Faculty of Economics and Business

# RELATIONSHIP BETWEEN STOCK RETURN AND FINANCIAL RATIOS: EVIDENCE FROM MALAYSIA

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This thesis is submitted as a fulfilment of the requirements for the degree of Master of Science in Finance.

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**Statement of Originality**

The work described in this dissertation, entitled
"**Relationship between Stock Return and Financial Ratios: Evidence from Malaysia**"
is to the best of the author's knowledge that of the author except
where due reference is made.

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**ABSTRAK**

**HUBUNGAN ANTARA PULANGAN SAHAM DENGAN NISBAH KEWANGAN:
BUKTI DARI MALAYSIA**

**Oleh**

**ANG HUI MEI**

Karya ini mengkaji kuasa menghuraikan hasil dividen, hasil pendapatan dan nisbah buku-kepada-pasaran ke arah pulangan saham masa depan di Malaysia. Panel Regresi Analisis dijalankan untuk menentukan hubungan manakala semakan diagnostik dan pemeriksaan keteguhan juga dilaksanakan untuk memastikan keputusan regresi adalah bebas daripada sebarang penyimpangan ekonometrik. Keputusan kajian ini menunjukkan nisbah buku-kepada-pasaran boleh digunakan untuk menjelaskan pulangan saham masa depan dalam tempoh sampel penuh, sebelum krisis, semasa krisis dan selepas krisis manakala hasil dividen menunjukkan kuasa penerangan yang lemah dalam pra-krisis sahaja. Oleh sebab kedua-dua hasil dividen dan nisbah buku-kepada-pasaran boleh digunakan untuk meramalkan pulangan saham masa depan, hal tersebut telah bercanggah dengan kecekapan pasaran separa kuat. Justeru, kami mempercayai bahawa pelabur-pelabur mempunyai kemungkinan untuk mengatasi prestasi pasaran.

**ABSTRACT**


**RELATIONSHIP BETWEEN STOCK RETURN AND FINANCIAL RATIOS:
EVIDENCE FROM MALAYSIA**



**By**


**ANG HUI MEI**

This paper examines the explanatory power of dividend yield, earnings yield and book-to-market ratio towards future stock return in Malaysia. Panel Regression Analysis was performed to determine the relationship while diagnostic checks and robustness checks were executed to ensure the regression results are free from any econometric biases. The results of this study show that book-to-market ratio can be used to explain future stocks returns in full sample period, pre-crisis, during crisis and post crisis whereas dividend yield portray weak explanatory power in pre-crisis only. Since both dividend yield and book-to-market ratio can be used to predict future stock return, therefore it has contradicted with semi-strong form of market efficiency. Hence, it is believed that there is a possibility for investors to outperform the market.

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# CHAPTER ONE

# INTRODUCTION

## 1.0    Introduction

Greed is often used to describe unlimited desire. This can be seen from the fact that most individuals today who are with increasingly savvy science advancement and technology are struggling to fulfill their desired lifestyle. However, to achieve that lifestyle, a fixed pay will never be sufficient for most people as it is hard to produce additional wealth.

"…life is not long enough;—human nature desires quick results, there is a peculiar zest in making money quickly, and remoter gains are discounted by the average man at a very high rate[1]." (Keynes, 1935)

Because of this human nature, it is normal for people to want 'great returns with minimal effort'. Hence, it is common to see long queues in the lottery shops where the people are attracted by the cumulative rewards that can be gained from just a little amount of money. Ironically, what they never realize is that they are actually making the contribution towards the cumulative reward as it is a game that bets luck on little possibilities. Games in casinos use the same concept too. There are a lot of visitors every day, but not many will actually win, even after numerous visits.

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[1] The quote is obtained from Chapter 12 of The General Theory of Employment, Interest and Money by Keynes (1935).

The money invested into these games will fare much better if it is injected into something that can make clear, promising, and productive contribution. For instance, fixed deposits and government bonds like treasury bills are some choices that offer both safety and steady investment. Although this type of investment does contribute to the economy and guarantee additional revenue, it takes a long time to replicate the investor's wealth profile. This has prompted many investors to divert their income into other investments that can give returns within a shorter time period, most prominently the stock market.

The stock market is an alternative investment platform which is able to generate profit in short hauls, but with certain levels of risk. It enables individuals and companies to trade stocks and derivatives at an agreed price. What makes the stock market attractive is that the liquidity of the exchange allows investors to trade securities easily. Since every investment does carry some risks, all investors, to different extent, has to play the role as a risk taker or a risk averse. The traditional mindset - the greater the risk, the greater the return; is definitely wrong. This is because 'the water that bears the boat is the same that swallows it up', so there is no certainty that greater risk will always promise greater return; it bears the risk for greater loss as well.

Investors are often perplexed on the possibility to earn great return with minimum risk. The answer to this question often lies in stock return prediction for investors around the world as it fulfils what the investors desire (Kheradyar, Ibrahim, & Nor 2011). However, before any investment decision is made, investors have to be equipped with sufficient knowledge and understanding on the financial reports and

information of the firms. In other words, analyses on the firm performance as well as identifying the major factors that determine the return of the investment are needed in order to ensure for better selection of common stocks for the investments.

## 1.1     Stock Valuation Analysis

Company reports, announcements, financial internet sites and official web sites are the important sources to assess for valuable information of a certain company. Madura (2009) claimed that ultimate financial characteristics such as earnings, dividends and many more are important sources in the analysis. If there are any changes on the ultimate financial characteristics, either in the firm or the others in the related industry, the effect will be reflected on the firm's stock price. Fundamentalist will tend to transform the ultimate financial characteristics into ratio forms like dividend yield, price earnings ratio and others to better understand the firm's current financial position as well as to make prediction on its future outcomes.

Nevertheless, in the point of view of Keynes (1935), stock valuation is not for accessing the fair value of a stock but a convention that serves for stability and liquidity of the investment provided it is a continuous process. Both perspectives are correct as both serve for better investment. Therefore, it is essential to unlock the secret hidden behind the association between stock return and financial ratios before any investment decision is made.

### 1.1.1 Stock Return and the Association between Stock Return and Financial Ratios

Basically, stock return is known as the profit or loss of a common stock for a particular period of time. It is the fraction of a publicly-traded company's earnings by the money invested in common stock. There are two types of returns to the shareholders which are total return and return. Shareholder total return is inclusive of capital gains and dividends while shareholder return only consists of capital gains[2]. Both indicate how well a company performs. Greater stock return reveals that the firm is doing well and it is profitable whereas lower return portrays the opposite.

Stocks with superior excess of return have always been targeted by investors. In order to find out stocks with the potential of superior excess return, an analysis on the association between stock return and financial ratios is carried out. Since different financial ratios carry different information and meanings of the company, thus it is believed that financial ratios carry some explanatory power on future stock return. As documented in Lewellen (2004), dividend yield, earnings yield and book-to-market ratio had a strong theoretical background in terms of explanatory power on stock return which resulted from specific characteristics of the ratios as compared to other financial ratios. Firstly, the ratios have stock prices as their denominator and consequently either the high or low of value that resulted from the ratio will indicate the future returns. Besides that, the ratios follow time variation in discount rates and thus it will be positively related to discount rate. Moreover, the ratios are able to explain future stock return as they capture the information about risk premium.

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[2] The information is taken from Morningstar Inc. (2010).

### 1.1.1.1 Dividend Yield

It is the fraction of dividends per share over market price of common stock. According to Fraser and Ormiston (2010), it is defined as the rate that gained by shareholders from dividends proportionate to current stock price. Generally, a higher dividend yield is preferable when both firms paid the same amount of dividend per share but with different share price. Higher dividend yield indicates that the firm is more profitable and thus it is able to give more spare cash for investors.

However, as revealed by Clark (2013), stocks with highest yield are not necessarily always the best choice as one might fall into dividend yield trap. As mentioned above, the denominator of dividend yield is the stock price. If the stock price of the firm fall while the company still remain paying the same amount of dividend per share, then there will be a boost in dividend yield. Otherwise, in another case where the company pays uncommonly high dividends, it will also cause high dividend yield. Normally, high dividend yields are the result of the fall of the stock price. The drop of the share price could symbolize the instability of the financial status of the firm in near future. It will be considered as a good investment if the fall of the stock prices is temporary. Conversely, if it is permanent, then it is the stock that has to be avoided as well as excluded from the portfolio. Therefore, it is essential to do further research on the firm as well as using other metrics for evaluation before any investment is made.

### 1.1.1.2 Earnings Yield

Gildersleeve (1999) documented that this financial ratio can be generated by two types of formula which are per share calculation and dollar amount of calculation. Per share calculation refers to the division of net income per share of common stock over share price of common stock. It is also the reciprocal of price earnings ratio. On the other hand, dollar amount of calculation is the fraction of net income applicable to common stock over the multiplication of share price of common stock with weighted average number of common stock shares issued and outstanding. It is used to determine the proportion earned by the company per dollar invested. Besides that, this ratio is also employed by investment managers who seek for optimal asset allocations.

There is no doubt that a higher earnings yield is preferable as it implies greater return for every dollar invested. Moreover, it was also recorded that higher ratios do not guarantee for better performance as well as a promising return. There are two types of condition that will trap investors. First, it is due to the behavior of the investors, who will purchase more and escalate the stock prices when they foresee large degree of future earnings potential. The second condition is the rise of earnings yield that caused by the fall of the stock price of the firm which might resulted from the slowdown of the firm. Investors were often trapped as they are unaware of the actual condition of the firm. Hence, it is always advisable to conduct thorough studies of the firm as well as exercise on more metrics for evaluation.

### 1.1.1.3 Book-to-Market Ratio

Brown (2012) claimed that this financial ratio links the book value of a firm's equity to the market value of the equity. In general, the book value refers to the historical cost which resulted from the subtraction of liabilities from assets of the firm while the market value is the market capitalization of the firm that is the product of stock price and the share outstanding of the firm.

Besides that, it is also the inverse of price-to-book value. Azzopardi (2006) stated that it enables comparison between book values and market values. It also can be served as an instrument for investors to find out the actual worth of the firm that is related to the market price. Thus, this ratio is able to identify whether a firm is undervalued or overvalued. As mentioned by Capaul, Rowley and Sharpe (1993), stock price is an assessment of firm's future prospect for investors. Therefore, the firm will be labeled as overvalued when investors have higher expectations on future prospect of the firm than the actual value the firm. In other words, if the ratio turns out to be less than one, it means that the firm is overvalued and vice-versa. Normally, higher ratio stock will be a superior choice for the investors to add in into their portfolio as the undervalued stocks have the potential to gain greater earnings.

## 1.2 Overview of Stock Market in Malaysia[3]

Bursa Malaysia is the major stock exchange of Malaysia that governs and regulates the stock market. Other than that, there are the main market and Access Certainty Efficiency (ACE) market which are the markets for securities of the stock exchange. The main market consists of 814 listed companies while the ACE market has 109 listed companies. Both markets had achieved the total market capitalization of RM 1,702 billion in 2013 (Annual report of Bursa Malaysia, 2013).

In the early 1930s, Bursa Malaysia was known as the Malayan Stockbroker's Association and no shares were traded during that time. Shares were only traded publicly after 30 years when the Malayan Stock Exchange was established. Later, the Stock Exchange of Malaysia was found in 1964. Due to the secession of Singapore from Malaysia in 1965, it became to be known as Stock Exchange of Malaysia and Singapore (SEMS). Nevertheless, SEMS was separated in 1973 as a consequence of the currency inter-changeability between the two countries. Before the operation was taken over by a new company that had been limited by guarantee, its name was Kuala Lumpur Exchange Berhad (KLSEB). It was then changed to Kuala Lumpur Stock Exchange (KLSE) in 1976. It took about 29 years to become a demutualized exchange and before it was finally re-named as Bursa Malaysia Berhad.

Prior to the introduction of FTSE Bursa Malaysia index in June 2006, Kuala Lumpur Composite Index (KLCI) was the main index used. This index series was jointly developed by Bursa Malaysia and the FTSE Group to provide a complete and

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[3] The main discussion in this section is adopted from Bursa Malaysia (2014) and its annual reports.

comprehensive set of indices to investor. Subsequently, it was renamed to FTSE Bursa Malaysia KLCI (FBM KLCI) after the enhancement of KLCI in July 2009. The methodology employed to calculate the index is based on market capitalization which emphasizes on free float and liquidity.

