LH Financial Group Public Company Limited
• SCB	• The Siam Commercial Bank Public Company Limited
• SET	• Stock Exchange of Thailand
• TCAP	• Thanachart Capital Public Company Limited
• TISCO	• Tisco Financial Group Public Company Limited
• TMB	• TMB Bank Public Company Limited
• UK	• England
• US/USA	• United States
• WTI	• West Texas Intermediate

Source: Developed by the author

Chapter 2

Review of Related Literature and Empirical Studies

This chapter first discusses some of the most popular theories related to predictive models of stock market return. Then, the definitions of Commodities, Consumer Confidence, Exchange Rates, Foreign Stock Markets, Inflation, Interest Rates, Money Supply and Real Estate and the related literature that deals with the same variables is discussed. The related literature is important in this study as it is used to prove that there is empirical evidence that supports the existence of relationships between Commodities, Consumer Confidence, Exchange Rates, Foreign Stock Markets, Inflation, Interest Rates, Money Supply and Real Estate and stock market return. Finally, some previous studies that deal with the degree of market efficiency that exists in the sectors and the composite index of the Stock Exchange of Thailand are presented.

2.1 Theory

There are two theories in financial literature that are most commonly cited as the theoretical foundation for predictive models of stock market return. They are called the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). These two theories are presented next.

Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM), which was introduced by Sharpe in 1964 to predict the returns of risky assets, focuses on the relationship between expected returns and the risk levels of risky assets. However, the downside of the

Capital Asset Pricing Model is that it is a single factor model, which uses only one factor to predict stock return.

The Capital Asset Pricing Model proposes that the optimal portfolio consists of a value-weighted mix of all assets available in the market, and it has two primary purposes. They are to provide a benchmark rate of return for evaluating possible investments and to help investors make educated approximations regarding the expected return from assets that are not yet being traded in the marketplace.

The Capital Asset Pricing Model is popular among scholars and common in finance textbooks because of its strong theoretical background and its ease of use. As such, in modern portfolio theory, the Capital Asset Pricing Model is an important analytic tool for explaining the risk-return relationship of risky assets.

However, a number of empirical studies, such as those by Coggin and Hunter (1985), Gibbons (1982), Lakonishok and Shapiro (1986), MacKinlay (1987), and Reinganum (1981), showed that abnormal returns existed in markets where the Capital Asset Pricing Model held true. This discrepancy between theory and empirical evidence led some people to argue that a multifactor model, a model where many factors were used to predict the return of an asset, would need to be developed to achieve increased predictive accuracy of the return of risky assets. The result was that the Arbitrage Pricing Theory (APT) model, which is discussed next, was developed.

Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) model, which was developed by Ross in 1976, filled the need for a multifactor model that would include more than one independent variable for predicting the return of risky assets. As such, it is more inclusive than the Capital Asset Pricing Model.

The Arbitrage Pricing Theory model proposes that the return of an asset is a linear function of various determinant factors. It expresses the sensitivity of the dependent variable to the independent variables in a factor-specific beta coefficient, and it proposes that the actual return of an asset is comprised of three parts. The first part is the asset's expected return at the beginning of a time period, which is also called the constant. The second part is the realization of any unexpected risk factors

during the period, or in other words changes in the independent variables of the study. The third part is the firm specific risk, or in other words the error events that are unique to a specific company. The Arbitrage Pricing Theory model is often applied to test relationships between macroeconomic variables and stock returns.

As 30 long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand are researched in this study for their relationship causal relationships with one dependent variable, the return of the Banking Sector Index of the Stock Exchange of Thailand, the Arbitrage Pricing Theory model forms the theoretical background for this study along with the Efficient Market Hypothesis, as was explained in the introduction in chapter one of this study.

2.2 Related Literature Review

Numerous studies show that stock markets indices are sensitive to changes in both local and foreign economic and social factors. For example, Harvey (1995) studied the relationships between five risk factors, namely World Equity Return, Return on Foreign Currency Index, Changing Price of Oil, Growth in World Industrial Production, and World Inflation Rate, and the stock market return of stock market indices of what he described as 21 developed countries, namely Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, the United Kingdom and the United States, and the return of the stock market indices of what he described as 20 emerging countries, namely Argentina, Brazil, Chili, Columbia, Greece, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Taiwan, Thailand, Turkey, Venezuela, and Zimbabwe. The findings of Harvey's study concluded that both local and foreign economic and social factors affected the return of stock market indices to different extents.

Based on the findings of previous literature of the relationship between economic and social factors and stock market return, this research proposes that local risk factors as well as foreign risk factors can cause changes in the return of the Stock

Exchange of Thailand (SET) and the industry indices and sector indices of the Stock Exchange of Thailand. The 30 long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand, that are studied in this research are the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

Commodities

Commodities may be defined as, “a reasonably homogeneous good or material, bought and sold freely as an article of commerce. Commodities include agricultural products, fuels, and metals and are traded in bulk on a commodity exchange or spot market,” (Commodity [Def 1], n.d.) or “a physical substance, such as food, grains, and metals, which is interchangeable with another product of the same type, and which investors buy or sell, usually through futures contracts. The price of the commodity is subject to supply and demand” (Commodity [Def 2], n.d.). In this study, for Commodities, the IMF Commodity Index was used, as an estimate of the price of commodities. As there is an untold number of commodities, two of the most popular commodities for investment, gold and oil, are studied in this paper to complement the commodity index and provide empirical evidence of long-term causal relationships from the price of gold and the price of oil to the return of the Banking Sector of the Stock Exchange of Thailand.

French and Li (2012) studied the relationship between commodity prices and United States equity investment into Brazil's Sao Paulo Stock Exchange Index (BOVESPA). The International Monetary Fund's (IMF) Commodity Index was used as a proxy of commodity prices. The study used monthly time-series data from a ten-year and five-month (from January 1998 to May 2008) period and the Granger Causality test was used to examine the said relationship. The results of the paper show a significant lag relationship between commodity prices and United States purchases of Brazilian equity. The analysis also found that higher commodity prices led to increased investment into the Brazil stock market index, which meant that a positive relationship between commodity prices and United States investment into Brazil's equity market existed. The researchers concluded that commodity prices were important determinants in forecasting the flow of funds from the United States into Brazilian equity, and that commodity prices was a variable that had not been considered in much of the existing literature. The researchers argued for the inclusion of commodity prices when modeling equity flows to resource rich nations. Thus, this paper tests the International Monetary Fund's Commodity Index as a long-term determinant of the return of the Banking Sector of the Stock Exchange of Thailand.

Gold Price

Gold price has a pretty straight forward meaning, as it means the price that is paid when buying gold and the price received when selling gold. In this study, the Gold Price is that set by the Gold Traders Association of Thailand, and the Thai Gold Bar (Buying) Price Index was used.

A thorough search for studies that provide empirical evidence of the existence of significant relationships between the price of gold and stock market return was carried out of the journals available on Emerald's online database. However, the findings of the search of related literature revealed that few studies have been conducted to test for the existence of the said relationship, as French and Li (2012) had concluded. From the search, it was found that of the studies that tested for a relationship between the price of gold and the return of stock market indices, no statistically significant relationships were found. This research takes the opportunity to explore the existence

of such a relationship in the Thai context, with regards to the long-term return of the Banking Sector Index of the Stock Exchange of Thailand.

Oil Price

Oil price has a pretty straight forward meaning, as it means the price that is paid when buying oil and the price that is received when selling oil. However, there are many different types of oil available in the market. In this study, three oil prices are used as proxies for oil price. They are Brent Price, Heating Oil Price, and WTI Price. For Brent, the Brent Crude Oil Commodity spot price was used. For Heating Oil, the New York Harbor (No. 2) Heating Oil Index was used. For WTI, which stands for West Texas Intermediate, the WTI Cushing Crude Oil Index was used.

Büyüksalvarcı (2010) studied the relationship between the oil price and the return of the Turkish Stock Exchange under the Arbitrage Pricing Theory (APT) model. The dependent variable was the return of the main Turkish stock market index, the Istanbul Stock Exchange Index-100. The study used monthly time-series data from a seven-year and three-month (from January 2003 to March 2010) period and the Ordinary Least Squares (OLS) test to examine the said relationship. The findings of the study show that the oil price had a significant negative relationship with the returns of the ISE-100 Index.

Samad and Bhat (2009) studied the relationship between the oil price and the stock prices of six oil and gas companies from three different countries. The listed oil companies were Exxon Mobil (NYSE), Chevron (NYSE), Reliance Industries (NSEI), Indian Oil (NSEI), Royal Dutch Shell (LSE), and Gazprom (LSE). The companies were chosen from each country's stock market to represent each country's respective oil and gas industry. The study used the Vector Auto Regression (VAR) test to examine the said relationships and daily data from a five-year (from August 08, 2003 to August 08, 2008) period. The findings of the study show that a significant short-term and long-term relationship between the oil price and stock prices existed, and that the directionalities of the relationships were sometimes positive and sometimes negative.

Saeed (2012) studied the relationships between the oil price and the return of nine sectors of the Karachi Stock Exchange 100 Index, namely the Oil and Gas sector, the Textile Composite sector, the Jute sector, the Cement sector, the Cable and Electrical Goods sector, the Automobile sector, the Chemical and Pharmaceutical sector, the Leasing sector, and the Glass and Ceramics sector. The study used the Ordinary Least Square test to examine the said relationships and monthly data from a ten-year (from June 2000 to June 2010) period. The findings of the study show that the oil price had a significant positive relationship with the Oil and Gas sector, the Automobile sector, and the Cable and Electronics sector.

Regarding the literature of the relationship between commodity prices and stock market indices, the literature shows support for the existence of the said relationship. However, literature that studies the relationship between commodity prices and stock market indices is not plentiful, as discovered by French and Li (2012). This paper tests for causal long-term relationship between commodity prices and the return of the Banking Sector of the Stock Exchange of Thailand. The five independent variables that proxy for commodity prices in this paper are Commodities Index Price, Gold Price, Brent Price, Heating Oil Price, and WTI Price. The expectation for the situation in Thailand is that causal relationships may exist between Commodities Prices, Gold Prices, Brent Prices, Heating Oil Prices, and WTI Prices and the return of the Banking Sector of the Stock Exchange of Thailand.

The following table, Table 2.1: Summary of Literature of Commodities, summarizes the literature cited in this study regarding the relationship between commodity prices and stock market return. Table 2.1 presents the authors of the studies, the alternative hypotheses of the studies and the findings of the related literature.

Table 2.1: Summary of Literature of Commodities		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> French and Li (2012) 	<ul style="list-style-type: none"> There is a relationship between commodity prices and US equity investment into Brazil's Sao Paulo Stock Exchange Index. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Büyükalvarcı (2010) 	<ul style="list-style-type: none"> There is a relationship between the oil price and the stock return of the 	<ul style="list-style-type: none"> A significant negative

<ul style="list-style-type: none"> • Samad and Bhat (2009) 	<p>Turkish Stock Exchange.</p> <ul style="list-style-type: none"> • There is a relationship between the oil price and stock prices of six oil and gas companies from the United States, the United Kingdom, and India. 	<p>relationship exists.</p> <ul style="list-style-type: none"> • Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> • Saeed (2012) 	<ul style="list-style-type: none"> • There is a relationship between the oil price and the stock returns of the Oil and Gas sector of the Karachi Stock Exchange 100 index. 	<ul style="list-style-type: none"> • A significant positive relationship exists.

Source: Integrated and created by the author

Consumer Confidence

Consumer confidence may be defined as, “an economic indicator that gauges how consumers interpret the present economic environment and their expectations for the future,” (Consumer Confidence [Def 1], n.d.) or “the degree of optimism that consumers are expressing for the state of the economy through their saving and spending activity” (Consumer Confidence [Def 2], n.d.). In this paper, for Consumer Confidence, Thailand’s Consumer Confidence Index was used, as an estimate of consumers’ level of optimism about the state of the Thai economy, with the idea being that a decline in consumer confidence may be a leading indicator of a contraction of economic activity, and an increase in consumer confidence may be a leading indicator of an expansion of economic activity.

A thorough search of the literature for studies that provide empirical evidence of relationships between consumer confidence and stock market return was carried out of the journals available on Emerald’s online database. The findings of the search revealed that rarely have studies been conducted to test for the existence of the said relationship. From the search, no study was found that provided empirical evidence of statistically significant relationships between consumer confidence and stock market return. As such, this paper takes the opportunity to explore the existence of a significant long-term causal relationship between consumer confidence and the return of the Banking Sector of the Stock Exchange of Thailand. The expectation for the Thai situation is that a long-term causal relationship from consumer confidence to the return of the Banking Sector of the Stock Exchange of Thailand may exist.

Exchange Rates

Exchange rate may be defined as, the “price for which the currency of a country can be exchanged for another country's currency,” (Exchange Rate [Def 1], n.d.) or the “rate at which one currency may be converted into another” (Exchange Rate [Def 2], n.d.). For a home currency, there are many exchange rates between it and the currencies of each of the other countries around the world. In this study, 11 currency exchange rates for the Thai Baht are tested for their long-term causal relationships with the return of the Banking Sector of the Stock Exchange of Thailand. They are the Austrian Dollar/Thai Baht Exchange Rate, the British Pound/Thai Baht Exchange Rate, the Chinese Yuan/Thai Baht Exchange Rate, the Euro/Thai Baht Exchange Rate, the Indian Rupee/Thai Baht Exchange Rate, the Japanese Yen/Thai Baht Exchange Rate, the New Zealand Dollar/Thai Baht Exchange Rate, the Russian Ruble/Thai Baht Exchange Rate, the Singapore Dollar/Thai Baht Exchange Rate, and the Swedish Krona/Thai Baht Exchange Rate.

Osamwonyi and Evbayiro-Osagie (2012) studied the relationship between the Nigerian Naira/United States Dollar exchange rate and the All-Share Index of the Nigerian capital market. The study used yearly data from a 30-year (from 1975 to 2005) period and the Vector Error Correction Model (VECM) test to examine the said relationship. The findings of the study show that the Nigerian Naira/United States Dollar exchange rate had a significant positive short-term relationship with the All-Share Index, as well as a significant negative long-term relationship with the All-Share Index.

Büyükşalvarcı (2010) studied the relationship between the Turkish Lira/United States Dollar exchange rate and the return of the Turkish Stock Exchange Market, namely the Istanbul Stock Exchange Index-100, under the Arbitrage Pricing Theory model. The study used monthly time-series data from a seven-year and three-month (from January 2003 to March 2010) period and the Ordinary Least Squares test to examine the said relationship. The findings of the study show that the Turkish Lira/United States Dollar exchange rate had a significant negative relationship with the returns of the ISE-100 Index.

Tangjitprom (2012) studied the relationship between the Thai Baht/United States Dollar exchange rate and the return of the Stock Exchange of Thailand. The study used monthly data from a ten-year (from January 2001 to December 2010) period and the Ordinary Least Squares test to examine the said relationship. The findings of the study show that the Thai Baht/United States Dollar exchange rate was significantly and negatively related to the return of the Stock Exchange of Thailand.

Joseph and Vezos (2006) studied the relationship between the United States exchange rate and changes in the stock return of United States banks. The study used daily data for an 11-year (from January 2, 1990 to January 5, 2001) period and the Exponential General Autoregressive Conditional Heteroskedastic (EGARCH) test to examine the said relationships. The findings of the study show that a significant positive relationship between the United States exchange rate and the stock return of United States banks existed.

Maysami, Howe and Hamzah (2004) studied the long-term relationships between the United States Dollar/Singapore Dollar exchange rate and the returns of the Finance Index, Property Index, and Hotel Index of the Stock Exchange of Singapore. The study used the Vector Error Correction Model (VECM) test and monthly data from a seven-year (from February 1995 to December 2001) period to examine the said relationships. The findings of the study show that the United States Dollar/Singapore Dollar exchange rate was significantly related with some of the dependent variables. The findings show that the exchange rate exhibited both significant positive and significant negative relationships with the different industry indices.

Saeed (2012) studied the relationships between the United States Dollar/Pakistani Rupee exchange rate and the return of nine sectors of the Karachi Stock Exchange 100 Index, namely the Oil and Gas sector, the Textile Composite sector, the Jute sector, the Cement sector, the Cable and Electrical Goods sector, the Automobile sector, the Chemical and Pharmaceutical sector, the Leasing sector, and the Glass and Ceramics sector. The study used the Ordinary Least Square test and monthly ten-year data (from June 2000 to June 2010) to examine the said relationships. The findings of the study show that the United States Dollar/Pakistani Rupee exchange rate had significant positive and significant and negative

relationships with the Oil and Gas sector, the Automobile sector, and the Cable and Electronics sector.

Kuwornu and Owusu-Nantwi (2011) studied the relationship between the United States Dollar/Ghana Cedi exchange rate and the return of the GSE All-Share Index, as a proxy for the Ghana stock market. The study used monthly time series data from a seven-year (from January 1992 to December 2008) period and the Full Information Maximum Likelihood Estimation test to examine the said relationship. The findings of the study show that a significant relationship between the United States Dollar/Ghana Cedi exchange rate and the returns of the stock market existed. The exchange rate exhibited a significant negative relationship with the return of the GSE All-Share Index.

Sabri (2004) studied the relationship between the United States Dollar exchange rate and the currencies of Mexico, Korea, South Africa, Turkey, and Malaysia and the respective returns of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. The study used monthly time-series data from a four-year (from January 1997 to December 2000) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show significant positive relationships between the currency exchange rates and the returns of the respective stock market indices.

Ibrahim and Aziz (2003) studied the relationship between the Malaysian Ringgit/United States Dollar exchange rate and the return of the Kuala Lumpur Composite Index (KLCI) under the Arbitrage Pricing Theory (APT) model. The study used monthly time-series data from a 21-year and eight-month (from January 1977 to August 1998) period and the Vector Autoregression test to examine the said relationship. The findings of the study show that a significant negative long-term relationship between the Malaysian Ringgit/United States Dollar exchange rate and the return of the Kuala Lumpur Composite Index existed.

Liu and Shrestha (2008) studied the relationship between the United States Dollar/Chinese Yuan exchange rate and the return of two Chinese stock markets; the SHSE composite index and the SZSE composite index. The study used monthly time-series data from a ten-month (from January 1992 to December 2001) period and the Heteroscedastic Cointegration test to examine the said relationships. The findings of

the study show that significant negative relationships existed between the Chinese Yuan and the return of the SHSE composite index and the SZSE composite index.

Wickremasinghe (2011) studied the relationship between the Sri Lankan Rupee/United States Dollar exchange rate and the return of the Sri Lankan stock exchange, namely All-Share Price Index. The study used monthly time-series data from a 20-year (from January 1985 to December 2004) period and the Granger Causality test to examine the said relationship. The findings of the study show that a bi-directional causal relationship between the All-Share Price Index and the Sri Lankan Rupee/United States Dollar exchange rate existed.

Adjasi, Biekpe and Osei (2011) studied the relationships between the Tunisian Dinar/United States Dollar exchange rate and the return of the Stock Market of Tunisia. The study used monthly time-series data from a 13-year (from 1992 to 2005) period and the Vector Autoregressive (VAR) test to examine the said relationships. The findings of the study show that a significant long-term positive relationship between the Tunisian Dinar/United States Dollar exchange rate and the return of the Stock Market of Tunisia existed.

Regarding the relationship between foreign currency exchange rates and stock market indices, the previous studies provide empirical evidence that relationships between exchange rates and stock market indices exist and can be either positive or negative. However, the majority of the findings point to a negative relationship between currency exchange rates and stock market indices. This research studies the long-term causal relationships between exchange rates and the return of the Banking Sector of the Stock Exchange of Thailand. Eleven currency exchange rates are studied for their long-term causal relationships with the return of the Banking Sector of the Stock Exchange of Thailand in this study. They are the Austrian Dollar/Thai Baht Exchange Rate, the British Pound/Thai Baht Exchange Rate, the Chinese Yuan/Thai Baht Exchange Rate, the Euro/Thai Baht Exchange Rate, the Indian Rupee/Thai Baht Exchange Rate, the Japanese Yen/Thai Baht Exchange Rate, the New Zealand Dollar/Thai Baht Exchange Rate, the Russian Ruble/Thai Baht Exchange Rate, the Singapore Dollar/Thai Baht Exchange Rate, the Swedish Krona/Thai Baht Exchange Rate and the United States Dollar/Thai Baht Exchange Rate. The expectation for the situation in Thailand regarding these independent variables and the dependent

variable, the return of the Banking Sector of the Stock Exchange of Thailand, is that long-term causal relationships may exist.

The following table, Table 2.2: Summary of Literature of Exchange Rates, summarizes the literature cited in this study regarding the relationship between exchange rates and stock market return. Table 2.2 presents the authors of the studies, the alternative hypotheses of the studies and the findings of the related literature.



Table 2.2: Summary of Literature of Exchange Rates		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Osamwonyi and Evbayiro-Osagie (2012) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and the stock return of the All-Share Index of Nigeria. 	<ul style="list-style-type: none"> A significant positive relationship and a significant negative relationship exist.
<ul style="list-style-type: none"> Büyükşalvarcı (2010) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and the stock return of the Turkish Stock Exchange. 	<ul style="list-style-type: none"> A significant negative relationship exists.
<ul style="list-style-type: none"> Tangjitprom (2012) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and the return of the Stock Exchange of Thailand. 	<ul style="list-style-type: none"> A significant negative relationship exists.
<ul style="list-style-type: none"> Joseph and Vezos (2006) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and stock return of US banks. 	<ul style="list-style-type: none"> Significant positive relationships exist.
<ul style="list-style-type: none"> Maysami, Howe and Hamzah (2004) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and the stock returns of the Finance Index, Property Index, and Hotel Index of the Stock Exchange of Singapore. 	<ul style="list-style-type: none"> Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> Saeed (2012) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate and the stock returns of the Oil and Gas, Textile Composite, Jute, Cement, Cable and Electrical Goods, Automobile, Chemical and Pharmaceutical, Leasing, and Glass and Ceramics sectors of the Karachi Stock Exchange 100 index. 	<ul style="list-style-type: none"> Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> Kuwornu and Owusu-Nantwi (2011) 	<ul style="list-style-type: none"> There is a relationship between the US Dollar and the Ghana Cedi exchange rate and the return of the GSE All Share Index (ASI). 	<ul style="list-style-type: none"> A significant negative relationship exists.
<ul style="list-style-type: none"> Sabri (2004) 	<ul style="list-style-type: none"> There is a relationship between the US Dollar exchange rate and the returns of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. 	<ul style="list-style-type: none"> Significant positive relationships exist.
<ul style="list-style-type: none"> Ibrahim and Aziz (2003) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate (Ringgit-US dollar rate) and the return of the Kuala Lumpur Composite Index (KLCI). 	<ul style="list-style-type: none"> A significant negative relationship exists.
<ul style="list-style-type: none"> Liu and Shrestha (2008) 	<ul style="list-style-type: none"> There is a relationship between the US Dollar and the Chinese Yuan exchange rate and the SHSE composite index and the SZSE composite index. 	<ul style="list-style-type: none"> Significant negative relationships exist.
<ul style="list-style-type: none"> Wickremasinghe (2011) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate (Sri Lankan Rupee/US Dollar) and the return of the Sri Lankan Stock Exchange. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Adjasi, Biekpe, and Osei (2011) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate (Tunisian Dinar/US Dollar) and the return of the stock market of Tunisia. 	<ul style="list-style-type: none"> A significant positive relationship exists.

Source: Integrated and created by the author

Foreign Stock Markets

Stock markets may be defined as, “a place where shares are bought and sold, i.e. a stock exchange,” (Stock Market [Def 1], n.d.) or a “general term for the organized trading of stocks through exchanges and over-the-counter” (Stock Market [Def 2], n.d.). By adding the word “foreign” before the words “stock market,” the meaning refers to stock markets that are located or belong to countries other than the home country, which in this case is Thailand. For this study, six foreign stock markets were examined for their long-term causal relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand. They are the German Stock Market Index, Hong Kong Stock Exchange Index, New York Stock Exchange Index, Swiss Stock Market Index, Taiwan Stock Market Index, and the Tokyo Stock Market Index. In this study, for the German Stock Market Index, the Deutsche Borsse AG German Stock (DAX) Index was used, for the Hong Kong Stock Exchange Index, the Hong Kong Hang Sang Index was used, for the New York Stock Exchange Index, the New York Stock Exchange Composite Index was used, for the Swiss Stock Market Index, the Swiss Market Index was used, for the Taiwan Stock Market Index, the Taiwan Stock Exchange Weighted Index was used, and for the Tokyo Stock Market Index, the Tokyo Stock Exchange Total Price Index was used.

Sabri (2004) studied the relationship between international stock indices (the New York Stock Exchange, the Tokyo Stock Price Index, and the London Stock Price Index) and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. The study used monthly time-series data from a four-year (from January 1997 to December 2000) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show that significant relationships between international stock indices and the return of stock markets of developing countries existed.

Karim and Majid (2010) studied the relationships between Malaysia’s stock market and the stock markets of its major trading partners (the USA, Japan, Singapore, China and Thailand). The variables were the return of the Kuala Lumpur Composite Index for Malaysia, the Singapore Straits Time Index for Singapore, the Standard and Poor 500 Index for the USA, the Tokyo Price Index for Japan, the Bangkok Stock Exchange Trade Index for Thailand and the Shenzhen Stock

Exchange Composite Index for China. The study used weekly time-series data from a 16-year and five-month (from January 1992 to May 2008) period and the Vector Autoregression (VAR) test to examine the said relationships. The findings of the study show that significant relationships between the stock market of Malaysia and the stock markets of Malaysia's major trading partners existed.

Kurihara and Nezu (2006) studied the causal relationship between the Japanese stock market and a United States stock market. The study used daily time-series data from a 15-year (from 1992 to 2006) period and the Vector Error Correction test to examine the said relationship. The findings of the study show that a significant causal relationship from United States stock prices to Japanese stock prices existed.

Chong, Drew and Veeraraghavan (2003) studied the causal relationship between a United States stock market and the return of Australia's stock market. The study used weekly time-series data from a ten-year (from 1991 to 2001) period and the Vector Autoregression test to examine the said relationships. The findings of the study show that short-term and long-term relationships between the Australian stock market and the United States stock market existed, and that the United States stock market Granger-caused the return of the Australian stock market.

Mansur (1991) studied the relationships between the Toronto 300 Composite Index for Canada, the London 100-Share Index for the United Kingdom, the Tokyo Nikkei Average Index for Japan, and the S&P 500 Index for the United States. The study used daily time-series data from a six-month (from July 27, 1987 to January 15, 1988) period and the Pair-wise Granger test to examine the said relationships. The findings of the study show that unidirectional causal relationships from the United States to Canada and from the United States to the United Kingdom existed. The findings also showed that bi-directional causality relationships between the United States and Japan existed.

Majid, Meera, Omar and Aziz (2009) studied the relationships between the stock market returns of the five founding members of ASEAN, namely Malaysia, Indonesia, Thailand, Singapore and the Philippines. The variables used in the study were the return of the Kuala Lumpur Stock Exchange Composite Index (KLSE-CI) for Malaysia, the return of the Jakarta Stock Exchange Composite Index (JSX-CI) for Indonesia, the return of the Bangkok Stock Exchange Trade Index (BSETI) for

Thailand, the return of the Philippines Stock Exchange Index (PSEI) for the Philippines, and the return of the Singapore All Equities Index (SAEI) for Singapore. The study used daily time-series data from a 19-year (from January 1, 1988 to December 31, 2006) period and the Granger Causality test to examine the said relationships. The findings of the study show that Singapore's stock market Granger-caused all the other ASEAN stock markets, while Indonesia's stock market was Granger-caused by the other ASEAN markets with the exception of Thailand's stock market. The Thai stock market was found to have no causal relationships with the rest of the ASEAN stock markets.

Wickremasinghe (2011) studied the relationships between a United States stock market and the return of Sri Lanka's All-Share Price Index. The study used monthly time-series data from an 18-year (from January 1985 to December 2004) period and the Granger Causality test to examine the said relationship. The findings of the study show that a bidirectional causal relationship between the All-Share Price Index and the United States stock index existed.

Perera and Wickramanayake (2012) studied the long-term relationships between the major South Asian financial markets, namely Bangladesh, India, Pakistan and Sri Lanka. The variables of the study were the return of the Dhaka Index (Bangladesh), the Sensex Index (India), the KSE100 Index (Pakistan) and the CSE All Index (Sri Lanka). The study used weekly time-series data from a 20-year and three-month (from January 1990 to March 2010) period and the Granger Causality test to examine the said relationships. The findings of the study show that the Indian stock market Granger-caused the Pakistani stock market and the Sri Lankan stock market. Also, the Pakistani stock market Granger-caused the Sri Lankan stock market.

