EFFICIENT MARKET HYPOTHESIS: EVIDENCE FROM ASEAN-5 COUNTRIES

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STATEMENT OF ORIGINALITY

The work described in this Final Year Project, entitled
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is to the best of the author's knowledge that of the author except
where due reference is made.

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ABSTRACT

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By

Wong Yeong Der

This study applies a number of univariate unit root tests (conventional unit root tests and Lagrange Multiplier (LM) unit root test with two breaks) for time series data to determine the efficient market hypothesis (EMH) in five ASEAN countries which consists of Indonesia, Malaysia, Philippines, Thailand and Singapore. The daily closing price spanning from January 2, 1997 until December 31, 2010 for each of the countries is utilized the stationarity tests. The study found that both the conventional unit root tests and LM unit root test with two breaks failed to reject the random walk hypothesis. This implies all the tested stock markets are non-stationary and efficient under weak form hypothesis. On the other hand, the break dates detected endogenously under LM unit root test occur around the actual market crash date.

ABSTRAK

HIPOTESIS PASARAN CEKAP: BUKTI DARI NEGARA ASEAN-5

Oleh

Wong Yeong Der

Tujuan kajian ini adalah untuk menguji kepegunan pasaran saham bagi lima negara dalam ASEAN-5 iaitu Indonesia, Malaysia, Filipina, Thailand and Singapura dengan menggunakan beberapa ujian kepengunan univariat (ujian kepegunan konvensional dan ujian kepegunan Lagrange Multiplier (LM) dengan dua tarikh berpecahan) untuk menentu hipotesis pasaran cekap (EMH) bagi pasaran saham tersebut. Harga tutup harian mula dari Januari 2, 1007 hingga Disember 31, 2010 diambil bagi kelima-lima pasaran saham untuk pengujian kepegunaan pasaran saham. Keputusan kajian ini mendapati bahawa semua ujian kepegunan gagal untuk menolak hipotesis pergerakan rawak (random walk hypothesis). Dengan ini, kesemua pasaran saham menunjukkan ketidakpegunan dan cekap dalam hipotesis bentuk lemah. Selain daripada itu, ujian kepegunan LM menunjukkan tarikh berpecahan adalah belaku berdekatan pada tarikh pasaran jatuh yang sebenar.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

For several decades the prediction of future stock price through the past behavior of the securities price was being argued until this modern age and still in the debate. The early paper in 1965 conducted by Eugene F. Fama on this issue had tested on the behavior of stock market. He claimed the future tend to repeat the past pattern of the securities market.

The origin of Efficient Market Hypothesis (EMH) can be traced back through the work of Fama and Paul A. Samuelson during 1960s. Both of the researchers developed the EMH in different agenda. Samuelson (1965) argued that the change in price must be unforeknowable when the efficient market is achieved. In his paper, Fama (1965) had done the earlier study of serial correlations in daily price changes of 30 stocks that comprise the Dow Jones Industrial Average index. The study was examined on the behavior of stock market prices. He claimed that there is extreme low positive correlation in daily changes which approaching zero for the practical purposes.

1.1 The Historical Development of EMH

Based on the historical review of the efficient market hypothesis by Sewell (2008), there are people discussed about efficient market far early before both of the researchers mentioned above. The efficient markets were clearly pointed up in the book, 'The Stock Markets of London, Paris and New York' by George Gibson in late 1880's. Gibson gave the statement as 'shares become publicly known in an open market, the value which they acquire may be regarded as the judgment of the best intelligence concerning them' (Gibson, 1889, as cited in Sewell 2008).