**Figure 1: Daily Closing Price of FBM KLCI and the Trading Volume, 2000-2013**
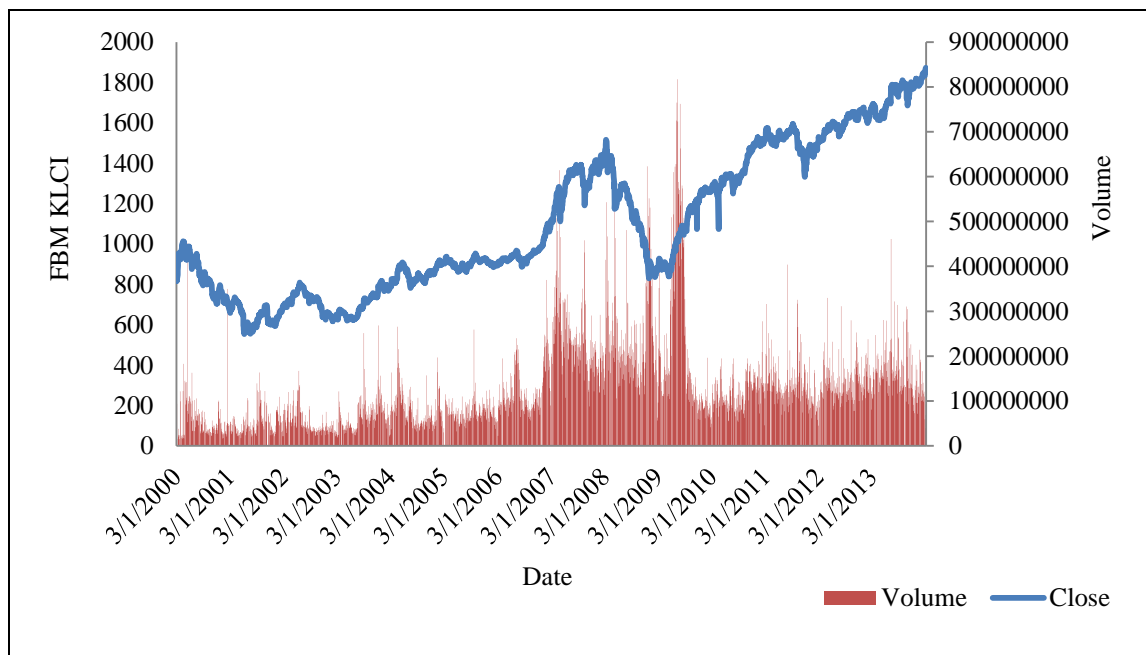


Source: Yahoo Finance (2014).

Figure 1 above depicts the historical composite index of Malaysia. The movement of the stock market had been quite volatile throughout the years. The climax was at 1516.22 points on 1st November 2008 whereas the lowest point was recorded on 9th April 2001 at 553.34 points. The fall that started from end of February in 2000 until the first half year in 2001 was caused by several reasons. According to the annual report of Bursa Malaysia in 2000, the downward pressure was due to the correction in KLCI and was aggravated by the volatility in Nasdaq Composite Index

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(NASDAQ) and Dow Jones Industrial Average (DJIA)[4]. Besides that, the forced-selling and margin calls by the stockbrokers and other domestic issues like restructuring of telecommunication companies, merger program for stock broking industry and liberalization of brokerage fee had also contributed to the downfall. At the same time, there were some other regional factors such as the weakening of Japanese economy and political tension in Taiwan. Although there were efforts on enhancing the local market performance by Morgan Stanley Capital International (MSCI) and KLSE, it did not contribute to any significant improvement.

In general, the annual report of Bursa Malaysia in 2001 showed that the downtrend in the early 2001 was mainly driven by the uncertain direction of global economy. Besides the political threats from the economic slowdown in the US, the escalating crude oil prices also dampened the performance of local stock market, especially on the Malaysian exports. However, it started to improve gradually from the lowest point after the release of the Eighth Malaysia Plan (8MP). The three key thrusts that boosted the local economy were the shift from growth to knowledge-driven approach; expedited structural changes in agriculture, manufacturing and services sectors; and intensified socio-economic stability. It is believed that the release of 8MP succeeded in building up the confidence of the investors towards the market as well as motivated the local firms for better performance.

The stock market indicated a significant upward trend in 15th June 2006. It started to increase from 886.48 points until the climax and reported a growth of 174.01 percent from the lowest point. As reported in the annual report of Bursa

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[4] It is the risen price of technology stocks at an unprecedented rate which succumbed the selling pressure in the US market during the last quarter of 1999 causes the severe correction in the US market. This matter has brought some effects to Malaysia as well as other regional bourses.

Malaysia in 2006, the cut in crude oil prices; steady US interest rates; the release of announcements regarding infrastructure and economic plans and bio-diesel initiatives; and mounting merger and acquisition of private and listed companies in the market were the internal and external factors that contributed to the bullish market. All these attracted many active foreign purchases in large cap KLCI stocks and thus it bolstered the KLCI gains in the last quarter of 2006.

The stock market again collapsed disastrously after the outbreak of US Subprime Mortgage Crisis in the last quarter of 2008. It slumped about 45.30 percent from the climax to 829.41 points on 29th October 2008. The annual report of Bursa Malaysia in 2008 documented that the government offered RM7 billion economic stimulus packages to mend the market condition after the occurrence of the crisis. Besides that, Bank Negara Malaysia (BNM) also reduced the overnight policy rate to 3.25 percent and statutory reserve requirement to 3.5 percent to increase the liquidity of the market as well as to enhance the confidence of investors. The responsive strategies were timely as the market showed some recovery after the action taken by the government and BNM.

The stock market continued to improve gradually in 2009 due to the continuous efforts of the government and BNM. The recovery was further enhanced by the positive earnings of US corporates which also added to the sentiment in tandem with other regional peers. However, the stock market encountered a second shrinkage on 9th February 2010 to 1233.86 points. Bursa Malaysia claimed that the shrinkage was induced by the continued concerns over contagion risks from Greece's debt crisis in its year 2010 annual report. Nevertheless, the stock market still managed to

progress after the depression in consequence of the efforts from government, BNM and the boost in US economy.

The growth remained stable until 19th September 2011. Then, the market experienced another dip and hit its lowest points of 1331.8 on 26th September 2011. This was attributable to the concerns on the deterioration of Euro zone debt crisis, as avowed in the annual report of 2011. The report came along with the warning on substantial downside risks to the economy by the US Federal Reserve as well as the demotion of credit ratings on three major banks in US. In Malaysia, the uncovering of Malaysian Budget 2012 injected some level of confidence into the local market and this has also aided the recovery process. Thus, the market continued to move on after the slop and documented with the closing price of 1530.73 points on 30th December 2011.

## 1.2.1    The Malaysian Stock Market during the Hit of Subprime Mortgage Crisis

The catastrophic financial crisis in 2007, as mentioned by Kregel (2008), was induced by the collapse of the subprime residential mortgage market in the United States.  The effect was jointly felt by many countries due to a widespread exposure of financial derivatives from the US real estate assets which then spiralled to a downfall in global trade.  As expected, Malaysia was not spared from the impact. Figure 2 below shows the trend of FTSE Bursa Malaysia index from year 2005 until 2012.

**Figure 2: Trend of FTSE Bursa Malaysia Index**
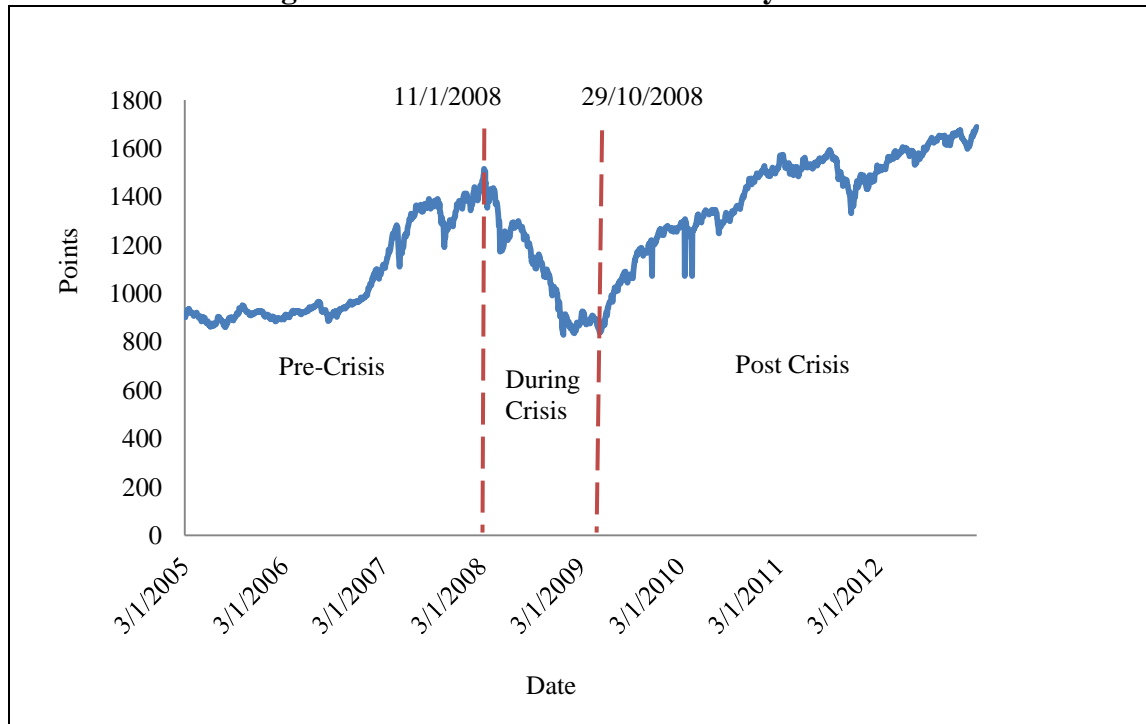


Source: Yahoo Finance (2014).

Figure 2 above clearly indicates the period for pre-crisis, during crisis, and post crisis in Malaysia. The climacteric hit Malaysia on 11th of January in 2008 and the index started to decline from 1516.22 points to 829.41 points on 29th of October 2008. In other words, the impact of the crisis lasted around ten months in Malaysia and has brought down Malaysia's economy and financial system to a certain extent, causing a drop of 686.81 points during the crisis.

Although it seems that the overall market has dampened by the Subprime, as recorded in The Report Malaysia 2008, Yeah[5] stated that the Subprime only spooked some investors instead of the market as the degree of indirect exposure through collateralized mortgage obligations held by Malaysian banks was negligible. The Finance Ministry of Malaysia, who had learnt a good lesson from the Asian Financial

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[5] The Chief Economist at Rating Agency Malaysia (RAM) Holdings.

Crisis, had kept the external borrowing low and consequently and this has narrowed the attack of Subprime.

Besides that, Malaysia also had strong economic fundamental. There was a slight improvement in September 2008 which resulted from the rose of crude palm oil (CPO) after strong performance in plantation sector. The saviour behind was Sime Darby, the world's largest listed plantation group, as it played the role as market leader during that time to attract fund managers. It was also the expected most liquid stock with the largest market capitalization and there were lots of investors who were optimistic with its future prospect during that time. Subsequently, the market hit 1413.7 in October which was due to positive investor sentiment over expectations on the reduction of interest rate in US as well as the performance on both construction and property sectors (The Report Malaysia 2008).

### 1.2.1.1 Concluding Remark

It seems that the market wasn't absolutely bad and discouraging investors from any investments. It does provide golden opportunity for investors to make profitable investments given that investors enable to foresee the opportunity. For instance, investors who have invested on Sime Darby during that time, he or she should have gained about RM3.24 per share from that stock as the stock price during 11/9/2008, which was the lowest point before it risen up, was RM5.95 per share while the stock price on 31/12/2014 was RM9.19 per share. Certainly, there were some other stocks whose stock prices also boost up from the bottom point during the

recession such as Nestle Malaysia Berhad[6], Mah Sing Group Berhad[7] and others. Hence, it has proven that opportunity for profitable gain can be achieved even if the stock market was bear.


## 1.3     Theoretical Framework


## 1.3.1     Rational Expectation Theory


This theory was proposed by Muth (1961). It has been used in the economic theory for quite some time and has also been referred as 'waves of optimism and pessimism' in determining the economic activity by Keynes. Basically, it is the anticipated action that is based on past information.