Dhanaraj, Gopalaswamy and Babu (2013) studied the relationships between the Dow Jones Industrial Average (United States) and the returns of the Shanghai SE Composite Index (China), the Bombay SE SENSEX (India), the Hang Seng Index (Hong Kong), the Straits Times Index (Singapore), the Korean SE Composite Index (South Korea), and the Taiwan SE Corp. Weighted Index (Taiwan). The study used daily time-series data from an 11-year (from Jan 1, 1999 to Dec 31, 2009) period and the Granger Causality test to examine the said relationships. The findings of the study

show that the Dow Jones Index significantly Granger-caused all the Asian stock market indices, and the stock prices of the Asian markets affected the US market.

Regarding the literature of the relationship between foreign stock market indices and local stock market indices, the findings of the previous studies provide empirical evidence that relationships between foreign stock markets and local stock markets exist. This study tests for the long-term causal relationships between foreign stock markets and the return of the Banking Sector of the Stock Exchange of Thailand. The six foreign stock market indices tested for their long-term causal relationships with the return of the Banking Sector of the Stock Exchange of Thailand are the German Stock Market Index, Hong Kong Stock Exchange Index, New York Stock Exchange Index, Swiss Stock Market Index, Taiwan Stock Market Index, and the Tokyo Stock Market Index. The expectation for the Thai situation is that long-term causal relationships may exist between foreign stock markets and the return of the Banking Sector of the Stock Exchange of Thailand.

The following table, Table 2.3: Summary of Literature of Foreign Stock Markets, summarizes the literature cited in this study regarding the relationships between foreign stock markets and local stock market return. Table 2.3 presents the authors of the studies, the alternative hypotheses of the studies, and the findings of the related literature.

Table 2.3: Summary of Literature of Foreign Stock Markets		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Sabri (2004) 	<ul style="list-style-type: none"> There is a relationship between the New York Stock Exchange, the Tokyo Stock Price Index, and the London Stock Price Index and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Karim and Majid (2010) 	<ul style="list-style-type: none"> There is a relationship between Malaysia's stock market and the stock markets of the USA, Japan, Singapore, China and Thailand. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Kurihara and Nezu (2006) 	<ul style="list-style-type: none"> There is a relationship between the Japanese stock market and a US stock market. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Chong, Drew and Veeraraghavan (2003) 	<ul style="list-style-type: none"> There is a relationship between the US stock market and the return of Australia's stock market. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Mansur (1991) 	<ul style="list-style-type: none"> There is a relationship between the Toronto 300 Composite Index, the London 100-Share Index, the Tokyo Nikkei Average Index, and the S&P 500 Index. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Majid, Meera, Omar and Aziz (2009) 	<ul style="list-style-type: none"> There is a relationship between the stock market returns of Malaysia, Indonesia, Thailand, Singapore and the Philippines. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Wickremasinghe (2011) 	<ul style="list-style-type: none"> There is a relationship between a US stock market and the return of Sri Lanka's stock exchange. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Perera and Wickramanayake (2012) 	<ul style="list-style-type: none"> There is a relationship between the stock markets of Bangladesh, India, Pakistan and Sri Lanka. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Dhanaraj, Gopalaswamy and Babu (2013) 	<ul style="list-style-type: none"> There is a significant relationship between the Dow Jones Industrial Average and the returns of the Shanghai SE Composite Index, the Bombay SE SENSEX, the Hang Seng Index, the Straits Times Index, the Korean SE Composite Index, and the Taiwan SE Corp. Weighted Index. 	<ul style="list-style-type: none"> Significant relationships exist.

Source: Integrated and created by the author

Inflation

Inflation may be defined as, “a sustained, rapid increase in prices, as measured by some broad index (such as Consumer Price Index) over months or years, and mirrored in the correspondingly decreasing purchasing power of the currency,” (Inflation [Def 1], n.d.) or “the overall general upward price movement of goods and services in an economy (often caused by a increase in the supply of money), usually as measured by the Consumer Price Index and the Producer Price Index” (Inflation [Def 2], n.d.). In this study, the Thai consumer price index proxies for inflation and is examined for its long-term causal relationship with the return of the Banking Sector of the Stock Exchange of Thailand. For the Thai Consumer Price Index, the Thailand Consumer Price Index (All Items) was used.

Osamwonyi and Evbayiro-Osagie (2012) studied the relationship between inflation and the return of the All-Share Index of the Nigerian Capital Market Index. The study used yearly data from a 30-year (from 1975 to 2005) period and the Vector Error Correction Model (VECM) test to examine the said relationship. The findings of the study show that the inflation rate had a significant positive relationship with the All-Share Index.

Rjoub, Türsoy and Günsel (2009) studied the relationship between inflation and the return of the Istanbul Stock Market. The study used monthly four-year and nine-month (from January 2001 to September 2005) data and the Ordinary Least Squares (OLS) test to examine the said relationship. The findings of the study show that there was a significant positive relationship between inflation and the stock returns of the Istanbul Stock Market.

Maysami, Howe and Hamzah (2004) studied the relationships between inflation and the return of the Finance Index, the Property Index, and the Hotel Index of the Singapore Stock Market. The study used monthly data from a seven-year (from February 1995 to December 2001) period and the Johansen’s Vector Error Correction Model (VECM) test to examine the relationship. The findings of the study show that a significant relationship between inflation and two of the dependent variables existed, and that the significant relationships were positive and negative.

Kuwornu and Owusu-Nantwi (2011) studied the relationship between the consumer price index, as a proxy for inflation, and the return of the GSE All-Share Index (ASI), as a proxy for the Ghana stock market. The study used monthly time-series data from a seven-year (from January 1992 to December 2008) period and the Full Information Maximum Likelihood Estimation test to examine the said relationship. The findings of the study show that a significant positive relationship between the consumer price index and the GSE All-Share Index existed.

Sabri (2004) studied the relationships between inflation and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. The study used monthly time-series data from a four-year (from January 1997 to December 2000) period and the Ordinary Least Squares test to examine the said relationship. The findings of the study show that positive significant relationships between inflation and the stock market return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia existed.

Ibrahim and Aziz (2003) studied the relationship between the consumer price index and the return of the Kuala Lumpur Composite Index (KLCI) under the Arbitrage Pricing Theory (APT) model. The study used monthly time-series data from a 21-year and eight-month (from January 1977 to August 1998) period and the Vector Autoregression test to examine the said relationships. The findings of the study showed that a positive long-term relationship between the consumer price index and the return of the Kuala Lumpur Composite Index existed.

Liu and Shrestha (2008) studied the relationships between inflation and the return of two Chinese stock markets, namely the SHSE Composite Index and the SZSE Composite Index. Inflation was represented by the Chinese consumer price index. The study used monthly time-series data from a ten-year (from January 1992 to December 2001) period and the Heteroscedastic Cointegration test to examine the said relationships. The findings of the study show that negative long-term relationships between inflation and stock returns existed.

Wickremasinghe (2011) studied the relationship between the consumer price index and the return of the Sri Lankan Stock Exchange, namely the All-Share Price Index (ASPI). The study used monthly time-series data from a 20-year (from January 1985 to December 2004) period and the Granger Causality test to examine the said

relationship. The findings of the study show that bi-directional causal relationships between the consumer price index and the All-Share Price Index existed.

Regarding the literature about the relationship between inflation and stock market indices, the findings of previous studies provide empirical evidence of the existence of such relationships. This study tests for a long-term causal relationship between Thai inflation, as measured from the Thai Consumer Price Index, and the return of the Banking Sector of the Stock Exchange of Thailand. The expectation for the Thai situation is that a long-term causal relationship between inflation and the return of the Banking Sector of the Stock Exchange of Thailand may exist.

The following table, Table 2.4: Summary of Literature of Inflation, summarizes the literature cited in this study regarding the relationship between inflation and stock market return. Table 2.4 presents the authors of the studies, the alternative hypotheses of the studies and the findings of the related literature.

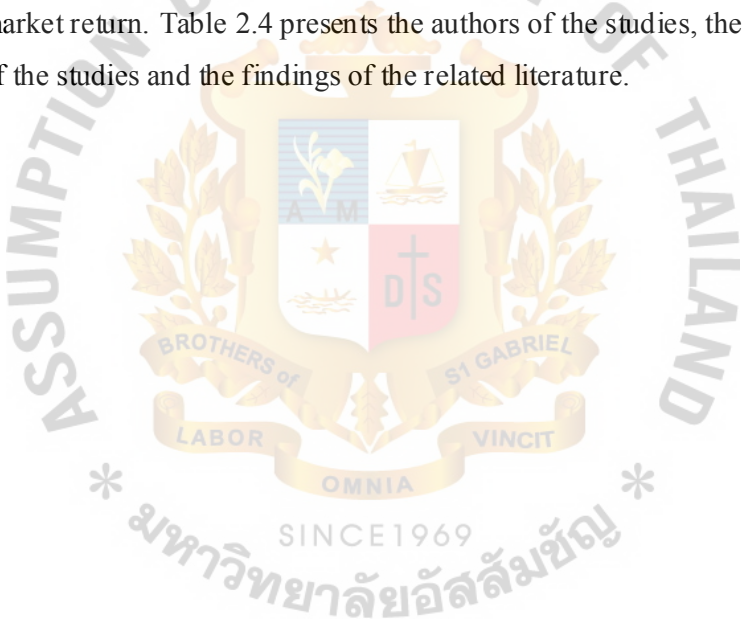


Table 2.4: Summary of Literature of Inflation		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Osamwonyi and Evbayiro-Osagie (2012) 	<ul style="list-style-type: none"> There is a relationship between inflation and the stock return of the All Share Index of Nigerian. 	<ul style="list-style-type: none"> A significant positive relationship exists.
<ul style="list-style-type: none"> Rjoub, Türsoy and Günsel (2009) 	<ul style="list-style-type: none"> There is a relationship between inflation and the stock return of the Istanbul Stock Market. 	<ul style="list-style-type: none"> A significant positive relationship exists.
<ul style="list-style-type: none"> Maysami, Howe and Hamzah (2004) 	<ul style="list-style-type: none"> There is a relationship between inflation and the stock return of the Finance Index, Property Index, and Hotel Index of the Stock Exchange of Singapore. 	<ul style="list-style-type: none"> Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> Kuwornu and Owusu-Nantwi (2011) 	<ul style="list-style-type: none"> There is a relationship between the inflation and the return of the GSE All Share Index. 	<ul style="list-style-type: none"> A significant positive relationship exists.
<ul style="list-style-type: none"> Sabri (2004) 	<ul style="list-style-type: none"> There is a relationship between inflation and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. 	<ul style="list-style-type: none"> Significant positive relationships exist.
<ul style="list-style-type: none"> Ibrahim and Aziz (2003) 	<ul style="list-style-type: none"> There is a relationship between the consumer price index and the return of the Kuala Lumpur Composite Index. 	<ul style="list-style-type: none"> A significant positive and a significant negative relationship exist.
<ul style="list-style-type: none"> Liu and Shrestha (2008) 	<ul style="list-style-type: none"> There is a relationship between inflation and the return of the SHSE Composite Index and the SZSE Composite Index. 	<ul style="list-style-type: none"> Significant negative relationships exist.
<ul style="list-style-type: none"> Wickremasinghe (2011) 	<ul style="list-style-type: none"> There is a relationship between the consumer price index and the return of the Sri Lankan Stock Exchange. 	<ul style="list-style-type: none"> Significant relationships exist.

Source: Integrated and created by the author

Interest Rates

Interest rate may be defined as, “the annualized cost of credit or debt-capital computed as the percentage ratio of interest to the principal,” (Interest Rate [Def 1], n.d.) or “a rate which is charged or paid for the use of money” (Interest Rate [Def 2], n.d.). In this study, two interest rates proxy for Interest Rates, and they are tested for long-term causal relationships with the return of the Banking Sector of the Stock Exchange of Thailand. They are the Thai Interest Rate from the Top Five Thai Banks and the Thai Interest Rate from the Top Four Thai Banks. For the Interest Rate from the Top Four Thai Banks, the Thai Interest Rate (Top 4 Banks) Index was used, and for the Thai Interest Rate from the Top Five Thai Banks, the Thai Interest Rate (Top 5 Banks) Index was used.

Rjoub, Türsoy and Günsel (2009) studied the relationship between the interest rate and the returns of the Istanbul Stock Market. The study used monthly four-year and nine-month (from January 2001 to September 2005) data and the Ordinary Least Squares (OLS) test to examine the said relationship. The findings of the study show that a significant positive relationship between the interest rate and the stock returns of the Istanbul Stock Market existed.

Büyükşalvarcı (2010) studied the relationship between the interest rate and the return of the Turkish Stock Exchange, namely the Istanbul Stock Exchange Index-100, under the Arbitrage Pricing Theory model. The study used monthly time-series data from a seven-year and three-month (from January 2003 to March 2010) period and the Ordinary Least Squares (OLS) test to examine the said relationship. The findings of the study show that a significant negative relationship between the interest rate and the returns of the ISE-100 Index existed.

Hussainey and Ngoc (2009) studied the relationship between the long-term interest rate and the short-term interest rate and Vietnamese stock prices. The study used monthly data from a seven-year and four-month (from January 2001 to April 2008) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show that a significant positive relationship between the short-term interest rate and Vietnamese stock prices, and a significant negative long-term relationship between long-term interest rates and Vietnamese stock prices existed.

Tangjitprom (2012) studied the relationship between the interest rate and the return of the Stock Exchange of Thailand (SET). The study used monthly data from a ten-year (January 2001 to December 2010) period and the Ordinary Least Squares test to examine the said relationship. The findings of the study show that a significant negative relationship between the interest rate and the return of the Stock Exchange of Thailand existed, and that the interest rate was also the most important macroeconomic variable in explaining variance in the return of the Stock Exchange of Thailand.

Park and Choi (2011) studied the relationship between actual interest rate changes and unexpected interest rate changes and the stock returns of United States property/liability (P/L) insurers. The study used weekly data from a nine-year (from 1992 to 2001) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show that relationships between the actual interest rate changes and the unexpected interest rate changes and the stock returns of the United States property/liability insurers existed, that the impacts of actual interest rate changes and unexpected interest rate changes on stock returns of the United States property/liability insurers were very similar, and that the directionality for the relationships varied depending on the period of the study.

Joseph and Vezos (2006) studied the relationships between the interest rate and stock returns of United States banks. The study used daily data from an 11-year (from January 2, 1990 to January 5, 2001) period and the Exponential General Autoregressive Conditional Heteroskedastic (EGARCH) test to examine the said relationships. The findings of the study show that significant positive and significant negative relationships between the interest rate and the stock returns of United States banks existed.

Liow and Huang (2006) studied the relationships between the interest rate and interest rate volatility and the returns of property stock indices of Singapore, Hong Kong, Japan and the United Kingdom. The study used monthly data from a 16-year (from 1987 to 2003) period and the Generalized Autoregressive Conditionally Heteroskedasticity in the Mean (GARCH-M) to examine the said relationships. The findings of the study show that significant relationships between the interest rate and interest rate volatility and the returns of property stock indices of Singapore, Hong

Kong and Japan and the United Kingdom existed. However, the directionalities of the relationships were inconclusive.

Maysami, Howe and Hamzah (2004) studied the relationships between the short-term interest rate and the long-term interest rate and the return of the Finance Index, the Property Index, and the Hotel Index of the Singaporean Stock Market. The study used monthly data from a six-year and 11-month (from February 1995 to December 2001) period and the Vector Error Correction Model (VECM) test to examine the said relationships. The findings of the study show that significant relationships for both independent variables with at least one of the dependent variables existed, and that the short-term interest rates exhibited a positive relationship and the long-term interest rates exhibited a negative relationship with the indices.

Samad and Bhat (2009) studied that relationship between the interest rate and the stock prices of six oil and gas companies from three different countries. The oil stocks were Exxon Mobil (NYSE), Chevron (NYSE), Reliance Industries (NSEI), Indian Oil (NSEI), Royal Dutch Shell (LSE), and Gazprom (LSE). The companies were chosen from each country's stock market to represent the respective country's oil and gas industry. The study used daily data from a five-year (from August 08, 2003 to August 08, 2008) period and the Vector Auto Regression (VAR) test to examine the said relationships. The findings of the study show that significant negative short-term and long-term relationships between the interest rate and the stock prices of the oil companies existed.

Saeed (2012) studied the relationships between the short-term interest rate and the return of nine sectors of the Karachi Stock Exchange 100 Index, namely the Oil and Gas sector, the Textile Composite sector, the Jute sector, the Cement sector, the Cable and Electrical Goods sector, the Automobile sector, the Chemical and Pharmaceutical sector, the Leasing sector, and the Glass and Ceramics sector. The study used monthly data from a ten-year (from June 2000 to June 2010) period and the Ordinary Least Square test to examine the said relationships. The findings of the study show that significant positive and significant negative relationships between the short-term interest and the return of the nine sectors of the Karachi Stock Exchange 100 Index existed.

Alam and Uddin (2009) studied the relationships between the interest rate and the return of the stock markets of Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, the Philippines, South Africa, Spain, and Venezuela. The study used monthly time-series data from a 15-year and three-month (from January 1988 to March 2003) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show that significant negative relationships between the interest rate and the return of the stock markets of Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, the Philippines, South Africa, Spain, and Venezuela existed.

Kuwornu and Owusu-Nantwi (2011) studied the relationship between the interest rate and the return of the GSE All-Share Index, as a proxy for the Ghana stock market. The study used monthly time-series data from a seventeen-year (from January 1992 to December 2008) period and the Full Information Maximum Likelihood Estimation test to examine the said relationships. The findings of the study show that a significant negative relationship between the interest rate and the GSE All-Share Index existed.

Sabri (2004) studied the relationships between the deposit interest rate and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia. The study used monthly time-series data from a four-year (from January 1997 to December 2000) period and the Ordinary Least Squares test to examine the said relationships. The findings of the study show that significant relationships between the deposit interest rate and the return of the stock markets of the emerging countries existed.

Liu and Shrestha (2008) studied the relationships between the interest rate and the return of Chinese stock markets, namely the SHSE Composite Index and the SZSE Composite Index. The study used monthly time-series data from a ten-year (from January 1992 to December 2001) period and the Heteroscedastic Cointegration test to examine the said relationships. The findings of the study show that significant negative relationships between the interest rate and the stock indices existed.

Wickremasinghe (2011) studied the relationship between the three-month fixed deposit rate and the return of Sri Lanka's stock exchange, namely the Sri Lanka All-

Share Price Index. The study used monthly time-series data from a 20-year (from January 1985 to December 2004) period and the Granger Causality test to examine the said relationship. The findings of the study show that a bi-directional causal relationship between the Sri Lanka All-Share Price Index and the three-month fixed deposit rate existed.

Regarding the literature about the relationship between interest rates and stock market indices, the findings of the previous studies provide empirical evidence of the existence of such relationships. The interest rate is one of the macroeconomic variables most test for a relationship with stock market return, and in many studies it has proven to have the highest correlation with the returns of stock markets, when compared against other macroeconomic variables. This study tests for the long-term causal relationship from the Thai interest rate to the return of the Banking Sector Index of the Stock Exchange of Thailand. The two variables that proxy for the Thai interest rate in this study are the Thai Interest Rate from the Top Four Thai Banks, and the Thai Interest Rate from the Top Five Thai Banks. The expectation for the Thai situation is that a long-term causal relationship may exist between Thai interest rates and the return of the Banking Sector of the Stock Exchange of Thailand.

The following table, Table 2.5: Summary of Literature of Interest Rates, summarizes the literature cited in this study regarding the relationship between interest rates and stock market return. Table 2.5 presents the authors of the studies, the alternative hypotheses of the studies and the findings of the related literature.

Table 2.5: Summary of Literature of Interest Rates		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> • Rjoub, Türsoy and Günsel (2009) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and the stock return of the Istanbul Stock Market. 	<ul style="list-style-type: none"> • A significant positive relationship exists.
<ul style="list-style-type: none"> • Büyüksalvarcı (2010) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and the stock return of the Turkish Stock Exchange. 	<ul style="list-style-type: none"> • A significant negative relationship exists.
<ul style="list-style-type: none"> • Hussainey and Ngoc (2009) 	<ul style="list-style-type: none"> • There is a relationship between the long-term and short-term interest rates and the stock prices of the Vietnamese Stock Market. 	<ul style="list-style-type: none"> • A significant positive and a significant negative relationship exist.
<ul style="list-style-type: none"> • Tangjitprom (2012) • Park and Choi (2011) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and the stock price of the Stock Exchange of Thailand. • There is a relationship between the interest rate and stock returns of US property/liability (P/L) insurers. 	<ul style="list-style-type: none"> • A significant negative relationship exists. • Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> • Joseph and Vezos (2006) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and the stock returns of US banks. 	<ul style="list-style-type: none"> • Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> • Liow and Huang (2006) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and property stock indices of Singapore, Hong Kong, Japan, and the United Kingdom. 	<ul style="list-style-type: none"> • Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> • Maysami, Howe and Hamzah (2004) 	<ul style="list-style-type: none"> • There is a relationship between the short-term and the long-term interest rate and the stock returns of the Finance Index, Property Index, and Hotel Index of the Stock Exchange of Singapore. 	<ul style="list-style-type: none"> • Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> • Samad and Bhat (2009) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and stock prices of six oil and gas companies from the United States, the United Kingdom, and India. 	<ul style="list-style-type: none"> • Significant negative relationships exist.
<ul style="list-style-type: none"> • Saeed (2012) 	<ul style="list-style-type: none"> • There is a relationship between the interest rate and the stock returns of the Oil and Gas, Textile Composite, Jute, Cement, Cable and Electrical Goods, Automobile, Chemical and Pharmaceutical, Leasing, and Glass and Ceramics sectors of the Karachi Stock Exchange 100 Index. 	<ul style="list-style-type: none"> • Significant positive and significant negative relationships exist.

• Alam and Uddin (2009)	• There is a relationship between the interest rate and the return of the stock markets of Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippine, S. Africa, Spain, and Venezuela.	• Significant negative relationships exist.
• Kuwornu and Owusu-Nantwi (2011)	• There is a relationship between the Treasury bill rate and the return of the Ghana Stock Exchange All Share Index.	• A significant negative relationship exists.
• Sabri (2004)	• There is a relationship between the deposit interest rate and the return of the stock markets of Mexico, Korea, South Africa, Turkey, and Malaysia.	• A significant relationship exists.
• Liu and Shrestha (2008)	• There is a relationship between the interest rate and the return of the SHSE Composite Index and the SZSE Composite Index.	• Significant negative relationships exist.
• Wickremasinghe (2011)	• There is a relationship between the three-month fixed-deposit interest rate on the return of Sri Lanka's stock exchange.	• Significant relationships exist.

Source: Integrated and created by the author

Money Supply

Money supply may be defined as, a “population's spending power represented by the quantity of liquid assets (usually cash) in an economy that can be exchanged for goods and services,” (Money Supply [Def 1], n.d.) or “the total supply of money in circulation in a given country's economy at a given time” (Money Supply [Def 2], n.d.). In this study, two measures of money supply are tested for long-term causal relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand. They are Money Supply (M1) and Money Supply (M2). Money Supply (M1) is the narrowest measure of money, and it includes currency in circulation, demand deposits and checking account balances. Money Supply (M2) is a broad, although not the broadest, measure of money, and it includes currency in circulation, demand deposits, checking account balances, negotiable order of withdrawal accounts, small time-related deposits, savings deposits, and non-institutional money-market funds. In this study, for Money Supply (M1), the Thai Money Supply (M1) Index was used, and for Money Supply (M2), the Thai Money Supply (M2) Index was used.

Osamwonyi and Evbayiro-Osagie (2012) studied the relationship between money supply and the All-Share Index of the Nigerian capital market. The study used yearly data from a 30-year (from 1975 to 2005) period and the Vector Error Correction Model (VECM) test to examine the said relationship. The findings of the study show that a significant positive relationship between money supply and the All-Share Index existed.

Rjoub, Türsoy and Günsel (2009) studied the relationship between money supply and the stock returns of the Istanbul Stock Market. The study used monthly four-year and nine-month (from January 2001 to September 2005) data and the Ordinary Least Squares (OLS) test to examine the said relationship. The findings of the study show that significant positive and significant negative relationships between money supply and the stock return of the Istanbul Stock Market existed.

Büyükşalvarcı (2010) studied the relationship between money supply and the return of the Turkish Stock Exchange, namely the Istanbul Stock Exchange Index-100, under the Arbitrage Pricing Theory framework. The study used monthly time series data from a seven-year and three-month (from January 2003 to March 2010)

period and the Ordinary Least Squares (OLS) test to examine the said relationships. The findings of the study show that a significant positive relationship between money supply and the returns of the ISE-100 Index existed.

Maysami, Howe and Hamzah (2004) studied the relationships between money supply and the return of Singapore's Finance Index, Property Index, and Hotel Index. The study used monthly data from a six-year and 11-month (from February 1995 to December 2001) period and the Johansen's Vector Error Correction Model (VECM) test to examine the said relationships. The findings of the study show that significant positive relationships between money supply and one of the dependent variables existed.

Ibrahim and Aziz (2003) studied the relationship between money supply (M2) and the return of the Kuala Lumpur Composite Index (KLCI) under the Arbitrage Pricing Theory (APT) framework. The study used monthly time series data from a 21-year and eight-month (from January 1977 to August 1998) period and the Vector Autoregression test to examine the said relationship. The results of the study show that a significant negative long-term relationship between the variables existed.

Liu and Shrestha (2008) studied the relationships between money supply and the return of two Chinese stock markets, namely the SHSE Composite Index and the SZSE Composite Index. The study used monthly time-series data from a ten-year (from January 1992 to December 2001) period and the Heteroscedastic Cointegration test to examine the said relationships. The findings of the study show that a significant positive long-term relationship between money supply and the stock prices existed.

Wickremasinghe (2011) studied the relationship between money supply and the return of Sri Lanka's stock exchange, namely the All-Share Price Index. The study used monthly time-series data from a 20-year (from January 1985 to December 2004) period and the Granger Causality test to examine the said relationship. The findings of the study show that a bi-directional causal relationship between the All-Share Price Index and money supply existed.

Regarding the literature of the relationship between money supply and stock market indices, previous studies provide empirical evidence that support the said relationship. Most studies indicate that money supply is positively related with the

return of stock market indices. This study examines the long-term causal relationship between the Thai money supply and the return of the Banking Sector Index of the Stock Exchange of Thailand. The two variables that are proxies for Thai money supply are Money Supply (M1) and Money Supply (M2). The expectation for the Thai situation is that a long-term causal relationship from money supply to the return of the Banking Sector Index of the Stock Exchange of Thailand may exist.

The following table, Table 2.6: Summary of Literature of Money Supply, summarizes the literature cited in this study regarding the relationship between money supply and stock market return. Table 2.6 presents the authors of the studies, the alternative hypotheses of the studies and the findings of the related literature.



Table 2.6: Summary of Literature of Money Supply		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Osamwonyi and Evbayiro-Osagie (2012) 	<ul style="list-style-type: none"> There is a relationship between money supply and the stock return of the All Share Index of Nigerian. 	<ul style="list-style-type: none"> A significant positive relationship exists.
<ul style="list-style-type: none"> Rjoub, Türsoy and Günsel (2009) 	<ul style="list-style-type: none"> There is a relationship between the money supply and the stock return of the Istanbul Stock Market. 	<ul style="list-style-type: none"> Significant positive and significant negative relationships exist.
<ul style="list-style-type: none"> Büyükşalvarcı (2010) 	<ul style="list-style-type: none"> There is a relationship between money supply and the stock return of the Turkish Stock Exchange. 	<ul style="list-style-type: none"> A significant positive relationship exists.
<ul style="list-style-type: none"> Maysami, Howe and Hamzah (2004) 	<ul style="list-style-type: none"> There is a relationship between money supply and the stock return of the Finance Index, Property Index, and Hotel Index of the Stock Exchange of Singapore. 	<ul style="list-style-type: none"> Significant positive relationships exist.
<ul style="list-style-type: none"> Ibrahim and Aziz (2003) 	<ul style="list-style-type: none"> There is a relationship between money supply (M2) on the return of the Kuala Lumpur Composite Index. 	<ul style="list-style-type: none"> A significant negative relationship exists.
<ul style="list-style-type: none"> Liu and Shrestha (2008) 	<ul style="list-style-type: none"> There is a relationship between money supply and the return of the SHSE Composite Index and the SZSE Composite Index. 	<ul style="list-style-type: none"> Significant positive relationships exist.
<ul style="list-style-type: none"> Wickremasinghe (2011) 	<ul style="list-style-type: none"> There is a relationship between money supply (M1) and the return of Sri Lanka's stock exchange. 	<ul style="list-style-type: none"> Significant relationships exist.