Sewell also cited that, in year 1905, the term random walk was introduced by Karl Pearson, a professor and Fellow of the Royal Society. The efficient market and random walk is widely discussed since then. In year 1923, Keynes obviously claimed that EMH effect caused the investors to earn more profits is not because of knowing better the future market, but rather for risk bearing in the financial market. Another economist (as cited in Sewell 2008), Frederick MacCauley found that a fluctuation in stock market was similar with a chance curve which obtained by throwing a dice (MacCauley, 1925). Cowless (1933) carried a study on the performance of investment professionals and found that the forecasters were unable to predict stock market. Amongst all the arguments on the issue of future price prediction that were published before 1960, only Cowles and Jones (1937) found significant inefficiencies based on the significant evidence of serial correlation in averaged time series indices of stock prices. In year 1944, after the year 1933 publication, Cowles explained that investment professions still cannot predict the future trend of market. According to Friedman (1953), EMH can be achieved even in the situations where trading

strategies of investors are correlated due to arbitrage. Another finding done by Cootner (1962) said that stock market do not follow random walk. Based on the spectral analysis performed on market prices one year later, Granger and Morgenstern (1963) concluded the short-run and long-run movements of the data series shown contrast result where the former was said to obey the simple random walk hypothesis. The 'business cycles' found to be not significant in this aspect (as cited in Sewell 2008).

In 1965, Fama's first discussion on efficient market which is famous among the literature defined an efficient market as:

> *A market where there are large numbers of rational profit maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants.*

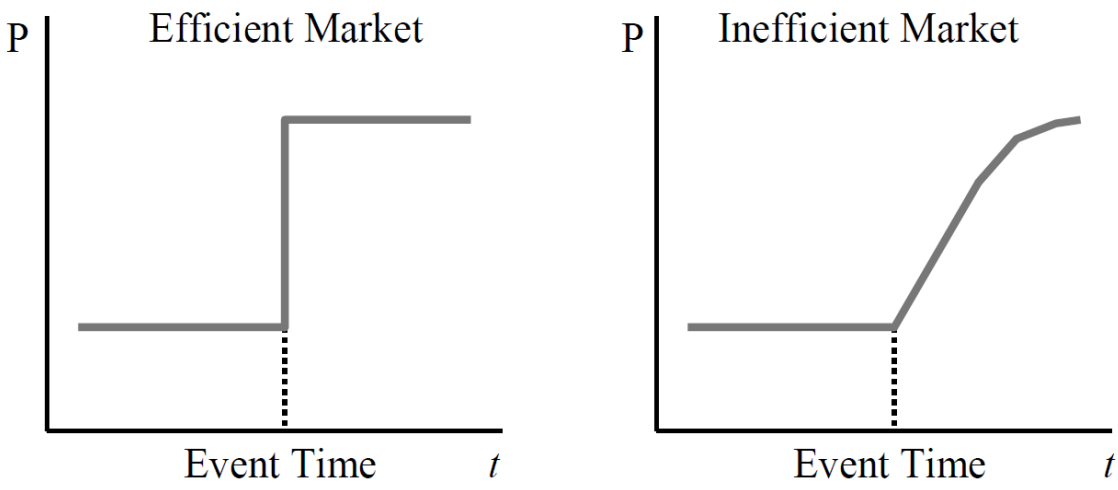
This description is very similar to the microeconomic concept on perfectly competitive market. In such competitive market, no investor would be able to earn abnormal profit. If this assumption is true in the stock market, any new information come to available in the market would reflect in the stock price very quickly.

Fama propounded that there are three levels of efficient market, namely the weak, semi-strong, and strong form market efficiency. The weak form of efficiency suggested that the information of security prices is fully reflected in the past price. In the semi-strong form, the price is adjusted according to the all public information. All

information including the private information in the strong form is fully reflected in the stock price. The efficiency market shows there is no investor would be able to earn abnormal profit based on information set when the market is efficient for that particular information set. Abnormal profits refer to the gain from a naive buy-and-hold strategy. Based on the EMH argument, there is no investor able to consistently make profit by trading only through na ïve buy-and-hold strategy.

Years after the Fama's studies, it came to the market efficiency test with the present of the "event study" methodology. In the new study, researchers take the event that occurred in different company and during different period into account. The involvement of the event was to see how it impacts the stock price.