Elliot (1986) expressed that information will be gathered until the point where the marginal benefit is equivalent to the marginal cost of the collection before an expectation is formed. Then, both the information gathered and the predictions done by the economic forecasters will be formed into an expectation towards the upcoming changes in the economy. Since the pre-announcement on the expansion or contraction of the economy does not have any influence on the real economy, individuals with rational thoughts and anticipation will not be cheated by the money illusion if there are any changes in the economy.

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[6] According to Yahoo Finance (2014), the lowest stock price was RM25.50 per share on 06/02/2008 while the stock price on 31/12/2014 was RM68.50 per share. The gain on this stock was about RM43.00 per share.
[7] Based on the information obtained from Yahoo Finance (2014), the lowest stock price was RM1.00 per share on 08/07/2008 whereas the stock price on 31/12/2014 was RM2.07 per share. The gain on this stock was about RM1.07 per share.

Certainly, expectations and outcomes are two different flows. Sargent (2008) pointed out that there are people who think that the future will always evolved steadily from the past in recurrent situations, so they tend to adjust their forecasts to conform to that stable pattern. However, the concept of rational expectations emphasizes that the outcomes may not always occur in favor with the expectations as there may be forecasting errors. Nevertheless, it is speculated that the forecasting errors will not persistently occur on one side or the other. Therefore, this concept has become the building blocks for some theories in the economics which includes efficient market hypothesis (EMH) and random walk hypothesis (RWH) in the securities pricing.

## 1.3.2 Efficient Market Hypothesis (EMH)

The idea of EMH was originated from Fama (1965). It consists of three forms of market hypotheses which differ by the degree of information reflected in the stock prices. When the market efficiency is weak, the current stock prices fully reflect all security market information such as historical stock prices, rates of return, trading data volume and others. This hypothesis indicates that the past information of security market should have no relationship with future rates of return. Nevertheless, investors are still able to gain little profit by using the past data to trade their securities.

Brown (2012) pointed out that in the case where the current stock prices fully reflect all publicly available information such as annual reports, financial press, earnings and dividend announcements and etc., the market efficiency is termed as

'semi-strong'. In this case, investors are still able to generate profit based on the public information. However, the profit gain is not above-average risk-adjusted profits as the cost of trading is taken into account and stock prices will also adjust immediately to the public information.

As for the strong form of market efficiency, the stock prices reflect all the existing information. Since all the known information is utilized optimally by the market participants, therefore the investor can neither generate profits nor outperform the market under such circumstances; this is true even for the insiders inclusive of the company's management as well as the member from the company's research department (Brealey, Myers and Allen, 2008, p. 359).

## 1.4    Problem Statement

Mispriced of securities do occurs in the stock market, in which there is a discrepancy of the stock's intrinsic value and its market value. The reasons that caused to pricing discrepancies of securities remain in dispute. As documented in the past studies, the mispriced of securities might be caused by over-react of stock prices on firm's specific information (Jegadeesh and Titman, 1995), trading volume of the stocks (Lee and Swaminathan, 2000), liquidity of the stock market (Acharya and Pedersen, 2005; Sadka, 2006), information asymmetry and agency costs (Pantzalis & Park, 2008) and others. Accordingly, stocks will be either overvalued or undervalued. Based on the findings in the previous studies, the pricing discrepancy seems to be

occurred at any time regardless the market and economic conditions of the country provided that it hits any factors above.

Since the basic objective for every investor is aiming for a profitable return and thus identifying undervalued stocks is one of the ways to obtain profitable return from stock market. Besides that, they also wished to beat the market. However, the analysis done to access the intrinsic value of a stock is based on the past information of firm as the latest information only can be obtained from last interim report of the firm. Therefore, it raises an issue on whether past information still able to reflect the current intrinsic value of the stock. Financial theory like EMH assumes that all information available is reflected on the prices of the securities (Fama, 1965). It means that past information of security market have no relationships with future rates of return and thus the investor can neither generate profits nor outperform the market under such circumstances. In short, the intrinsic value of the stocks that they have accessed might be misleading.

Nevertheless, anomalies do occur in the real investment world. There are investors who have succeeded in outperforming the market consistently without taking unreasonable risks by using fundamental analysis – identify undervalued stocks. According to Willis (2003), Peter Lynch, who focused on company's fundamental, had beaten the Standard and Poor (S&P) 500 with the average of 13.4 percentage points annually in his 13 years of managing Fidelity's Magellan fund[8]. In addition, as pointed out by Light and Lauricella (2011), Bill Miller[9], who focused on value investing, had also beaten the S&P every year from 1991 until 2005 by betting boldly

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[8] It is a domiciled mutual fund in US from the funds of Fidelity family.
[9] He is the chairman and former Chief Investment Officer in Legg Mason Capital Management.

on technology and financial stocks. Not only that, according to Loomis (2012), the Chairman as well as the President and Chief Executive Officer (CEO) of Berkshire Hathaway Inc., Warren Buffett, have beaten the S&P for a total of 39 years. Jain (2010) claimed that Buffett prefers to do a thorough research on the growth stocks and the management of the stocks before performing any investment. In fact, this is said to be the secret behind his historic success in the stock market.

From the anomalies above, it seems that there is a conflict between theory and facts as EMH stated that past information have no relationships with future rates of return while the successful stock market beaters have proven the different. The fundamental analysis, which was done by those successful market beaters before placing their investment, is the transformation of the figures in the financial report of the firm into ratios form – financial ratios. These ratios will aids in accessing the intrinsic value of the stock and subsequently superior return will be gained.

Empirically, financial variables like dividend yield, earnings yield and book-to-market ratios are the important variables in explaining stock market fluctuation (Lettau and Ludgvigson, 2001; Lewellen, 2004). As mentioned earlier on, these three ratios have some specific characteristics which makes them notable than other financial ratios in terms of stock return prediction. First, these ratios have stock prices as their denominator and thus either the high or low of value that resulted from the ratio will indicate the future returns. Besides that, these ratios follow time variation in discount rates as a result it will be positively related to discount rate. Moreover, the ratios are able to explain future stock return since they capture the information about risk premium. Since these three ratios enable to capture stock market fluctuation, thus

it might be useful indicators during the surrounding period of financial crisis. Then, investors can take advantage on it to generate profit instead of losses if its explanatory power towards future stock return is proven.

However, it is a hot arguable issue on financial studies of asset pricing as there are studies which support and against the explanatory power of certain financial variables. Furthermore, studies regarding using financial ratios as tools to predict future stock returns during the surrounding period of financial crisis are quite rare as most of the past studies concern about firm performance during the hit of financial crisis. Therefore, it will be an interesting finding if the financial ratios can be proven useful in predicting future stock return during the surrounding period of financial crisis.

In addition, most of the preceding studies are done within developed countries. Thus, it is important to keep in mind that the results are based on firms of their countries. Since there is a distinct difference in politics, economy, and society among all countries, the results may not always be applicable in other countries. The stock market of less developed countries has considerably lesser studies, but it is believed that these emerging markets can give more profit over time than those established market. Forbes (2012) revealed that even Gerald Minack, the global developed market strategist at Morgan Stanley, also prefers to invest in emerging market rather than the developed ones as they have more rooms to experience faster growth and thus can promise a better return in the investments. Furthermore, Forbes (2012) also showed that the North American fixed income strategist at Barclays

Capital – Jose Wyne, also encourages investors to go for Asian equities as its Sharpe ratio[10] is attractive.

Since Malaysia is one of the emerging markets located in Asia, it is believed that Malaysia also shares the great potential to grow in the future, thus investments has a great prospect. This study had come out with the hypotheses as below:

$H_0$ : Dividend yield does not consist of explanatory power on future stock return in Malaysia regardless the sample period.

$H_1$ : Dividend yield consists of explanatory power on future stock return in Malaysia regardless the sample period.

$H_2$ : Dividend yield does not consist of explanatory power on future stock return in Malaysia in pre-crisis period.

$H_3$ : Dividend yield consists of explanatory power on future stock return in Malaysia in pre-crisis period.

$H_4$ : Dividend yield does not consist of explanatory power on future stock return in Malaysia during crisis period.

$H_5$ : Dividend yield consists of explanatory power on future stock return in Malaysia during crisis period.

$H_6$ : Dividend yield does not consist of explanatory power on future stock return in Malaysia in post crisis period.

$H_7$ : Dividend yield consists of explanatory power on future stock return in Malaysia in post crisis period.

$H_8$ : Earnings yield does not consist of explanatory power on future stock return in Malaysia regardless the sample period.

$H_9$ : Earnings yield consists of explanatory power on future stock return in Malaysia regardless the sample period.

$H_{10}$ : Earnings yield does not consist of explanatory power on future stock return in Malaysia in pre-crisis period.

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[10] It is also known as Sharpe measure. According to Brown and Reilly (2009), it is a measurement for comparing the benefit of a portfolio to its risk and it is calculated by dividing the average return in excess of the risk-free rate with the standard deviation of the portfolio's return.

| $H_{11}$ | : | Earnings yield consists of explanatory power on future stock return in Malaysia in pre-crisis period. |
|---|---|---|
| $H_{12}$ | : | Earnings yield does not consist of explanatory power on future stock return in Malaysia during crisis period. |
| $H_{13}$ | : | Earnings yield consists of explanatory power on future stock return in Malaysia during crisis period. |
| $H_{14}$ | : | Earnings yield does not consist of explanatory power on future stock return in Malaysia in post crisis period. |
| $H_{15}$ | : | Earnings yield consists of explanatory power on future stock return in Malaysia in post crisis period. |
| $H_{16}$ | : | Book-to-market ratio does not consist of explanatory power on future stock return in Malaysia regardless the sample period. |
| $H_{17}$ | : | Book-to-market ratio consists of explanatory power on future stock return in Malaysia regardless the sample period. |
| $H_{18}$ | : | Book-to-market ratio does not consist of explanatory power on future stock return in Malaysia in pre-crisis period. |
| $H_{19}$ | : | Book-to-market ratio consists of explanatory power on future stock return in Malaysia in pre-crisis period. |
| $H_{20}$ | : | Book-to-market ratio does not consist of explanatory power on future stock return in Malaysia during crisis period. |
| $H_{21}$ | : | Book-to-market ratio consists of explanatory power on future stock return in Malaysia during crisis period. |
| $H_{22}$ | : | Book-to-market ratio does not consist of explanatory power on future stock return in Malaysia in post crisis period. |
| $H_{23}$ | : | Book-to-market ratio consists of explanatory power on future stock return in Malaysia in post crisis period. |

**1.5     Objective of the Study**

**1.5.1     General Objective**

The main objective of this study is to investigate whether financial ratios consist of explanatory power towards future stock return in Malaysia market.

**1.5.2     Specific Objectives**

The specific objectives of the study are as below:
  i.    To determine the relationship between stock return with dividend yield, earnings yield and book-to-market ratio during the full sample period;
  ii.   To determine the relationship between stock return with dividend yield, earnings yield and book-to-market ratio in pre-crisis;
  iii.  To determine the relationship between stock return with dividend yield, earnings yield and book-to-market ratio during crisis;
  iv.   To determine the relationship between stock return with dividend yield, earnings yield and book-to-market ratio in post-crisis.

**1.6     Significance of the Study**

This study provides a systematic analysis on the relationship between firm characteristics and stock returns across the listed firms in Malaysia, which is one of the emerging markets in Asia. The findings from the study enable the investors to be

knowledgeable about which financial ratios can better explain future stock return in different market conditions. This information is essential in guiding the investors to plan for a profitable investment or trading strategy that is applicable in different market conditions.

Besides that, every financial ratio does carry different information and meanings of the company. When the relationship between financial ratios and future stock return is verified, it also signifies something regarding the firms instead of the explanatory power on stock return. Therefore, the results enable to reveal the problems encountered by most of the firms in the market. Hence, this study also provides some suggestions to either resolve or mitigate the problems.

On top of that, the findings also enable to find out whether EMH is supported or opposed. The data used to construct this study can be easily obtained from publicly available reports of the firms. If the variable is found to be statistically significant towards future stock return in the analysis, it will denote that there is a conflict with semi-strong form of EMH. Whereas if it happens in the other way round, it means that semi-strong form of EMH is obeyed and this notifies that investors will not be able to derive above-average risk-adjusted profits from their transactions.

