CHAPTER 1

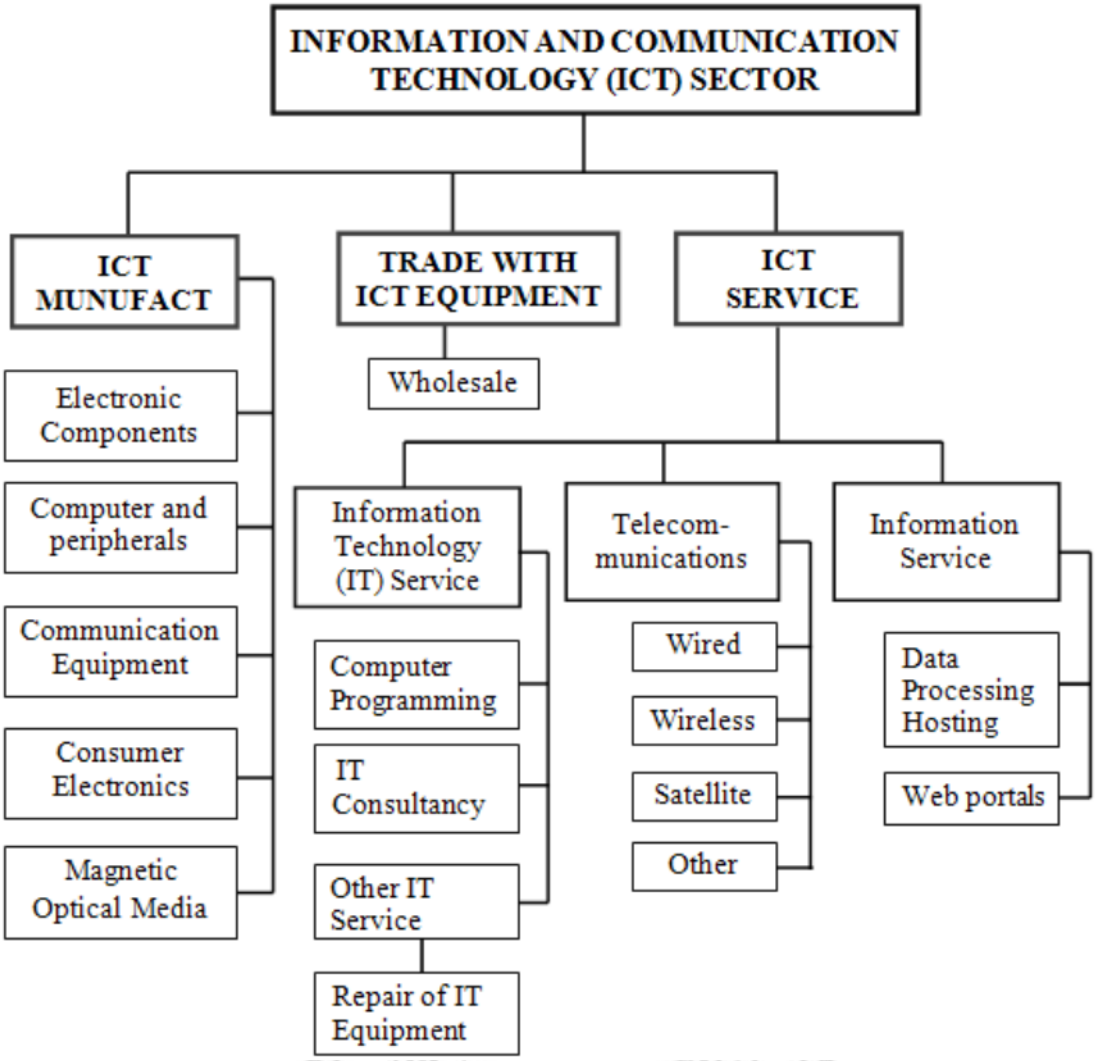
Introduction

1.1 Principle, Theory and Rationale

The global economy is changing all the time, so each country has to create partnerships with other countries. Communication is important to connect the information in terms of economy, import, export, and also build business relations and coordination of domestic trade.