Figure 1.1
Market Reaction to an Unanticipated Favorable Event

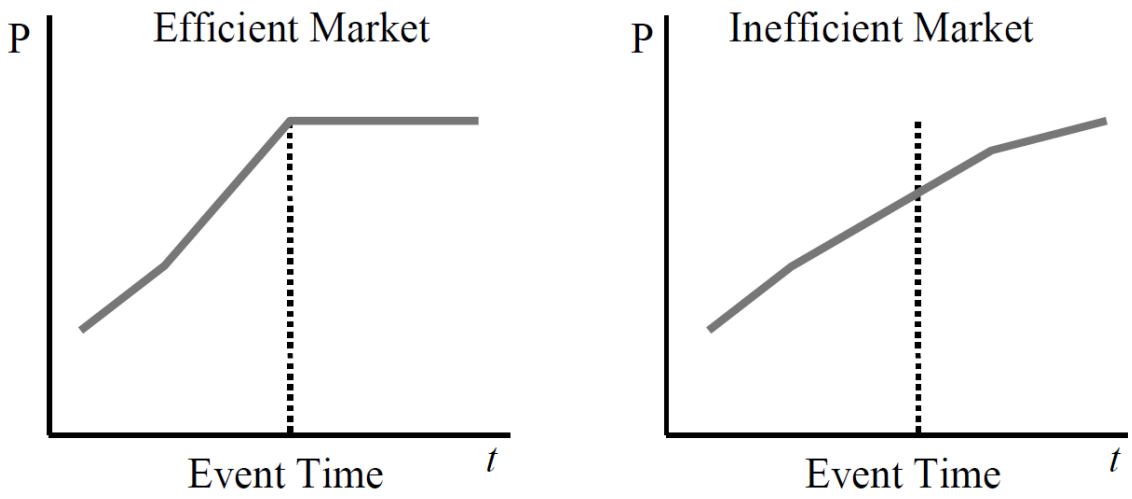


Source: Efficient Market Hypothesis and Behavioral Finance - Is a Compromise in Sight?

Chuvakhin's (2002) study has shown that there are two conditions which are in the form of unanticipated favorable event and anticipated favorable event. In the unanticipated event, the stock price increases rapidly upward when the event occurs in

efficient market and subsequently achieve constant price. Oppositely, in the inefficient market, the stock price would take some time to achieve the same price with the efficient market after the event.

Figure 1.2
Market Reaction to an Anticipated Favorable Event



Source: Efficient Market Hypothesis and Behavioral Finance - Is a Compromise in Sight?

In the anticipated event, the price of stock market drifts upward and achieves constant right after the event time. The stock price tends to take more time to achieve the same price level.

Fama, Fisher, Jensen, and Roll with their FFJR study contributed to the construction of the first event study in year 1969 (as cited in Chuvakhin, 2002). The FFJR finding was similar to the anticipated event in the efficient market. They were said to found that the stock market begins to anticipate a stock split more than two years prior to what actually happens. The consequences also known on the day stock split is happened through that anticipation. The finding proved that the event study

can eventually predict the future stock market trend with the occurrence of particular event.

The event study technique was further refined by Johnson *et al.* (1985). The study was on the analysis of the stock price reaction to sudden executive deaths. Four of the researchers conclude that the stock price reacts to the unexpected death of CEO. They found the stock market is bullish as the CEO was the founder of the company.

Rozeff and Kinney (1976) found that stock returns in January are highest among other months. Similar finding was appeared in year 1981where the stock prices were reported tend to go down on every Mondays. Gibbons and Hess (1981) found that the "Monday Effect" were clearly not consistent with the weak-form market efficiency. They claimed the effect tended to decrease over time. The market participants took advantage when they discovered this effect. However, their return also decrease over time consistent with the movement of Monday Effect.

Grossman and Stiglits (1980) shown that the impossibility to perfectly informational efficient lie in market. Their argument stated that the prices cannot perfectly reflect the available information because those information is highly in the cost. They also argued that even if the perfectly reflection of information in the price come to be true, the high cost would caused the investor who spent high resources on obtaining it receive no compensation. Thus, 'a sensible model of market equilibrium must leave some incentive for information-gathering' especially in security analysis (Sewell, 2008).