Furthermore, the findings of this study will also be able to determine whether there is the opportunity to outperform the market. If stock prices are found to follow a random walk, it will indicate that future price movement could not be predicted based on information about past prices. However, if it is discovered in the opposite way, then prediction on future stock prices can be made. Since the financial ratios consist

of stock prices, thus it can be said that the current financial ratios can be used to predict for future stock return too. As a result, this study enables to prove on the opportunity to outperform the market in Malaysia.

Lastly, since most of the prior literatures are based on developed markets, literatures in this field for the emerging markets like Malaysia are still evolving. Thus, this study also contributes towards the existing literatures which study on the relationship between financial ratios and stock returns in different market condition in Malaysia.

## 1.7    Scope of the Study

This study investigates whether stock return in Malaysian market can be explained by financial ratios. Data such as stock prices, FBM KLCI, dividend yield, earnings yield and book-to-market ratio were obtained from quarterly report of the firm, Yahoo Finance and Thompson Reuters Data Stream to conduct the study. The study included all the public listed firms in Bursa Malaysia. Quarterly time series data from the year of 2005 until 2011 were utilized for all the variables except for stock prices as stock return is calculated in one quarter in advanced.

There are five chapters in this study and it is outlined as the following: Chapter Two is the literature review, Chapter Three is the discussion about the methodology used in the study, Chapter Four consists of the result of the empirical analysis and lastly Chapter Five is the conclusions and the implications of the study.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.0     Introduction**

Related studies done by past researchers regarding this research topic is thoroughly examined and reviewed in this section. The empirical tests found in these studies are of utmost importance because they provide substantial evidence and support to this research.

**2.1     Reviews on Stock Return and Financial Ratios – Developed Countries**

Wolf's study (2000) was set up to resolve the existence of strong dependency structures and biases upon the estimation of regression coefficients which could cause incorrectness of the result from what was predicted. He applied the sub-sampling technique to study the predictive power of dividend yield towards stock returns on three different sets of data which included the New York Stock Exchange (NYSE) equal-weighted indices, NYSE value-weighted indices as well as the S&P 500 index. Besides that, he also did a simulation study to estimate small sample properties on stock return regressions. Both the sampling period of NYSE equal- and value-weighted is from December of 1947 to December 1986 while the data set of S&P 500 had a longer period which began from December 1947 until January 1995. Through the study, he found that the technique has presented the observed data in a very

intuitive and simple way where no modification was needed even if it wanted to change in other scenarios. Regardless, it was under a poor condition with the problems of dependency and heteroskedasticity, where this technique was also able to provide correct results.  In the end of his study, there was no evidence found for the predictability of stock return over short and medium horizons whereas only little evidence shown on the long horizon which is subjected with doubts.

Pinfold, Wilson and Li (2001) highlighted the effect of book-to-market ratio and size on New Zealand stock market by following the methodology of Fama and French (1992). They divided the stocks into a series of equally weighted portfolios with the prior concern on size and followed by book-to-market ratio. Then, they further divided them in into 10 equally weighted portfolios with 8 shares in each. Upon selecting the sample, they ignored firms with the market capitalization which were not more than N.Z. $20 million due to insufficient trading volume and did not take account of financial institutions, foreign companies, listed property trusts and listed index funds as their sample. The sample period was from 1st October 1993 to 30th September 2000. Their findings have shown that size effect is almost insignificant on stock return even though the market was large while book-to-market ratio did not improve predictive power to predict the stock return in New Zealand market. They concluded that it is hard to attain superior returns due to high variability of returns on a period-by-period basis that makes it risky and the small market size that makes it lack of diversification. Even reducing the number of portfolios does not help in increasing the potential benefits of the strategy.

With the concern on the condition of the variables in predicting stock return, Cremers (2002) studied the predictability of excess stock returns by utilizing the Bayesian framework. He employed the monthly data of all listed firms in S&P 500 dated from 1954 until 1988 in his study. He introduced a new method which takes consideration on large degree of model uncertainty whereby the priors enable reflection on the prior information in an economically meaningful and intuitive way. The study also took account on the perspectives of two types of investors, which are the sceptical and the confident, about the expected return on the predictive regression, the variance of the residuals as well as the number of predictors included. It was realized that the data which implied posterior probabilities were more supportive for stock return predictability for both types of investors. Besides that, six variables were clearly identified by the used of Bayesian methodology like past returns, dividend yields and earnings/price ratio; perform relatively poorly in this study. As for the out-of-sample results for the Bayesian average models generated by the use of rolling estimation windows, prediction was enhanced towards the classical statistical model selection methods and it was in line with the in-sample results with little evidence on predictability.

Lam (2002) examined the relationship between stock return and beta, size, leverage, book-to-market equity ratio, and earning-price (E/P) ratio in the Hong Kong stock market via the method of Fama and French (1992). The sample period was from July 1984 to June 1997. He claimed that the beta failed to consistently justify the average monthly stock return whereas the cross-sectional variation in average monthly returns over the period seemed to be captured by size, book-to-market equity and E/P ratios. Even though the ability in capturing cross-sectional variation in

average monthly returns for book leverage and market is certified, their effect will be dominated by the other three ratios if all the ratios are taken into account. Throughout the study, similar results were obtained for all sub-periods, months and size groups which are in line with the previous studies.

Lewellen (2004) investigated the predictive ability of financial ratios on the aggregate stock returns. He specially chose dividend yield (DY), book-to-market (B/M) ratio and earnings price (E/P) ratios as the variables for this study as they measure stock prices relative to fundamental besides sharing similar time-series properties. DY became the primary focus in this study since it drew attention in the literature. Lagged DY was used to regress the monthly return so as to avoid any problem caused by the overlapping return. He conducted the test for full sample period (1946-2000) and sub-sample period (1946-1972 and 1973-2000) for dividend yield while full sample period (1963-2000) and truncated sample period (1963-1994) for B/M and E/P. In the end of the study, the strong predictive power of DY was found in the full sample period as well as in the sub-samples while weaker forecasting power were discovered for both B/M and E/P in full sample period. Moreover, it was also discovered that the sample for the last few years carried large impacts on the results.

Due to the suspicious results in the past studies which involved high frequency in rejecting the null hypothesis on stock return predictability, Campbell and Yogo (2006) re-examined the evidence for stock return predictability. The motivation behind this was the realisation that stock returns which contained a lot of noise were the main reasons that lowered the prediction power of the financial variables.

Therefore, they proposed a new Bonferroni test which can be worked with standard regression methods, fairly complement with the general assumptions on the dynamics of the predictor variable as well as the distribution of the innovations and it was more efficient than those which have been proposed in the previous studies. Besides that, they also developed a pre-test to determine whether the conventional t-test will lead to a valid inference. They tested it on different series of data which include annual S&P 500 index for the sample period of 1871 until 2002 and value-weighted index on NYSE/AMEX for annual, quarterly and monthly data from 1926 until 2002. Through the utilization of the test developed, they discovered that earnings-price ratio predict returns for all frequencies in the sample period of 1926-2002 while dividend-price ratio only can predict returns at annual frequency. Moreover, they also found evidence on the predictive power of short-term nominal interest rate and long-short yield spread on stock return for the sample period of 1952-2002.

Daniel and Titman (2006) proposed a new way of decomposing book-to-market ratio to determine its predictability of future stock return. They employed the monthly data of all the listed firms in United States from July of 1968 until December of 2003 as their sample of their study. Before they decomposed book-to-market ratio into tangible information, which referred to the past and current performance in the accounting statements of the firm and intangible information which is the future performance, they conducted a correlation test on book-to-market ratio and past return. Subsequently, they continued with regression analysis and robustness check. Eventually, this decomposition method was found to be able to beat the findings in the previous literature. There is no relationship between future stock return and the past performance of the firm. However, they found out that there is a strong negative

relationship between future returns and intangible information. Moreover, they recognized both book-to-market ratio and composite equity issuance measure as a good proxy to forecast future stock returns.

Ang and Bekaert (2007) re-examined the conventional wisdom, which argued that the predictive power of dividend yield is stronger in long haul, from the previous studies concerning the predictability of stock return in aggregate market. Therefore, they investigated the predictive power of dividend yields on excess returns, cash flows and interest rates in both long and short horizon for few countries which included the US, United Kingdom (UK), Germany and France by employing present value model. The longer data set involved all the countries except for France and the sample period was from June 1953 until December 2001 while the shorter data set included all the countries and the sample period was from February 1975 until December 2001. Their findings showed that excess return can only be predicted by dividend yields at short horizons together with the short rate. They further detected that the short rate owned greater predictive power than dividend yield. Moreover, they also discovered that high future interest rates can be predicted by high dividend yield. Furthermore, they also determined that both dividend and earnings yield are good predictors for future cash-flow growth rates and their results are consistent with several previous studies such as Engstrom (2003), Lettau and Ludvigson (2005) and others.

Jiang and Lee (2007) have developed a new model, the log linear cointegration (LLCI) model, to explain the relationship between stock return, dividend yield and book-to-market ratio. The LLCI model is a linear combination of

excess stock returns with log book-to-market and log dividend yield. They have chosen annual data from 1946 until 2004 of all the firms listed in the S&P industrial index as their sample of the study. Firstly, three different models were constructed. The first model consisted of log linear dividend yield model; the log linear book-to-market as the second model and; the log linear cointegration model as the third model. The reason for this was to determine which model can better explain future profitability and excess stock returns. Next, the Augmented Dickey-Fuller (ADF), Phillips and Perron (PP) and Kwaitkowski, Philips, Schmidt and Shin (KPSS) tests were conducted to verify the existence of the cointegration vector among the variables followed by Vector Autoregressive (VAR) based cross-equation restriction tests to find out which model better fit the data. Subsequently, both Ordinary Least Square (OLS) and VAR estimates were exercised on the overall dataset to forecast expected returns before determining the forecast evaluation of LLCI model using the Diebold and Mariano (DM) test for the out-of-sample forecast and bootstrapping forecast for both in-sample-forecast. In the end of the study, it was proven that the LLCI model can better explain the predictive power of dividend yield and book-to-market ratio in excess stock returns than log linear dividend yield model and log linear book-to-market model which study the relationship towards excess stock returns alone.

Campbell and Thompson (2008), who are against the findings of Goyal and Welch (2007) that proved that historical average excess stock return have better forecasting power than other predictor variables on future excess stock returns, took up the challenge by re-investigating the predictive power of standard variables on excess stock returns. The financial ratios selected were dividend-price ratio, earnings-price ratio, smooth earnings-price ratio, book-to-market ratio, return on equity, T-bill

rate, long-term yield, default spread, inflation net equity issuance and consumption-wealth ratio. They employed monthly data from year 1872 until 2005 and further divided it into three monthly sample periods which were 1927 to 1956, 1956 to 1980 and 1980 to 2005. They tested the performance of all the firms listed in S&P 500 on both in sample and out-of-sample with different sample periods on the variables by regression analysis. Theoretically expected signs appeared on the regression coefficient and positive fitted values of the equity premium were the alternative restrictions taken into account in performing the test in order to suit on any theoretically motivated forecasting regression. Moreover, they also observed both the sign and magnitude of the regression coefficient on the valuation ratios. Finally, they discovered that only if weak restrictions are enforced on the signs of the coefficients and return forecasts, most of the predictor variables will have resulted in better performance for the out-of sample. They argued that it carries economical meanings for investors even though the explanatory power for the out-of-sample is small. Furthermore, the performance of valuation forecast on the out-of-sample can be enhanced by eradicating the necessity of short sample coefficient estimation on volatile stock returns.

Aono and Iwaisako (2010) presented the evidence of reexamination on the predictability of Japanese stock returns by using dividend yield. They extended the 'predictive regression' framework of Stambaugh (1986, 1999) by following the paper done by Lewellen (2004) and Campbell and Yogo (2006). Both monthly and quarterly data from 1970 until 2006 were utilized as the sample period. Finally, it was proven that the predictive ability of log dividend for future monthly stock returns when

lagged returns is included in the sample period that exclude from the bubble economy and also taken positive autocorrelation in monthly aggregate returns into account.