ICT is a tool for driving the economy. Investment in developing ICT has an important role in economic growth. Due to developing ICT, productivity and labor have become more efficient. This also renders countries more competitive. As a result, the increase in Gross Domestic Product (GDP) will lead to economic and social growth.

From the International Standard Industrial Classification of all Economic Activities (ISIC), industries in the ICT sector can be grouped into (1) ICT manufacturing industries which include the manufacture of electronic components and boards, manufacture of computers and peripheral equipment, manufacture of communication equipment, manufacture of consumer electronics, and manufacture of magnetic and optical media. (2) ICT trade industries are divided in 2 groups. Firstly, there are wholesale of computers, computer peripheral equipment and software. Secondly, there are wholesale electronic and telecommunications equipment and parts. (3) ICT services industries are separated in 3 parts. The first part is Information Technology (IT) service. This divided into sub-groups are computer programming, IT consultancy, and other IT services such as repair of IT equipment. The second part is telecommunications such as wired, wireless and satellite. The Third part is information services such as data processing hosting and web portals (Organization for Economic Co-operation and Development, 2007).



Source: Organization for Economic Co-operation and Development (2007)

Figure 1.1: Information and Communication Technology sector

The availability of ICT is ranked by World Competitiveness Scoreboard from 137 countries in 2014. There are 6 countries that were ranked in the top 100 including Singapore (10th), Malaysia (63th), Thailand (64th), the Philippines (74th), Indonesia (85th) and Vietnam (95th)

Table 1.1: World competitiveness ranking in ICT use

Countries	World Competitiveness Scoreboard 2014 (137 countries)
Singapore	10
Malaysia	63
Thailand	64
The Philippines	74
Indonesia	85
Vietnam	95
Cambodia	107
Lao PDR	120
Myanmar	129
Brunei	N/A

Source: International Institute for Management Development (2014)

Table 1.1 shows that the top five member countries of ASEAN with the highest ICT uses are Singapore, Malaysia, Thailand, the Philippines and Indonesia.

Telecommunication is a form of communication with the transmission of information, such as voice, photos videos, etc., through analog or digital electronics. It is vital in the economy in as far as it helps to transfer data and voice easier and faster than ever before in modern history. It is a basic infrastructure that is very important to the development of countries. The population and business sector need to efficiently communicate with each other. Nowadays, development requires constant advances in communication technology. Moreover, the industry has to rely on telecommunication systems for expanding and adding value to business either directly or indirectly. For example, business can reduce production costs by making the production more efficient thereby increasing the ability to compete. Thus, companies that naturally rely heavily on information and communication have to improve the quality of their response to the rise in demand. To achieve this, the companies need to find sources of capital. Hence, capital markets constitute one of the sources of capital.

The Association of South East Asia Nations (ASEAN) was established on August 8th ,1976. ASEAN consists of 10 Southeast Asian member countries. They are Thailand, Laos, Vietnam, Cambodia, Singapore, Malaysia, the Philippines, Myanmar and Brunei Darussalam. The aim of the foundation is to promote cooperation and mutual aid in the respective economies, as well as politics and culture. ASEAN is projected to become a major market in the international arena (Association of Southeast Asia Nations, 2012). The total ASEAN's population is about 600 million that is 8.5% of the world population. Total GDP is 1.5 trillion dollars or 2% of the gross world product. This counts as the main

reason why ASEAN attracts a lot of investors interested in ventures in the region. Such ASEAN integration reduces dependence on external markets of other regions and creates bargaining power and potential competition in the world market
(Nikom Virachpanich, 2012).

Table 1.2: GDP of the ASEAN Countries in 2014

Order	Country	GDP(U.S. dollar)
1	Indonesia	888.5
2	Thailand	373.8
3	Malaysia	326.9
4	Singapore	307.9
5	Philippines	284.6
6	Vietnam	186.2
7	Myanmar	64.33
8	Brunei	17.26
9	Cambodia	16.71
10	Laos	11.27