Source: Integrated and created by the author

Real Estate

Real estate may be defined as, “land and anything fixed, immovable, or permanently attached to it such as appurtenances, buildings, fences, fixtures, improvements, roads, shrubs and trees (but not growing crops), sewers, structures, utility systems, and walls,” (Real Estate [Def 1], n.d.) or “a piece of land, including the air above it and the ground below it, and any buildings or structures on it” (Real Estate [Def 2], n.d.). In this study, two real estate variables are tested for long-term causal relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand. They are the Thai Real Estate Price and the Thai Retail Real Estate Sales Value. In this study, for Thai Real Estate Price, the Thai Land Price Index was used, and for Thai Retail Real Estate Sales Value, the Thai Retail Sales of Housing and Real Estate Index were used.

Wilson, Okunev and Ta (1996) studied the relationship between real estate prices and the securities markets of Australia under the Arbitrage Pricing Theory (APT) framework. The study used quarterly time-series data from a 23-year (from the 1970s to 1993) period and the Granger Causality test to examine the said relationship. The findings of the study show that for some periods, significant relationships between real estate prices and the securities markets of Australia existed.

Hui and Ng (2012) studied the relationship between Hong Kong’s residential property sales value and the return of Hong Kong’s stock market, namely the Hang Seng Index. The study used quarterly time-series data from a 22-year (from 1984 to 2006) period and the Granger Causality test to analyze the said relationship. The findings of the study show that a significant relationship between Hong Kong’s residential property market and the Hang Seng Index existed.

Regarding the literature of the relationship between real estate prices and real estate sales value and stock indices, the previous studies are very few. A thorough search on Emerald’s online database for studies that provide empirical evidence of a relationship between real estate prices and real estate sales value and stock market return only resulted in two studies regarding the said relationships. As, very little empirical evidence is available regarding the relationships between real estate prices and real estate sales value and stock market return, this study takes the opportunity to explore the existence of such relationships in the Thai context, with regards to the

return of the Banking Sector Index of the Stock Exchange of Thailand. This study tests the long-term causal relationships between real estate prices and real estate sales value and the return of the Banking Sector Index of the Stock Exchange of Thailand. The expectation for the Thai situation is that long-term causal relationships between real estate prices and real estate sales value and the return of the Banking Sector of the Stock Exchange of Thailand may exist.

The following table, Table 2.7: Summary of Literature of Real Estate, summarizes the literature cited in this study regarding the relationship between real estate prices and real estate sales value and stock market indices. Table 2.7 presents the authors of the studies, the alternative hypotheses and the findings of the related literature.

Table 2.7: Summary of Literature of Real Estate		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Wilson, Okunev and Ta (1996) 	<ul style="list-style-type: none"> There is a relationship between real estate prices and the stock price of the securities markets of Australia. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Hui and Ng (2012) 	<ul style="list-style-type: none"> There is a relationship between Hong Kong's residential property sales value and the return of the Hang Seng Index. 	<ul style="list-style-type: none"> A significant relationship exists.

Source: Integrated and created by the author

The related literature cited in this chapter provides supporting empirical evidence regarding the relationships between Commodity Prices, Foreign Exchange Rates, Foreign Stock Markets, Inflation, Interest Rates, Money Supply, and Real Estate Prices and the return of stock market indices from countries around the world. These determinants and their respective studies have been summarized in the following table, Table 2.8: Summary of Related Literature. Table 2.8 presents the categories of the macroeconomic variables examined in this study along with the corresponding related studies.

Table 2.8: Summary of Related Literature	
Macroeconomic Variables	Previous Studies
• Commodities	• French and Li (2012), Büyükşalvarcı (2010), Samad and Bhat (2009), Saeed (2012)
• Consumer Confidence	• ---
• Exchange Rates	• Osamwonyi and Evbayiro-Osagie (2012), Büyükşalvarcı (2010), Tangjitprom (2012), Joseph and Vezos (2006), Maysami, Howe and Hamzah (2004), Saeed (2012), Kuwornu and Owusu-Nantwi (2011), Sabri (2004), Ibrahim and Aziz (2003), Liu and Shrestha (2008), Wickremasinghe (2011), Adjasi, Biekpe, and Osei (2011)
• Foreign Stock Markets	• Sabri (2004), Karim and Majid (2010), Kurihara and Nezu (2006), Chong, Drew and Veeraraghavan (2003), Mansur (1991), Majid, Meera, Omar and Aziz (2009), Wickremasinghe (2011), Perera and Wickramanayake (2012), Dhanaraj, Gopalaswamy and Babu (2013)
• Inflation	• Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Maysami, Howe and Hamzah (2004), Kuwornu and Owusu-Nantwi (2011), Sabri (2004), Ibrahim and Aziz (2003), Liu and Shrestha (2008), Wickremasinghe (2011)
• Interest Rates	• Rjoub, Türsoy and Günsel (2009), Büyükşalvarcı (2010), Hussainey and Ngoc (2009), Tangjitprom (2012), Park and Choi (2011), Joseph and Vezos (2006), Liow and Huang (2006), Maysami, Howe and Hamzah (2004), Samad and Bhat (2009), Saeed (2012), Alam and Uddin (2009), Kuwornu and Owusu-Nantwi (2011), Sabri (2004), Liu and Shrestha (2008), Wickremasinghe (2011)
• Money Supply	• Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Büyükşalvarcı (2010), Maysami, Howe and Hamzah (2004), Ibrahim and Aziz (2003), Liu and Shrestha (2008), Wickremasinghe (2011)
• Real Estate	• Wilson, Okunev and Ta (1996), Hui and Ng (2012)

Source: Integrated and created by the author

2.3 Previous Studies

The literature, that was presented in the previous section of this study, provides empirical evidence of relationships between the determinants of stock market return, that are investigated in this study, and the stock market return. In this part, studies that deal directly with the Thai situation are presented. Ideally, these studies would be about the long-term causal relationships between the independent variables of this study and the return of the Banking Sector Index of the Stock Exchange of Thailand. However, a thorough search of the journals on Emerald's online database and on the Google search engine did not discover the existence of studies that deal with the long-term determinants of the Banking Sector Index of the Stock Exchange of Thailand. As such, the three studies presented in this section deal with the long-term determinants of the composite index of the Stock Exchange of Thailand.

Jiranyakul (2012) studied the long-term relationship between the Thai Baht/United States Dollar exchange rate and the return of the Stock Exchange of Thailand (SET). The stock market return variable that was used was the percentage change of the composite index of the Stock Exchange of Thailand. The exchange rate variable that was used was the percentage change of the Thai Baht/United States Dollar exchange rate. The study used monthly time-series data from a 13-year and two-month (from July 1997 to June 2010) period and the Granger Causality test to examine the said relationship. The findings of the study show that a long-term positive unidirectional causal relationship from the Stock Exchange of Thailand to the Thai Baht/United States Dollar exchange rate existed. However, the findings of the study also show that a long-term causal relationship from the Thai Baht/United States Dollar exchange rate to the Stock Exchange of Thailand did not exist.

Regarding the similarities between Jiranyakul's (2012) study and this study, the main similarities are that the United States exchange rate, the Granger Causality test, and percentage change data were used in both studies. It will be interesting to see from the findings of this study whether or not the lack of a long-term causal relationship from the Thai Baht/United States Dollar exchange rate to the composite index of the Stock Exchange of Thailand, that Jiranyakul (2012) found empirical evidence of, is also true for the Banking Sector Index of the Stock Exchange of Thailand.

Regarding the differences between Jiranyakul's (2012) study and this study, the main difference is that Jiranyakul (2012) tested one exchange rate, namely the Thai Baht/United States Dollar exchange rate, as a long-term determinant, whereas the current study tests 11 exchange rates as long-term determinants. As such, the current study will further explain the relationship between exchange rates and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Valadkhani and Chancharat (2008) studied the long-term causal relationships between the stock market indices of Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the United Kingdom and the United States and the return of the Stock Exchange of Thailand (SET). The study used monthly time-series data from an 18-year (from December 1987 to December 2005) period and the Granger Causality test to examine the said relationships. The findings of the study show that three significant unidirectional causal relationships from the stock returns of Hong Kong, the Philippines and the United Kingdom to the return of the Stock Exchange of Thailand existed. It also found that significant bidirectional causal relationships between the stock market returns of Thailand and the stock market indices of Thailand's three neighboring countries, namely Malaysia, Singapore and Taiwan existed.

Regarding the similarities between Valadkhani and Chancharat's (2008) study and this study, the main similarities are that a large number of foreign stock markets, the Granger Causality test, and percentage change data were used. It will be interesting to see from the findings of this study whether or not the long-term causal relationship from the variables that are common to both studies, namely the stock markets of Hong Kong, Japan, the United States and Taiwan to the return of the Stock Exchange of Thailand, that Valadkhani and Chancharat (2008) found empirical evidence of, is also true for the Banking Sector Index of the Stock Exchange of Thailand.

Regarding the differences between Valadkhani and Chancharat's (2008) study and this study, the main difference is that Valadkhani and Chancharat (2008) set the Stock Exchange of Thailand as the dependent variable, whereas the current study set the Banking Sector Index of the Stock Exchange of Thailand as the dependent variable. As such, the findings of this study may vary from the findings of Valadkhani and Chancharat's (2008) study if the Banking Sector of the Stock Exchange of

Thailand behaves differently than the aggregate index does to movements in the stock market indices of Hong Kong, Japan, Taiwan and the United States.

Ibrahim (2010) studied the long-term causal relationship between House Prices and the return of the Stock Exchange of Thailand. The study used quarterly time-series data from an 11-year (from 1995 to 2006) period and the Granger Causality test to examine the said relationship. The findings of the study show that a significant unidirectional causal relationship from the return of the Stock Exchange of Thailand to House Prices existed. However, the findings of the study also show that a long-term causal relationship from House Prices to the return of the Stock Exchange of Thailand did not exist.

Regarding the similarities between Ibrahim's (2010) study and this study, the main similarities are that Real Estate Prices, the Granger Causality test, and percentage change data were used. It will be interesting to see from the findings of this study whether or not the lack of a long-term causal relationship from Real Estate Prices to the composite index of the Stock Exchange of Thailand, that Ibrahim (2010) found empirical evidence of, is also true for the Banking Sector Index of the Stock Exchange of Thailand. The Banking Sector Index of the Stock Exchange of Thailand and the aggregate Stock Exchange of Thailand Index might not behave similarly to changes in Real Estate Prices especially if banks are more sensitive to the changes due to the large amount of Real Estate that banks own and rent.

Regarding the differences between Ibrahim's (2010) study and this study, the main difference is that Ibrahim (2010) used quarterly time-series data and an 11-year period of data collection, whereas the current study uses monthly time series data from a ten-year period. Although quarterly data can be used in such studies, using quarterly data is not common practice, as can be seen from the literature review. This may be because fewer observations are tested when quarterly data is used, which might compromise the results of the statistical analysis. As such, the findings may vary between these two studies.

The following table, Table 2.9: Summary of Previous Studies, summarizes the three previously discussed studies regarding determinants of the return of the Stock Exchange of Thailand. Table 2.9 presents the authors of the related studies, the alternative hypotheses of the related studies and findings of the related studies.

Table 2.9: Summary of Previous Studies		
Authors	Alternative Hypotheses	Findings
<ul style="list-style-type: none"> Jiranyakul (2012) 	<ul style="list-style-type: none"> There is a relationship between the exchange rate (Thai Baht to US Dollar) and the return of the Stock Exchange of Thailand. 	<ul style="list-style-type: none"> A significant relationship exists.
<ul style="list-style-type: none"> Valadkhani and Chancharat (2008) 	<ul style="list-style-type: none"> There is a relationship between the stock markets of Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the UK and the USA and the return of the Stock Exchange of Thailand. 	<ul style="list-style-type: none"> Significant relationships exist.
<ul style="list-style-type: none"> Ibrahim (2010) 	<ul style="list-style-type: none"> There is a relationship between housing prices and the return of the Stock Exchange of Thailand. 	<ul style="list-style-type: none"> A significant relationship exists.

Source: Integrated and created by the author



Chapter 3

Research Frameworks

This chapter first presents the theoretical framework, which makes up the basis for the relationships between the independent variables and the dependent variable of this study. Then the conceptual framework, which is the visual presentation of the relationships being studied in this research, is presented. Next, the hypotheses, which are the statements of the relationships that are being studied, are developed and presented in order to clarify the relationships that are under study. To close off this chapter, the operationalization of the variables is presented, where the independent variables are defined to avoid confusion among the readers.

3.1 Theoretical Framework

This study's focus is on eight groups of determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand (SET), namely Commodities, Consumer Confidence, Exchange Rates, Foreign Stock Markets, Inflation, Interest Rates, Money Supply, and Real Estate. These eight groups contain 30 determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, namely the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from

the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price. The theoretical relationships between the independent and dependent variables are expanded upon next.

Commodities

Studies by Büyükşalvarcı (2010), French and Li (2012), Saeed (2012), and Samad and Bhat (2009) provide empirical evidence of significant relationships between commodity prices and stock market return.

The relationship between commodity prices and stock market return may be explained by examining the investment opportunities that commodities provide, which make commodities an alternative to investing in stock markets. Commodities like stock indices are high risk and high return assets, as such investment funds tend to move between these two investment vehicles. As the prices of commodities and stock indices depend on demand and supply, movement of funds between commodities and stock indices forms a relationship between these two assets. If the expected return from commodities increases or if the expected return from the stock market decreases, some investors will move money into commodities and away from stock markets to achieve a better return. Likewise, if the expected return from commodities decreases or if the expected return from the stock market increases, some investors will move money into the stock market and away from commodities.

Another explanation for the relationship between commodity prices and stock market return is about the cost of goods and services. Commodities are used in the production and delivery of goods and services. As such, fluctuations in the prices of commodities, such as gold and oil, can make the cost of living either increase or decrease, as the changes in costs are passed on to customers. When the cost of living increases, people have less disposable income for expenditures, savings and investment. This may result in for example less investment in stock markets and fewer savings at banks. Less investment in the stock market and fewer savings at banks can negatively affect the stock value of Banks that are listed on the Stock Exchange of

Thailand through less investment funds for banks to make a return on and less demand for banking stocks.

Yet another possible explanation of the relationship between commodity prices and the return of stock markets is directly related to the Banking Sector. Thais are particularly enthusiastic about investing in gold. If Thai people have enough extra funds, it is common for them to invest it in gold rather than in their bank accounts. As banks largely rely on deposits as sources of funds, from which they can receive a return from reinvesting the funds elsewhere, when bank deposits decrease, bank investment of the funds in the form of loans will also decrease and affect the profitability of banks, which would hurt the stock prices of the banks in Thailand, as they are listed on the Stock Exchange of Thailand.

The above relationships between the prices of commodities and the return of the Banking Sector Index of the Stock Exchange of Thailand, lead to an expected negative causal relationship between the prices of commodities and the return of the Banking Sector of the Stock Exchange of Thailand.

Consumer Confidence

A consumer confidence index measures consumer confidence and it indicates the degree of optimism consumers have of state of the economy.

A possible explanation for the relationship between consumer confidence and stock market return is that when people and institutions feel more confident about their financial situation, they tend to increase their spending and consumption as they aim for a better quality of life. For individuals, an increase in consumption and spending may lead to a greater use of credit cards, which directly benefit the profitability of banks through more revenue from fee payments and more revenue from interest payments. For institutions, an increase in consumers' consumption and spending increases the need for investment in inventory and other assets required for the production and delivery of goods and services. One way to raise the required funds is through loans from banks. As more institutions take out loans from banks, banks earn more fee revenue and interest revenue, which directly increases banks' profitability. The reverse is also true in the case of a decrease in consumer confidence.

The above relationships between consumer confidence and the return of the Banking Sector Index of the Stock Exchange of Thailand, lead to an expected positive causal relationship between Consumer Confidence and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Exchange Rates

Studies by Adjasi, Biekpe, and Osei (2011), Büyüksalvarcı (2010), Ibrahim and Aziz (2003), Joseph and Vezos (2006), Kuwornu and Owusu-Nantwi (2011), Liu and Shrestha (2008), Maysami, Howe and Hamzah (2004), Osamwonyi and Evbayiro-Osagie (2012), Sabri (2004), Saeed (2012), Tangjitprom (2012), and Wickremasinghe (2011) provide empirical evidence of significant relationships between exchange rates and stock market return.

An explanation of the relationship between exchange rates and stock market return is that the success and profitability of businesses are directly linked to the business activities of foreign competitors due to globalization. For businesses that engage in exporting and/or importing, a change in the exchange rates of countries with which they do business, affects the costs of imports and the revenue from exports. For example, assuming that other variables remain constant, if the Thai Baht appreciates against the United States Dollar, exports from Thailand receive less value for their sales abroad, and imports to Thailand become cheaper. For exporters a strong Thai Baht hurts their profit margins if they absorb the additional costs of the strong Baht, or a strong Baht hurts their competitiveness if they pass on the additional costs from the strong Baht to protect their profit margins. When business slows for Thai companies, the said companies require less funding for expansionary activities, like the purchase of assets required for the production and delivery of goods and services. As these companies require less funding, they take out fewer loans from banks, which provides banks with less funds to earn a return on. The reverse is also true in the case of a weak Thai Baht.

Another possible explanation of the relationship between exchange rates and stock market return regards the indirect effect that changes in the exchange rate have on the competition of businesses that engage in only local business in Thailand. For these companies, a weak Thai Baht makes the goods and services that foreign

companies sell in Thailand less profitable. Or if foreign companies maintain their profit margins by passing on the extra costs to customers, their goods and services become more expensive in the Thai market. This reduces their offerings competitiveness against Thai offerings, which would likely benefit the Thai companies through increased sales. Increased sales may cause local companies to take out more loans from banks, which provide banks with extra funds to earn a return on.

For an export-reliant country, like Thailand, the depreciation of the local currency has a favorable impact on the country's business. The above relationships between the exchange rate and the return of the Banking Sector of the Stock Exchange of Thailand, lead to an expected negative causal relationship between the value of the Thai Baht and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Foreign Stock Markets

Studies by Chong, Drew and Veeraraghavan (2003), Dhanaraj, Gopalaswamy and Babu (2013), Karim and Majid (2010), Kurihara and Nezu (2006), Majid, Meera, Omar and Aziz (2009), Mansur (1991), Perera and Wickramanayake (2012), Sabri (2004), and Wickremasinghe (2011) provide empirical evidence of significant relationships between foreign stock exchanges and local stock exchanges.

An explanation of the relationship between foreign stock markets and the local stock market is that the economies of countries around the world have become more economically interdependent due to increased globalization. Countries rely on sales in other countries or sells to citizens of other countries as a main source of revenue and profit. As such, when the economies and people of major economic powers do well financially, a positive impact can be felt on the local economy through more business with the people and institutions of those countries. For example, if the European Union suffers from a recession, some or many Europeans have less disposable income to spend on holidays abroad. Instead of coming to Thailand for their holidays, they may choose to spend the holidays at home with their families. The result is less business, revenue, and profit for the tourism industry in Thailand and the facilitators of the tourism industry in Thailand. As banks provide loans for resorts and hotels to

be built to cater to tourists, less tourism results in less demand for such loans. And as loans are a major source of funds for banks, from which they can earn a return, a fewer number of loans negatively affects the profitability of banks.

The above relationship between foreign stock market indices and the return of the Banking Sector Index of the Stock Exchange of Thailand, leads to an expected positive causal relationship between the return of foreign stock markets and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Inflation

Studies by Ibrahim and Aziz (2003), Kuwornu and Owusu-Nantwi (2011), Liu and Shrestha (2008), Maysami, Howe and Hamzah (2004), Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Sabri (2004), and Wickremasinghe (2011) provide empirical evidence of significant relationships between inflation and stock market return.

An explanation of the relationship between inflation and stock market return is that a moderate pace of inflation is an indicator of a healthy economy. This is because with time, income and revenue increase in a healthy economy, which makes it possible for people to pay more for the goods and services that they want. In a free-market economy, where price levels are determined by demand and supply, an increase in the demand of goods and services results in an increase in the price of goods and services, which may then result in mild inflation. A healthy economy results in profitable operations for businesses, which has a positive effect on the value of companies listed on stock markets. The reverse is also true in the case of deflation of the general price level.

The above relationship between inflation and the return of stock market indices leads to the expectation of a significant positive causal relationship between inflation and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Interest Rates

Studies by Rjoub, Türsoy and Günsel (2009), Büyükşalvarcı (2010), Hussainey and Ngoc (2009), Tangjitprom (2012), Park and Choi (2011), Joseph and Vezos (2006), Liow and Huang (2006), Maysami, Howe and Hamzah (2004), Samad and Bhat (2009), Saeed (2012), Alam and Uddin (2009), Kuwornu and Owusu-Nantwi (2011), Sabri (2004), Liu and Shrestha (2008), and Wickremasinghe (2011) provide empirical evidence of significant relationships between interest rates and stock market return.

An explanation for the relationship between interest rates and stock market return is that businesses, especially banks, have investments and debts, which are sensitive to changes in interest rates. When a loan is taken, the taker of the loan must pay a return (interest rate) to the provider of the loan. When the interest rate increases, loans become more expensive, which increase the costs to the takers of loans and increase the revenue to providers of loans. Businesses with more interest-rate sensitive assets and liabilities are more interest-rate sensitive than businesses with fewer interest-rate sensitive assets and liabilities. The business model of most banks revolves around providing a small interest rate to attract deposits of funds, which are then distributed in the form of loans at higher interest rates. Thus, the investments and debts of banks are highly sensitive to changes in interest rates.

Another explanation of the relationship between interest rates and stock market return is that interest rates affect stock prices of businesses through the discounting process used in the valuation of a fair stock price. In asset pricing, future cash-flows of a company are discounted to the present time to determine a fair stock value. The interest rate is used to discount the future cash-flows. As such, a higher interest rate causes a lower fair present value of equity, and a lower interest rate causes a higher fair present value of equity assuming equal future cash flows.

Yet another explanation about the relationship between interest rates and stock market indices is that changes in the interest rate encourage movements of funds between stock market instruments and money market instruments. When the interest rate increases, investment in debt instruments becomes more attractive than previously relative to investment in equity markets, as the return from debt instruments increases relative to the return from equity markets. This causes some

investment to move from equity markets to debt instruments, thus providing a negative relationship between interest rates and the return of stock markets.

The above relationships between interest rates and stock market return, lead to an expected significant negative causal relationship between the Thai interest rate and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Money Supply

Studies by Osamwonyi and Evbayiro-Osagie (2012), Rjoub, Türsoy and Günsel (2009), Büyükşalvarcı (2010), Maysami, Howe and Hamzah (2004), Ibrahim and Aziz (2003), Liu and Shrestha (2008), and Wickremasinghe (2011) provide empirical evidence of significant relationships between money supply and stock market return.

An explanation about the relationship between money supply and stock market return is that when there is more money in an economy, it has to go somewhere, or in other words it has to be used for something. This leads to an increase in the demand for goods, services and assets. Businesses benefit from increased demand for goods and services, as they are able to sell greater quantities of their offerings. The values of listed companies benefit from increased demand for financial assets, as stock values may increase due to increased investment in stocks. Banks not only benefit from increased demand for their stocks but also from an increase in deposits, which enables banks to increase lending. As interest received from loans is an essential source of profit for banks, the issuing of more loans increases the profitability of banks, which positively influences the value of banks listed on the stock market.

The above relationships between money supply and stock market return, lead to the expectation of a significant positive causal relationship between money supply and the return of the Banking Sector Index of the Stock Exchange of Thailand.

Real Estate

The study by Wilson, Okunev and Ta (1996) provides empirical evidence of significant relationships between real estate prices and stock market return. Also, the study by Hui and Ng (2012) provides empirical evidence of significant relationships

between real estate sales value and stock market return. The explanation about the relationship between real estate prices and sales value and stock market indices is not well documented in previous studies.

An explanation of the relationship between real estate prices and stock market return is that businesses, that own a lot of real estate, benefit from higher real estate prices through the appreciation of the value of their real estate assets. Banks are an example of businesses that own a lot of real estate. Banks have many branches and collateral real estate that they repossess when their clients forfeit on their debts. An increase in the price of real estate provides a higher fetching price for the repossessed real estate when it is sold, as well as a higher value of the land where bank branches are located. An increase in the value of the land that banks own is reflected in banks financial documents, which are an essential part of asset pricing. Thus, an increase in the asset value of banks is reflected through an increase in the stock value of the said banks.

Another possible explanation for the relationship between real estate prices and stock market return is that higher real estate prices enable individuals and institutions to leverage their real estate to obtain larger lines of credit and loans from banks. As the interest payment on bigger loans is more than that of smaller loans, the bigger loans represent an opportunity for increased interest revenue and profit for banks, which benefits the stock value of listed banks.

An explanation about the relationship between real estate sales value and stock market return is that an increase in the purchases of real estate among individuals represents the positive attitudes that individuals have about their own financial situation. This is because people buy houses and real estate when they think they can afford them. As such, if more people are buying real estate and the value of the purchases of real estate is increasing, it stands to reason that more people feel confident about their own financial situation. An increase in people's confidence about their financial situation implies that an economy is robust. A robust economy means good business for businesses, including banks.

Another explanation about the relationship between real estate sales value and stock market return is that the value of real estate sales may reflect an increase in the demand for real estate loans from banks. An increase in the demand for real estate loans is an indicator of greater profitability for banks as they can forecast greater streams of revenue and cash flow. In asset pricing, future cash flows of a company are

discounted to the present time to determine a fair stock value. As such, greater expectations of future revenue and cash flows may increase the present value of stocks.

The above relationships between real estate prices and real estate sales value and stock market return, lead to the expectation of a significant positive causal relationship between the price of real estate and the value of real estate sales and the return of the Banking Sector Index of the Stock Exchange of Thailand.

The theoretical framework provides the theory of the relationships between the independent variables and the dependent variable of this study. The relationships are between the independent variables, namely commodities, consumer confidence, exchange rates, foreign stock markets, inflation, interest rates, money supply, and real estate and the return of the dependent variable, namely the Banking Sector Index of the Stock Exchange of Thailand.

The following table, Table 3.1: Summary of Theoretical Framework for Banking Sector of Stock Exchange of Thailand, summarizes the directionalities of each variable group's relationship with the Banking Sector Index of Stock Exchange of Thailand.

Table 3.1: Summary of Theoretical Framework for Banking Sector of Stock Exchange of Thailand	
Variables	Directionalities
• Commodity Prices	• Negative
• Consumer Confidence	• Positive
• Exchange Rates	• Negative
• Foreign Stock Market Indices	• Positive
• Inflation	• Positive
• Interest Rates	• Negative
• Money Supply	• Positive
• Real Estate Prices and Sales	• Positive

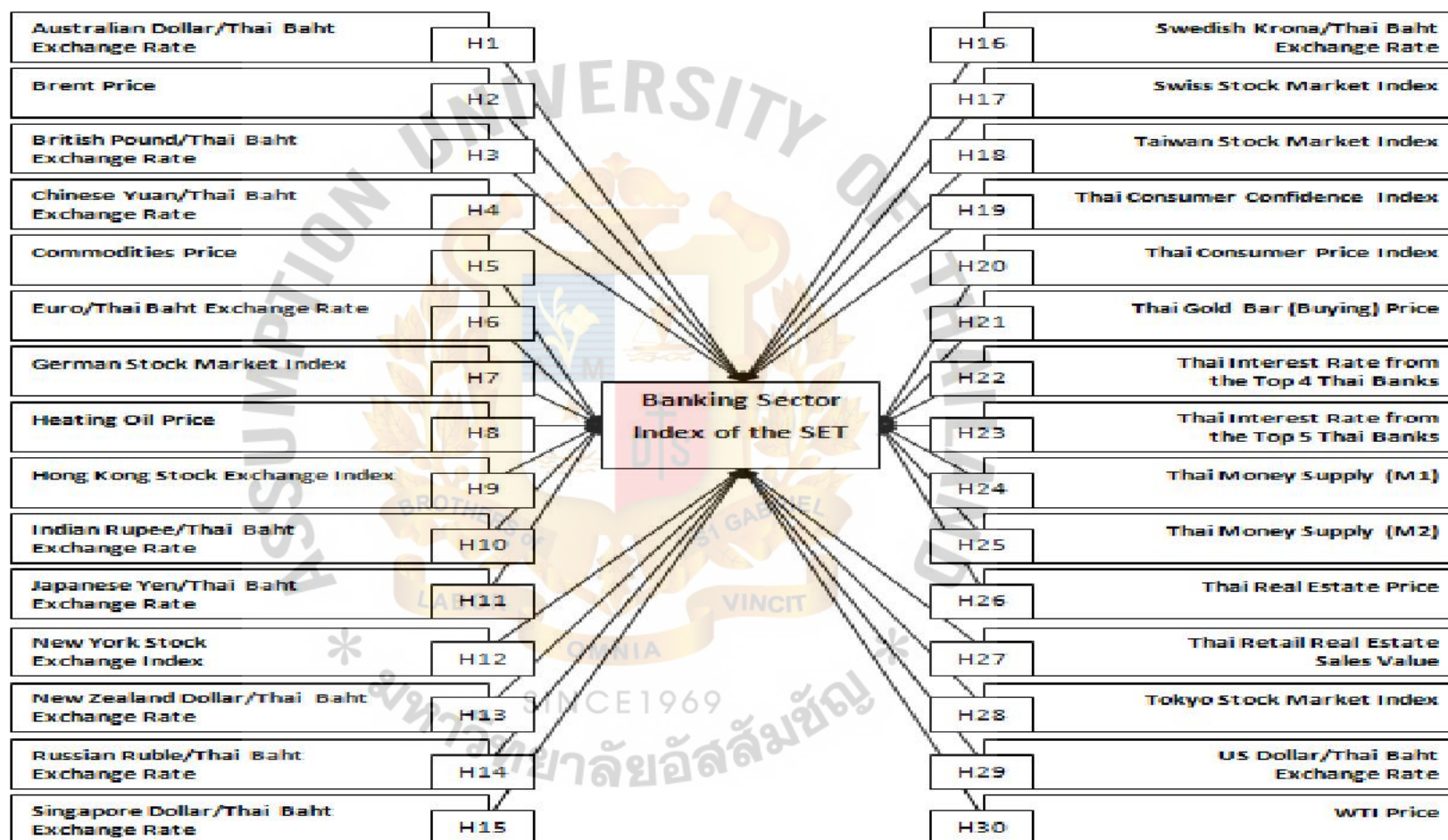
Source: Integrated and created by the author

3.2 Conceptual Framework

Based on the related literature and the theoretical framework, explanatory determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, were extracted and tested in this study. A total of 30 determinants are examined for their long-term causal relationship with the return of the Banking Sector Index of the Stock Exchange of Thailand. The 30 independent variables of this study are the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

The following figure, Figure 3.1: The Conceptual Framework of the Determinants of the Return of the Banking Sector of the Stock Exchange of Thailand, graphically presents the relationships studied in this research.