Ferreira and Santa-Clara (2011) employed the sum-of-the-parts (SOP) method to study predictability of dividend-price ratio, earnings growth and price-earnings ratio growth towards stock returns. Three ratios were decomposed and the forecasting ability was tested separately by exploiting its time series characteristics. The same data was used by Goyal and Welch (2008), which are all the listed firms in S&P 500 with a more recent sample period of 1927 until 2007. The descriptive statistics and correlation of the data set were determined before they were decomposed. At the end of the study, they discovered that SOP methods worked well on both the UK and Japan data whereby the predictive power was greater than US. In addition, both dividend-price ratio and earnings growth are found to have equal predictive powers on stock returns. Moreover, it was realized that the SOP method was also able to generate better gain for investors besides having better performance in out of sample than historical mean or predictive regressions. They claimed that the reason for generating better gain by utilizing SOP method is due to the absence of estimation error. They even suggested that the SOP method can be applied in the calculation of cost of capital for project and firm valuation.

Jiang and Lee (2012) furthered their study on stock return predictability by decomposing the financial ratios into a cyclical component and stochastic trend component. The same financial ratios, which are the dividend yield, earnings yield and book-to-market ratio were utilized in this study. The quarterly data of all the listed firms in S&P 500 from year 1926 until 2008 were chosen. At the outset, they

conducted ADF and PP tests to verify the stationarity of the data followed by correlation matrix to determine the correlation between the variables. Afterwards, the financial ratios were decomposed by utilizing the Kalman filter method recommended by Hodrick and Prescott (1997) before proceeding with the univariate and multivariate estimation using the OLS method. In addition, they also executed out-of-sample prediction. In the end of their study, they discovered that the decomposed financial ratios were able to predict future stock return and fundamentals in both long and short haul which contradicted with the previous findings. Furthermore, the out-of-sample prediction resulted that cyclical component of earnings yield can better predict market return while stochastic trend component of book-to-market ratio can better predict fundamentals. Moreover, they found out that prediction using cyclical components of financial ratios is able to enhance the returns and vice-versa for the stochastic trend components. They claimed that cyclical components mirrored local mean reversion effect whereas the stochastic trend component showed long-run persistence effect and this has supported the poor predictability of financial ratios in the short run which is on account of the offsetting effect. All in all, they had proven that the method of decomposing financial ratios aids to better prediction on future stock returns and fundamentals.

## 2.2 Reviews on Stock Return and Financial Ratios – Developing Countries

Aydogan and Gursov (2000) conducted a research to find out the predictive ability on future stock market returns of average price-earnings (P/E) and book-to-market ratios (PBV) in Turkey. They pooled the market averages of P/E and PBV of

19 emerging equity markets into quintiles and grouped them with the future returns within the next 3-months, 6-months and 12-months. The sampling period was 1986 to 1999. They performed econometric tests on the panel data by employing similar approach of Fama and MacBeth (1973) algorithm within an international capital asset pricing model (CAPM) framework. The coefficients were estimated by using Seemingly Unrelated Regressions (SUR) method with a common intercept term and fixed effects in order to eliminate the correlation of the error terms between the cross-sectional components. In the end of the study, they discovered that both P/E and PBV have predictive power on future return and particularly on long haul. Thus, they concluded that it can be used as a tool to develop the strategy of market timing as well as asset allocation in emerging equity markets.

Auret and Sinclaire (2006) extended the study of Van Rensburg and Robertson (2003) by adding book-to-market ratio in their study. The same data set from the study of Van Rensburg and Robertson (2003) was employed which is the monthly data from July 1990 to June 2000 for all the sectors of the listed firms in Johannesburg Stock Exchange (JSE). They have chosen five most significant variables; size, price-earnings ratio, cash flow to-price, dividend yield, price-to-net asset value that has been used in the study of Van Rensburg and Robertson (2003) and book-to-market ratio as the variables in their study. First, the univariate OLS regressions were performed to verify the explanatory power for every variable. Next, pairwise correlation test was conducted to determine which pair of the variables is highly correlated before they precede it to bivariate and multivariate regressions. They realized that there is a significant positive relationship between book-to-market ratio and stock return. In addition, they also discovered that book-to-market ratio has

almost completely subsumed the effect of size and price-to-earnings in both bivariate and three-variable regressions.

Chairatanawan (2008) conducted a study to determine the predictability of stock return with financial ratios in Thailand. He used the quarterly data from the first quarter of 1997 until the fourth quarter of 2004 – which was during the post crisis. A total of 65 listed firms were selected as the sample of the study after filtering it according to the method of selection criteria in Dreman (1982). Twelve financial ratios were employed as the independent variables in the study which represented the key financial ratios of profitability, liquidity, long term debt paying ability and investment ratios. He classified the ratios into three models: the first model studied the relationship between stock return with all the key financial ratios; the second model studied the relationship between stock return with all the key financial ratios except investment ratios; and the third model studied the relationship between market capital and all the key financial ratios. The Ordinary Least Square Regression Model (OLS) was performed to obtain the $R^2$. He found that there was no significant relationship between stock return and all the key financial ratios but a strong linear relationship existed between market capital and all the key financial ratios instead.

Lee and Lee (2008) studied the predictive power of dividend yield, earnings yield and capital gain towards future stock return in Malaysia. 78 listed firms were used as the sample of the study and monthly financial data from 1995 to 2005 were employed as the sample period of the study. First of all, they determined the stationarity of the data by conducting ADF, PP, and KPSS tests. Next, the OLS method was executed as the data were not stationary. They examined the predictive

power of the financial ratios by conducting the test on a financial ratio alone in an estimation as well as the predictive power when two financial ratios are allocated in an estimation. They discovered that the dividend yield had stronger predictive power than the earnings yield. Hence, they concluded that either the dividend yield or the earnings yield alone can be used for making portfolio decisions related with trading strategies. The combination of dividend yield and capital gain as well as the combination of earnings yield and capital gain are able to provide valuable information regarding trading strategy.

Allen and Bujang (2009) extended the study of Goyal and Welch (2003, 2006) to examine the explanatory power of dividend yield and dividend price ratios on stock market returns and equity premium on the Malaysian stock market. They obtained the monthly data of all the firms listed in the Main Board of Bursa Malaysia dated from 1990 to 2007. They further categorized the data set into three sub-samples which are before, during and after the financial crisis of 1997. ADF, PP and KPSS test were performed to determine the stationarity of the data. Next, Mincer-Zarnowitz (1969) executed the regression analysis to determine the relationship between the actual and forecasted stock returns and equity premium. They also did a comparison on their findings with the findings of Cochrane (2006). In the end of the study, they found out that their findings were consistent with the earlier study of Fama and French (1988) which confirmed the predictive power of both dividend yield and dividend price ratio towards stock returns and equity premium. Moreover, the forecasting result presented poor performances in all pre, during and post financial crisis. This was in line with the findings of Ang and Bakaert (2001), Goyal and Welch (2003, 2006) and Cochrane (2006).

Floros *et al.* (2009) employed the OLS method, Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model, and Error Correction Model Generalised Autoregressive Conditional Heteroscedasticity (ECM-GARCH) to investigate the stock return predictability by using financial ratios in Greece. They obtained monthly data of all the listed firms in Greek stock index dated from February 1992 until December 2004. The financial ratios selected were dividend yield, price earnings ratio and book to market value. Initially, they verified the stationarity of the data set by performing ADF test before they categorized it into 3 sample periods which are full sample from March 1992 to December 2004, in sample period from March 1992 to December 2002 and out-of-sample from January 2003 to December 2004 for further tests. They estimated the GARCH by utilizing Marquardt algorithm and Heteroskedasticity consistent covariance option. Then, they determined whether the series was cointegrated by executing Johansen cointegration test. Finally, they used the ECM-GARCH model to describe the equilibrium relationship and volatility of the series on both univariate and multiple regressions. For the forecasting part, they used root mean square (RMSE), mean absolute error (MAE) and Mean Absolute Percentage Error (MAPE) as benchmark for both static and dynamic forecasts. In the end of the study, their results showed that ECM-GARCH model is the best model for predicting future stock return.

Safari (2009) conducted a study about the interrelationship between dividend yields and stock returns in both bull and bear market conditions in Malaysia. A monthly sample period of 66 months from January 2000 until June 2005 was chosen. 60 listed firms were selected as his sample of the study and categorized into high dividend yield firms, medium dividend yield firms and low dividend yield firms. Then,

the relationship of dividend yield and stock return in the same month and also a one month lagged dividend yield with current stock return were studied by performing regression analysis. It was discovered that the simultaneous month dividend yield was insignificantly negative related with stock return and the vice-versa happened for the one month lagged dividend yield. The findings were different from the prior studies in the developed market where positive relationship between dividend yield and stock return in bear market, significant negative relationship between dividend yield and stock return in bull market were found. However, the significant positive relationship between dividend yield and stock return in both bull and bear markets were found. He argued that it is due to taxation effect as Malaysia does not apply the double taxation rule. Safari (2009) added that the difference in ownership structure of Malaysian firms also caused to the difference in the findings from the prior studies.

The findings of Tudor (2009) on the subject of investigating the relationship between stock return, beta, size, leverage, book-to-market equity and earnings-price ratios in Romania overthrew the Capital Asset Pricing Model (CAPM) besides supporting the explanatory power of book-to-market equity and earnings-price ratio on stock return. Tudor (2009) utilized the annual data of the entire listed firm on Bucharest Stock Return Exchange (BSE) from January 2002 until March 2008. Simple and multiple regression analysis were executed to determine the explanatory power of the price ratios. It was successfully proven that the Romanian market is not efficient as the two price ratios had strong relationship towards future returns in the equal-weighted portfolio that she has constructed in her study. She added that the failure of CAPM is due to the over-extrapolation of past performances by the investors and the unrealistic assumptions of CAPM.

Kheradyar *et al.* (2011) investigated whether financial ratios as empirical predictors of stock return is true in Malaysia. They employed monthly data set of 960 listed firms in Bursa Malaysia from January 2000 until December 2009 as their sample of their study. First of all, they examined the stationarity of the data by conducting ADF, PP, Im, Pesaran and Shin (IPS) and Levin, Lin and Chu (LLC). After confirming the stationarity of the data, the predictability of dividend yield, earnings yield and book-to-market ratio alone with future stock returns were examined before being combined into a model and tested with Generalized Least Squares (GLS) method. Besides that, they also carried out the Ramsey RESET test to ensure no misspecification of omitted variable, incorrect function form and correlation between the independent variables and error terms. It was proven that book-to-market ratio has greater predictive power, which is consistent with Fama and French (1992, 1995), Kothari and Shanken (1997), and Pontiff and Schall (1998), then followed by dividend yield and earnings yield. They added that stock return predictability can be enhanced by combining the ratios.

Pour (2011) further confirmed the relationship between dividend yield and future stock return with the existence of moderating effect which is measured by the composite index in Malaysia. He used 180 listed firms in Bursa Malaysia and utilized monthly data from January 1991 until January 2011 as their sample of the study. There are four models created. The first model consisted of dividend yield and future stock return. The second model included future stock return, dividend yield and the interaction variable which was formed by multiplying market condition with dividend yield. The third model consisted of future stock return, dividend yield, market condition and the interaction variable. The last model was inclusive all the variables

in model 3 with the addition of size which was measured by logarithm market value of the firm. Then, the regression analysis was performed on the four models. Finally, he confirmed the moderating effect on the relationship between future stock return and dividend yield. Besides that, his findings also proved that the addition of moderation variable can enhance the explanation power of the model.

Khan *et al.* (2012) conducted a study to examine the relationship between stock return, dividend yield, earning yield and book-to-market ratio in Pakistan. They used the annual data from the sample period of 2005 until 2011 of 100 listed firms in Karachi Stock Exchange. For the measurement of variables, they adopted the method of Kheradyar *et al*. (2011) to define the variables. Before the tests were executed, firms were divided equally into two equal samples to produce different estimation from the two samples as well as to minimize the effects of random sampling errors. Besides that, they also formed two models which were simple regression models and a multiple regressions model. The simple regression models study the relationship between stock return with dividend yield, stock return with earnings yield and stock return with book-to-market ratio whereas multiple regressions model is inclusive of all variables. The GLS method was employed to tackle the heteroskedasticity problem and non-normality distributed residuals. They realized that both earnings yield and dividend yield were positively related with stock return while book-to-market ratio is negatively related with stock return. Moreover, they also discovered that the book-to-market ratio has stronger predictive power than both dividend yield and earnings yield. Furthermore, the combination of financial ratios was found to be able to enhance the predictability of stock returns.