Source: imd, 2014

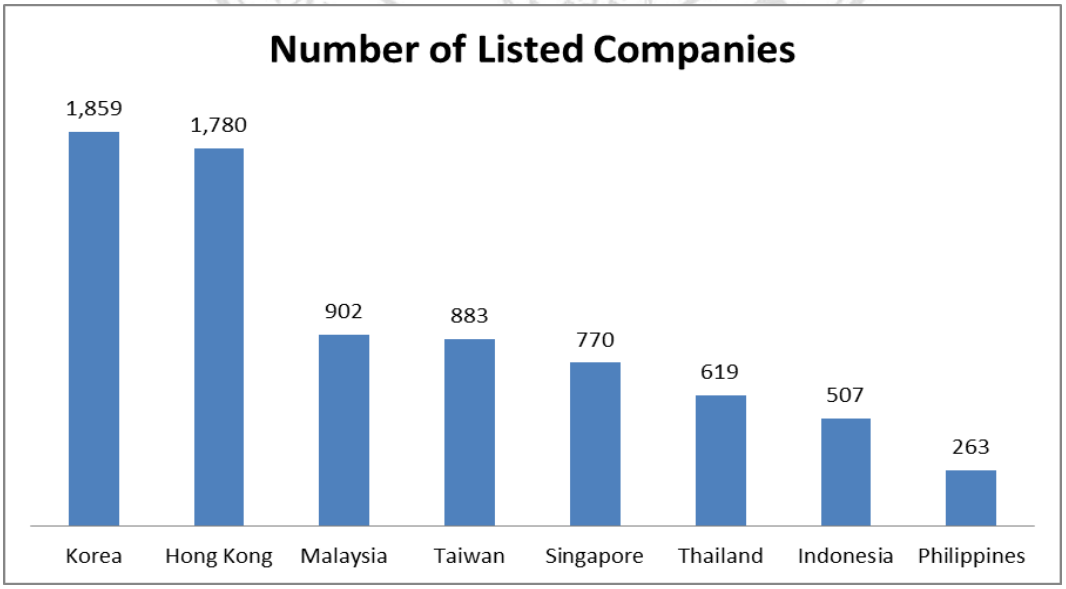
In 2014, the top five ASEAN member countries with the highest GDP are Indonesia, Thailand, Malaysia, Singapore and the Philippines. GDP is a tool for measuring economic activities in countries. It measures the total value of goods and services that are produced over a period of time. The GDP is an important index for investors who want to decide whether to invest in a country. The GDP shows economic growth as well as income and purchasing power of a respective population.

ASEAN stock exchanges are an indispensable part of the ASEAN Capital Market Integration. This integration is a collaboration of the 7 stock exchanges of Malaysia (Kuala Lumpur Stock Exchange –KLSE), Indonesia (Indonesia Stock Exchange- IDX), the Philippines (Philippine Stock Exchange- PSE), Singapore (Singapore Exchange- SGX), Thailand (The Stock Exchange of Thailand- SET), and Vietnam (Hanoi Stock Exchange- HNX and Ho Chiminh Stock Exchange - HOSE). The purpose of this integration is to promote the growth of the ASEAN capital market by bringing more ASEAN investment opportunities to more investors (ASEAN integration, 2012).

Source: World Federation Exchanges (WFE)