Figure 1: The Conceptual Framework of the Determinants of the Return of the Banking Sector of the Stock Exchange of Thailand (SET)



Source: Integrated and created by the author

3.3 Research Hypotheses

The hypotheses of this study are statements of the relationships between the dependent variable, namely the return of the Banking Sector Index of the Stock Exchange of Thailand, and the independent variables, namely the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top 4 Thai Banks, Thai Interest Rate from the Top 5 Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, US Dollar/Thai Baht Exchange Rate, and WTI Price.

The relationships were tested to prove (fail to reject) or disprove (reject) the null hypothesis (H_0) at a 95 percent confidence level, as is common practice in research. The 95 percent confidence level was chosen, as a 95 percent confidence level shows strong support for the alternative hypothesis (H_a) if the null hypothesis is rejected. The Granger Causality test was used in this study to either reject the null hypothesis or fail to reject the null hypothesis at the said confidence level. In the cases where the null hypothesis is rejected, the alternative hypothesis is accepted.

The following 30 pairs of hypotheses are tested in this study:

- H_{10} : Australian Dollar/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H_{1a} : Australian Dollar/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.

- H2₀: Brent Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H2_a: Brent Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H3₀: British Pound/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H3_a: British Pound/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H4₀: Chinese Yuan/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H4_a: Chinese Yuan/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H5₀: Commodities Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H5_a: Commodities Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H6₀: Euro/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H6_a: Euro/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H7₀: German Stock Market Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H7_a: German Stock Market Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H8₀: Heating Oil Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H8_a: Heating Oil Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H9₀: Hong Kong Stock Exchange Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H9_a: Hong Kong Stock Exchange Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.

- H10₀: Indian Rupee/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H10_a: Indian Rupee/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H11₀: Japanese Yen/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H11_a: Japanese Yen/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H12₀: New York Stock Exchange Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H12_a: New York Stock Exchange Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H13₀: New Zealand Dollar/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H13_a: New Zealand Dollar/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H14₀: Russian Ruble/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H14_a: Russian Ruble/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H15₀: Singapore Dollar/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H15_a: Singapore Dollar/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H16₀: Swedish Krona/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H16_a: Swedish Krona/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H17₀: Swiss Stock Market Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H17_a: Swiss Stock Market Index

Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.

- H18₀: Taiwan Stock Market Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H18_a: Taiwan Stock Market Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H19₀: Thai Consumer Confidence Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H19_a: Thai Consumer Confidence Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H20₀: Thai Consumer Price Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H20_a: Thai Consumer Price Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H21₀: Thai Gold Bar (Buying) Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H21_a: Thai Gold Bar (Buying) Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H22₀: Thai Interest Rate from the Top 4 Thai Banks does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H22_a: Thai Interest Rate from the Top 4 Thai Banks Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H23₀: Thai Interest Rate from the Top 5 Thai Banks does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H23_a: Thai Interest Rate from the Top 5 Thai Banks Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H24₀: Thai Money Supply (M1) does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H24_a: Thai Money Supply (M1) Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.

- H25₀: Thai Money Supply (M2) does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H25_a: Thai Money Supply (M2) Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H26₀: Thai Real Estate Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H26_a: Thai Real Estate Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H27₀: Thai Retail Real Estate Sales Value does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H27_a: Thai Retail Real Estate Sales Value Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H28₀: Tokyo Stock Market Index does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H28_a: Tokyo Stock Market Index Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H29₀: US Dollar/Thai Baht Exchange Rate does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H29_a: US Dollar/Thai Baht Exchange Rate Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.
- H30₀: WTI Price does not Granger-cause the return of the Banking Sector of the Stock Exchange of Thailand. H30_a: WTI Price Granger-causes the return of the Banking Sector of the Stock Exchange of Thailand.

3.4 Operationalization of the Variables

The following table, Table 3.2: Operationalization of Dependent Variable and Independent Variables, is presented next. The variables used in this study are presented in the first column. The dependent variable is shown first and the independent variables follow the dependent variable. The operational components of

the respective concepts are explained in the second column to describe the properties of each concept. The final column presents the level of measurement of the data of the respective variables. The level of measurement of all the variables in this study is ratio. Ratio data is data that has a true zero point, which means that “zero” represents “none,” and anything less than “zero” is less than “none.” Other characteristics of ratio data are that the interval between each number is continuous and identical.



Table 3.2: Operationalization of Dependent Variable and Independent Variables

Concepts	Operational Components	Level of Measurement
• Banking Sector Index of the Stock Exchange of Thailand	• Value of the Banking Sector of the SET Index from Bloomberg	• Ratio
• Australian Dollar/Thai Baht Exchange Rate	• Indirect Quotation of the Australian Dollar/Thai Baht Exchange Rate	• Ratio
• Brent Price	• Spot Price of the Brent Crude Oil Commodity	• Ratio
• British Pound/Thai Baht Exchange Rate	• Indirect Quotation of the British Pound/Thai Baht Exchange Rate	• Ratio
• Chinese Yuan/Thai Baht Exchange Rate	• Indirect Quotation of the Chinese Yuan/Thai Baht Exchange Rate	• Ratio
• Commodities Price	• Value of the IMF Commodity Index	• Ratio
• Euro/Thai Baht Exchange Rate	• Indirect Quotation of the Euro/Thai Baht Exchange Rate	• Ratio
• German Stock Market Index	• Value of the Deutsche Borsse AG German Stock (DAX) Index	• Ratio
• Heating Oil Price	• Value of the New York Harbor (No. 2) Heating Oil Index	• Ratio
• Hong Kong Stock Exchange Index	• Value of the Hong Kong Hang Sang Index	• Ratio
• Indian Rupee/Thai Baht Exchange Rate	• Indirect Quotation of the Indian Rupee/Thai Baht Exchange Rate	• Ratio
• Japanese Yen/Thai Baht Exchange Rate	• Indirect Quotation of the Japanese Yen/Thai Baht Exchange Rate	• Ratio
• New York Stock Exchange Index	• Value of the New York Stock Exchange Composite Index	• Ratio
• New Zealand Dollar/Thai Baht Exchange Rate	• Indirect Quotation of the New Zealand Dollar/Thai Baht Exchange Rate	• Ratio
• Russian Ruble/Thai Baht Exchange Rate	• Indirect Quotation of the Russian Ruble/Thai Baht Exchange Rate	• Ratio

• Singapore Dollar/Thai Baht Exchange Rate	• Indirect Quotation of the Singapore Dollar/Thai Baht Exchange Rate	• Ratio
• Swedish Krona/Thai Baht Exchange Rate	• Indirect Quotation of the Swedish Krona/Thai Baht Exchange Rate	• Ratio
• Swiss Stock Market Index	• Value of the Swiss Market Index	• Ratio
• Taiwan Stock Market Index	• Value of the Taiwan Stock Exchange Weighted Index	• Ratio
• Thai Consumer Confidence Index	• Value of the Thai Consumer Confidence Index	• Ratio
• Thai Consumer Price Index	• Value of the Thai Consumer Price Index (All Items)	• Ratio
• Thai Gold Bar (Buying) Price	• Value of the Thai Gold Bar (Buying) Price Index	• Ratio
• Thai Interest Rate from the Top 4 Thai Banks	• Value of the Thai Interest Rate (Top 4 Banks) Index	• Ratio
• Thai Interest Rate from the Top 5 Thai Banks	• Value of the Thai Interest Rate (Top 5 Banks) Index	• Ratio
• Thai Money Supply (M1)	• Value of the Thai Money Supply (M1) Index	• Ratio
• Thai Money Supply (M2)	• Value of the Thai Money Supply (M2) Index	• Ratio
• Thai Real Estate Price	• Value of the Thai Land Price Index	• Ratio
• Thai Retail Real Estate Sales Value	• Value of the Thai Retail Sales of Housing and Real Estate Index	• Ratio
• Tokyo Stock Market Index	• Value of the Tokyo Stock Exchange Total Price Index	• Ratio
• US Dollar/Thai Baht Exchange Rate	• Indirect Quotation of the US Dollar/Thai Baht Exchange Rate	• Ratio
• WTI Price	• Value of the West Texas Intermediate Cushing Crude Oil Index	• Ratio

Source: Integrated and created by the author

Chapter 4

Research Methodology

This chapter provides insight into the properties of the data that was used in this study and how the said data was statistically treated. First, the research method of this study is explained. Second, the collection of the data is expanded upon to explain what data was collected and how it was collected. Finally, the statistical treatment of the data is presented to explain how the data of this study was statistically examined.

4.1 Method of Research Used

The two main goals of this study are to determine whether or not the Banking Sector Index of the Stock Exchange of Thailand is market efficient and to determine what the significant long-term causal determinants of the return of the Banking Sector of the Stock Exchange of Thailand are.

This study uses only secondary data for the 30 determinants studied for their respective relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand. They are the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top 4 Thai Banks, Thai Interest Rate from the Top 5 Thai Banks, Thai Money Supply (M1), Thai Money Supply

(M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, US Dollar/Thai Baht Exchange Rate, and WTI Price.

The overall process that was used in this study required following a number of steps. The first step was to determine the composition of the above list of independent variables. This step involved a review of existing literature regarding the determinants of stock market return and the determinants of the return of banking sector indices of stock markets. Once the list of potential variables was completed, all the data of this study (secondary data) was extracted from Bloomberg. After all the required data was available, it was statistically analyzed, by the Pair-wise Granger Causality test, for significant long-term relationships with the dependent variable of this study, namely the return of the Banking Sector Index of the Stock Exchange of Thailand. These relationships were required to pass the 95 percent confidence level for there to be reason enough to believe that long-term causal relationships between the variables existed. Finally, the significant long-term independent variables were selected to provide evidence of market inefficiency in the Banking Sector Index of the Stock Exchange of Thailand. In the event of an independent variable exhibiting statistically significant long-term relationships with the dependent variable at various time-lags, the lag period with the highest significant relationship was selected, as it represented the most significant relationship between the two variables.

4.2 Collection of the Data

All the data used in this study is secondary data collected from Bloomberg. Only one source was utilized for the data collection of this study to save time and prevent the occurrence of any errors that may occur when combining data from different sources. All the data likewise covers a complete ten-year (from January 2003 to December 2012) period. The data was end-of-month data and there were no breaks in the data or missing data. The data was downloaded from Bloomberg to Microsoft Excel. The raw data was not tampered with in any way in the collection process.

4.3 Statistical Treatment of the Data

After all the required secondary data was downloaded from Bloomberg, a three-step process was used to examine the data.

The first step was to change all the data into first-difference percentage change data. The purpose of this was threefold. First, the percentage change data provided weight to the value of each whole index. This is important because one unit does not always have the same importance. For example, moving from unit one to unit two represents a 100 percent $[(2-1)/1]*100 = 100$ percent increase for a one unit change, but moving from unit 100 to unit 101 represents a one percent $[(101-100)/100]*100 = 1$ percent increase for a one unit change. As such, this study took the weight of the indices into account by changing the data to first-difference percentage change data to increase the comparability of indices with different values but the same unit change. Second, the percentage change data solved the problem of the data being in different types of units. For example the United States Stock Index is in the United States Dollar, the Japanese Stock Index is in the Japanese Yen. This is like comparing apples and oranges. By changing all the data into percentages, the data was uniformed and useful for comparison purposes. Finally, as data with trends, like macroeconomic data, is usually non-stationary, macroeconomic data can not usually be used with the Granger Causality test, which was employed in this study, due to a prerequisite of the Granger Causality test being that the data used in Granger Causality tests must be stationary. Percentage change data has a high chance of being stationary as required for the Granger Causality tests (The stationary tests are explained in step two.). As such, the percentage change data may make the raw data more usable for this study.

The formula used to find the percentage change was:

Monthly percentage change at time $t = (V_t - V_{t-1}) / V_{t-1}$, where, V_t is the end-of-month value of each variable at time t , and V_{t-1} is the end-of-month value of each variable of the previous month.

For, the dependent variable:

- BANKINGSECTORSET is the percentage change of the return of the Banking Sector Index of the Stock Exchange of Thailand.

For the independent variables:

- AUDTHB is the percentage change of the Australian Dollar/Thai Baht Exchange Rate.
- BRENT is the percentage change of the Brent Price.
- GBPTHB is the percentage change of the British Pound/Thai Baht Exchange Rate.
- CNYTHB is the percentage change of the Chinese Yuan/Thai Baht Exchange Rate.
- COMMODITY is the percentage change of the Commodities Price.
- EURTHB is the percentage change of the Euro/Thai Baht Exchange Rate.
- GERMANSTOCK is the percentage change of the German Stock Market Index.
- HEATINGOIL is the percentage change of Heating Oil Price.
- HONGKONGSTOCK is the percentage change of the Hong Kong Stock Exchange Index.
- INRTHB is the percentage change of the Indian Rupee/Thai Baht Exchange Rate.
- JPYTHB is the percentage change of the Japanese Yen/Thai Baht Exchange Rate.
- NEWYORKSTOCK is the percentage change of the New York Stock Exchange Index.
- NZDTHB is the percentage change of the New Zealand Dollar/Thai Baht Exchange Rate.
- RUBTHB is the percentage change of the Russian Ruble/Thai Baht Exchange Rate.
- SGDTHB is the percentage change of the Singapore Dollar/Thai Baht Exchange Rate.
- SEKTHB is the percentage change of the Swedish Krona/Thai Baht Exchange Rate.
- SWISSSTOCK is the percentage change of the Swiss Stock Market Index.
- TAIWANSTOCK is the percentage change of the Taiwan Stock Market Index.
- THAICONSCONF is the percentage change of the Thai Consumer Confidence Index.
- THAICPI is the percentage change of the Thai Consumer Price Index.

- THAIGOLDBAR is the percentage change of the Thai Gold Bar (Buying) Price.
- THAIINTERESTFOURBANKS is the percentage change of the Thai Interest Rate from the Top 4 Thai Banks.
- THAIINTERESTFIVEBANKS is the percentage change of the Thai Interest Rate from the Top 5 Thai Banks.
- THAIMONE is the percentage change of the Thai Money Supply (M1).
- THAIMTWO is the percentage change of the Thai Money Supply (M2).
- THAILANDPRICE is the percentage change of the Thai Real Estate Price.
- THAIRETAILHOUSESALES is the percentage change of the Thai Retail Real Estate Sales Value.
- TOKYOSTOCK is the percentage change of the Tokyo Stock Market Index.
- USDTHB is the percentage change of the US Dollar/Thai Baht Exchange Rate.
- WTI is the percentage change of the WTI Price.

The second step of the statistical treatment of the data was to test whether the percentage change data was stationary or not with the Augmented Dickey-Fuller unit root test. The problem that may arise when non-stationary data is used with the Granger Causality test is that significant relationships might seem to exist, even when they actually do not exist. This phenomenon is referred to as spurious regression. The Augmented Dickey-Fuller (ADF) unit root test is the standard test when checking whether data is stationary or not in time-series applications like this study. The null hypothesis in the Augmented Dickey-Fuller unit root test is that the data is non-stationary. The relationships in the null hypotheses of this study were required to pass the Augmented Dickey-Fuller root test at a 95 percent confidence level to reject the null hypothesis, as the 95 percent confidence level provides strong reason to reject the null hypothesis and accept the alternative hypothesis and may be the confidence level most commonly used by researchers.

The third step, after the Augmented Dickey-Fuller unit root test proved what data was stationary and what data was not stationary, was to examine the causal relationships between the stationary independent variables and the dependent variable, namely the return of the Banking Sector Index of the Stock Exchange of Thailand. The relationships were tested with the Pair-wise Granger Causality test. The Granger causality test is used to examine for long-term causal relationships between variables.

In this study, each relationship was examined at the 95 percent confidence level, as is standard practice, to prove or disprove the 30 null hypotheses in this study. Pair-wise Granger Causality tests were conducted for each relationship with lags from one period (month) to 12 periods (months). In the event that multiple time-lags produced significant long-term relationships between one independent variable and the dependent variable, the time-lag that showed the greatest level of significance was chosen for that variable on the condition that the level of significance of the relationship was less than 0.05 ($p\text{-value} < 0.05$).

The relationships between each independent variable and the dependent variable were tested with the following Granger Causality equation:

The value of variable $Y_t = \alpha_0 + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots + \alpha_n x_{t-n} + \gamma_1 y_{t-1} + \gamma_2 y_{t-2} + \dots + \gamma_n y_{t-n} + \varepsilon_t$, where, α_1 to α_n are the coefficients of each lag value of variables x and y , α_0 is the constant, and ε_t is the error term. $H_0: \alpha_1 = \alpha_2 = \dots = \alpha_n = 0$. H_a : at least one of $\alpha_1, \alpha_2, \dots, \alpha_n$ is not equal to 0.

The above three-step process was used for the statistical analysis of this study to test the relationships in the hypotheses of this study. The results of the statistical process outlined above provided the answers to the questions:

- Is the Banking Sector Index of the Stock Exchange of Thailand market inefficient?
- What are the long-term causal determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand?
- What are the time-lags between the causal determinants and the return of the Banking Sector Index of the Stock Exchange of Thailand?

Chapter 5

Presentation of Data and Critical Discussion of Results

This chapter consists of two main parts, which follows the statistical process of data treatment as stated in the previous chapter. The first part presents the results of the Augmented Dickey-Fuller (ADF) unit root tests for all of the variables to determine whether or not the data is stationary. The second part presents the results of the Pair-wise Granger Causality tests, which tests for significant long-term relationships between the dependent variable and the independent variables. The Granger Causality test also provides the number of time-lags for each statistically significant relationship.

The following variables are the independent variables studied in this research; the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, US Dollar/Thai Baht Exchange Rate, and WTI Price.

5.1 Augmented Dickey-Fuller Unit Root Test

There are two ways from the results of the Augmented Dickey-Fuller Unit Root test (ADF) to conclude whether or not data is stationary. The first way is to compare the t-statistic against the critical value, both of which are provided in the results of the Augmented Dickey-Fuller Unit Root test. If the t-statistic is less than the critical value, the null hypothesis fails to be rejected, which is equivalent to accepting the null hypothesis, which is that the data has a unit root and thus is stationary.

The second way is to compare the p-value (or probability value), which is also obtained from the Augmented Dickey-Fuller Unit Root test against the confidence level set by the author of the study. If the p-value is less than one minus the confidence level (1-confidence level), the null hypothesis fails to be rejected, which is equivalent to accepting the null hypothesis, which is that the data has a unit root and thus is stationary.

In this study, the second way was used and the confidence level was set at 95 percent. As such if the p-value is less than 0.05 (1-.95), the null hypothesis fails to be rejected, and the data has a unit root and thus is stationary. However, if the p-value is greater than 0.05 (1-.95), the null hypothesis is rejected, and the data does not have a unit root and is not stationary. Non-stationary data will not be tested with the Granger Causality test, as stationary data is a prerequisite for the Granger Causality test. Following are the results of the Augmented Dickey-Fuller Unit Root Tests.

The following table, Table 5.1: Banking Sector of the Stock Exchange of Thailand (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Banking Sector Index of the Stock Exchange of Thailand. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, BANKINGSECTORSET has a unit root, and the data is stationary.

Table 5.1: Banking Sector of the Stock Exchange of Thailand (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
BANKINGSECTORSET has a unit root	Augmented Dickey-Fuller test statistic	-9.906020	0.0000
	Critical values: 1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

Source: Integrated and created by the author

The following table, Table 5.2: Australian Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Australian Dollar/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, AUDTHB has a unit root, and the data is stationary.

Table 5.2: Australian Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
AUDTHB has a unit root	Augmented Dickey-Fuller test statistic	-9.751672	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.3: Brent (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Brent Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, BRENT has a unit root, and the data is stationary.

Table 5.3: Brent (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
BRENT has a unit root	Augmented Dickey-Fuller test statistic	-8.392740	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.4: British Pound/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the British Pound/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, GBPTHB has a unit root, and the data is stationary.

Table 5.4: British Pound/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
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Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
GBPTHB has a unit root		t-Statistic	Prob.*
	<hr/>		
	Augmented Dickey-Fuller test statistic		
		-10.28061	0.0000
	Critical values:	1% level	-4.036983
		5% level	-3.448021
		10% level	-3.149135

Source: Integrated and created by the author

The following table, Table 5.5: Chinese Yuan/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Chinese Yuan/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, CNYTHB has a unit root, and the data is stationary.

Table 5.5: Chinese Yuan/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
CNYTHB has a unit root		t-Statistic	Prob.*
	<hr/>		
	Augmented Dickey-Fuller test statistic		
		-10.93284	0.0000
	Critical values:	1% level	-3.486064
		5% level	-2.885863
		10% level	-2.579818

Source: Integrated and created by the author

The following table, Table 5.6: Commodities Index (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Commodities Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, COMMODITY has a unit root, and the data is stationary.

Table 5.6: Commodities Index (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
COMMODITY has a unit root		t-Statistic	Prob.*
	<hr/>		
	Augmented Dickey-Fuller test statistic		
		-9.136452	0.0000
	Critical values:	1% level	-4.036983
		5% level	-3.448021
		10% level	-3.149135

Source: Integrated and created by the author

The following table, Table 5.7: Euro/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Euro/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, EURTHB has a unit root, and the data is stationary.

Table 5.7: Euro/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis		Augmented Dickey-Fuller Unit Root Test	
		t-Statistic	Prob.*
EURTHB has a unit root	Augmented Dickey-Fuller test statistic	-11.52011	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.8: German Stock Market (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the German Stock Market Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, German Stock Market has a unit root, and the data is stationary.

Table 5.8: German Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis		Augmented Dickey-Fuller Unit Root Test	
		t-Statistic	Prob.*
GERMANSTOCK has a unit root	Augmented Dickey-Fuller test statistic	-9.624516	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.9: Heating Oil (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for Heating Oil Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, HEATINGOIL has a unit root, and the data is stationary.

Table 5.9: Heating Oil (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
HEATINGOIL has a unit root	Augmented Dickey-Fuller test statistic	-10.61874	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.10: Hong Kong Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Hong Kong Stock Exchange Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, HONGKONGSTOCK has a unit root, and the data is stationary.

Table 5.10: Hong Kong Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
HONGKONGSTOCK has a unit root	Augmented Dickey-Fuller test statistic	-9.628619	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.11: Indian Rupee/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Indian Rupee/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, INRTHB has a unit root, and the data is stationary.

Table 5.11: Indian Rupee/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
INRTHB has a unit root	Augmented Dickey-Fuller test statistic	-10.05153	0.0000
	Critical values: 1% level	-4.037668	
	5% level	-3.448348	
	10% level	-3.149326	

Source: Integrated and created by the author

The following table, Table 5.12: Japanese Yen/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Japanese Yen/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, JPYTHB has a unit root, and the data is stationary.

Table 5.12: Japanese Yen/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
JPYTHB has a unit root	Augmented Dickey-Fuller test statistic		
		-10.58626	0.0000
	Critical values: 1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

Source: Integrated and created by the author

The following table, Table 5.13: New York Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the New York Stock Exchange Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, NEWYORKSTOCK has a unit root, and the data is stationary.

Table 5.13: New York Stock Exchange (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
NEWYORKSTOCK has a unit root	Augmented Dickey-Fuller test statistic		
		-8.644791	0.0000
	Critical values: 1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

Source: Integrated and created by the author

The following table, Table 5.14: New Zealand Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the New Zealand Dollar/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, NZDTHB has a unit root, and the data is stationary.

Table 5.14: New Zealand Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
NZDTHB has a unit root	Augmented Dickey-Fuller test statistic	-10.49076	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.15: Russian Ruble/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Russian Ruble/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, RUBTHB has a unit root, and the data is stationary.

Table 5.15: Russian Ruble/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
RUBTHB has a unit root	Augmented Dickey-Fuller test statistic	-9.076926	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.16: Singapore Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Singapore Dollar/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, SGDTHB has a unit root, and the data is stationary.

Table 5.16: Singapore Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
SGDTHB has a unit root	Augmented Dickey-Fuller test statistic	-11.85960	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	

	10% level	-3.149135
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Source: Integrated and created by the author

The following table, Table 5.17: Swedish Krona/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Swedish Krona/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, SEKTHB has a unit root, and the data is stationary.

Table 5.17: Swedish Krona/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
SEKTHB has a unit root	Augmented Dickey-Fuller test statistic	-10.45267	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.18: Swiss Stock Market (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Swiss Stock Market Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, SWISSSTOCK has a unit root, and the data is stationary.

Table 5.18: Swiss Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
SWISSSTOCK has a unit root	Augmented Dickey-Fuller test statistic	-8.171824	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.19: Taiwan Stock Market (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Taiwan Stock Market Index. As the p-value is 0.0000, which is

less than 0.05, the null hypothesis fails to be rejected. Thus, TAIWANSTOCK has a unit root, and the data is stationary.

Table 5.19: Taiwan Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
TAIWANSTOCK has a unit root	Augmented Dickey-Fuller test statistic	-9.704826	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.20: Thai Consumer Confidence (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for Thai Consumer Confidence Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAICONSCONF has a unit root, and the data is stationary.

Table 5.20: Thai Consumer Confidence (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
THAICONSCONF has a unit root	Augmented Dickey-Fuller test statistic	-7.289033	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.21: Thai Consumer Price Index (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Consumer Price Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAICPI has a unit root, and the data is stationary.

Table 5.21: Thai Consumer Price Index (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*

THAICPI has a unit root	Augmented Dickey-Fuller test statistic			-7.487139	0.0000
	Critical values:		1% level	-4.036983	
			5% level	-3.448021	
			10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.22: Thai Gold Bar (Buying) Price (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Gold Bar (Buying) Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAIGOLDBAR has a unit root, and the data is stationary.

Table 5.22: Thai Gold Bar (Buying) Price (Results of Augmented Dickey-Fuller Unit Root Test)					
Null Hypothesis		Augmented Dickey-Fuller Unit Root Test			
THAIGOLDBAR has a unit root				t-Statistic	Prob.*
		Augmented Dickey-Fuller test statistic		-13.18109	0.0000
		Critical values:	1% level	-4.036983	
			5% level	-3.448021	
			10% level	-3.149135	

Source: Integrated and created by the author

The following table, Table 5.23: Thai Interest Rate from the Top 4 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Interest Rate from the Top Four Thai Banks. As the p-value is 0.0002, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAIINTERESTFOURBANKS has a unit root, and the data is stationary.

Table 5.23: Thai Interest Rate from the Top 4 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
THAIINTERESTFOURBANKS has a unit root		t-Statistic	Prob.*
	Augmented Dickey-Fuller test statistic		-5.167522 0.0002
	Critical values:	1% level	-4.037668
		5% level	-3.448348
		10% level	-3.149326

Source: Integrated and created by the author

The following table, Table 5.24: Thai Interest Rate from the Top 5 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Interest Rate from the Top Five Thai Banks. As the p-value is 0.0003, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAIINTERESTFIVEBANKS has a unit root, and the data is stationary.