## 2.3    Reviews on Stock Return and Financial Ratios – Mixed Evidence


Chen *et al*. (2010) investigated the relationship between firm characteristics and cross sectional stock returns on the Chinese market by using eighteen firm specific variables that had successfully predicted stock returns in the US. The variables include firm size, book-to-price ratio, momentum, earnings-to-price ratio, cash flow-to-price ratio, sales growth, accruals-to-total assets ratio, net operating assets-to-total assets ratio, capital expenditures-to-total assets, research and development expenditures-to-market value of equity ratio, advertising expenditures-to-market value of equity ratio, assets growth from prior year, change in gross profit margin, net cash flow received from external equity financing, net cash flow received from debt financing, idiosyncratic risk, trading volume turnover and illiquidity. Comparison was done on both China and US by using the two data sets which shared the similar sample period of 1995-2007.  Adjustment on the sign of each variable of the Chinese stock returns predictors were made before it is proceeded to the test as it was desired that each variable be made positively related to the stock returns. Examples of these are the US. Fama and French (1993) three-factor model which was employed to perform the robustness test and the procedure of Fama and MacBeth (1973) which was utilized to work out the time-series averages of the coefficients on each of the predictors. However, only book-to-market ratio, net operating assets, R&D spending, asset growth and illiquidity have the predictive power towards stock returns in China whereas ten out of eighteen predictors were found to predict the stock returns of  US. In short, the result proved weaker predictability in the Chinese market. They argued that weak predictability on the Chinese market did not indicate market

inefficiency, but it is due to high price inefficiency and the homogeneousness of return predictors in China.

Park (2010) conducted a study to determine the period when stock return can be predicted by dividend yield. He employed both monthly data of 15 years which started from year 1974 until year 2006 for 29 countries whereby different country started from different years as the sample of his study. He checked the stationarity of his data by using ADF test before he proceeded with Nyblom's test for the stability of the mean of stock returns. Austria and Chile were excluded from the following tests because the mean of stock returns of these two countries were constant in Nyblom's test. Next, the modified residual-based ratio test was utilized to find out the change in persistence. Lastly, predictive power of dividend-price ratio was assessed via the method of Campbell and Yogo (2006). In the end of his study, he realized that the predictive power of dividend-price ratio only exists when both future stock return and dividend-price ratio are non-stationary and it will lose its predictive power when dividend-price ratio is stationary. He added that the predictability of dividend-price ratio change accordingly with its persistency and thus he advised for careful use of the dividend-price ratio for portfolio choices adjustment by considering on its persistency beforehand.

**2.4     Summary of the Findings of Past Studies Done in Developed and Developing Countries**

**2.4.1     Stock Return and Dividend Yield**

Prior studies have proven the strong relationship of the three financial ratios towards future stock return. For the relationship between dividend yield and stock return, Floros *et al*. (2009), Aono and Iwaisako (2010), Pour (2011) and others confirmed the explanatory power of dividend yield in both developed and developing countries. The findings of Cremers (2002) and Campbell and Thompson (2008) showed poor explanatory power of dividend yield towards future stock return in US.

In terms of the length of sample period used in the study, there are different findings from previous studies even though some are using the same country as sample of the study. For instance, Wolf (2000) found that there was no predictive power of dividend yield towards future stock return in both short and medium horizon but discovered little evidence in long haul in US. Nevertheless, Ang & Bekaert (2007) noticed the predictive power of dividend yield in short horizons only in US, UK, France and Germany. Lewellen (2004) too, who used US as the sample of the study, he uncovered the strong predictive power in both long and short horizons. This might be due to different in the sample period as well as methodology used in the study.

On the other hand, in terms of the frequency in the sample period, Campbell and Yogo (2006) stated that the predictive power of dividend yield only can be determined at annual frequency. Besides that, Safari (2009) has proven that the one

month lagged dividend yield is positively related with future stock return in Malaysia and significant positive relationship is detected in both bull and bear markets. He supported that it was due to taxation effect and difference in ownership structure of the firm. Furthermore, the findings of Lee and Lee (2008) and Kheradyar *et al*. (2011) evidenced that dividend yield has stronger explanatory power that earnings yield.

### 2.4.1    Stock Return and Earnings Yield

The studies of Lam (2002), Tudor (2009), Jiang and Lee (2012) and etc has verified the explanatory power on earnings yield towards stock return. Both Cremers (2002) and Campbell and Thompson (2008) determined poor predictability of earnings yield in US while Lewellen (2004) demonstrated weak predictive power in long horizon in US. Moreover, the result of Campbell and Yogo (2006) has proven that earnings yield enable to predict future stock return in the data frequency of annual, quarterly and monthly. Additionally, both studies of Kheradyar *et al.* (2011) and Khan *et al*. (2012) suggested that combination of financial ratios enable to enhance the predictability of future stock return.

### 2.4.2    Stock Return and Book-to-Market Ratio

There are number of preceding studies that proven the predictability of book-to-market ratio on future stock return such as Daniel and Titman (2006), Chen *et al.* (2010), Jiang and Lee (2012) and many more. Aydogan and Gursov (2000) detected

the explanatory power in long horizon whereas both Lewellen (2004) and Campbell and Thompson (2008) found weak explanatory power in US especially in long haul.

In addition, there are also evidences that revealed the dominant effect of book-to-market ratio with other financial ratios. Such as the findings of Auret and Sinclaire (2006), they found that the effect of book-to-market ratio has almost covered the effect of other financial ratios in their studies. The results of Kheradyar *et al.* (2011) and Khan *et al.* (2012) too, unearthed that the predictive power of book-to-market ratio is greater than dividend yield and earnings yield.

## 2.5     Concluding Remark

The reviews above clearly indicated that literatures based on developing countries are not as much of those conducted in developed countries. Moreover, the time period used in the past studies is either in the long period or short period as the researchers believed that financial ratios do display different signalling power in different length of time. However, no literature was done on studying the predictability of future stock return by using dividend yield, earnings yield and book-to-market ratio in pre-, during and post financial crisis based on the reviews above. Thus, it is believed that studies which examine the effect of the signalling power of financial ratios in pre, during and post financial crisis can bring more contributions and able to provide useful insights to the investors. Yet it can be documented in the current literatures too. Furthermore, it is essential to treasure the developing countries

than the developed countries as it has more rooms for arbitrage. Hence, this research will add more value on the current literatures.

**CHAPTER THREE**

**METHODOLOGY**

**3.0     Introduction**

This chapter discusses the research design and the econometric techniques used to study the relationships among stock return, dividend yield, earnings yield, and book-to-market ratio. This shall begin with a brief discussion on research design, followed by data collection, model of research, variable discussion, and method of analysis. Further analysis was only performed after the data had been diagnostically checked to ensure that the data was free from econometric biases. Then, several regression analyses were carried out, which included Pooled Ordinary Least Square (PLS), Random Effects Model (RE) and Fixed Effects Model (FE) tests, to determine the relationship among the aforementioned variables. Lastly, robustness check was done to rectify the econometric problems as well as to minimize the standard errors in the model. Data estimation was completed using the STATA 11 software.

**3.1     Research Design**

The research was conducted to present empirical evidence on examining the relationship among stock return, dividend yield, earnings yield, and book-to-market ratio in full sample period - pre, during and post financial crisis. This study analysed all the public listed companies in Bursa Malaysia. The dataset was checked and

cleaned to eliminate outliers that would affect the results. The data were stacked and further categorized into three subsample periods, which were pre-crisis, during crisis and post financial crisis before being tested and analysed.

Firstly, diagnostic checks for multicollinearity, heteroskedasticity and serial correlation were conducted to ensure that the data was free from econometric biases before being subjected to regression analyses (the PLS, RE, and FE tests) to obtain the coefficients for each variable and each sample period. The best model was determined using the Breusch-Pagan Lagrangian multiplier (LM) test and the Hausman test. Time dummies were created to identify the time effect in the model and the insignificant dummy variables were dropped off to obtain the best regression result. Lastly, standard errors estimation in the presence of a fixed firm and time effect (the robustness check) was performed to resolve the econometric problems as well as to reduce standard errors.

## 3.2 Data Description

The data set used in the study comprised of the quarterly data on stock price (P), stock return (SR), dividend yield (DY), earnings yield (EY), and book-to-market ratio[11] (BTM) of all the public listed company listed before 2005. These terms are defined as follows:

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[11] This ratio is directly obtained from the interim report of the company.

P     =    close price of the stock

SR   =    the subtraction of close price of current quarter and close price of previous quarter divided by close price of previous quarter; $\dfrac{P_1 - P_0}{P_0}$

DY   =    the fraction of dividend per share (DPS) of current quarter from the interim report and closed price of previous quarter; $\dfrac{DPS_1}{P_0}$

EY   =    the fraction of earnings per share (EPS) of current quarter from the interim report and closed price of previous quarter; $\dfrac{EPS_1}{P_0}$

BTM  =    the fraction of book value of the ordinary equity of the firm (BV) and market value of the ordinary equity (MV); $\dfrac{BV}{MV}$

The dataset with missing values for delisted firms were excluded since it would augment the dataset and was free from survivorship bias. These three financial ratios - DY, EY and BTM were chosen to be the financial ratios in this study. These three financial ratios have stock prices as its denominator, and thus the value from the ratios indicate the future returns. In other words, the effect of any changes in the stock prices is directly reflected on the ratio. The mispricing view also explained that the ratios shall turn out to be low when stock prices are overpriced and vice-versa. Meanwhile, the rational pricing theory also described that these ratios track time-variation in discount rates. This means that the ratios shall be low when the discount rates are low and vice versa. Furthermore, these ratios have also been widely used in past studies and their strong relationship with future stock return in other countries is well proven.

All the data were collected from Thompson Reuters Data Stream, Yahoo Finance, and Bursa Malaysia. The sample period obtained was from 2005:Q1 until 2011:Q4. Quarterly data was chosen since a quarterly report is the most sought after by investors to perform their investment valuation. Not only that, this sample period could assist in determining the effect of financial ratios towards future stock returns in full sample period - pre, during and post financial crisis with attention paid to the 2007 financial crisis. In other words, this research was designed to study whether the financial ratios aforementioned carry the signalling power of future stock returns in full sample period (2005:Q1-2011:Q4), pre (2005:Q1-2007:Q4), during (2008:Q1-2008:Q4) and post crisis (2009:Q1-2011:Q4).

Financial crises, regardless of its scale, impact the economy and stock market other than causing uninformed or uneducated investors to suffer severe losses. However, the adverse impact can be minimized when investors are well-equipped with comprehensive investment plans and are able to make well-informed investment decisions. At such turbulent period, some investors are also able to grab the golden opportunity to generate wealth. Hence, it is well believed that, by employing this sample period to study the relationship between financial ratios and future stock returns, the results generated shall be able to provide useful insights for investors in facilitating their investment plans according to their risk appetite.

## 3.3    Model Formulation[12]

The panel model below shows the starting point of the analysis:

$$y = \alpha + ue_{it}\beta + \varepsilon_{it}, \quad i = 1,2,...,N \ ; \ t = 1,2,...,T \qquad (6)$$

where:

$i$      =  firms (cross section)

$t$      =  time (time series)

α      =  dependent variable of firms $i$ at time $t$

$ue_{it}$   =  scalar which captures the unobserved cross section effects

       =  $it$ th observation on the independent variables

β      =  $ue$ x 1

Time dummies are included in the specification.   α is a scalar which captures the unobserved cross section effects. Common one-way error component is used as the disturbances in the model with $\varepsilon_{it} = \lambda_i + \mu_t$ where $\lambda_i$ represents the unobservable individual-specific effect while $\mu_t$ denotes the remainder disturbances.

Equation (7) below is modified from Equation (6) above by replacing the variables used in the study and this equation was utilized for estimation.

$$SR_{it} = \beta_0 + \beta_1 DY_{1it-1} + \beta_2 EY_{2it-1} + \beta_3 BTM_{3it-1} + \varepsilon_{it-1} \qquad (7)$$

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[12] The information is retrieved from Hamzah and Lau (2011).

where:

SR    =  stock return

DY    =  dividend yield

EY    =  earnings yield

BTM   =  book-to-market ratio

$\beta_0$    =  intercept

$\beta_1 - \beta_3$  =  regression coefficients

$\varepsilon$    =  error term

$i$     =  firm

$t$     =  year

## 3.4    Data Analysis

Two types of software were used to analyse the data collected. Initially, descriptive statistic and correlation matrix were executed to determine the nature of the data. Next, diagnostic check was carried out to ensure that the data was free from econometric biases. This was followed by regression analyses - PLS, RE, and FE model tests to determine the best model. Robustness check was also performed to rectify any econometric problems as well as minimize the standard errors in the model. All tests were executed using STATA 11.