Figure 1.2: Market Capitalization to GDP

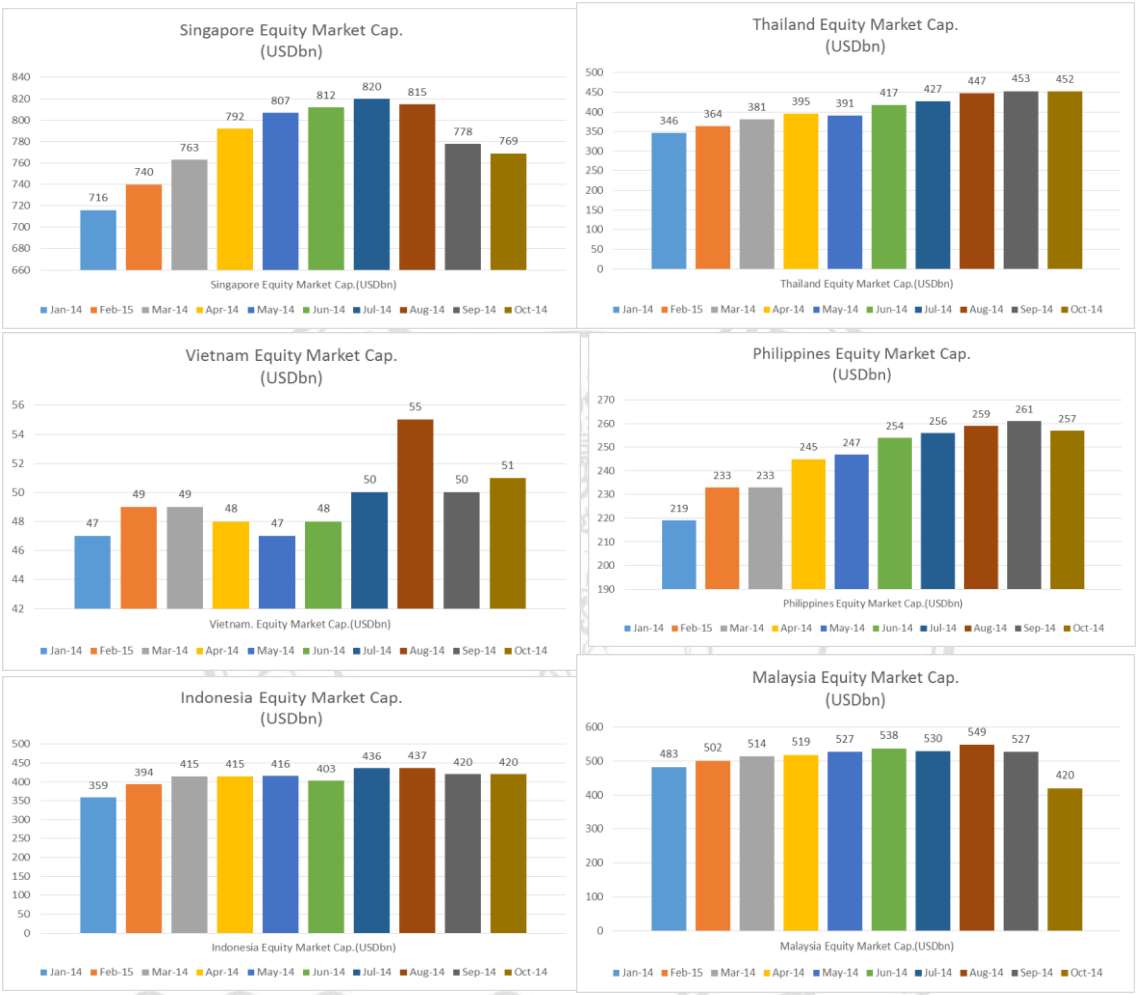
Figure 1.2 shows market capitalization to GDP comparison of selected countries in Asia. Among ASEAN countries, Singapore has the highest market capitalization to GDP ratio which is 247% followed by Malaysia (138%), Thailand (112%), the Philippines (84%) and Indonesia (43%). However, all of these ASEAN countries have together less market capitalization compared to Hong Kong.



Source: World Federation Exchanges (WFE)

Figure 1.3: Number of Listed Companies

Figure 1.3 shows the number of listed companies in selected Asia countries. With 902, Malaysia has the highest number of listed companies followed by Singapore (770), Thailand (619), Indonesia (507) and the Philippines (263) respectively.



Data Source: Jakarta Post

Figure 1.4: Market Capitalization of ASEAN-6 Equity Market

Figure 1.4 shows that Singapore has the highest equity market capitalization. The lowest equity market capitalization is in Vietnam. The gap between the aforementioned ASEAN 5 countries and Vietnam is very significant. This study will therefore not include Vietnam. Furthermore, this study will not discuss the other remaining in ASEAN member countries which are Brunei Darussalam, Cambodia, Laos, and Myanmar because they are not participating in ASEAN stock exchange markets as their stock markets are too small. Brunei will open a stock exchange in 2017. The numbers of listings stock of Cambodia are two stock exchanges, Lao are four and Myanmar are two (Bloomberg, 2014).