Table 5.24: Thai Interest Rate from the Top 5 Thai Banks (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
THAIINTERESTFIVEBANKS has a unit root	Augmented Dickey-Fuller test statistic	-5.048261	0.0003
	Critical values: 1% level	-4.037668	
	5% level	-3.448348	
	10% level	-3.149326	

Source: Integrated and created by the author

The following table, Table 5.25: Thai Money Supply (M1) (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Money Supply (M1). As the p-value is 0.1718, which is greater than 0.05, the null hypothesis is rejected. Thus, THAIMONE does not have a unit root, and the data is not stationary.

Table 5.25: Thai Money Supply (M1) (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
THAIMONE has a unit root	Augmented Dickey-Fuller test statistic	-2.306764	0.1718
	Critical values: 1% level	-3.492523	
	5% level	-2.888669	
	10% level	-2.581313	

Source: Integrated and created by the author

The following table, Table 5.26: Thai Money Supply (M2) (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Money Supply (M2). As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAIMTWO has a unit root, and the data is stationary.

Table 5.26: Thai Money Supply (M2) (Results of Augmented Dickey-Fuller Unit Root Test)		
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test	
	t-Statistic	Prob.*
THAIMTWO has a unit root	Augmented Dickey-Fuller test statistic	-6.266718 0.0000
	Critical values: 1% level	-3.488063
	5% level	-2.886732
	10% level	-2.580281

Source: Integrated and created by the author

The following table, Table 5.27: Thai Real Estate Price (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Real Estate Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAILANDPRICE has a unit root, and the data is stationary.

Table 5.27: Thai Real Estate Price (Results of Augmented Dickey-Fuller Unit Root Test)		
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test	
	t-Statistic	Prob.*
THAILANDPRICE has a unit root	Augmented Dickey-Fuller test statistic	-10.75630 0.0000
	Critical values: 1% level	-4.036983
	5% level	-3.448021
	10% level	-3.149135

Source: Integrated and created by the author

The following table, Table 5.28: Thai Retail Real Estate Sales Value (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Thai Retail Real Estate Sales Value. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, THAIRETAILHOUSESALES has a unit root, and the data is stationary.

Table 5.28: Thai Retail Real Estate Sales Value (Results of Augmented Dickey-Fuller Unit Root Test)		
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test	
	t-Statistic	Prob.*
THAIRETAILHOUSESALES has a unit root	Augmented Dickey-Fuller test statistic	-13.35848 0.0000
	Critical values: 1% level	-4.036983

	5% level	-3.448021
	10% level	-3.149135

Source: Integrated and created by the author

The following table, Table 5.29: Tokyo Stock Market (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the Tokyo Stock Market Index. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, TOKYOSTOCK has a unit root, and the data is stationary.

Table 5.29: Tokyo Stock Market (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
TOKYOSTOCK has a unit root	Augmented Dickey-Fuller test statistic	-8.129890	0.0000
	Critical values: 1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

Source: Integrated and created by the author

The following table, Table 5.30: US Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for the US Dollar/Thai Baht Exchange Rate. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, USDTHB has a unit root, and the data is stationary.

Table 5.30: US Dollar/Thai Baht Exchange Rate (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
USDTHB has a unit root	Augmented Dickey-Fuller test statistic	-9.622633	0.0000
	Critical values: 1% level	-3.486064	
	5% level	-2.885863	
	10% level	-2.579818	

Source: Integrated and created by the author

The following table, Table 5.31: WTI (Results of Augmented Dickey-Fuller Unit Root Test), provides the result of the Augmented Dickey-Fuller unit root test for WTI

Price. As the p-value is 0.0000, which is less than 0.05, the null hypothesis fails to be rejected. Thus, WTI has a unit root, and the data is stationary.

Table 5.31: WTI (Results of Augmented Dickey-Fuller Unit Root Test)			
Null Hypothesis	Augmented Dickey-Fuller Unit Root Test		
		t-Statistic	Prob.*
WTI has a unit root	Augmented Dickey-Fuller test statistic	-9.109070	0.0000
	Critical values: 1% level	-4.036983	
	5% level	-3.448021	
	10% level	-3.149135	

Source: Integrated and created by the author

The results of the Augmented Dickey-Fuller unit root tests show that the data in its percentage change form is stationary for all the variables of this study except for the variable, Thai Money Supply (M1). Thai Money Supply (M1) is excluded from the Pair-wise Granger Causality tests that are presented next, as Thai Money Supply (M1) does not pass the prerequisite for the Pair-wise Granger Causality test, which is that the variable must be stationary.

Thus, the Austrian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, US Dollar/Thai Baht Exchange Rate, and WTI Price are all stationary and are examined next for their long-term causal relationships with the dependent variable, namely the return of the Banking Sector Index of the Stock Exchange of Thailand.

The following table, 5.32: Summary of Augmented Dickey-Fuller Unit Root Test, presents the results of the Augmented Dickey-Fuller unit root tests conducted in

this study. Table 5.32 presents the null hypotheses of the Augmented Dickey-Fuller unit root tests in the first column, the p-value of the Augmented Dickey-Fuller unit root tests in the second column and the findings of the Augmented Dickey-Fuller unit root tests in the last column.



Table 5.32: Summary of Augmented Dickey-Fuller Unit Root Test		
Null Hypotheses	Prob.	95 % Confidence
• BANKINGSECTORSET has a unit root	• 0.0000	• Failed to Reject
• AUDTHB has a unit root	• 0.0000	• Failed to Reject
• BRENT has a unit root	• 0.0000	• Failed to Reject
• GBPTHB has a unit root	• 0.0000	• Failed to Reject
• CNYTHB has a unit root	• 0.0000	• Failed to Reject
• COMMODITY has a unit root	• 0.0000	• Failed to Reject
• EURTHB has a unit root	• 0.0000	• Failed to Reject
• GERMANSTOCK has a unit root	• 0.0000	• Failed to Reject
• HEATINGOIL has a unit root	• 0.0000	• Failed to Reject
• HONGKONGSTOCK has a unit root	• 0.0000	• Failed to Reject
• INRTHB has a unit root	• 0.0000	• Failed to Reject
• JPYTHB has a unit root	• 0.0000	• Failed to Reject
• NEWYORKSTOCK has a unit root	• 0.0000	• Failed to Reject
• NZDTHB has a unit root	• 0.0000	• Failed to Reject
• RUBTHB has a unit root	• 0.0000	• Failed to Reject

• SGDTHB has a unit root	• 0.0000	• Failed to Reject
• SEKTHB has a unit root	• 0.0000	• Failed to Reject
• SWISSSTOCK has a unit root	• 0.0000	• Failed to Reject
• TAIWANSTOCK has a unit root	• 0.0000	• Failed to Reject
• THAICONSCONF has a unit root	• 0.0000	• Failed to Reject
• THAICPI has a unit root	• 0.0000	• Failed to Reject
• THAIGOLDBAR has a unit root	• 0.0000	• Failed to Reject
• THAIINTERESTFOURBANKS has a unit root	• 0.0002	• Failed to Reject
• THAIINTERESTFIVEBANKS has a unit root	• 0.0003	• Failed to Reject
• THAIMONE has a unit root	• 0.1718	• Reject
• THAIMTWO has a unit root	• 0.0000	• Failed to Reject
• THAILANDPRICE has a unit root	• 0.0000	• Failed to Reject
• THAIRETAILHOUSESALES has a unit root	• 0.0000	• Failed to Reject
• TOKYOSTOCK has a unit root	• 0.0000	• Failed to Reject
• USDTHB has a unit root	• 0.0000	• Failed to Reject
• WTI has a unit root	• 0.0000	• Failed to Reject

Source: Integrated and created by the author

5.2 Pair-wise Granger Causality Test

In this section, the long-term relationships between each independent variable and the dependent variable, the return of the Banking Sector Index of the Stock Exchange of Thailand are examined with the Pair-wise Granger Causality test to determine the significant relationships and the respective lag periods. One independent variable, Thai Money Supply (M1), has been removed from this analysis due to it not passing the unit root test above. Thus, the independent variables in this part are the Austrian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, US Dollar/Thai Baht Exchange Rate, and WTI Price. Each one of these independent variables are tested for long-term causal relationships with lag periods of one month to 12 months. The results of the Pair-wise Granger Causality tests are presented next.

The following table, Table 5.33: Australian Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Australian Dollar/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0066, which is less than 0.05. Thus, the null hypothesis, AUDTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, AUDTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is two months.

Table 5.33: Australian Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	AUDTHB does not Granger Cause BANKINGSECTORSET	4.63142	0.0335
2	AUDTHB does not Granger Cause BANKINGSECTORSET	5.24623	0.0066
3	AUDTHB does not Granger Cause BANKINGSECTORSET	3.47197	0.0186
4	AUDTHB does not Granger Cause BANKINGSECTORSET	2.66692	0.0362
5	AUDTHB does not Granger Cause BANKINGSECTORSET	3.29232	0.0084
6	AUDTHB does not Granger Cause BANKINGSECTORSET	2.66190	0.0194
7	AUDTHB does not Granger Cause BANKINGSECTORSET	2.22936	0.0381
8	AUDTHB does not Granger Cause BANKINGSECTORSET	1.92097	0.0656
9	AUDTHB does not Granger Cause BANKINGSECTORSET	2.49277	0.0135
10	AUDTHB does not Granger Cause BANKINGSECTORSET	2.19745	0.0249
11	AUDTHB does not Granger Cause BANKINGSECTORSET	1.93479	0.0456
12	AUDTHB does not Granger Cause BANKINGSECTORSET	1.87636	0.0492

Source: Integrated and created by the author

The following table, Table 5.34: Brent (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from Brent Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0030, which is less than 0.05. Thus, the null hypothesis, BRENT does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, BRENT does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Table 5.34: Brent (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	BRENT does not Granger Cause BANKINGSECTORSET	0.02454	0.8758
2	BRENT does not Granger Cause BANKINGSECTORSET	0.16473	0.8483
3	BRENT does not Granger Cause BANKINGSECTORSET	0.17095	0.9158
4	BRENT does not Granger Cause BANKINGSECTORSET	0.16326	0.9565
5	BRENT does not Granger Cause BANKINGSECTORSET	1.14277	0.3426
6	BRENT does not Granger Cause BANKINGSECTORSET	0.92844	0.4780
7	BRENT does not Granger Cause BANKINGSECTORSET	0.86152	0.5398
8	BRENT does not Granger Cause BANKINGSECTORSET	1.65246	0.1204
9	BRENT does not Granger Cause BANKINGSECTORSET	3.05944	0.0030
10	BRENT does not Granger Cause BANKINGSECTORSET	2.94279	0.0031
11	BRENT does not Granger Cause BANKINGSECTORSET	2.77858	0.0039
12	BRENT does not Granger Cause BANKINGSECTORSET	1.77107	0.0666

Source: Integrated and created by the author

The following table, Table 5.35: British Pound/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the British Pound/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0157, which is less than 0.05. Thus, the null hypothesis, GBPTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, GBPTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is five months.

Table 5.35: British Pound/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	GBPTHB does not Granger Cause BANKINGSECTORSET	1.80089	0.1822
2	GBPTHB does not Granger Cause BANKINGSECTORSET	2.68660	0.0725
3	GBPTHB does not Granger Cause BANKINGSECTORSET	1.64077	0.1841
4	GBPTHB does not Granger Cause BANKINGSECTORSET	2.66752	0.0362
5	GBPTHB does not Granger Cause BANKINGSECTORSET	2.94777	0.0157
6	GBPTHB does not Granger Cause BANKINGSECTORSET	2.24350	0.0449
7	GBPTHB does not Granger Cause BANKINGSECTORSET	2.25418	0.0360
8	GBPTHB does not Granger Cause BANKINGSECTORSET	2.17435	0.0362
9	GBPTHB does not Granger Cause BANKINGSECTORSET	1.96914	0.0518
10	GBPTHB does not Granger Cause BANKINGSECTORSET	1.67921	0.0980
11	GBPTHB does not Granger Cause BANKINGSECTORSET	1.46993	0.1578
12	GBPTHB does not Granger Cause BANKINGSECTORSET	1.46746	0.1533

Source: Integrated and created by the author

The following table, Table 5.36: Chinese Yuan/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Chinese Yuan/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.1013, which is greater than 0.05. Thus, the null hypothesis, AUDTHB does not Granger Cause BANKINGSECTORSET, fails to be rejected. As such, AUDTHB does not Granger Cause BANKINGSECTORSET.

Table 5.36: Chinese Yuan/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	CNYTHB does not Granger Cause BANKINGSECTORSET	0.01994	0.8880
2	CNYTHB does not Granger Cause BANKINGSECTORSET	0.69586	0.5008
3	CNYTHB does not Granger Cause BANKINGSECTORSET	2.12397	0.1013
4	CNYTHB does not Granger Cause BANKINGSECTORSET	1.48035	0.2133
5	CNYTHB does not Granger Cause BANKINGSECTORSET	1.79435	0.1204
6	CNYTHB does not Granger Cause BANKINGSECTORSET	1.51099	0.1821
7	CNYTHB does not Granger Cause BANKINGSECTORSET	1.34859	0.2359
8	CNYTHB does not Granger Cause BANKINGSECTORSET	1.17625	0.3215
9	CNYTHB does not Granger Cause BANKINGSECTORSET	1.03821	0.4162
10	CNYTHB does not Granger Cause BANKINGSECTORSET	0.90201	0.5349
11	CNYTHB does not Granger Cause BANKINGSECTORSET	0.88850	0.5547
12	CNYTHB does not Granger Cause BANKINGSECTORSET	1.03829	0.4227

Source: Integrated and created by the author

The following table, Table 5.37: Commodities Index (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Commodities Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0008, which is less than 0.05. Thus, the null hypothesis, COMMODITY does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, COMMODITY does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Table 5.37: Commodities Index (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	COMMODITY does not Granger Cause BANKINGSECTORSET	0.01452	0.9043
2	COMMODITY does not Granger Cause BANKINGSECTORSET	0.04571	0.9553
3	COMMODITY does not Granger Cause BANKINGSECTORSET	0.06519	0.9782
4	COMMODITY does not Granger Cause BANKINGSECTORSET	0.08786	0.9861
5	COMMODITY does not Granger Cause BANKINGSECTORSET	0.85356	0.5151
6	COMMODITY does not Granger Cause BANKINGSECTORSET	0.84793	0.5360
7	COMMODITY does not Granger Cause BANKINGSECTORSET	0.88298	0.5230
8	COMMODITY does not Granger Cause BANKINGSECTORSET	1.43060	0.1938
9	COMMODITY does not Granger Cause BANKINGSECTORSET	3.55569	0.0008
10	COMMODITY does not Granger Cause BANKINGSECTORSET	3.30851	0.0011
11	COMMODITY does not Granger Cause BANKINGSECTORSET	3.15676	0.0013
12	COMMODITY does not Granger Cause BANKINGSECTORSET	1.91942	0.0434

Source: Integrated and created by the author

They following table, Table 5.38: Euro/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Euro/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0017, which is less than 0.05. Thus, the null hypothesis, EURTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, EURTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is 12 months.

Table 5.38: Euro/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	EURTHB does not Granger Cause BANKINGSECTORSET	2.64449	0.1066
2	EURTHB does not Granger Cause BANKINGSECTORSET	1.82517	0.1659
3	EURTHB does not Granger Cause BANKINGSECTORSET	1.66389	0.1790
4	EURTHB does not Granger Cause BANKINGSECTORSET	2.48099	0.0482
5	EURTHB does not Granger Cause BANKINGSECTORSET	2.52281	0.0338
6	EURTHB does not Granger Cause BANKINGSECTORSET	2.14573	0.0545
7	EURTHB does not Granger Cause BANKINGSECTORSET	1.95209	0.0694
8	EURTHB does not Granger Cause BANKINGSECTORSET	2.50355	0.0164
9	EURTHB does not Granger Cause BANKINGSECTORSET	2.34476	0.0198
10	EURTHB does not Granger Cause BANKINGSECTORSET	2.10803	0.0318
11	EURTHB does not Granger Cause BANKINGSECTORSET	1.91777	0.0478
12	EURTHB does not Granger Cause BANKINGSECTORSET	2.97623	0.0017

Source: Integrated and created by the author

The following table, Table 5.39: German Stock Market (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the German Stock Market Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0421, which is less than 0.05. Thus, the null hypothesis, GERMANSTOCK does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, GERMANSTOCK does Granger Cause BANKINGSECTORSET. The lag period of this relationship is one month.

Table 5.39: German Stock Market (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	4.22303	0.0421
2	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	2.84450	0.0623
3	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	2.15178	0.0978
4	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.41688	0.2333
5	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.17482	0.3266
6	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	0.95431	0.4601
7	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	0.98712	0.4452
8	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.26044	0.2735
9	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.36680	0.2147
10	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.16916	0.3222
11	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1.07379	0.3918
12	GERMANSTOCK does not Granger Cause BANKINGSECTORSET	0.45120	0.9368

Source: Integrated and created by the author

The following table, Table 5.40: Heating Oil (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from Heating Oil Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.00005, which is less than 0.05. Thus, the null hypothesis, HEATINGOIL does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, HEATINGOIL does Granger Cause BANKINGSECTORSET. The lag period of this relationship is ten months.

Table 5.40: Heating Oil (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	HEATINGOIL does not Granger Cause BANKINGSECTORSET	0.29896	0.5856
2	HEATINGOIL does not Granger Cause BANKINGSECTORSET	1.00165	0.3705
3	HEATINGOIL does not Granger Cause BANKINGSECTORSET	0.85055	0.4692
4	HEATINGOIL does not Granger Cause BANKINGSECTORSET	0.65003	0.6281
5	HEATINGOIL does not Granger Cause BANKINGSECTORSET	0.83465	0.5280
6	HEATINGOIL does not Granger Cause BANKINGSECTORSET	0.56285	0.7589
7	HEATINGOIL does not Granger Cause BANKINGSECTORSET	1.15557	0.3354
8	HEATINGOIL does not Granger Cause BANKINGSECTORSET	1.12754	0.3521
9	HEATINGOIL does not Granger Cause BANKINGSECTORSET	4.32320	0.0001
10	HEATINGOIL does not Granger Cause BANKINGSECTORSET	4.42284	0.00005
11	HEATINGOIL does not Granger Cause BANKINGSECTORSET	4.06041	0.00009
12	HEATINGOIL does not Granger Cause BANKINGSECTORSET	2.22172	0.0176

Source: Integrated and created by the author

The following table, Table 5.41: Hong Kong Stock Exchange (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Hong Kong Stock Exchange to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0427, which is less than 0.05. Thus, the null hypothesis, HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, HONGKONGSTOCK does Granger Cause BANKINGSECTORSET. The lag period of this relationship is two months.

Table 5.41: Hong Kong Stock Exchange (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	3.33546	0.0704
2	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	3.24264	0.0427
3	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	2.25723	0.0858
4	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	1.50457	0.2060
5	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	1.35007	0.2493
6	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	1.05855	0.3925
7	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.83619	0.5599
8	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.88342	0.5335
9	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.79461	0.6220
10	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.68130	0.7391
11	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.96406	0.4850
12	HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	0.74000	0.7086

Source: Integrated and created by the author

The following table, Table 5.42: Indian Rupee/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Indian Rupee/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0011, which is less than 0.05. Thus, the null hypothesis, INRTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, INRTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is three months.

Table 5.42: Indian Rupee/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	INRTHB does not Granger Cause BANKINGSECTORSET	7.85499	0.0059
2	INRTHB does not Granger Cause BANKINGSECTORSET	5.87469	0.0037
3	INRTHB does not Granger Cause BANKINGSECTORSET	5.71900	0.0011
4	INRTHB does not Granger Cause BANKINGSECTORSET	4.13660	0.0037
5	INRTHB does not Granger Cause BANKINGSECTORSET	3.39585	0.0070
6	INRTHB does not Granger Cause BANKINGSECTORSET	2.88844	0.0122
7	INRTHB does not Granger Cause BANKINGSECTORSET	2.98885	0.0069
8	INRTHB does not Granger Cause BANKINGSECTORSET	2.59821	0.0130
9	INRTHB does not Granger Cause BANKINGSECTORSET	2.37003	0.0186
10	INRTHB does not Granger Cause BANKINGSECTORSET	2.09282	0.0331
11	INRTHB does not Granger Cause BANKINGSECTORSET	1.79138	0.0678
12	INRTHB does not Granger Cause BANKINGSECTORSET	1.66701	0.0893

Source: Integrated and created by the author

The following table, Table 5.43: Japanese Yen/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Japanese Yen/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.6209, which is greater than 0.05. Thus, the null hypothesis, JPYTHB does not Granger Cause BANKINGSECTORSET, failed to be rejected. As such, JPYTHB does not Granger Cause BANKINGSECTORSET.

Table 5.43: Japanese Yen/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	JPYTHB does not Granger Cause BANKINGSECTORSET	0.09222	0.7619
2	JPYTHB does not Granger Cause BANKINGSECTORSET	0.07914	0.9240
3	JPYTHB does not Granger Cause BANKINGSECTORSET	0.23471	0.8720
4	JPYTHB does not Granger Cause BANKINGSECTORSET	0.17728	0.9497
5	JPYTHB does not Granger Cause BANKINGSECTORSET	0.40781	0.8424
6	JPYTHB does not Granger Cause BANKINGSECTORSET	0.73709	0.6209
7	JPYTHB does not Granger Cause BANKINGSECTORSET	0.65821	0.7067
8	JPYTHB does not Granger Cause BANKINGSECTORSET	0.50240	0.8517
9	JPYTHB does not Granger Cause BANKINGSECTORSET	0.58696	0.8047
10	JPYTHB does not Granger Cause BANKINGSECTORSET	0.49943	0.8862
11	JPYTHB does not Granger Cause BANKINGSECTORSET	0.38297	0.9594
12	JPYTHB does not Granger Cause BANKINGSECTORSET	0.56996	0.8602

Source: Integrated and created by the author

The following table, Table 5.44: New York Stock Exchange (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the New York Stock Exchange Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0504, which is greater than 0.05. Thus, the null hypothesis, NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET, failed to be rejected. As such, NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET.

Table 5.44: New York Stock Exchange (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	3.90801	0.0504
2	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	1.95737	0.1460
3	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	1.31836	0.2721
4	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.83007	0.5089
5	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.81356	0.5426
6	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.67918	0.6668
7	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.55172	0.7931
8	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.49615	0.8562
9	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.70483	0.7030
10	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.59953	0.8103
11	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.60840	0.8169
12	NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	0.48952	0.9155

Source: Integrated and created by the author

The following table, Table 5.45: New Zealand Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the New Zealand Dollar/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0107, which is less than 0.05. Thus, the null hypothesis, NZDTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, NZDTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is five months.

Table 5.45: New Zealand Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	NZDTHB does not Granger Cause BANKINGSECTORSET	3.80748	0.0534
2	NZDTHB does not Granger Cause BANKINGSECTORSET	3.86332	0.0238
3	NZDTHB does not Granger Cause BANKINGSECTORSET	2.90904	0.0378
4	NZDTHB does not Granger Cause BANKINGSECTORSET	2.82002	0.0286
5	NZDTHB does not Granger Cause BANKINGSECTORSET	3.16160	0.0107
6	NZDTHB does not Granger Cause BANKINGSECTORSET	2.70287	0.0178
7	NZDTHB does not Granger Cause BANKINGSECTORSET	2.28996	0.0333
8	NZDTHB does not Granger Cause BANKINGSECTORSET	1.94516	0.0620
9	NZDTHB does not Granger Cause BANKINGSECTORSET	1.92690	0.0576
10	NZDTHB does not Granger Cause BANKINGSECTORSET	1.71686	0.0891
11	NZDTHB does not Granger Cause BANKINGSECTORSET	1.78238	0.0695
12	NZDTHB does not Granger Cause BANKINGSECTORSET	1.77767	0.0654

Source: Integrated and created by the author

The following table, Table 5.46: Russian Ruble/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Russian Ruble/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0016, which is less than 0.05. Thus, the null hypothesis, RUBTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, RUBTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is seven months.

Table 5.46: Russian Ruble/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	RUBTHB does not Granger Cause BANKINGSECTORSET	2.88336	0.0922
2	RUBTHB does not Granger Cause BANKINGSECTORSET	2.53423	0.0838
3	RUBTHB does not Granger Cause BANKINGSECTORSET	3.78577	0.0125
4	RUBTHB does not Granger Cause BANKINGSECTORSET	4.15127	0.0036
5	RUBTHB does not Granger Cause BANKINGSECTORSET	3.89656	0.0028
6	RUBTHB does not Granger Cause BANKINGSECTORSET	2.98730	0.0100
7	RUBTHB does not Granger Cause BANKINGSECTORSET	3.62272	0.0016
8	RUBTHB does not Granger Cause BANKINGSECTORSET	3.11552	0.0036
9	RUBTHB does not Granger Cause BANKINGSECTORSET	2.99495	0.0036
10	RUBTHB does not Granger Cause BANKINGSECTORSET	2.63030	0.0075
11	RUBTHB does not Granger Cause BANKINGSECTORSET	2.71282	0.0047
12	RUBTHB does not Granger Cause BANKINGSECTORSET	2.39548	0.0103

Source: Integrated and created by the author

The following table, Table 5.47: Singapore Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Singapore Dollar/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0039, which is less than 0.05. Thus, the null hypothesis, SGDTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, SGDTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is five months.

Table 5.47: Singapore Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	SGDTHB does not Granger Cause BANKINGSECTORSET	0.64035	0.4252
2	SGDTHB does not Granger Cause BANKINGSECTORSET	1.66750	0.1933
3	SGDTHB does not Granger Cause BANKINGSECTORSET	3.40875	0.0201
4	SGDTHB does not Granger Cause BANKINGSECTORSET	3.09038	0.0189
5	SGDTHB does not Granger Cause BANKINGSECTORSET	3.71157	0.0039
6	SGDTHB does not Granger Cause BANKINGSECTORSET	3.02822	0.0092
7	SGDTHB does not Granger Cause BANKINGSECTORSET	2.56764	0.0180
8	SGDTHB does not Granger Cause BANKINGSECTORSET	2.21429	0.0329
9	SGDTHB does not Granger Cause BANKINGSECTORSET	2.00691	0.0471
10	SGDTHB does not Granger Cause BANKINGSECTORSET	1.77061	0.0776
11	SGDTHB does not Granger Cause BANKINGSECTORSET	1.78068	0.0698
12	SGDTHB does not Granger Cause BANKINGSECTORSET	2.20828	0.0183

Source: Integrated and created by the author

The following table, Table 5.48: Swedish Krona/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Swedish Krona/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0152, which is less than 0.05. Thus, the null hypothesis, SEKTHB does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, SEKTHB does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Table 5.48: Swedish Krona/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	SEKTHB does not Granger Cause BANKINGSECTORSET	4.59617	0.0341
2	SEKTHB does not Granger Cause BANKINGSECTORSET	2.36399	0.0987
3	SEKTHB does not Granger Cause BANKINGSECTORSET	1.55183	0.2052
4	SEKTHB does not Granger Cause BANKINGSECTORSET	2.84739	0.0274
5	SEKTHB does not Granger Cause BANKINGSECTORSET	2.68115	0.0254
6	SEKTHB does not Granger Cause BANKINGSECTORSET	2.17839	0.0511
7	SEKTHB does not Granger Cause BANKINGSECTORSET	2.14114	0.0462
8	SEKTHB does not Granger Cause BANKINGSECTORSET	2.24935	0.0302
9	SEKTHB does not Granger Cause BANKINGSECTORSET	2.44640	0.0152
10	SEKTHB does not Granger Cause BANKINGSECTORSET	2.17723	0.0263
11	SEKTHB does not Granger Cause BANKINGSECTORSET	2.01712	0.0362
12	SEKTHB does not Granger Cause BANKINGSECTORSET	2.16766	0.0207

Source: Integrated and created by the author

The following table, Table 5.49: Swiss Stock Market (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Swiss Stock Market Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0346, which is less than 0.05. Thus, the null hypothesis, SWISSSTOCK does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, SWISSSTOCK does Granger Cause BANKINGSECTORSET. The lag period of this relationship is one month.