### 3.4.1    Panel Regression Analysis[13]

The assumption which states that homogeneity exists in the unit of observation when α is set to be equal to each other for all the *i* upon estimation while using the standard cross-sectional techniques can cause inconsistent and biased estimation if the cross section effects are, in fact, heterogeneous. On the other hand, pooled ordinary least squares model has complicated error process like the heteroskedasticity across panel units and serial correlation within panel units. In order to get a reliable and efficient estimation, either random or fixed effects model shall be utilized in the estimation to control the heterogeneity. Moreover, once restrictions are imposed on the overly restrictive OLS model to allow only the constant to differ over $i$, the heterogeneity is restricted to the intercept terms of the relationship. This restriction is applicable to the slope coefficients, which can be changed to have a non-changing constant for both units and time and an intercept which varies over unit or time.

The random effects model assumes that $\lambda_i$ is not correlated with the regressor and vice versa for the fixed effects model. There are two types of test to find out how to model the error term between the pooled model and the effects model. The first is the Breusch-Pagan (LM) test, which was employed to distinguish between the pooled model and the random effects model.  The second was the Hausman test, which was used to distinguish between random effects model and fixed effects model.

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[13] The information is obtained from Baum (2006) and Hamzah and Lau (2011).

LM value of the Breusch-Pagan LM test is generated from the pooled OLS residuals. The hypothesis of Breusch-Pagan and the model are as below:

$$H_0 : \sigma_\lambda^2 = 0$$
$$H_A : \sigma_\lambda^2 > 0$$

where $Y_{it} = X_{it}\beta + \varepsilon_{it}$ and $\varepsilon_{it} = \alpha_{it} + \mu_{it}$.

$$\frac{NT}{2(T-1)} \left[ \frac{\Sigma_{i=1}^{N}(\Sigma_{t=1}^{T}\widehat{\varepsilon}_{it})^2}{\Sigma_{i-1}^{N}\Sigma_{t=1}^{T}\widehat{\varepsilon}_{it}^2} - 1 \right]^2$$

$H_0$ is rejected if the calculated value exceeds the tabulated chi-squared value, which means that the data has cross section effects and random effects model is more suitable than the pooled least square model. By representing the variance-covariance matrix of $\beta_{fe}$ and $\beta_{re}$ by $V_{fe}$ and $V_{re}$, respectively, and by letting $k$ to be the dimension of $\beta$, the Hausman test says that:

$$Hausman = (\widehat{\beta}_{fe} - \widehat{\beta}_{re})'[V_{fe} - V_{re}]^{-1}(\widehat{\beta}_{fe} - \widehat{\beta}_{re})$$

The hypothesis of Hausman test is expressed as below:

$$H_0 : \text{cov}(\lambda_i, x_{it}) = 0$$
$$H_1 : \text{cov}(\lambda_i, x_{it}) \neq 0$$

where $Y_{it} = X_{it}\beta + \varepsilon_{it}$, and $\varepsilon_{it} = \alpha_{it} + \mu_{it}$.

Fixed effects estimator is selected when p-value is less than 0.01, which means $H_0$ is rejected.

When the final model is detected as FE model, time dummies were created to test whether time fixed effects were needed when running a FE model. It was used to determine if the dummies for all quarters of the year were equal to zero, which means that no time fixed effects were needed. If the p-value is less than 0.01, the null hypothesis of no time effect is rejected.

### 3.4.2    Estimating Standard Errors in the Presence of a Fixed Firm and Time Effect[14]

It is essential to adjust standard errors for possible dependence in the residuals so that the true variability of the coefficient estimates is not over or underestimated. This is one of the robustness checks for the presence of both firm effect and time effect. The estimation of variance-covariance matrix below is proposed by Cameron, Gelbach and Miller (2006) and Thompson (2006).

$$V_{\text{Firm\&Time}} = V_{\text{Firm}} + V_{\text{Time}} - V_{\text{White}} \tag{8}$$

It is an estimation that merges the standard errors clustered by firm together with the standard errors clustered by time. Standard errors clustered by firm capture the unspecified correlation between observations on the same firm in different years

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[14] The information is retrieved from Peterson (2009).

while standard errors clustered by time capture the unspecified correlation between observations on different firms in the same year. White variance-covariance matrix is subtracted off to keep away from double counting since there are diagonals of the variance-covariance matrix in both firm- and time-clustered variance-covariance. This method produces less biased standard errors.

# CHAPTER FOUR

# EMPIRICAL RESULTS AND INTERPRETATION

## 4.0     Introduction

This chapter presents the empirical results of the model. This begins with the descriptive statistics and correlation matrix of the variables since these corresponded to the datasets used in the regression analyses. The next presented results are the outcome of diagnostic checks on multicollinearity, heteroskedasticity, and serial correlation. This was followed by the PLS, RE, and FE tests executed to determine which model was the most suitable for the dataset. The Breusch-Pagan (LM) test was used to determine whether it was a PLS model or RE model before Hausman test was done to see whether the RE model was most preferable. FE model would be chosen if it passed the Hausman test. Time dummies were created to identify the time effect in the model and the insignificant dummy variables were removed to obtain the best regression result for the model. Estimation on the standard errors in the presence of a fixed firm and time effect, i.e., the robustness check, was executed after determining the best regression result for the model. The same procedure was repeated for each sample period of the study.

## 4.1 Descriptive Statistics

Table 1 reports the summary of the descriptive statistics for all variables in both full and three subsample periods. The book-to-market ratio achieved the highest mean and standard deviation among all variables for all sample periods. Its mean and standard deviation were respectively 1.60 and 1.10 in full sample period; 1.43 and 0.94 in pre-crisis period; and 1.72 and 1.19 in both during crisis and post-crisis periods. On the other hand, both stock return and dividend yield achieved the lowest mean of 0.03 in the full sample period and post crisis period. Stock return had the lowest mean of 0.00 in pre-crisis period while dividend yield held the lowest mean of 0.03 during crisis period. As for standard deviation, earnings yield held the lowest standard deviation of 0.14 in the full sample period while dividend yield had the lowest standard deviation of 0.03 in all other three sample periods.

In short, the range for mean was between 0.00 and 1.72 while the range for standard deviation was between 0.03 and 0.94. The mean value of stock return is referring to the expected return. Based on the result obtained, the highest expected return is during crisis, which is 0.14. On the other hand, standard deviation is referring to investment volatility. In this case, during crisis period has the highest investment volatility.

**Table 1: Results of Descriptive Statistics**

| Variables | Mean | Standard Deviation | Minimum | Maximum | Observations |
|---|---|---|---|---|---|
| *Panel A: Full Sample Period* | | | | | |
| SR | 0.03 | 0.26 | -0.98 | 6.23 | 15232 |
| DY | 0.03 | 0.31 | 0.00 | 0.91 | 15232 |
| EY | 0.09 | 0.14 | -0.86 | 7.40 | 15232 |
| BTM | 1.60 | 1.10 | -0.39 | 14.29 | 15232 |
| *Panel B: Pre-Crisis* | | | | | |
| SR | 0.00 | 0.25 | -0.77 | 2.65 | 6528 |
| DY | 0.03 | 0.03 | 0.00 | 0.91 | 6528 |
| EY | 0.08 | 0.16 | -0.68 | 7.40 | 6528 |
| BTM | 1.43 | 0.94 | 0.03 | 14.29 | 6528 |
| *Panel C: During Crisis* | | | | | |
| SR | 0.14 | 0.33 | -0.64 | 4.60 | 2176 |
| DY | 0.03 | 0.03 | 0.00 | 0.23 | 2176 |
| EY | 0.12 | 0.16 | 0.89 | 1.72 | 2176 |
| BTM | 1.72 | 1.19 | 0.03 | 11.11 | 2176 |
| *Panel D: After Crisis* | | | | | |
| SR | 0.03 | 0.22 | -0.98 | 6.23 | 6528 |
| DY | 0.03 | 0.03 | 0.00 | 0.24 | 6528 |
| EY | 0.92 | 0.12 | -0.22 | 2.58 | 6528 |
| BTM | 1.72 | 1.19 | -0.39 | 12.50 | 6528 |

## 4.2    Correlation Matrix

Table 2 illustrates the correlation between each variable in all sample periods. The correlation between stock return and other variables ranged between -0.11 and 0.11 for all sample periods and was considered as pretty low. On the other hand, the correlation between dividend yield and other variables was rather small as it ranged between -0.15 and 0.21 for all sample periods. The correlation coefficient of earnings yield with other variables was between -0.03 and 0.14 while that for book-to-market ratio ranged between -0.15 and 0.14 for all sample periods. In summary, the correlation coefficients of all variables in all sample periods are within plausible

ranges and this confirms the choice of regressors and instruments. In other words, it means that there was no multicollinearity problem between the variables.

**Table 2: Results of Correlation Matrix**

|  | SR | DY | EY | BTM |
|---|---|---|---|---|
| *Panel A: Full Sample Period* | | | | |
| SR | 1.00 | | | |
| DY | 0.00 | 1.00 | | |
| EY | 0.03 | 0.14 | 1.00 | |
| BTM | 0.07 | -0.09 | 0.10 | 1.00 |
| *Panel B: Pre-Crisis* | | | | |
| SR | 1.00 | | | |
| DY | 0.04 | 1.00 | | |
| EY | 0.04 | 0.07 | 1.00 | |
| BTM | 0.11 | -0.03 | 0.04 | 1.00 |
| *Panel C: During Crisis* | | | | |
| SR | 1.00 | | | |
| DY | -0.11 | 1.00 | | |
| EY | -0.03 | 0.21 | 1.00 | |
| BTM | -0.01 | -0.09 | 0.11 | 1.00 |
| *Panel D: After Crisis* | | | | |
| SR | 1.00 | | | |
| DY | 0.00 | 1.00 | | |
| EY | -0.01 | 0.19 | 1.00 | |
| BTM | 0.04 | -0.15 | 0.14 | 1.00 |

## 4.3 Diagnostic Checking

It is essential to perform diagnostic checks for the results obtained from the analysis in order to ensure that it is free from any econometric biases. Table 3 below shows the outcome for the diagnostic checking. First, the variance inflation factor (VIF) was executed to detect whether it consist of multicollinearity problem. The rule of thumb in VIF is that multicollinearity problems only can be certified if the VIF mean is greater than 10. As illustrated in Table 5, all the VIF means are less than 1.10.

Therefore, no multicollinearity problem was detected in the model for the entire three sample periods.

The Modified Wald Statistic was employed to detect group wise heteroskedasticity in the residuals of the model. The heteroskedasticity problem was detected in the model for all the sample periods as all are significant at 1 percent. Next, the Woolridge test was executed to examine autorcorrelation in the panel data. Again, the serial correlation problem was found in all the sample periods as it is significant at 1 percent.

In order to rectify the problem of heteroskedasticity and serial correlation, adjustments on standard errors were made by using the robustness check of estimating standard errors in the presence of a fixed firm and time effect and the result will be presented in the Table 6, 6a, 6b and 6c.

**Table 3: Results of Diagnostic Checking**

|  | Multicollinearity (vif) | Heteroskedasticity | Serial Correlation |
|---|---|---|---|
| Full Sample Period | 1.03 | 85282.91 (0.0000)*** | 23.011 (0.0000)*** |
| Pre-Crisis | 1.01 | $1.20 \times 10^5$ (0.0000)*** | 5.939 (0.0051)*** |
| During Crisis | 1.05 | $3.50 \times 10^6$ (0.0000)*** | 14.562 (0.0002)*** |
| Post Crisis | 1.07 | $2.60 \times 10^5$ (0.0000)*** | 8.789 (0.0032)*** |

## 4.4    Static Linear Panel Models

Table 4 shows the result of the fixed effect model, Breusch-Pagan LM test, and Hausman test for full sample period while Table 4a, 4b and 4c depict the results for the three subsample periods which are pre-crisis, during crisis, and after crisis. As the results of Breusch-Pagan LM test in all sample periods were significant, it proved that RE model was superior to Pooled OLS model. Thus, Hausman test was carried out to determine which model was preferable for all sample periods. The results concluded that FE model was better than RE model for all sample periods since it was significant in all sample periods.