From the World Development Report year 1994, telecommunication industry plays an important role in large economy. It covers the provision of services to the population at all levels of the economy. Moreover, it is a role as an intermediary or a significant cost to operate other types of economic activity. Hence, when the countries have low income, the infrastructure needs to be a field of irrigation, roads. However, when the countries have a higher income, telecommunications and electrical infrastructure requirements are higher. Thus, the information and communications industry is an industry that is vital to the development of the ASEAN community. Furthermore, the study of Steven Troung Trong Vu (2013) found that when the ASEAN member countries open the gate way for investment to foreign investors, information and communication industry will be a major industry that foreign investors have interest in investing. This will lead to capital inflow from investors both inside and outside the ASEAN countries.

Stock Exchange is an alternative investment for investors domestally and outside the country. The stock market trading value fluctuates by the economy of the country that has an effect on it. Most investors invest in companies with high returns. But if the company has high-yield, it also has high-risk. The risk-lover investors tend to invest in securities with high risk and high returns. The risk-averse investors often invest in securities with low risk and low return. ICT companies with interested investors will be invested to expand the firms and to develop the advance ICT technology. Hence, the returns in ICT stocks can attract the investors and then the company can bring this fund to invest. As a result, the communication, economic, education, and countries will be even better.

Although the telecommunication industry is an attractive industry to invest in ASEAN exchanges, investing in telecommunications industry is risky because the price of stocks is highly volatile. As a result, if the investors know about the day of the week that highly fluctuates, it will help the investors to make the decision and to decrease risk from price volatility.

It is important to note that the volatility of stock returns by the day of the week may help investors to adjust their investment style. Fama (1970) discussed the day of a week has an effect on trade value. This research attracts the attention of researchers worldwide to consider the day of week patterns by observing stock returns which fluctuate on different days at different times. In particular, the pattern of incomplete market performance shows that the stock prices and returns fluctuated as usual. In contrast, if an

abnormality of the day of week occurs, the returns from investing in stocks will be not as expected. due to the nature of the days of week having an effect on trade value and returns from investing in the stock market. Furthermore, Engle (1993) said investors who are risk-averse will adjust their investment by reducing investment in securities that the volatility is expected to increase. To find out the impact of the days of week is useful in managing risk and speculating for estimating the valuation of securities. Karolyi (1995) mentions a study of the impact of the days of week engage with the volatility of the stock market. Investors can take advantage of the education that they will lead to a change in investment style and a strategic approach. This patterns guides investors' decisions. Kiymaz and Berument (2003) mentioned the volatility varies by day of the week for the developed countries. To find out the impact of the days of the week on the trading value is very important. If investors can be aware of this impact of the days of the week, they could alter the pattern of investment in the stock market in order to avoid the risk of fluctuations in the price of the stock. Borges (2009) discussed days of the week that have an effect on trading value. This research investigates the day of the week that has an impact on stock returns by evaluating different ways under the scrutiny of the daily return. The aim is to prove the variance of returns and to prove the impact of the day of the week on trading value and to find out the impact of the factors that result in abnormal returns on securities.

The research problem of this investigation is to examine the trend of the data and how the manifestation of the volatility of ASEAN stock returns in the ICT sector can be tested by using the GARCH model. The main goal is to analyze the volatility of ICT stock returns in the top five ASEAN countries to estimate. The study is useful for investors in decision making with regard to investing in the ICT sector in 5 ASEAN countries. The results will be useful to administrators and stakeholders of companies on the ICT industry for planning and coping with the market volatility. Furthermore, the findings of the research can also be used in a well-built market research plan of the ICT by public sector agencies in the future.

1.2 Purpose of the study

To investigate the manifestation of the day of the week effect on ICT stock market in ASEAN in terms of returns and volatility.

1.3 Advantages of the Study

1. The information in this research that which day of the week effect on the stock volatility in ICT sector in ASEAN will guide the investors to change their patterns and protect them from the higher volatility in ICT stock in ASEAN.

2. The benefit from the analysis of GARCH model on the day of the week in ASEAN stock market is to give the information to private sector which can inform them about the investment in ICT stock in ASEAN countries. The investors can use the results of this study for making decision in ICT stock in ASEAN market.

1.4 Scope of the Study

The data used in this study is daily series of ICT stock price indices data over the period from April 4th 2011 to March 25th 2016 totaling 5 years. The source of the data is Finance and Investment Center (FIC). The standard OLS and GARCH with dummy variable models are employed to identify the day of the week effect which present in both returns and volatility.