Table 5.49: Swiss Stock Market (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	4.57056	0.0346
2	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	2.14254	0.1221
3	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	1.74290	0.1624
4	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	1.19868	0.3157
5	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.92488	0.4680
6	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.72540	0.6301
7	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.63112	0.7291
8	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.68742	0.7016
9	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.66196	0.7410
10	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.57428	0.8309
11	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.61812	0.8087
12	SWISSSTOCK does not Granger Cause BANKINGSECTORSET	0.35415	0.9753

Source: Integrated and created by the author

The following table, Table 5.50: Taiwan Stock Market (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Taiwan Stock Market Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0061, which is less than 0.05. Thus, the null hypothesis, TAIWANSTOCK does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, TAIWANSTOCK does Granger Cause BANKINGSECTORSET. The lag period of this relationship is two months.

Table 5.50: Taiwan Stock Market (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	1.87083	0.1740
2	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	5.34487	0.0061
3	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	3.36767	0.0212
4	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	2.53262	0.0445
5	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	2.17296	0.0627
6	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	1.70832	0.1266
7	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	1.28698	0.2647
8	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	1.20761	0.3029
9	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	1.09669	0.3731
10	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	0.99957	0.4519
11	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	0.99957	0.4537
12	TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	0.90819	0.5425

Source: Integrated and created by the author

The following table, Table 5.51: Thai Consumer Confidence (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from Thai Consumer Confidence Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0075, which is less than 0.05. Thus, the null hypothesis, THAICONSCONF does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAICONSCONF does Granger Cause BANKINGSECTORSET. The lag period of this relationship is four months.

Table 5.51: Thai Consumer Confidence (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAICONSCONF does not Granger Cause BANKINGSECTORSET	4.90477	0.0287
2	THAICONSCONF does not Granger Cause BANKINGSECTORSET	2.36190	0.0989
3	THAICONSCONF does not Granger Cause BANKINGSECTORSET	1.46572	0.2279
4	THAICONSCONF does not Granger Cause BANKINGSECTORSET	3.68258	0.0075
5	THAICONSCONF does not Granger Cause BANKINGSECTORSET	3.03204	0.0135
6	THAICONSCONF does not Granger Cause BANKINGSECTORSET	2.42673	0.0312
7	THAICONSCONF does not Granger Cause BANKINGSECTORSET	2.25947	0.0356
8	THAICONSCONF does not Granger Cause BANKINGSECTORSET	2.13557	0.0397
9	THAICONSCONF does not Granger Cause BANKINGSECTORSET	1.91771	0.0589
10	THAICONSCONF does not Granger Cause BANKINGSECTORSET	1.68030	0.0978
11	THAICONSCONF does not Granger Cause BANKINGSECTORSET	1.44258	0.1690
12	THAICONSCONF does not Granger Cause BANKINGSECTORSET	1.01573	0.4424

Source: Integrated and created by the author

The following table, Table 5.52: Thai Consumer Price Index (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Consumer Price Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0175, which is less than 0.05. Thus, the null hypothesis, THAICPI does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAICPI does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAICPI does not Granger Cause BANKINGSECTORSET	0.00405	0.9494
2	THAICPI does not Granger Cause BANKINGSECTORSET	0.14802	0.8626
3	THAICPI does not Granger Cause BANKINGSECTORSET	0.09168	0.9645
4	THAICPI does not Granger Cause BANKINGSECTORSET	0.65692	0.6233
5	THAICPI does not Granger Cause BANKINGSECTORSET	1.96781	0.0895
6	THAICPI does not Granger Cause BANKINGSECTORSET	2.26417	0.0431
7	THAICPI does not Granger Cause BANKINGSECTORSET	1.78878	0.0980
8	THAICPI does not Granger Cause BANKINGSECTORSET	2.14332	0.0389
9	THAICPI does not Granger Cause BANKINGSECTORSET	2.39408	0.0175
10	THAICPI does not Granger Cause BANKINGSECTORSET	2.14034	0.0291
11	THAICPI does not Granger Cause BANKINGSECTORSET	2.09252	0.0292
12	THAICPI does not Granger Cause BANKINGSECTORSET	1.88099	0.0485

Source: Integrated and created by the author

The following table, Table 5.53: Thai Gold Bar (Buying) Price (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Gold Bar (Buying) Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0405, which is less than 0.05. Thus, the null hypothesis, THAIGOLDBAR does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAIGOLDBAR does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Table 5.53: Thai Gold Bar (Buying) Price (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.45282	0.5023
2	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.65879	0.5195
3	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	1.10055	0.3522
4	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.79601	0.5303
5	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.64051	0.6693
6	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.62074	0.7133
7	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.54562	0.7979
8	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	0.49681	0.8558
9	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	2.06691	0.0405
10	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	1.92890	0.0513
11	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	1.74246	0.0774
12	THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	1.81069	0.0595

Source: Integrated and created by the author

The following table, Table 5.54: Thai Interest Rate from the Top 4 Thai Banks (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Interest Rate from the Top Four Thai Banks to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0488, which is less than 0.05. Thus, the null hypothesis, THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAIINTERESTFOURBANKS does Granger Cause BANKINGSECTORSET. The lag period of this relationship is seven months.

Table 5.54: Thai Interest Rate from the Top 4 Thai Banks (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.53934	0.2172
2	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.68824	0.1895
3	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.19120	0.3166
4	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.74235	0.1460
5	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.36141	0.2449
6	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.33174	0.2500
7	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	2.11548	0.0488
8	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.67307	0.1150
9	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.59343	0.1288
10	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.37718	0.2039
11	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.30566	0.2352
12	THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	1.15360	0.3301

Source: Integrated and created by the author

The following table, Table 5.55: Thai Interest Rate from the Top 5 Thai Banks (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Interest Rate from the Top Five Thai Banks to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0400, which is less than 0.05. Thus, the null hypothesis, THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAIINTERESTFIVEBANKS does Granger Cause BANKINGSECTORSET. The lag period of this relationship is seven months.

Table 5.55: Thai Interest Rate from the Top 5 Thai Banks (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.80847	0.1813
2	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.70495	0.1864
3	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.20863	0.3101
4	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.66692	0.1630
5	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.32060	0.2611
6	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.32134	0.2546
7	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	2.20693	0.0400
8	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.75289	0.0962
9	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.64092	0.1152
10	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.43227	0.1793
11	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.37154	0.2011
12	THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	1.21320	0.2881

Source: Integrated and created by the author

The following table, Table 5.56: Thai Money Supply (M2) (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Money Supply (M2) to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.1566, which is greater than 0.05. Thus, the null hypothesis, THAIMTWO does not Granger Cause BANKINGSECTORSET, failed to be rejected. As such, Thai Money Supply (M2) does not Granger Cause BANKINGSECTORSET.

Table 5.56: Thai Money Supply (M2) (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAIMTWO does not Granger Cause BANKINGSECTORSET	0.05936	0.8079
2	THAIMTWO does not Granger Cause BANKINGSECTORSET	0.67813	0.5096
3	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.61385	0.1903
4	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.69464	0.1566
5	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.25418	0.2895
6	THAIMTWO does not Granger Cause BANKINGSECTORSET	0.99093	0.4356
7	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.16773	0.3283
8	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.27263	0.2670
9	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.10179	0.3695
10	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.26608	0.2618
11	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.08650	0.3817
12	THAIMTWO does not Granger Cause BANKINGSECTORSET	1.29592	0.2366

Source: Integrated and created by the author

The following table, Table 5.57: Thai Real Estate Price (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Real Estate Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.00009, which is less than 0.05. Thus, the null hypothesis, THAILANDPRICE does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAILANDPRICE does Granger Cause BANKINGSECTORSET. The lag period of this relationship is twelve months.

Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	0.26334	0.6088
2	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	0.27913	0.7570
3	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	1.62996	0.1866
4	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	1.80646	0.1329
5	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	1.52681	0.1878
6	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	1.86617	0.0939
7	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	3.87824	0.0009
8	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	3.97961	0.0004
9	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	3.56613	0.0008
10	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	3.29909	0.0011
11	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	2.83209	0.0033
12	THAILANDPRICE does not Granger Cause BANKINGSECTORSET	3.91754	0.00009

Source: Integrated and created by the author

The following table, Table 5.58: Thai Retail Real Estate Sales Value (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Thai Retail Real Estate Sales Value to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0035, which is less than 0.05. Thus, the null hypothesis, THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, THAIRETAILHOUSESALES does Granger Cause BANKINGSECTORSET. The lag period of this relationship is eleven months.

Table 5.58: Thai Retail Real Estate Sales Value (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	3.86564	0.0517
2	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.03899	0.1349
3	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	1.69934	0.1714
4	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.59196	0.0406
5	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.75133	0.0224
6	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.35643	0.0359
7	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.09593	0.0509
8	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	1.92204	0.0654
9	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	1.67528	0.1062
10	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	1.76498	0.0788
11	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.81886	0.0035
12	THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	2.04526	0.0299

Source: Integrated and created by the author

The following table, Table 5.59: Tokyo Stock Market (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the Tokyo Stock Market Index to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.0630, which is greater than 0.05. Thus, the null hypothesis, TOKYOSTOCK does not Granger Cause BANKINGSECTORSET, failed to be rejected. As such, TOKYOSTOCK does not Granger Cause BANKINGSECTORSET.

Table 5.59: Tokyo Stock Market (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	3.52321	0.0630
2	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	1.60516	0.2054
3	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	1.00912	0.3916
4	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.73649	0.5691
5	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.62817	0.6786
6	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.42834	0.8585
7	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.30803	0.9488
8	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.28375	0.9699
9	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.46197	0.8964
10	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.38064	0.9521
11	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.33317	0.9761
12	TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	0.52630	0.8919

Source: Integrated and created by the author

The following table, Table 5.60: US Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from the US Dollar/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value is 0.4088, which is greater than 0.05. Thus, the null hypothesis, USDTHB does not Granger Cause BANKINGSECTORSET, failed to be rejected. As such, USDTHB does not Granger Cause BANKINGSECTORSET.

Table 5.60: US Dollar/Thai Baht Exchange Rate (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	USDTHB does not Granger Cause BANKINGSECTORSET	0.01195	0.9131
2	USDTHB does not Granger Cause BANKINGSECTORSET	0.40709	0.6666
3	USDTHB does not Granger Cause BANKINGSECTORSET	0.84989	0.4695
4	USDTHB does not Granger Cause BANKINGSECTORSET	0.77262	0.5454
5	USDTHB does not Granger Cause BANKINGSECTORSET	0.58147	0.7141
6	USDTHB does not Granger Cause BANKINGSECTORSET	0.57977	0.7457
7	USDTHB does not Granger Cause BANKINGSECTORSET	0.51868	0.8185
8	USDTHB does not Granger Cause BANKINGSECTORSET	0.73846	0.6573
9	USDTHB does not Granger Cause BANKINGSECTORSET	1.04793	0.4088
10	USDTHB does not Granger Cause BANKINGSECTORSET	0.89816	0.5384
11	USDTHB does not Granger Cause BANKINGSECTORSET	0.95863	0.4899
12	USDTHB does not Granger Cause BANKINGSECTORSET	0.92086	0.5303

Source: Integrated and created by the author

The following table, Table 5.61: WTI (Results of Pair-wise Granger Causality Tests), presents the results of the Pair-wise Granger Causality Test for the long-term causal relationship from WTI Price to the return of the Banking Sector Index of the Stock Exchange of Thailand with time-lags from one period (one month) to 12 periods (12 months). The table shows that the lowest p-value was 0.0096, which is less than 0.05. Thus, the null hypothesis, WTI does not Granger Cause BANKINGSECTORSET, is rejected, and the alternative hypothesis is accepted. As such, WTI does Granger Cause BANKINGSECTORSET. The lag period of this relationship is nine months.

Table 5.61: WTI (Results of Pair-wise Granger Causality Tests)			
Number of Lags	Null Hypothesis	F-Statistic	Prob.
1	WTI does not Granger Cause BANKINGSECTORSET	0.02056	0.8862
2	WTI does not Granger Cause BANKINGSECTORSET	0.06511	0.9370
3	WTI does not Granger Cause BANKINGSECTORSET	0.09926	0.9603
4	WTI does not Granger Cause BANKINGSECTORSET	0.06170	0.9929
5	WTI does not Granger Cause BANKINGSECTORSET	0.89727	0.4859
6	WTI does not Granger Cause BANKINGSECTORSET	0.96086	0.4557
7	WTI does not Granger Cause BANKINGSECTORSET	0.91666	0.4971
8	WTI does not Granger Cause BANKINGSECTORSET	1.76849	0.0929
9	WTI does not Granger Cause BANKINGSECTORSET	2.62194	0.0096
10	WTI does not Granger Cause BANKINGSECTORSET	2.49982	0.0108
11	WTI does not Granger Cause BANKINGSECTORSET	2.45846	0.0101
12	WTI does not Granger Cause BANKINGSECTORSET	1.63798	0.0968

Source: Integrated and created by the author

The Pair-wise Granger Causality tests revealed that the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Real Estate Price, Thai Retail Real Estate Sales Value and WTI Price had statistically significant (at a 95 percent confidence level) long-term causal relationships to the return of the Banking Sector Index of the Stock Exchange of Thailand.

Of the independent variables examined with the Pair-wise Granger Causality test for relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand, the Chinese Yuan/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, Tokyo Stock Market Index, Thai Money Supply (M2) and United States Dollar/Thai Baht Exchange Rate did not Granger-cause the return of the Banking Sector Index of the Stock Exchange of Thailand. As such, the empirical evidence from this study suggests that no long-term causal relationships exist from the Chinese Yuan/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, Tokyo Stock Market Index, Thai Money Supply (M2) and United States Dollar/Thai Baht Exchange Rate to the Banking Sector Index of the Stock Exchange of Thailand.

At first glance, it may seem odd that the results of the statistical analysis point to no long-term relationships from the Chinese Yuan/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, Tokyo Stock Market Index and United States Dollar/Thai Baht Exchange Rate to the return of the Banking Sector Index of the Stock Exchange of Thailand, due to the fact that the United States, China and Japan have some of the biggest economies in the world.

One explanation for the nonexistence of long-term causal relationships between the Chinese Yuan/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, Tokyo Stock Market Index and United States Dollar/Thai Baht Exchange Rate and the return of the Banking Sector Index of the Stock Exchange of Thailand may be that short-term causal relationships, rather than long-term relationships, may exist between the said variables. If this is in fact the case as suspected by the researcher, it would mean that the Banking Sector Index of the Stock Exchange of Thailand is market efficient to some major economic variables, but market inefficient to other economic variables. This would imply a weak form of market efficiency in the Banking Sector of the Stock Exchange of Thailand.

Also found from the Pair-wise Granger Causality test was that no long-term causal relationship from Money Supply (M2) to the return of the Banking Sector Index of the Stock Exchange of Thailand existed. The lack of such a relationship may indicate a short-term relationship from Money Supply (M2) to the return of the Banking Sector Index of the Stock Exchange of Thailand or no relationship at all.

As this study examines only long-term relationships between the independent variables and the dependent variable of the study, the question about whether or not short-term relationships exist between the variables of this study cannot be answered in this study, rather only speculation may be provided in this regard.

In conclusion, the statistical analysis of this study shows that the Banking Sector Index of the Stock Exchange of Thailand is largely market inefficient. As such, it may be possible for investors to achieve abnormal returns from investment in the Banking Sector Index of the Stock Exchange of Thailand.

Investors may incorporate the variables, Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Commodities Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Four Thai Banks, Thai Interest Rate from the Top Five Thai Banks, Thai Real Estate Price, Thai Retail Real Estate Sales Value and WTI Price, into their predictive models of the return of the Banking Sector of the Stock Exchange of Thailand to achieve abnormal returns from the Banking Sector of the Stock Exchange of Thailand, due to the existence of market inefficiency in the said sector of the Stock Exchange of Thailand.

The following table, Table 5.62: Summary of Granger Causality Tests, presents the null hypotheses of this study in the first column, the most significant lag period of each relationship in the second column, the p-value of each relationship in the third column, the F-statistic, which is the degree in percentage that the return of the Banking Sector Index of the Stock Exchange of Thailand changes when a one percentage change in the respective independent variable occurs, in the fourth column, and the findings regarding the null hypotheses in the fifth column. An example of the interpretation of the F-statistic is that for the Australian Dollar/Thai Baht Exchange Rate, a one percent change in the Australian Dollar/Thai Baht

Exchange Rate causes the highly elastic 5.24623 percent change in the return of the Banking Sector Index of the Stock Exchange of Thailand.



Table 5.62: Summary of Granger Causality Tests				
Null Hypotheses	Lags	Prob.	F-Statistic	95% Confidence
• AUDTHB does not Granger Cause BANKINGSECTORSET	2	0.0066	5.24623	Rejected
• BRENT does not Granger Cause BANKINGSECTORSET	9	0.0030	3.05944	Rejected
• GBPTHB does not Granger Cause BANKINGSECTORSET	5	0.0157	2.94777	Rejected
• CNYTHB does not Granger Cause BANKINGSECTORSET	3	0.1013	2.12397	Failed to be rejected
• COMMODITY does not Granger Cause BANKINGSECTORSET	9	0.0008	3.55569	Rejected
• EURTHB does not Granger Cause BANKINGSECTORSET	12	0.0017	2.97623	Rejected
• GERMANSTOCK does not Granger Cause BANKINGSECTORSET	1	0.0421	4.22303	Rejected
• HEATINGOIL does not Granger Cause BANKINGSECTORSET	10	0.00005	4.42284	Rejected
• HONGKONGSTOCK does not Granger Cause BANKINGSECTORSET	2	0.0427	3.24264	Rejected
• INRTHB does not Granger Cause BANKINGSECTORSET	3	0.0011	5.71900	Rejected
• JPYTHB does not Granger Cause BANKINGSECTORSET	6	0.6209	0.73709	Failed to be rejected
• NEWYORKSTOCK does not Granger Cause BANKINGSECTORSET	1	0.0504	3.90801	Failed to be rejected
• NZDTHB does not Granger Cause BANKINGSECTORSET	5	0.0107	3.16160	Rejected
• RUBTHB does not Granger Cause BANKINGSECTORSET	7	0.0016	3.62272	Rejected
• SGDTHB does not Granger Cause BANKINGSECTORSET	5	0.0039	3.71157	Rejected
• SEKTHB does not Granger Cause BANKINGSECTORSET	9	0.0152	2.44640	Rejected
• SWISSSTOCK does not Granger Cause BANKINGSECTORSET	1	0.0346	4.57056	Rejected
• TAIWANSTOCK does not Granger Cause BANKINGSECTORSET	2	0.0061	5.34487	Rejected
• THAICONSCONF does not Granger Cause BANKINGSECTORSET	4	0.0075	3.68258	Rejected
• THAICPI does not Granger Cause BANKINGSECTORSET	9	0.0175	2.39408	Rejected
• THAIGOLDBAR does not Granger Cause BANKINGSECTORSET	9	0.0405	2.06691	Rejected
• THAIINTERESTFOURBANKS does not Granger Cause BANKINGSECTORSET	7	0.0488	2.11548	Rejected
• THAIINTERESTFIVEBANKS does not Granger Cause BANKINGSECTORSET	7	0.0400	2.20693	Rejected
• THAIMTWO does not Granger Cause BANKINGSECTORSET	4	0.1566	1.69464	Failed to be

				Rejected
• THAILANDPRICE does not Granger Cause BANKINGSECTORSET	12	0.00009	3.91754	Rejected
• THAIRETAILHOUSESALES does not Granger Cause BANKINGSECTORSET	11	0.0035	2.81886	Rejected
• TOKYOSTOCK does not Granger Cause BANKINGSECTORSET	1	0.0630	3.52321	Failed to be Rejected
• USDTHB does not Granger Cause BANKINGSECTORSET	9	0.4088	1.04793	Failed to be Rejected
• WTI does not Granger Cause BANKINGSECTORSET	9	0.0096	2.62194	Rejected

Source: Integrated and created by the author



Chapter 6

Conclusions and Recommendations

This chapter is comprised of three parts. The first part summarizes the findings of the long-term causal relationships researched in this study. The second part explains the implications of the findings of this study and provides recommendations based on these findings. The last part of this chapter expands upon the opportunities for further research to build upon the research conducted in this study.

6.1 Summary and Conclusions

This study used the Pair-wise Granger Causality statistical test and end-of-month time-series data from a ten-year (from January 2003 to December 2012) period to examine statistically significant long-term causal relationships (at a 95 percent confidence level) from Commodity Prices, Consumer Confidence, Exchange Rates, Foreign Stock Market Indices, Inflation, Interest Rates, Money Supply and Real Estate Price and Sales Value to the return of the Banking Sector Index of the Stock Exchange of Thailand.

The independent variables of this study were the Australian Dollar/Thai Baht Exchange Rate, Brent Price, British Pound/Thai Baht Exchange Rate, Chinese Yuan/Thai Baht Exchange Rate, Commodities Index Price, Euro/Thai Baht Exchange Rate, German Stock Market Index, Heating Oil Price, Hong Kong Stock Exchange Index, Indian Rupee/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, New York Stock Exchange Index, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, Swedish Krona/Thai Baht Exchange Rate, Swiss Stock Market Index, Taiwan Stock Market Index, Thai Consumer Confidence Index, Thai Consumer Price Index, Thai Gold Bar (Buying) Price, Thai Interest Rate from the Top Five Thai Banks, Thai

Interest Rate from the Top Four Thai Banks, Thai Money Supply (M1), Thai Money Supply (M2), Thai Real Estate Price, Thai Retail Real Estate Sales Value, Tokyo Stock Market Index, United States Dollar/Thai Baht Exchange Rate and WTI Price.

The one dependent variable of this study was the return of the Banking Sector Index of the Stock Exchange of Thailand.

This study was conducted because it was found that in the Thai context, few published studies deal with the relationship between macroeconomic variables and industry indices or sector indices of the Stock Exchange of Thailand, and it was not clear as to what the long-term determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand were. As such, the findings of this study may be significantly important primarily for traders and investors because it provides information that will help traders and investors make more optimal investment decisions about how to invest their limited resources in the Banking Sector of the Stock Exchange of Thailand.

The main objectives for conducting this study were to determine whether or not the Banking Sector Index of the Stock Exchange of Thailand is market inefficient, to determine the long-term causal determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, and to determine the time-lags between the causal determinants and the return of the Banking Sector Index of the Stock Exchange of Thailand?

With regards to the first question about the level of market efficiency of the Banking Sector of the Stock Exchange of Thailand, this study found that long-term causal relationships from Commodity Prices, Consumer Confidence, Exchange Rates, Foreign Stock Market Indices, Inflation, Interest Rates, and Real Estate to the return of the Banking Sector Index of the Stock Exchange of Thailand existed. These significant causal long-term relationships indicate that the Banking Sector Index of the Stock Exchange of Thailand is market inefficient, and that there is thus the opportunity for investors to achieve abnormal returns from investing in the Banking Sector of the Stock Exchange of Thailand.

With regards to the second question about what the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand are, this study

found that for commodities, the long-term determinants of return of the Banking Sector of the Stock Exchange of Thailand are Brent Price, Commodities Price, Heating Oil Price, Thai Gold Bar (Buying) Price, and WTI Price. For consumer confidence, the Thai Consumer Confidence Index is a long-term determinant of the return of the Banking Sector of the Stock Exchange of Thailand. For exchange rates, the Australian Dollar/Thai Baht Exchange Rate, British Pound/Thai Baht Exchange Rate, Euro/Thai Baht Exchange Rate, Indian Rupee/Thai Baht Exchange Rate, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, and Swedish Krona/Thai Baht Exchange Rate are the long-term determinants of return of the Banking Sector of the Stock Exchange of Thailand. For foreign stock markets, the German Stock Market Index, Hong Kong Stock Exchange Index, Swiss Stock Market Index, and Taiwan Stock Market Index are the long-term determinants of return of the Banking Sector of the Stock Exchange of Thailand. For inflation, the Thai Consumer Price Index is the long-term determinant of return of the Banking Sector of the Stock Exchange of Thailand. For interest rates, the Thai Interest Rate from the Top Four Thai Banks, and Thai Interest Rate from the Top Five Thai Banks are the long-term determinants of return of the Banking Sector of the Stock Exchange of Thailand. For real estate, the Thai Real Estate Price, and Thai Retail Real Estate Sales Value are the long-term determinants of return of the Banking Sector of the Stock Exchange of Thailand.

On the other hand this study also found some independent variables that are not long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand. For exchange rates, they are the Chinese Yuan/Thai Baht Exchange Rate, Japanese Yen/Thai Baht Exchange Rate, and US Dollar/Thai Baht Exchange Rate. For foreign stock markets, they are the New York Stock Exchange Index, and Tokyo Stock Market Index. For money supply, it is Thai Money Supply (M2).

With regards to the question about the lag periods of the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand, they are as follow. For commodities, they are Brent Price (nine months), Commodities Index Price (nine months), Heating Oil Price (ten months), Thai Gold Bar (Buying) Price (nine months), and WTI Price (nine months). All these commodity variables exhibited similar lag times of approximately nine months. For consumer confidence, it is Thai Consumer Confidence Index (four months). For exchange rates, they are Australian

Dollar/Thai Baht Exchange Rate (two months), British Pound/Thai Baht Exchange Rate (five months), Euro/Thai Baht Exchange Rate (12 months), Indian Rupee/Thai Baht Exchange Rate (three months), New Zealand Dollar/Thai Baht Exchange Rate (five months), Russian Ruble/Thai Baht Exchange Rate (seven months), Singapore Dollar/Thai Baht Exchange Rate (five months), and Swedish Krona/Thai Baht Exchange Rate (nine months). The lag periods varied greatly depending on the specific exchange rate. They varied from two months to one year. For foreign stock markets, they are German Stock Market Index (one month), Hong Kong Stock Exchange Index (two months), Swiss Stock Market Index (one month), and Taiwan Stock Market Index (two months). The lag periods from the foreign stock markets were very short at one to two months only. The Banking Sector of the Stock Exchange of Thailand is nearly efficient in incorporating information from foreign stock markets into its stock price, and it may be that the foreign stock market indices researched in this study and many more have short-term relationships with the Banking Sector of the Stock Exchange of Thailand. For inflation, it is Thai Consumer Price Index (nine months). For interest rates, they are Thai Interest Rate from the Top Four Thai Banks (seven months), and Thai Interest Rate from the Top Five Thai Banks (seven months). Both interest rates exhibited the same lag period of seven months. For real estate, they were Thai Real Estate Price (12 months) and Thai Retail Real Estate Sales Value (11 months).

When comparing the results of this study with the results of the previous research cited in chapter two of this study, it was found that the Banking Sector Index of the Stock Exchange of Thailand exhibits very similar relationships to those found in the previous studies of the composite index of the Stock Exchange of Thailand.

First, Jiranyakul's (2012) study, which researched the long-term effects of the Thai Baht/United States Dollar exchange rate on the return of the Stock Exchange of Thailand, found that no causality ran from the Thai Baht/United States Dollar exchange rate to the composite index of the Stock Exchange of Thailand. Similarly, the current study found no significant long-term causal relationship from the United States Dollar/Thai Baht exchange rate to the Banking Sector Index of the Stock Exchange of Thailand.

Second, Valadkhani and Chancharat's (2008) study, which researched the long-term relationships between the stock markets of Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the United Kingdom and the United States of America and the return of the Stock Exchange of Thailand, found that three unidirectional Granger causalities ran from the stock returns of Hong Kong, the Philippines and the United Kingdom to those of Thailand. The study also found that bidirectional Granger causality existed between the market stock returns of Thailand and the stock markets of its three neighboring countries, Malaysia, Singapore and Taiwan.

The current study found that significant Granger causality existed from the German Stock Market, Hong Kong Stock Exchange, Swiss Stock Market, and Taiwan Stock Market to the Banking Sector of the Stock Exchange of Thailand. It also found that Granger causality did not exist from the New York Stock Exchange and Tokyo Stock Market to the Banking Sector Index of the Stock Exchange of Thailand.

The variables that are common to both studies are the stock market indices of Hong Kong, Japan, the United States of America, and Taiwan. The current paper confirms the findings for all of these variables. It was found in Valadkhani and Chancharat's (2008) study that the stock markets of Hong Kong and Taiwan Granger-caused the composite index of the Stock Exchange of Thailand, and that the stock markets of Japan and the United States of America did not Granger-cause the composite index of the Stock Exchange of Thailand. Similarly, the current study found that the stock markets of Hong Kong and Taiwan Granger-cause the Banking Sector Index of the Stock Exchange of Thailand, and that the stock markets of Japan and the United States of America did not Granger-cause the Banking Sector Index of the Stock Exchange of Thailand.

Finally, Ibrahim (2010)'s study, which examined the long-term effects of housing prices on the return of the composite index of the Stock Exchange of Thailand, found no unidirectional Granger causality from house prices to stock prices. However, the findings of Ibrahim's (2010) study are contrary to the finding of the current study, which found that real estate prices significantly Granger-caused the Banking Sector Index of the Stock Exchange of Thailand.