Years after that, the EMH testing was then continuously testing on the different stock markets over different time period, adopting statistical test such as serial correlation tests, runs test, variance ratio tests, unit root tests and spectral analysis. Some of the studies were in consistent with EMH and some were not. LeRoy and Porter (1981) for example, had proven those stock markets are inefficiency due to the market exhibit excess volatility. Fama and French (1988) also found large negative autocorrelations for stock portfolio return over a year. The finding which concluded the impact in the stock price is permanent, which means there is no repeating pattern in the future stock price and it subsequently the hypothesis of market efficiency. However, in the research done by Lo and MacKinlay (1988) strongly rejected the random walk hypothesis for weekly stock market returns using the variance-ratio test. In the same year, Poterba and Summers (1988) claimed that the stock return show positive autocorrelation for short period and opposite outcome for long term period which in contrast with the finding of Granger and Morgenstern (1963).

The EMH has been extensively grow in the number of studies by researchers and economists in many other aspects, including the incorporation of non-trade assets such as human capital, state-dependent preferences, heterogenous investors, asymmetric information, and transactions cost. However, the main focus of this study is mainly on the efficiency in stock market on predicting the financial crisis.

1.2 Background of ASEAN-5 Stock Markets

There are five main stock markets which similar as in term of the development in South East Asia (SEA) region. These five stock markets namely Bursa Malaysia (KLSE) in Malaysia, Jakarta Stock Exchange (JSX) in Indonesia, Philippines Stock Exchange (PSE) in the Philippines, Singapore Exchange (SGX) in Singapore and Stock Exchange of Thailand (SET) in Thailand. This section will cover the background of these five main stock markets.

1.2.1 Bursa Malaysia (KLSE)

Bursa Malaysia (MYX), the stock exchange of Malaysia was previously named Kuala Lumpur Stock Exchange (KLSE). On April 14, 2004, the name was changed Bursa Malaysia with the purpose to enhance the competitive position and to move along with the global trends in the exchange sector.

Back to the year 1930, the first security organization established with the set up of Singapore Stockbrokers' Association in Malaysia. After seven years, it was re-registered as the Malayan Stockbrokers' Association. However, the share of the organization was still remaining close for the public trading. The Malayan Stock Exchange came to exist at the year 1960 and the shares began to trade publicly. At the same year, traditional method which links the trading room between Singapore and Kuala Lumpur through direct telephone lines was carried out to create a single market with the same stocks and shares listed at the single price on both boards.

The situation sustained for four years and the Stock Exchange of Malaysia was inaugurated at the year of 1964. Stock Exchange of Malaysia and Singapore (SEMS) continue function as the stock exchange centre in Malaysia after the secession of Singapore from Malaysia one year later. In 1973, Stock Exchange of Malaysia and Singapore was separated into Kuala Lumpur Stock Exchange Berhad and Stock Exchange of Singapore which lead to the cease of interchangeability of the currency between both countries. Kuala Lumpur Stock Exchange (KLSE) took over the operations of the Kuala Lumpur Stock Exchange Berhad in year 1976. KLSE is a company limited by guarantee.

In the year 2004, KLSE was re-named became Bursa Malaysia Berhad which the purpose was to enhance competitive position and focusing on the customer-driven and market-oriented. Bursa Malaysia aimed at improving the product and service offerings, increasing the liquidity and velocity of share market. The improvement on efficiency of the business while achieving economies of scale in the operation is also one of the main objectives.

On 18 March 2005, Bursa Malaysia put it listed on the Main Board of Bursa Malaysia Securities Berhad. Bursa Malaysia in the present day consists of a Main Board, a Second Board and MESDAQ with total market capitalization of MYR700 billion (US$189 billion). The main index for Bursa Malaysia is Kuala Lumpur Composite Index (KLCI).

1.2.2 Jakarta Stock Exchange (JSX)

The origin of Jakarta Stock Exchange (JSX) traces back in 1910s which was started up under the Dutch colonial government. It halted for trading during World War I and II and reopened again in 1977. The new open stock exchange was under the management of the Capital Market Executive Agency controlled by Ministry of Finance.