6.2 Implications and Recommendations

This study was conducted because it was found that in the Thai context, few studies dealt with the market efficiency of the Banking Sector Index of the Stock Exchange of Thailand. As such, the main objectives for conducting this study were to determine whether or not the Banking Sector Index of the Stock Exchange of Thailand is market inefficient, to determine the long-term causal determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, and to determine the time-lags between the causal determinants and the return of the Banking Sector Index of the Stock Exchange of Thailand?

With regards to the first objective to determine the level of market efficiency of the Banking Sector of the Stock Exchange of Thailand, this study found long-term causal relationships from Commodity Prices, Consumer Confidence, Exchange Rates, Foreign Stock Market Indices, Inflation, Interest Rates, and Real Estate to the return of the Banking Sector Index of the Stock Exchange of Thailand. These significant causal long-term relationships indicate that the Banking Sector Index of the Stock Exchange of Thailand is market inefficient, and that there is thus the opportunity for investors to achieve abnormal returns from investing in the Banking Sector of the Stock Exchange of Thailand.

Thus, it is recommended that investors invest in the Banking Sector of the Stock Exchange of Thailand if they are, as economic theory suggests, interested in achieving substantial returns on their investments. However, it is not necessarily true, when comparing to the other sectors of the Stock Exchange of Thailand, that investing in the Banking Sector of the Stock Exchange of Thailand will result in the maximization of return. The Banking Sector of the Stock Exchange of Thailand may not provide the maximum return if there are also market inefficiencies in other sectors of the Stock Exchange of Thailand, where investors may also achieve abnormal returns.

With regards to the second objective to determine what the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand are, this study found empirical evidence that 23 such determinants existed. These determinants may be used to improve investors' accuracy of predicting future returns

of the Banking Sector of the Stock Exchange of Thailand to help investors determine whether or not investing in the said sector of the Stock Exchange of Thailand is a good investment. My utilizing the findings of this study, investors will be able to more accurately predict the return of their investments at a specified future date.

For prospective investors, if the expected rate of return of would-be investments meets their required rate of return, then investing would be the likely next step, as investors would be more likely to actually achieve the expected rate return due to the increased accuracy of their predictive models thanks to the inclusion of the 23 significant independent variables of this study in such predictive models. However, if the expected rate of return of would-be investments in the Banking Sector of the Stock Exchange of Thailand does not meet investors' required rate of return, then investors would be comfortable with not investing in the Banking Sector of the Stock Exchange of Thailand, as the increased accuracy of their predictive models may be more trustworthy than the previous forecast models thanks to the inclusion of the 23 significant independent variables of this study.

For people already invested in the Banking Sector of the Stock Exchange of Thailand, inclusion of the 23 significant independent variables of this study into their predictive models may show that they had previously miscalculated the expected returns from the said sector. If a new lower return than the previously expected return is forecast due to the improved forecast model, investors may choose to reinvest their funds elsewhere. On the other hand, if a new higher return than the previously expected return is forecast due to the improved forecast model, investors may choose to redouble their investments or hold their investments to achieve a larger return on investment.

The 23 significant independent variables, that may be included in forecast models for their long-term effect on the return of the Banking Sector of the Stock Exchange of Thailand, based on the findings of this study are for commodities, Brent Price, Commodities Price, Heating Oil Price, Thai Gold Bar (Buying) Price, and WTI Price, for consumer confidence, the Thai Consumer Confidence Index, for exchange rates, the Australian Dollar/Thai Baht Exchange Rate, British Pound/Thai Baht Exchange Rate, Euro/Thai Baht Exchange Rate, Indian Rupee/Thai Baht Exchange Rate, New Zealand Dollar/Thai Baht Exchange Rate, Russian Ruble/Thai Baht

Exchange Rate, Singapore Dollar/Thai Baht Exchange Rate, and Swedish Krona/Thai Baht Exchange Rate, for foreign stock markets, the German Stock Market Index, Hong Kong Stock Exchange Index, Swiss Stock Market Index, and Taiwan Stock Market Index, for inflation, the Thai Consumer Price Index, for interest rates, the Thai Interest Rate from the Top Four Thai Banks, and Thai Interest Rate from the Top Five Thai Banks, and for real estate, the Thai Real Estate Price, and Thai Retail Real Estate Sales Value.

With regards to the third objective to determine what the lag periods of the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand are, the statistical analysis provides the 23 lag periods for the 23 significant relationships of this study. Investors may use the respective lag periods for each relationship when developing a predictive model with long-term predictors of the return of the Banking Sector of the Stock Exchange of Thailand.

The 23 lag periods of the 23 significant independent variables based on the findings of this study are for commodities, Brent Price (nine months), Commodities Index Price (nine months), Heating Oil Price (ten months), Thai Gold Bar (Buying) Price (nine months), and WTI Price (nine months), for consumer confidence, Thai Consumer Confidence Index (four months), for exchange rates, Australian Dollar/Thai Baht Exchange Rate (two months), British Pound/Thai Baht Exchange Rate (five months), Euro/Thai Baht Exchange Rate (12 months), Indian Rupee/Thai Baht Exchange Rate (three months), New Zealand Dollar/Thai Baht Exchange Rate (five months), Russian Ruble/Thai Baht Exchange Rate (seven months), Singapore Dollar/Thai Baht Exchange Rate (five months), and Swedish Krona/Thai Baht Exchange Rate (nine months), for foreign stock markets, German Stock Market Index (one month), Hong Kong Stock Exchange Index (two months), Swiss Stock Market Index (one month), and Taiwan Stock Market Index (two months), for inflation, Thai Consumer Price Index (nine months), for interest rates, Thai Interest Rate from the Top Four Thai Banks (seven months), and Thai Interest Rate from the Top Five Thai Banks (seven months), and for real estate, Thai Real Estate Price (12 months) and Thai Retail Real Estate Sales Value (11 months).

6.3 Further Research

With the objective of furthering investors' understanding of the market efficiency and rate of return of the Banking Sector Index of the Stock Exchange of Thailand and of increasing the accuracy of predictive models of the return of the Banking Sector of the Stock Exchange of Thailand, this part of this study expands upon the areas where further research was found to be needed during the course of this study. The two areas that the researcher recommends that further research explore are expanded upon below.

First, analyzing the directionality of the relationships between each of the independent variables and the dependent variable would make for an interesting and useful study. The benefit of establishing the directionality between each relationship would be vast, as it would enable the combination of the various independent variables into one mathematical function, which could then be easily used (after being combined with other significant short-term variables) to forecast changes in the expected rate of return of the Banking Sector of the Stock Exchange of Thailand.

The analysis of the directionality of each relationship was not carried out in this study as the software that would have been able to create a single mathematical function with a combination of the 23 significant relationships of this study, each with its own time-lag, was not available to the researcher at the time of the study.

The Pair-wise Granger Causality test is useful for determining significant long-term relationships each with its own time lag. But the limitation of the Pair-wise Granger Causality test is that directionality is not given, which made making a single mathematical function inclusive of all the 23 significant independent variables of this study impossible.

And finally, further studies, that examine the short-term determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, would be most useful as an addition to the long-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand that were researched in this paper. The inclusion of the short-term determinants of the return of the Banking Sector of the Stock Exchange of Thailand is to improve the accuracy of forecasting the return of the Banking Sector Index of the Stock Exchange of Thailand.

It is most likely that some of the independent variables included in this study may have significant short-term relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand. If these short-term relationships are more significant than those of the long-term relationships, the short-term relationship should replaced the long-term relationship and would improve the accuracy of models that predict the return of the Banking Sector Index of the Stock Exchange of Thailand.

In addition to looking for significant short-term relationships between the 30 independent variables researched in this study and the return of the Banking Sector Index of the Stock Exchange of Thailand, other variables that were not included in this study may also be examined for significant short-term relationships with the return of the Banking Sector Index of the Stock Exchange of Thailand, as there are many other variables yet to be tested for short-term relationships with the Banking Sector of the Stock Exchange of Thailand.

As the focus of this study was regarding the long-term determinants of the return of the Banking Sector Index of the Stock Exchange of Thailand, the question about short-term relationships was not explored in this study. Thus, it was subsequently left for further studies and further research enthusiasts.

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Appendix A. Raw Data from Bloomberg

Date	Banking Sector of the SET Index	Australian Dollar/Thai Baht Exchange Rate	Brent	British Pound/Thai Baht Exchange Rate	Chinese Yuan/Thai Baht Exchange Rate	Commodities Index	Euro/Thai Baht Exchange Rate	German Stock Market
12/31/2002	144.9	24.1975	28.66	69.3595	5.2063	235.1541	45.2137	2892.63
1/31/2003	161.29	25.0911	31.1	70.49	5.165	253.4514	46.0247	2747.83
2/28/2003	156.77	26.0272	32.79	67.283	5.1649	278.572	46.2303	2547.05
3/31/2003	157.33	25.8897	27.18	67.7828	5.1743	232.2788	46.7447	2423.87
4/30/2003	161.27	26.8719	23.68	68.5293	5.1775	215.6376	47.9429	2942.04
5/30/2003	170.04	27.2753	26.32	68.3009	5.0389	235.2415	49.2212	2982.68
6/30/2003	173.37	28.2891	28.33	69.4995	5.0794	233.2028	48.3462	3220.58
7/31/2003	183.82	27.2345	28.37	67.5199	5.0657	233.1563	47.1181	3487.86
8/29/2003	203.99	26.4811	29.49	64.835	4.9667	242.459	45.195	3484.58
9/30/2003	207.99	27.2599	27.61	66.54	4.8391	232.6344	46.595	3256.78
10/31/2003	211.66	28.2814	27.7	67.63	4.8236	238.4895	46.2822	3655.99
11/28/2003	210.8	28.9141	28.45	68.7121	4.8219	245.8032	47.9231	3745.95
12/31/2003	277.89	29.7993	30.17	70.7061	4.7872	260.5434	49.9064	3965.16
1/30/2004	240.93	29.9966	29.18	71.5425	4.7371	260.088	48.9618	4058.6
2/27/2004	242.04	30.3967	32.23	73.3587	4.7446	278.6556	49.0811	4018.16
3/31/2004	228.44	30.1276	31.51	72.5412	4.7445	282.1227	48.3268	3856.7
4/30/2004	234.22	28.8737	34.48	71.17	4.85	289.5122	47.9759	3985.21
5/31/2004	230.86	28.9953	36.58	74.3079	4.8981	301.4126	49.4143	3921.41
6/30/2004	233.8	28.6101	34.5	74.5111	4.9441	286.3553	49.9428	4052.73
7/30/2004	216.45	29.0335	40.03	75.1942	4.9904	307.4776	49.6667	3895.61
8/31/2004	213.19	29.3082	39.61	75.0249	5.0293	295.5954	50.7159	3785.21
9/30/2004	213.43	30.1247	46.38	75.0415	5.0015	337.7328	51.4871	3892.9

10/29/2004	212.12	30.7181	48.98	75.3446	4.9592	355.2492	52.5212	3960.25
11/30/2004	237.68	30.4677	45.51	75.2744	4.7611	342.5017	52.3438	4126
12/31/2004	235.77	30.3518	40.46	74.6909	4.7019	310.4673	52.7415	4256.08
1/31/2005	248.3	29.9032	45.92	72.5763	4.6575	331.4828	50.2549	4254.85
2/28/2005	258.57	30.2765	50.06	73.483	4.6173	355.8531	50.58	4350.49
3/31/2005	234.93	30.2339	54.29	73.9449	4.727	383.6221	50.7067	4348.77
4/29/2005	229.21	30.8243	51.09	75.2906	4.766	353.6854	50.7716	4184.84
5/31/2005	241.82	30.7064	50.73	73.8197	4.9087	354.8881	49.987	4460.63
6/30/2005	237.37	31.5083	55.58	74.0337	4.9909	379.7879	50.028	4586.28
7/29/2005	238.35	31.5183	59.37	73.2107	5.1384	401.999	50.4942	4886.5
8/31/2005	246.43	31.1748	67.02	74.4708	5.0961	465.1507	50.9653	4829.69
9/30/2005	256.14	31.2801	63.48	72.4243	5.0729	469.5595	49.3698	5044.12
10/31/2005	241.73	30.5096	58.1	72.1663	5.0442	422.8763	48.9034	4929.07
11/30/2005	242.33	30.4244	55.05	71.3238	5.1043	415.9086	48.6134	5193.4
12/30/2005	264.31	30.1308	58.98	70.6758	5.0817	431.7214	48.6085	5408.26
1/31/2006	282.53	29.5187	65.99	69.2837	4.8295	453.9183	47.3252	5674.15
2/28/2006	288.23	29.0092	61.76	68.5185	4.8618	415.8627	46.5843	5796.04
3/31/2006	278.04	27.8539	65.91	67.5336	4.8489	442.519	47.1009	5970.08
4/28/2006	285.74	28.5078	72.02	68.5316	4.6829	474.7863	47.4172	6009.89
5/31/2006	258.52	28.7021	70.41	71.3327	4.7543	474.5546	48.867	5692.86
6/30/2006	250.36	28.3403	73.51	70.4553	4.7721	484.6753	48.7593	5683.31
7/31/2006	248.31	29.0101	75.15	70.6887	4.7635	498.2476	48.3212	5681.97
8/31/2006	254.38	28.7036	70.25	71.5767	4.7236	465.868	48.1531	5859.57
9/29/2006	258.73	28.0216	62.48	70.3348	4.7513	428.0533	47.608	6004.33
10/31/2006	279.12	28.3906	59.03	69.9759	4.6564	429.2243	46.8224	6268.92
11/30/2006	291.02	28.2484	64.26	70.398	4.5708	463.6554	47.4148	6309.19
12/29/2006	252.91	27.9541	60.86	69.4395	4.5419	433.6465	46.7922	6596.92
1/31/2007	245.66	26.999	57.4	68.2942	4.475	427.2178	45.2897	6789.11
2/28/2007	256.44	26.6653	61.89	66.4814	4.379	448.4914	44.7802	6715.44
3/30/2007	261.99	26.2084	68.1	63.7598	4.1931	468.115	43.2736	6917.03
4/30/2007	261.91	27.2671	67.65	65.685	4.2607	474.4641	44.832	7408.87

5/31/2007	268.08	27.2363	68.04	65.1357	4.3009	470.648	44.2604	7883.04
6/29/2007	286.76	26.9228	71.41	63.6791	4.1638	489.152	42.9281	8007.32
7/31/2007	309.31	25.5891	77.05	61.0406	3.9662	515.941	41.1204	7584.14
8/31/2007	293.5	26.5449	72.69	65.4715	4.3106	495.304	44.2329	7638.17
9/28/2007	294.62	28.3047	79.17	65.2563	4.2472	546.133	45.4826	7861.51
10/31/2007	315.95	29.5752	90.63	65.8433	4.2411	599.31	45.8674	8019.22
11/30/2007	292.26	27.1717	88.26	63.1936	4.152	577.987	44.9615	7870.52
12/31/2007	290.93	26.0841	93.85	59.1516	4.0594	610.169	43.4812	8067.32
1/31/2008	269.71	28.1482	92.21	62.3714	4.3749	608.378	46.6917	6851.75
2/29/2008	296.46	29.0627	100.1	62.1793	4.3767	679.778	47.4511	6748.13
3/31/2008	297.28	28.6707	100.3	62.3409	4.4729	668.913	49.6122	6534.97
4/30/2008	300.16	29.8823	111.36	62.9665	4.5349	721.067	49.5077	6948.82
5/30/2008	293.28	31.0284	127.78	64.4049	4.68	786.583	50.5366	7096.79
6/30/2008	256.79	32.0559	139.83	66.6225	4.8787	862.809	52.6804	6418.32
7/31/2008	235.54	31.5842	123.98	66.5714	4.9069	760.199	52.3013	6479.56
8/29/2008	248.68	29.3693	114.05	62.3283	5.0047	708.156	50.2105	6422.3
9/30/2008	210.15	26.8307	98.17	60.2996	4.9456	622.237	47.7172	5831.02
10/31/2008	149.89	23.4532	65.32	56.4608	5.1349	449.461	44.7113	4987.97
11/28/2008	136.18	23.2485	53.49	54.5322	5.1903	390.646	45.0222	4669.44
12/31/2008	141.81	24.4171	45.59	50.8113	5.091	349.038	48.5418	4810.2
1/30/2009	145.42	22.3028	45.88	50.8481	5.1171	336.205	44.8071	4338.35
2/27/2009	149.56	23.1195	46.35	51.8143	5.2912	336.24	45.8562	3843.74
3/31/2009	148.2	24.5397	49.23	50.8466	5.1942	358.526	47.0393	4084.76
4/30/2009	173.85	25.6018	50.8	52.1828	5.1735	365.848	46.6842	4769.45
5/29/2009	197.32	27.4915	65.52	55.5618	5.0256	443.053	48.5936	4940.82
6/30/2009	229.67	27.4578	69.3	56.0595	4.9861	450.217	47.7924	4808.64
7/31/2009	244.52	28.4442	71.7	56.8726	4.9809	457.407	48.52	5332.14
8/31/2009	248.84	28.7023	69.65	55.4028	4.9797	453.787	48.7571	5464.61
9/30/2009	274.9	29.5192	69.07	53.443	4.8985	462.748	48.9511	5675.16
10/30/2009	259.03	30.0967	75.2	55.0349	4.9	496.808	49.2384	5414.96
11/30/2009	284.24	30.4333	78.47	54.6105	4.8665	512.574	49.8534	5625.95

12/31/2009	291.42	29.9577	77.93	54.0004	4.8879	524.621	47.79	5957.43
1/29/2010	275.35	29.3294	71.46	53.0426	4.8613	486.145	46.0067	5608.79
2/26/2010	287.48	29.5988	77.59	50.3818	4.8432	517.484	45.063	5598.46
3/31/2010	319.42	29.6511	82.7	49.1555	4.7371	530.159	43.6812	6153.55
4/30/2010	297.18	29.9361	87.44	49.4136	4.7463	549.941	43.066	6135.7
5/31/2010	293.38	27.5084	74.65	47.2866	4.7629	488.193	40.0177	5964.33
6/30/2010	307.62	27.2712	75.01	48.5547	4.7852	495.177	39.7133	5965.52
7/30/2010	334.33	29.1503	78.18	50.6614	4.7591	524.809	42.0789	6147.97
8/31/2010	370.13	27.8491	74.64	48.0715	4.5932	499.162	39.6488	5925.22
9/30/2010	398.87	29.3496	82.31	47.6367	4.5352	546.064	41.3795	6229.02
10/29/2010	390.56	29.4524	83.15	47.9346	4.4885	564.16	41.7573	6601.37
11/30/2010	380.85	28.9615	85.92	47.0617	4.5318	575.84	39.2159	6688.49
12/31/2010	390.97	30.7589	94.75	46.8657	4.5497	631.83	40.2309	6914.19
1/31/2011	362.79	30.8451	101.01	49.4988	4.6896	655.26	42.3509	7077.48
2/28/2011	381.03	31.1682	111.8	49.7197	4.6562	690.85	42.2485	7272.32
3/31/2011	408.02	31.2705	117.36	48.5289	4.6236	725.62	42.8617	7041.31
4/29/2011	421.87	32.7767	125.89	49.9339	4.6024	758.79	44.2361	7514.46
5/31/2011	409.86	32.3523	116.73	49.839	4.6793	707.26	43.6442	7293.69
6/30/2011	399.39	32.9475	112.48	49.3099	4.7541	668.85	44.5647	7376.24
7/29/2011	439.3	32.7133	116.74	48.8718	4.6225	686.08	42.8405	7158.77
8/31/2011	406	32.0439	114.85	48.7191	4.6934	674.69	43.0105	5784.85
9/30/2011	351.8	30.1412	102.76	48.6564	4.8911	591	41.762	5502.02
10/31/2011	366.5	32.3438	109.56	49.4651	4.8325	647.96	42.5584	6141.34
11/30/2011	352.08	31.7424	110.52	48.5086	4.839	658.02	41.5081	6088.84
12/30/2011	376.01	32.1955	107.38	49.0334	5.012	644.91	40.8991	5898.35
1/31/2012	385.78	32.9158	110.98	48.8387	4.9126	660.68	40.5461	6458.91
2/29/2012	430.02	32.684	122.66	48.4808	4.8389	703.5	40.5787	6856.08
3/30/2012	454.21	31.905	122.88	49.3422	4.8974	688.71	41.1335	6946.83
4/30/2012	473.78	32.0517	119.47	49.8847	4.8953	684.88	40.6964	6761.19
5/31/2012	436.61	30.9841	101.87	49.0364	4.9989	596.2	39.3615	6264.38
6/29/2012	458.79	32.3143	97.8	49.5823	4.9669	599.44	39.9678	6416.28

7/31/2012	487.08	33.108	104.92	49.4186	4.9553	635.82	38.7834	6772.26
8/31/2012	473.94	32.2915	114.57	49.5654	4.9278	675.03	39.3393	6970.79
9/28/2012	511.59	31.9958	112.39	49.8519	4.9076	665.73	39.6442	7216.15
10/31/2012	493.56	31.8539	108.7	49.5156	4.922	637.74	39.7866	7260.63
11/30/2012	507.28	32.0234	111.23	49.1713	4.9321	650.05	39.8798	7405.5
12/31/2012	539.68	31.7968	111.11	49.6833	4.9097	646.58	40.356	7612.39

Date	Heating Oil	Hong Kong Stock Exchange	India Rupee/Thai Baht Exchange Rate	Japanese Yen/Thai Baht Exchange Rate	New York Stock Exchange	New Zealand Dollar/Thai Baht Exchange Rate	Russian Ruble/Thai Baht Exchange Rate	Singapore Dollar/Thai Baht Exchange Rate
12/31/2002	86.43	9321.29	0.898	36.26	5000	22.588	1.3483	24.8544
1/31/2003	96.08	9258.95	0.894	35.66	4868.68	23.2849	1.3422	24.5846
2/28/2003	128.84	9122.66	0.898	36.215	4716.07	23.9474	1.3536	24.6443
3/31/2003	79.49	8634.45	0.902	36.255	4730.21	23.7728	1.3646	24.2843
4/30/2003	81.64	8717.22	0.905	36.075	5131.56	24.0851	1.3778	24.1383
5/30/2003	75.42	9487.38	0.887	35	5435.37	24.0606	1.3582	24.0911
6/30/2003	78.08	9577.12	0.906	35.06	5501.38	24.6751	1.3853	23.85
7/31/2003	79.13	10134.83	0.909	34.825	5558.99	24.3936	1.3869	23.8454
8/29/2003	81.27	10908.99	0.898	35.215	5660.16	23.6389	1.3483	23.4824
9/30/2003	77.66	11229.87	0.875	35.935	5644.03	23.8442	1.3095	23.1695
10/31/2003	78.18	12190.1	0.881	36.315	5959.01	24.5049	1.3326	22.9689
11/28/2003	82.99	12317.47	0.872	36.41	6073.02	25.5528	1.3425	23.1496
12/31/2003	90.15	12575.94	0.868	36.955	6440.3	25.9934	1.3551	23.3127
1/30/2004	93.24	13289.37	0.866	37.145	6551.63	26.4632	1.3749	23.1809
2/27/2004	95.99	13907.03	0.868	36.005	6692.37	27.008	1.3763	23.1526
3/31/2004	88.37	12681.67	0.9	37.68	6599.06	26.2654	1.3772	23.4595
4/30/2004	95.01	11942.96	0.899	36.255	6439.42	25.0485	1.3812	23.5176
5/31/2004	99.92	12198.24	0.892	37.035	6484.72	25.6236	1.3982	23.8866
6/30/2004	100.25	12285.75	0.89	37.63	6602.99	26.0397	1.4077	23.8283

7/30/2004	114.93	12238.03	0.889	37.11	6403.15	26.3147	1.4192	24.0386
8/31/2004	110.69	12850.28	0.898	38.1269	6454.22	27.279	1.4225	24.3379
9/30/2004	139.17	13120.03	0.901	37.6193	6570.25	28.0589	1.4167	24.5843
10/29/2004	144.27	13054.66	0.904	38.7949	6692.71	28.0707	1.4279	24.6679
11/30/2004	138.77	14060.05	0.883	38.2477	7005.72	28.1508	1.4006	24.0747
12/31/2004	121.35	14230.14	0.895	37.9196	7250.06	27.9293	1.4039	23.8524
1/31/2005	133.21	13721.69	0.882	37.1715	7089.83	27.3881	1.3757	23.5391
2/28/2005	149.32	14195.35	0.875	36.5487	7321.23	27.7833	1.3808	23.5772
3/31/2005	165.76	13516.88	0.894	36.5066	7167.53	27.8362	1.4035	23.7004
4/29/2005	143.63	13908.97	0.906	37.6509	7008.32	28.854	1.4199	24.0854
5/31/2005	144.99	13867.07	0.93	37.4148	7134.33	28.6345	1.4386	24.3804
6/30/2005	161.04	14201.06	0.95	37.2549	7217.78	28.8159	1.4434	24.5194
7/29/2005	162.87	14880.98	0.958	37.025	7476.66	28.3546	1.4548	25.0435
8/31/2005	204.8	14903.55	0.935	37.3181	7496.09	28.7436	1.4494	24.5524
9/30/2005	204.86	15428.52	0.933	36.1738	7632.98	28.384	1.4405	24.2612
10/31/2005	174.73	14386.37	0.905	35.0359	7433.12	28.5582	1.4266	24.0817
11/30/2005	160.77	14937.14	0.898	34.4253	7645.28	28.989	1.4317	24.3866
12/30/2005	172.3	14876.43	0.91	34.8452	7753.95	27.9811	1.4269	24.6722
1/31/2006	176.07	15753.14	0.882	33.221	8106.55	26.8072	1.3844	24.0027
2/28/2006	171.08	15918.48	0.88	33.7609	8060.61	25.8634	1.3938	24.0954
3/31/2006	186.28	15805.04	0.871	33.0107	8233.2	23.9567	1.4032	24.0653
4/28/2006	201.29	16661.3	0.836	32.9673	8471.43	23.961	1.381	23.7366
5/31/2006	195.3	15857.89	0.822	33.8749	8189.11	24.2017	1.4126	24.1422
6/30/2006	194.8	16267.62	0.829	33.3115	8169.07	23.2208	1.42	24.0839
7/31/2006	195.79	16971.34	0.815	33.0078	8242.12	23.4045	1.412	23.963
8/31/2006	193.55	17392.27	0.807	32.0102	8388.56	24.6581	1.4048	23.8876
9/29/2006	165.46	17543.05	0.818	31.7863	8469.65	24.5393	1.4019	23.6586
10/31/2006	157.19	18324.35	0.815	31.3649	8774.98	24.599	1.3733	23.5736
11/30/2006	180.83	18960.48	0.8	30.917	8969	24.4978	1.3634	23.2456
12/29/2006	158.29	19964.72	0.801	29.7774	9139.02	24.9515	1.3466	23.1049
1/31/2007	165.46	20106.42	0.788	28.794	9254.73	24.0157	1.3127	22.6453

2/28/2007	177.79	19651.51	0.766	28.5497	9124.54	23.7373	1.2961	22.1771
3/30/2007	187.44	19800.93	0.745	27.5007	9261.82	23.1611	1.2468	21.3565
4/30/2007	191.65	20318.98	0.798	27.4861	9627.73	24.3235	1.2787	21.6161
5/31/2007	188.9	20634.47	0.81	27.0268	9978.64	24.2358	1.2709	21.5229
6/29/2007	203.32	21772.73	0.778	25.7368	9873.02	24.4946	1.2313	20.7148
7/31/2007	210	23184.94	0.743	25.3394	9554.5	22.9101	1.1756	19.814
8/31/2007	203.72	23984.14	0.795	28.0322	9596.98	22.7786	1.2651	21.2768
9/28/2007	223.19	27142.47	0.802	27.7672	10039.28	24.1635	1.2827	21.4651
10/31/2007	250.66	31352.58	0.805	27.3886	10311.61	24.5075	1.2843	21.8752
11/30/2007	252.71	28643.61	0.776	27.6242	9856.85	23.4863	1.2535	21.2135
12/31/2007	263.63	27812.65	0.752	26.6679	9740.32	22.8104	1.204	20.6944
1/31/2008	253.15	23455.74	0.798	29.5195	9126.16	24.7535	1.2875	22.1751
2/29/2008	283.85	24331.67	0.778	30.0978	8962.46	24.9379	1.2961	22.4021
3/31/2008	308.05	22849.2	0.782	31.5196	8797.29	24.678	1.3375	22.8392
4/30/2008	317.7	25755.35	0.783	30.4474	9299.6	24.737	1.3382	23.3736
5/30/2008	366.08	24533.12	0.771	30.7933	9401.08	25.4289	1.3699	23.8511
6/30/2008	390.04	22102.01	0.777	31.4833	8660.48	25.488	1.4263	24.5918
7/31/2008	343.37	22731.1	0.789	31.0687	8438.64	24.6154	1.4306	24.5136
8/29/2008	315.88	21261.89	0.779	31.4551	8382.08	23.9745	1.3884	24.1769
9/30/2008	285.36	18016.21	0.721	31.9041	7532.8	22.6811	1.3202	23.5739
10/31/2008	200.51	13968.67	0.71	35.6658	6061.09	20.4732	1.2976	23.6604
11/28/2008	167.12	13888.24	0.708	37.1251	5599.3	19.474	1.2705	23.4484
12/31/2008	140.32	14387.48	0.714	38.3234	5757.05	20.1234	1.1379	24.2977
1/30/2009	145.26	13278.21	0.714	38.8846	5195.79	17.8172	0.9787	23.1631
2/27/2009	126.72	12811.57	0.708	37.0885	4617.03	18.1145	1.0079	23.3976
3/31/2009	133.51	13576.02	0.7	35.868	4978.98	19.8614	1.0455	23.3108
4/30/2009	130.22	15520.99	0.708	35.769	5513.36	19.9435	1.0659	23.8239
5/29/2009	163.44	18171	0.729	36.005	6004.07	21.981	1.1082	23.7648
6/30/2009	177.52	18378.73	0.711	35.3431	5905.15	21.9943	1.0932	23.5291
7/31/2009	178.76	20573.33	0.71	35.9422	6424.28	22.5228	1.0815	23.6461
8/31/2009	177.42	19724.19	0.697	36.5239	6643.24	23.3035	1.0699	23.6027

9/30/2009	182.49	20955.25	0.695	37.2861	6910.88	24.1888	1.1149	23.7205
10/30/2009	196.86	21752.87	0.712	37.1306	6739.45	24.0229	1.148	23.8898
11/30/2009	202.31	21821.5	0.714	38.4696	7092.36	23.7886	1.1355	24.0035
12/31/2009	211.51	21872.5	0.717	35.8817	7184.96	24.1198	1.1112	23.753
1/29/2010	189.92	20121.99	0.719	36.7507	6883.78	23.2653	1.0919	23.5862
2/26/2010	199.49	20608.7	0.717	37.1716	7035.04	23.0817	1.1052	23.5091
3/31/2010	216.78	21239.35	0.72	34.6034	7447.8	22.976	1.0986	23.1126
4/30/2010	227.73	21108.59	0.73	34.4644	7474.4	23.5481	1.1037	23.6347
5/31/2010	200.2	19765.19	0.701	35.6305	6791.57	22.1299	1.0527	23.2336
6/30/2010	197.92	20128.99	0.699	36.615	6469.65	22.2226	1.037	23.1777
7/30/2010	199.27	21029.81	0.695	37.291	6998.99	23.4063	1.0667	23.7012
8/31/2010	197.44	20536.49	0.664	37.1406	6704.15	21.8587	1.0147	23.0628
9/30/2010	223.65	22358.17	0.675	36.3388	7281.07	22.2851	0.9924	23.0553
10/29/2010	220.76	23096.32	0.674	37.1789	7513.35	22.9444	0.9729	23.1433
11/30/2010	230.19	23007.99	0.658	36.1056	7430.94	22.4336	0.9578	22.8802
12/31/2010	254.12	23035.45	0.672	37.0056	7964.02	23.4528	0.9838	23.4229
1/31/2011	274.08	23447.34	0.674	37.6036	8139.16	23.9008	1.0357	24.1752
2/28/2011	292.33	23338.02	0.676	37.4664	8438.55	23.0247	1.0615	24.065
3/31/2011	308.36	23527.52	0.679	36.4249	8404.98	23.055	1.0668	24.0189
4/29/2011	324.46	23720.81	0.676	36.7988	8671.41	24.1998	1.0906	24.4045
5/31/2011	305.01	23684.13	0.673	37.1706	8477.28	24.9762	1.0842	24.5776
6/30/2011	292.15	22398.1	0.688	38.1293	8319.1	25.4798	1.1024	25.0153
7/29/2011	309.12	22440.25	0.673	38.7617	8079.44	26.1672	1.0779	24.7094
8/31/2011	307.07	20534.85	0.65	39.0629	7528.39	25.5725	1.037	24.8542
9/30/2011	279.48	17592.41	0.637	40.4996	6791.65	23.7503	0.9672	23.8619
10/31/2011	303.67	19864.87	0.631	39.2902	7565.03	24.7747	1.0118	24.4797
11/30/2011	301.02	17989.35	0.591	39.799	7484.5	24.1037	1.0052	24.088
12/30/2011	292.75	18434.39	0.595	41.0167	7477.03	24.5282	0.9804	24.3356
1/31/2012	306.28	20390.49	0.627	40.6346	7838.48	25.612	1.0234	24.6294
2/29/2012	319.05	21680.08	0.621	37.5352	8113.25	25.4051	1.0413	24.332
3/30/2012	315.79	20555.58	0.606	37.1792	8206.93	25.2313	1.0489	24.513

4/30/2012	317.97	21094.21	0.583	38.4895	8119.07	25.1551	1.0444	24.8378
5/31/2012	270.62	18629.52	0.567	40.6436	7463.96	23.9864	0.9552	24.7054
6/29/2012	270.1	19441.46	0.567	39.5513	7801.84	25.2913	0.9753	24.9467
7/31/2012	284.3	19796.81	0.566	40.3474	7863.94	25.4934	0.9778	25.3228
8/31/2012	316.84	19482.57	0.563	39.852	8014.93	25.1375	0.965	25.0783
9/28/2012	316.32	20840.38	0.583	39.5579	8251	25.5975	0.9886	25.1243
10/31/2012	307.07	21641.82	0.57	38.4702	8221.4	25.2534	0.9789	25.162
11/30/2012	303.38	22030.39	0.566	37.2364	8260.43	25.1947	0.9953	25.1654
12/31/2012	304.51	22656.92	0.556	35.2637	8443.51	25.347	1.0004	25.0483

Date	Swedish Krona /Thai Baht Exchange Rate	Swiss Stock Market	Taiwan Stock Market	Thai Consumer Confidence	Thai Consumer Price Index	Thai Gold Bar (Buying) Price	Thai Interest Rate from the Top 4 Thai Banks	Thai Interest Rate from the Top 5 Thai Banks
12/31/2002	4.958	4630.8	4452.45	91.9	76.6	7000	2	2
1/31/2003	4.9804	4422.5	5015.16	92	77.3	7350	2	2
2/28/2003	5.0394	4148.2	4432.46	93.5	77.2	6950	2	2
3/31/2003	5.0665	4085.6	4321.22	91.4	77.2	6650	1.8125	1.8
4/30/2003	5.2573	4542.7	4148.07	88.7	77.5	6700	1.8125	1.8
5/30/2003	5.3947	4630.8	4555.9	91.7	77.8	7150	1.8125	1.8
6/30/2003	5.2569	4813.7	4872.15	95.9	77.5	6800	1.25	1.25
7/31/2003	5.1101	5079.1	5318.34	100	77.5	7050	1.0625	1.05
8/29/2003	4.8759	5124.2	5650.83	98	77.9	7100	1.0625	1.05
9/30/2003	5.1691	5043.5	5611.41	103.2	77.8	7150	1.0625	1.05
10/31/2003	5.0973	5211.4	6045.12	107.2	77.9	7200	1	1
11/28/2003	5.2889	5317.5	5771.77	110.2	78	7350	1	1
12/31/2003	5.5109	5487.8	5890.69	112.4	78	7700	1	1
1/30/2004	5.319	5736.4	6375.38	109.5	78.3	7400	1	1
2/27/2004	5.3167	5798.4	6750.54	107.4	78.9	7350	1	1
3/31/2004	5.2135	5618.6	6522.19	105.6	79.1	7750	1	1

4/30/2004	5.2392	5774.4	6117.81	104	79.4	7350	1	1
5/31/2004	5.431	5627.1	5977.84	102.5	79.7	7450	1	1
6/30/2004	5.4491	5619.1	5839.44	100.6	79.9	7500	1	1
7/30/2004	5.3824	5547.2	5420.57	98.3	80	7550	1	1
8/31/2004	5.5494	5421.7	5765.54	95.4	80.3	7900	1	1
9/30/2004	5.6942	5465.3	5845.69	94.5	80.6	8000	1	1
10/29/2004	5.8017	5363.4	5705.93	92.9	80.6	8200	1	1
11/30/2004	5.8601	5444.2	5844.76	94.6	80.3	8400	1	1
12/31/2004	5.8454	5693.2	6139.69	92.8	80.3	8100	1	1
1/31/2005	5.5153	5771.4	5994.23	94.6	80.4	7750	1	1
2/28/2005	5.5815	5931.3	6207.83	92.9	80.8	7900	1	1
3/31/2005	5.5292	5929.7	6005.88	89.5	81.6	7900	1	1
4/29/2005	5.5271	5870.79	5818.07	88.7	82.2	8050	1	1
5/31/2005	5.4604	6127.2	6011.56	87.9	82.7	7950	1	1
6/30/2005	5.2913	6253.08	6241.94	85.7	82.9	8450	1	1.05
7/29/2005	5.3629	6600.88	6311.98	84.7	84.2	8400	1.1875	1.2
8/31/2005	5.4642	6517.21	6033.47	84.6	84.8	8450	1.375	1.4
9/30/2005	5.3011	6898.88	6118.61	85.4	85.4	9150	2	2
10/31/2005	5.1224	7036.65	5764.3	86.8	85.7	9100	2.25	2.25
11/30/2005	5.1053	7407.52	6203.47	87.9	85	9600	2.2	2.2
12/30/2005	5.1664	7583.93	6548.34	88.7	84.9	9950	2.5	2.5
1/31/2006	5.129	7810.88	6532.18	87.1	85.1	10200	3	3
2/28/2006	4.9388	7892.63	6561.63	85.1	85.3	10250	3	3
3/31/2006	4.9873	8023.3	6613.97	83.7	86.2	10400	3.6875	3.7
4/28/2006	5.1081	8047.29	7171.77	82.5	87.2	11250	4	4
5/31/2006	5.2751	7604.4	6846.95	81.5	87.8	11750	4	4
6/30/2006	5.2969	7652.1	6704.41	81	87.8	10550	4	4
7/31/2006	5.2488	7941.83	6454.58	80	88	11300	4	4
8/31/2006	5.1868	8167.96	6611.77	79.1	88	10900	4	4
9/29/2006	5.1223	8425.91	6883.05	82.1	87.7	10600	4	4
10/31/2006	5.0792	8569.72	7021.32	83.5	88.1	10400	4	4

11/30/2006	5.2285	8484.57	7567.72	83.1	88	10800	4	4
12/29/2006	5.1749	8785.74	7823.72	82.4	88	10750	4	4
1/31/2007	5.0014	9135.11	7699.64	79.9	87.7	10850	3.81	3.85
2/28/2007	4.8396	8789.7	7901.96	79	87.4	11200	3.5625	3.6
3/30/2007	4.6378	8976.99	7884.41	78.5	87.9	10950	3.25	3.25
4/30/2007	4.9046	9428.27	7875.42	77.6	88.8	11150	2.75	2.75
5/31/2007	4.756	9450.85	8144.95	76.9	89.5	10750	2.25	2.35
6/29/2007	4.6389	9209.36	8883.21	76.8	89.5	10550	2.25	2.35
7/31/2007	4.4632	8885.04	9287.25	75.8	89.5	10600	2.3125	2.3
8/31/2007	4.707	8881.46	8982.16	75.7	89	10750	2.3125	2.3
9/28/2007	4.9521	8933.48	9476.52	75.8	89.5	11800	2.3125	2.3
10/31/2007	4.985	9019.57	9711.37	75.5	90.3	12450	2.3125	2.3
11/30/2007	4.8046	8828.36	8586.4	76.2	90.7	12750	2.3125	2.3
12/31/2007	4.6071	8484.46	8506.28	77.3	90.7	13100	2.3125	2.3
1/31/2008	4.9322	7670.44	7521.13	78.1	91.5	14250	2.3125	2.3
2/29/2008	5.0683	7533.86	8412.76	79.5	92.1	14500	2.3125	2.3
3/31/2008	5.2879	7224.31	8572.59	80.7	92.6	13900	2.3125	2.3
4/30/2008	5.2942	7529	8919.92	79.9	94.2	13200	2.3125	2.3
5/30/2008	5.4118	7511.29	8619.08	78.8	96.3	13800	2.3125	2.3
6/30/2008	5.5605	6958.51	7523.54	78	97.3	14500	2.75	2.75
7/31/2008	5.5399	7141.21	7024.06	78.9	97.7	14450	2.75	2.75
8/29/2008	5.3043	7238.74	7046.11	77.7	94.8	13400	2.75	2.75
9/30/2008	4.8914	6654.89	5719.28	76.8	94.9	14100	2.75	2.75
10/31/2008	4.5196	6153.21	4870.66	75.8	93.8	12400	2.75	2.75
11/28/2008	4.3787	5816.6	4460.49	74.2	92.6	13300	2.75	2.75
12/31/2008	4.4354	5534.53	4591.22	74.8	91.1	13900	1.75	1.8
1/30/2009	4.1901	5290.05	4247.97	75.2	91.1	17250	1.4375	1.5
2/27/2009	4.0154	4690.67	4557.15	74	92	15850	1.3125	1.4
3/31/2009	4.3045	4927.43	5210.84	72.8	92.4	15450	0.975	0.98
4/30/2009	4.3837	5225.92	5992.57	72.1	93.3	14850	0.9125	0.93
5/29/2009	4.5492	5349.74	6890.44	71.5	93.1	15750	0.7875	0.83

6/30/2009	4.4217	5403.97	6432.16	72.5	93.4	15100	0.9375	0.95
7/31/2009	4.7324	5950.69	7077.71	73.4	93.4	15050	0.9375	0.95
8/31/2009	4.7786	6217.12	6825.95	74.5	93.8	15300	1	1
9/30/2009	4.8027	6323.18	7509.17	75.6	94	15800	0.825	0.86
10/30/2009	4.7161	6285.76	7340.08	75.4	94.1	16500	0.825	0.86
11/30/2009	4.7632	6260.95	7582.21	76.5	94.4	18450	0.7	0.76
12/31/2009	4.6605	6545.91	8188.11	77.7	94.3	17250	0.7	0.76
1/29/2010	4.4901	6440.72	7640.44	79.3	94.84	17000	0.7	0.76
2/26/2010	4.6412	6710.99	7436.1	78.4	95.37	17400	0.7	0.71
3/31/2010	4.4809	6873.37	7920.06	77.3	95.59	16950	0.675	0.69
4/30/2010	4.4491	6616.82	8004.25	75	96.06	17800	0.675	0.69
5/31/2010	4.1635	6312.6	7373.98	75.5	96.25	18600	0.675	0.69
6/30/2010	4.1599	6128.06	7329.37	77.1	96.5	19000	0.675	0.69
7/30/2010	4.4705	6200.78	7760.63	79.3	96.65	17950	1.0625	1.07
8/31/2010	4.2347	6180.89	7616.28	80.8	96.88	18250	1.0625	1.07
9/30/2010	4.5029	6296.33	8237.78	81.5	96.81	18800	1.1625	1.2
10/29/2010	4.4795	6472.23	8287.09	80.2	96.83	19100	1.1625	1.2
11/30/2010	4.2994	6312.43	8372.48	79	97.04	19500	1.1625	1.2
12/31/2010	4.4728	6436.04	8972.5	80.8	97.19	19950	1.49375	1.485
1/31/2011	4.7852	6479.15	9145.35	81.5	97.72	19550	1.7	1.69
2/28/2011	4.8441	6610.44	8599.65	80.9	98.11	20300	1.7	1.69
3/31/2011	4.7888	6357.55	8683.3	79.8	98.59	20400	1.86875	1.895
4/29/2011	4.949	6539.7	9007.87	79.6	99.95	21950	2.06875	2.085
5/31/2011	4.9108	6554.71	8988.84	80.4	100.29	21950	2.06875	2.085
6/30/2011	4.8562	6187.07	8652.59	81.7	100.42	21950	2.2375	2.25
7/29/2011	4.7413	5783.35	8644.18	84.1	100.6	22750	2.4875	2.49
8/31/2011	4.7233	5528.52	7741.36	83.4	101.04	25800	2.6125	2.59
9/30/2011	4.5395	5531.74	7225.38	81.8	100.7	24050	2.7375	2.74
10/31/2011	4.7244	5731.27	7587.69	72.4	100.89	24900	2.7375	2.74
11/30/2011	4.5679	5652.31	6904.12	71	101.11	25200	2.7375	2.74
12/30/2011	4.5835	5936.23	7072.08	73.1	100.62	23400	2.7375	2.74

1/31/2012	4.5567	5970.49	7517.08	74.2	101.02	25400	2.7375	2.74
2/29/2012	4.6009	6109.93	8121.44	75.5	101.39	25500	2.725	2.73
3/30/2012	4.657	6235.51	7933	76.6	101.99	24250	2.725	2.73
4/30/2012	4.5714	6096.34	7501.72	77.6	102.42	24150	2.725	2.73
5/31/2012	4.3806	5850.18	7301.5	77.1	102.82	23500	2.725	2.73
6/29/2012	4.5611	6066.86	7296.28	78.6	102.99	23750	2.725	2.73
7/31/2012	4.6353	6399.27	7270.49	78.1	103.35	24150	2.725	2.73
8/31/2012	4.7131	6388.01	7397.06	77.9	103.76	24550	2.725	2.73
9/28/2012	4.6964	6495.88	7715.16	77	104.1	25750	2.725	2.73
10/31/2012	4.6272	6595.13	7166.05	77.8	104.24	24850	2.5375	2.55
11/30/2012	4.611	6820.6	7580.17	79.1	103.87	25050	2.425	2.46
12/31/2012	4.7039	6822.44	7699.5	80.2	104.27	24000	2.425	2.41

Date	Thai Money Supply (M1)	Thai Money Supply (M2)	Thai Real Estate Price Index	Thai Retail Real Estate Sales Value Index	Tokyo Stock Market	US Dollar/Thai Baht Exchange Rate	WTI
12/31/2002	656.31	6647.16	144.9	107.5	843.29	43.11	31.2
1/31/2003	656.58	6708.98	144.9	120	821.18	42.76	33.51
2/28/2003	654.11	6744.9	144.9	116.83	818.73	42.79	36.6
3/31/2003	660.75	6764.78	144.7	119.5	788	42.84	31.04
4/30/2003	654.34	6753.76	144.7	119.5	796.56	42.86	25.8
5/30/2003	650.36	6813.72	144.7	119.5	837.7	41.75	29.56
6/30/2003	648.52	6789.34	143.7	119.5	903.44	42	30.19
7/31/2003	646.07	6815.86	143.7	119.83	939.4	41.98	30.54
8/29/2003	661.03	6855.08	143.7	119.83	1002.01	41.2	31.57
9/30/2003	666.02	6874.85	144.1	120	1018.8	40.03	29.2
10/31/2003	693.34	6908.19	144.1	120	1043.36	39.92	29.11
11/28/2003	774.22	7037.12	144.1	120	999.75	39.91	30.41
12/31/2003	750.2	7062.32	143.5	120	1043.69	39.62	32.52
1/30/2004	742.61	7151.6	143.5	120	1047.51	39.26	33.05

2/27/2004	766.25	7193.92	143.5	120	1082.47	39.29	36.16
3/31/2004	751.88	7217.43	145.5	120	1179.23	39.29	35.76
4/30/2004	766.69	7311.11	145.5	118.33	1186.31	40.06	37.38
5/31/2004	752.43	7321.45	145.5	118.43	1139.94	40.55	39.88
6/30/2004	742.52	7238.01	145.8	118.43	1189.6	40.93	37.05
7/30/2004	751.84	7340.36	145.8	118.43	1139.3	41.32	43.8
8/31/2004	744.44	7349.31	145.8	118.43	1129.55	41.63	42.12
9/30/2004	766.65	7380.28	145.1	116.64	1102.11	41.4	49.64
10/29/2004	780.03	7416.78	145.1	115.14	1085.43	41.05	51.76
11/30/2004	788.76	7482.92	145.1	114.43	1098.79	39.42	49.13
12/31/2004	829.88	7471.43	148.1	112.5	1149.63	38.92	43.45
1/31/2005	820.7	7549.69	148.1	112.43	1146.14	38.55	48.2
2/28/2005	842.47	7605.55	148.1	112.71	1177.41	38.24	51.75
3/31/2005	832.61	7564.58	152.9	107.38	1182.18	39.12	55.4
4/29/2005	833.84	7573.98	152.9	107.64	1129.93	39.45	49.72
5/31/2005	825.63	7584.91	152.9	108	1144.33	40.63	51.97
6/30/2005	808.73	7540.23	153.5	109.29	1177.2	41.33	56.5
7/29/2005	815.67	7617.99	153.5	109.79	1204.98	41.66	60.57
8/31/2005	823.04	7674.93	153.5	108.86	1271.29	41.28	68.94
9/30/2005	833.4	7739.82	156	109.07	1412.28	41.05	66.24
10/31/2005	818.63	7751.57	156	108.71	1444.73	40.78	59.76
11/30/2005	854.41	7878.79	156	107	1536.21	41.25	57.32
12/30/2005	890.22	7926.92	158.9	107	1649.76	41.03	61.04
1/31/2006	886.81	8113.02	158.9	107.36	1710.77	38.93	67.92
2/28/2006	883.73	8147.37	158.9	108.43	1660.42	39.09	61.41
3/31/2006	883.72	8211.94	157.4	110.07	1728.16	38.88	66.63
4/28/2006	889.65	8281.49	157.4	110.07	1716.43	37.53	71.88
5/31/2006	867.8	8348.13	157.4	112.07	1579.94	38.14	71.29
6/30/2006	853.04	8242.38	162.1	112.5	1586.96	38.12	73.93
7/31/2006	826.41	8326.33	162.1	113.36	1572.01	37.86	74.4
8/31/2006	851.43	8397.8	162.1	113.79	1634.46	37.58	70.26

9/29/2006	848.45	8405.27	163.3	113.79	1610.73	37.57	62.91
10/31/2006	835.92	8439.28	163.3	115.57	1617.42	36.66	58.73
11/30/2006	875.52	8579.08	163.3	115.57	1603.03	35.85	63.13
12/29/2006	911.47	8573.38	163.8	115.14	1681.07	35.45	61.05
1/31/2007	866.09	8680.47	163.8	114.86	1721.96	35.81	58.14
2/28/2007	908.56	8818.33	163.8	114.71	1752.74	35.51	61.79
3/30/2007	916.64	8890.32	163.9	115.57	1713.61	35.01	65.87
4/30/2007	931.67	8947.3	163.9	115.57	1701	34.76	65.71
5/31/2007	923.84	9018.41	163.9	115.57	1755.68	34.63	64.01
6/29/2007	888.21	8907.71	166.4	115.57	1774.88	34.54	70.68
7/31/2007	883.31	9011.77	166.4	115.57	1706.18	33.79	78.21
8/31/2007	904.21	9006.49	166.4	115.57	1608.25	34.31	74.04
9/28/2007	919.14	8987.68	171	113.87	1616.62	34.26	81.66
10/31/2007	904.5	9042.18	171	114.4	1620.07	33.98	94.53
11/30/2007	953.68	9064.7	171	114.73	1531.88	33.85	88.71
12/31/2007	999.9	9109.47	175.3	118.8	1475.68	33.72	96
1/31/2008	971.37	9187.09	175.3	120.53	1346.31	33.03	91.75
2/29/2008	990.1	9323.36	175.3	121.93	1324.28	31.93	101.84
3/31/2008	1000.86	9393.19	93.5	121.93	1212.96	31.44	101.58
4/30/2008	1014.47	9421.39	93.5	123.2	1358.65	31.58	113.46
5/30/2008	1024.83	9433.92	93.5	128.8	1408.14	32.49	127.35
6/30/2008	987	9296.18	92.4	134.4	1320.1	33.44	140
7/31/2008	962.02	9272.92	92.4	136.13	1303.62	33.52	124.08
8/29/2008	992.98	9398.21	92.4	137.76	1254.71	34.22	115.46
9/30/2008	977.1	9409.98	98.7	135.76	1087.41	33.86	100.64
10/31/2008	977.53	9521.64	98.7	136.88	867.12	35.04	67.81
11/28/2008	1010.45	9726.82	98.7	136.65	834.82	35.48	54.43
12/31/2008	1041.22	9944.33	100.7	136	859.24	34.74	44.6
1/30/2009	1036.44	10045.13	100.7	136	794.03	34.97	41.68
2/27/2009	1039.78	10203.88	100.7	136	756.71	36.19	44.76
3/31/2009	1033	10232.88	104	133.12	773.66	35.5	49.66

4/30/2009	1060.41	10265.39	104	133.12	837.79	35.28	51.12
5/29/2009	1103.52	10298.54	104	134.29	897.91	34.32	66.31
6/30/2009	1025.57	10133.74	108.4	132.41	929.76	34.06	69.89
7/31/2009	1013.26	10004.12	108.4	132.47	950.26	34.03	69.45
8/31/2009	1061.01	10107.58	108.4	132.47	965.73	34.01	69.96
9/30/2009	1052.1	10112.61	109.3	137.59	909.84	33.44	70.61
10/30/2009	1079.55	10180.35	109.3	136.29	894.67	33.45	77
11/30/2009	1115.18	10346.94	109.3	132.21	839.94	33.23	77.28
12/31/2009	1174.55	10617.01	111.1	128.84	907.59	33.37	79.36
1/29/2010	1148.1	10602.17	111.1	129.05	901.12	33.19	72.89
2/26/2010	1187.47	10684.52	111.1	127.47	894.1	33.06	79.66
3/31/2010	1182.41	10855.59	111.2	125.89	978.81	32.34	83.76
4/30/2010	1182.47	10831.83	111.2	125.16	987.04	32.4	86.15
5/31/2010	1261.88	11001.46	111.2	123.58	880.46	32.52	73.97
6/30/2010	1180.18	10846.41	112.1	123.58	841.42	32.45	75.63
7/30/2010	1173.02	10887.11	112.1	122.41	849.5	32.24	78.95
8/31/2010	1181.41	10968.09	112.1	122.09	804.67	31.27	71.92
9/30/2010	1175.47	11116.1	110.7	124.77	829.51	30.35	79.97
10/29/2010	1202.29	11323.3	110.7	127.05	810.91	29.94	81.43
11/30/2010	1235.4	11497.56	110.7	127.64	860.94	30.21	84.11
12/31/2010	1302.44	11776.42	118.2	127.5	898.8	30.06	91.38
1/31/2011	1326.16	11817.19	118.2	127.95	910.08	30.93	92.19
2/28/2011	1346.29	12155.38	118.2	127.95	951.27	30.6	96.97
3/31/2011	1345.61	12284.44	121.6	128.32	869.38	30.28	106.72
4/29/2011	1346.97	12497.92	121.6	128.32	851.85	29.88	113.93
5/31/2011	1395.8	12577.16	121.6	129	838.48	30.32	102.7
6/30/2011	1336.64	12614.37	121.6	128.77	849.22	30.73	95.42
7/29/2011	1336.28	12799.2	121.6	129	841.37	29.76	95.7
8/31/2011	1345.15	12874.32	121.6	128	770.6	29.93	88.81
9/30/2011	1328.02	12912.33	120.3	126.27	761.17	31.19	79.2
10/31/2011	1361.93	13151.09	120.3	126.27	764.06	30.71	93.19

11/30/2011	1362.72	13330.53	120.3	127.68	728.46	30.87	100.36
12/30/2011	1414.27	13565.98	123.3	126.91	728.61	31.55	98.83
1/31/2012	1400.49	13693.41	123.3	126.23	755.27	30.99	98.48
2/29/2012	1421.54	13819.66	123.3	126.23	835.96	30.46	107.07
3/30/2012	1436.62	13898.42	130	125.05	854.35	30.83	103.02
4/30/2012	1439.81	13809.43	130	125.05	804.27	30.73	104.87
5/31/2012	1455.23	13843.79	130	125.71	719.49	31.83	86.53
6/29/2012	1452.79	14012.99	122.2	125.42	770.08	31.56	84.96
7/31/2012	1413.36	14137.98	122.2	125.63	736.31	31.52	88.06
8/31/2012	1461.67	14262.28	122.2	125.63	731.64	31.3	96.47
9/28/2012	1483.55	14544.5	125.7	125.63	737.42	30.83	92.19
10/31/2012	1472.23	14693.03	125.7	126.88	742.33	30.7	86.24
11/30/2012	1508.25	14885.88	125.7	127.29	781.46	30.71	88.91
12/31/2012	1598.26	14966.58	129.7	127.13	859.8	30.59	91.82