On July 13, 1992, the bourse was privatized under the Jakarta Exchange Inc. The change transformed the functions of Bapepam to Capital Market Supervisory Agency. JSX was once launched a new developed system to boost the management of trading stocks namely Jakarta Automated Trading System (JATS) on March 22, 1995.

There are two stock market indices in JSX: JSX Composite and Jakarta Islamic Index (JII). JII was established in the regulation by Islamic Law (Syariah) in 2002 and it currently trading on the 30 corporate stocks on the list.

After five years passed in September 2007, the establishment of Indonesian Stock Exchange (with the merger between Jakarta Stock Exchange and Surbaya Stock Exchange) create bigger and stronger stock market in Indonesia which boosts Indonesia one step ahead.

1.2.3 Philippine Stock Exchange (PSE)

The Philippine Stock Exchange was formed with the combination of two large stock exchanges: Manila Stock Exchange (MSE) and Makati Stock Exchange (MkSE). On December 23, 1992, the two long separated bourses which traded on the same stock for the same companies was merged and become the present PSE.

PSE was able to implement its own policies and give out penalties on erring stock brokers, traders and companies with the granted status – Self-Regulatory Organization (SRO) by the Philippine Securities and Exchange Commission in year 1998. In 1999, the stock exchange transformed from the non-profit, no stock, and member governed organization into a revenue-earning corporation lead by president and board of directors. It was eventually listed itself on the exchange.

With the new implemented classification system, PSE was divided in to eight indices according to the industry sector: PSE All Shares Index (ALL), PSE Composite/Industrial Index (CI), PSE Composite Index (PHISIX), PSE Financial Index (BF), PSE Mining Index (MIN), PSE Oil Index (OIL), PSE Property Index (PTY) and PSE Small and Medium Enterprise Index (SME).

1.2.4 Singapore Stock Exchange (SGX)

Singapore Stock Exchange Limited (SGX), the Asia-Pacific's first demutualised and integrated securities and derivatives exchange was established on 1 December 1999. It was the subsequent of the merger of the two recognized and well organized financial institution which was namely Stock Exchange of Singapore (SES) and the Singapore International Monetary Exchange (SIMEX).

SGX is the only controller of Singapore securities exchange and derivatives exchange and the clearing houses. It offers a comprehensive and efficient infrastructure for investors to trade financial products and raising capital.

History shows SGX was the first exchange in Asia-Pacific to be listed through a public offer and private placement on 23 November 2000. MSCI Singapore Free Index and the Straits Times Index, for instant, both are the component of benchmark indices on the bourse where it is being listed. SGX is a huge leading securities exchange which was the Asia earliest fully trading through electronic exchange.

The SGX is divided into SGX Mainboard and the SGX SESDAQ for all the listing company. This market is well known as a trading platform of variety derivative securities. This leading stock market was the first exchange in Asia to offer equity index futures and become the world's widest range of Asian index futures.

1.2.5 Stock Exchange of Thailand (SET)

The formation of the Stock Exchange of Thailand was in the 1960's. The first five –year National Economic and Social Development Plan was formed at that time to propose for the improvement of the economic growth and stability and to develop the populations' standard of living. Five years later, the Second National Economic and Social Development Plan (1967-1971) proposed to develop a well-ordered securities market in order to enhance the mobility of addition capital for the economic boost of the country.

The stock market of Thailand transformed twice in the history. The Bangkok Stock Exchange was the first stock exchange available in the nation. It transformed to the Securities Exchange of Thailand.

The Bangkok Stock Exchange was once inactive due to the failure in this privately owned exchange caused by two factors: (1) lack of government support, (2) limited understanding of investor on equity market. However, the inactive did not go through a very long period. The stock exchange was reactive as 'The Securities Exchange of Thailand' initiated by Government in 1971 with the new enacted of regulatory framework on operations of finance and securities companies. The reactivated stock exchange was official began trading on April 30, 1975. The stock exchange revamped its name to The Stock Exchange of Thailand on January 1, 1991.