In both full sample period and pre-crisis period, all variables were significant and positively related to stock return. However, all variables in the sample period of during crisis were negatively related to stock return and BTM was the only variable that was significant. As for the result in post crisis period, all variables were significant and only EY was negatively related to stock return while DY and BTM were positively related to stock return.

**Table 4: Results of Panel Data Analysis (Full Sample Period)**

| Dependent Variable: SR | |
|---|---|
| | FE |
| Constant | -0.04 (-6.76)*** |
| DY | 0.20 (2.02)** |
| EY | 0.03 (1.78)* |
| BTM | 0.04 (13.03)*** |
| Breusch-Pagan LM Test | 36.67 (0.0000)*** |
| Hausman Test | 121.07 (0.0000)*** |
| Observations | 15232 |

Notes: Figures in the parenthesis are t-statistics, except for Breusch-Pagan LM test and Hausman test, which are p-values. ***,** and  * indicate the respective 1%, 5% and 10% significance levels.

**Table 4a: Results of Panel Data Analysis (Pre-Crisis)**

Dependent Variable: SR

|  | FE |
| --- | --- |
| Constant | -0.15 (-14.45)*** |
| DY | 0.50 (3.02)*** |
| EY | 0.05 (2.09)** |
| BTM | 0.09 (14.51)*** |
| Breusch-Pagan LM Test | 15.47 (0.0001)*** |
| Hausman Test | 141.85 (0.0000)*** |
| Observations | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Breusch-Pagan LM test and Hausman test, which are p-values. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 4b: Results of Panel Data Analysis (During Crisis)**

Dependent Variable: SR

|  | FE |
| --- | --- |
| Constant | 0.44 (16.14)*** |
| DY | -0.58 (-1.16) |
| EY | -0.05 (-0.59) |
| BTM | -0.16 (-10.58)*** |
| Breusch-Pagan LM Test | 13.86 (0.0002)*** |
| Hausman Test | 138.90 (0.0000)*** |
| Observations | 2176 |

Notes: Figures in the parenthesis are t-statistics, except for Breusch-Pagan LM test and Hausman test, which are p-values. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 4c: Results of Panel Data Analysis (Post Crisis)**

Dependent Variable: SR

|  | FE |
| --- | --- |
| Constant | -0.00 (-0.28) |
| DY | 0.31 (1.71)* |
| EY | -0.08 (-2.84)*** |
| BTM | 0.02 (3.32)*** |
| Breusch-Pagan LM Test | 7.50 (0.0062)*** |
| Hausman Test | 12.95 (0.0047)*** |
| Observations | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Breusch-Pagan LM test and Hausman test, which are p-values. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

## 4.5    Testing for Time Effect

This section discusses the findings of time effects in full sample period and the three subsamples period. Table 5, 5a, 5b and 5c demonstrate the results for the test for time effect in different sample periods. Since the FE model was the most preferable model among the three models, it was essential to determine whether time effect existed in the model. Therefore, time dummies were created in the model. The results showed that there was time effect in the model in all sample periods since all results were significant at 1 percent level of significance. Therefore, we proceeded with removing the insignificant time dummies until only significant time dummies were left. This was because insignificant time dummies would influence the results.

As indicated in Table 5, 5a, 5b and 5c, a drastic change has been observed in the results as compared to the original FE model which does not have time dummies. Other than for the post crisis period, the book-to-market ratio was the only significant variable in the model for all sample periods after including significant time dummies. Moreover, as opposed to the results in full sample period, pre-crisis period, and post crisis period, there was a slight change in the sign of coefficients of the variables for the during crisis period. Both dividend yield and earnings yield turned positive after including time dummies. As for the significance of the variables, there was a great change in both full period and pre-crisis period. Dividend yield and earnings yield turned out to be insignificant while book-to-market ratio maintained its significance. As for the during crisis period, the book-to-market ratio, i.e., the only significant variable in the model, remained negatively correlated with stock return whereas the other two variable became positive and stayed insignificant. On the other hand, the

result for post-crisis period only showed slight changes on the coefficients for all variables as compared to the original FE model without time dummies. The sign for all variables remained the same and all variables were significant in at least 10 percent level of significance.

**Table 5: Results of Testing Time Effect (Full Sample Period)**

| | Dependent Variable: SR | |
|---|---|---|
| | FE with Time Dummies | FE with Time Dummies (after dropping insignificant dummy variable) |
| Constant | 0.02 (1.89)* | 0.03 (3.80)*** |
| DY | 0.10 (1.10) | 0.10 (1.07) |
| EY | 0.01 (0.61) | 0.01 (0.61) |
| BTM | 0.04 (12.08)*** | 0.04 (12.19)*** |
| Time-Effect | 97.15 (0.0000)*** | - |
| Observations | 15232 | 15232 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 5a: Results of Testing Time Effect (Pre-Crisis)**

| | Dependent Variable: SR | |
|---|---|---|
| | FE with Time Dummies | FE with Time Dummies (after dropping insignificant dummy variable) |
| Constant | -0.02 (-1.27) | -0.02 (-1.62) |
| DY | 0.25 (1.63) | 0.24 (1.62) |
| EY | 0.02 (0.97) | 0.02 (0.97) |
| BTM | 0.06 (10.48)*** | 0.06 (10.51)*** |
| Time-Effect | 110.39 (0.0000)*** | - |
| Observations | 6528 | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 5b: Results of Testing Time Effect (During Crisis)**

| | FE with Time Dummies | FE with Time Dummies (after dropping insignificant dummy variable) |
|---|---|---|
| | Dependent Variable: SR | |
| Constant | 0.45 (14.71)*** | 0.45 (14.71)*** |
| DY | 0.19 (0.39) | 0.19 (0.39) |
| EY | 0.01 (0.17) | 0.01 (0.17) |
| BTM | -0.10 (-5.70)*** | -0.10 (-5.70)*** |
| Time-Effect | 49.85 (0.0000)*** | - |
| Observations | 2176 | 2176 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 5c: Results of Testing Time Effect (Post Crisis)**

| | FE with Time Dummies | FE with Time Dummies (after dropping insignificant dummy variable) |
|---|---|---|
| | Dependent Variable: SR | |
| Constant | -0.03 (-1.57) | -0.04 (-3.93)*** |
| DY | 0.24 (1.33) | 0.29 (1.65)* |
| EY | -0.06 (-2.06)** | -0.05 (-1.94)* |
| BTM | 0.02 (3.16)*** | 0.02 (3.74)*** |
| Time-Effect | 39.81 (0.0000)*** | - |
| Observations | 6528 | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

## 4.6	Robustness Checks

In order to rectify the problem of heteroskedasticity and serial correlation that had been detected earlier on, adjustments on standard errors were made. Since it is a FE model, it means that the model consists of firm effect. Moreover, it has the time effect too. Thus, the robustness check of estimating standard errors in the presence of a fixed firm and time effect was chosen to adjust for the standard errors.

As demonstrated in Table 6, 6a, 6b and 6c, there is a slight change in the results in terms of the sign, the coefficients, and the significance of the variables after the adjustment. The book-to-market ratio in the full sample period remained as the only significant variable which was significant at 1 percent. It means that investors get 1 percent of stock return from every percent of rise in book-to-market ratio. On the other hand, the sign for dividend yield turned to negative and remained insignificant.

As for the pre-crisis period, besides experiencing a small change in the coefficient of each variable, the dividend yield turned out to be significant at 10 percent level of significance while the book-to-market ratio was significant at 1 percent level of significance. The result can be interpreted as: 1 percent increase in dividend yield causes an increase of 17 percent in stock return. Besides that, 1 percent rise in book-to-market ratio also brings forth 2 percent increase in stock return.

Small changes are also seen in the result for the during crisis period, as reported in Table 6b. Dividend yield was negatively related to stock return, but was still insignificant. On the other hand, the book-to-market ratio turned out to be

positively correlated with stock return and was significant at 5 percent level of significance. Therefore, the result indicated that every percent lifted in book-to-market ratio leads to an improvement of 1 percent in stock return.

In post crisis period, the sign for all variables were unchanged. However, both dividend yield and earnings yield had turned out to be insignificant while the book-to-market ratio stayed significant at 1 percent level of significance. Thus, the result showed that every percent increase in book-to-market ratio boosts up 1 percent in stock return.

All in all, it was concluded that book-to-market ratio was the only metric that could be used to predict stock return regardless of the economic condition.

**Table 6: Results of Robustness Checks (Full Sample Period)**

| Dependent Variable: SR | |
| --- | --- |
| | Estimating Standard Errors in the Presence of a Fixed Firm and Time Effect |
| Constant | 0.07 (0.01)*** |
| DY | -0.02 (0.05) |
| EY | 0.01 (0.02) |
| BTM | 0.01 (0.00)*** |
| Observations | 15232 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and * indicate the respective 1%, 5% and 10% significance levels.

**Table 6a: Results of Robustness Checks (Pre-Crisis)**

| | Dependent Variable: SR |
|---|---|
| | Estimating Standard Errors in the Presence of a Fixed Firm and Time Effect |
| Constant | 0.04 (0.01)*** |
| DY | 0.17 (0.09)* |
| EY | 0.03 (0.03) |
| BTM | 0.02 (0.00)*** |
| Observations | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and  * indicate the respective 1%, 5% and 10% significance levels.

**Table 6b: Results of Robustness Checks (During Crisis)**

| | Dependent Variable: SR |
|---|---|
| | Estimating Standard Errors in the Presence of a Fixed Firm and Time Effect |
| Constant | 0.31 (0.02)*** |
| DY | -0.66 (0.18) |
| EY | 0.04 (0.04) |
| BTM | 0.01 (0.01)** |
| Observations | 2176 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and  * indicate the respective 1%, 5% and 10% significance levels.

**Table 6c: Results of Robustness Checks (Post Crisis)**

| | Dependent Variable: SR |
|---|---|
| | Estimating Standard Errors in the Presence of a Fixed Firm and Time Effect |
| Constant | -0.02 (0.01)*** |
| DY | 0.08 (0.08) |
| EY | -0.02 (0.02) |
| BTM | 0.01 (0.00)*** |
| Observations | 6528 |

Notes: Figures in the parenthesis are t-statistics, except for Heteroskedasticity, Serial Correlation and Time-Effect, which are p-values whereas the figures in the parenthesis for FE with robust standard errors are standard errors. ***,** and  * indicate the respective 1%, 5% and 10% significance levels.

# CHAPTER FIVE

# CONCLUSION AND POLICY IMPLICATION

## 5.0    Introduction

The first section of this chapter summarizes the findings presented in the previous chapter. This is followed by a discussion on the empirical findings. After that, the policy implications are presented. Limitation of the study as well as the contribution of this study is also discussed. Before this chapter ends with the conclusion of the whole study, suggestions are given on future research as the extension of this study.

## 5.1    Summary of the Findings

This research was set up to determine whether financial ratios had explanatory power towards future stock return in Malaysia market. Therefore, three financial ratios were chosen, i.e., dividend yield, earnings yield and book-to-market ratio since strong theoretical background had been established in terms of their explanatory power on stock return because of their specific characteristics. This study also further explored the explanatory power of these three ratios in three different sample periods which were pre-crisis, during crisis and post crisis periods. Basic data set checking such as descriptive statistics, correlation matrix, and diagnostic tests were performed to ensure that the data was free from econometric biases before

proceeding with regression analyses. The FE model was chosen among the static linear panel models since it had passed Hausman test in all sample periods. The FE model was subjected to time effect test to determine for time effect and it was proven that time effect existed in the model for all three sample periods. Insignificant time dummies were then removed until all the time dummies were significant and this procedure was repeated for all sample periods. Standard errors estimation in the presence of a fixed firm and time effect was performed to adjust the standard errors as well as to rectify heteroskedasticity and serial correlation. The final results showed that dividend yield was significant and positively related to future stock return in pre-crisis period while book-to-market ratio was significant and positively related to future stock return in all sample periods which means that only $H_3$, $H_{16}$, $H_{17}$, $H_{18}$, $H_{19}$, $H_{20}$, $H_{21}$, $H_{22}$ and $H_{23}$ are not rejected in this study.

## 5.2    Discussion on the Empirical Findings

Dividend yield was positively related to future stock return at 10 percent of significant level in pre-crisis period. Statistically, it means that 1 percent increase in dividend yield leads to 17 percent increase in future stock return in pre-crisis period. On the other hand, book-to-market ratio was positively related to stock return in all sample periods in at least 5 percent of significance level. Statistically, it means that, when there is a boost in book-to-market ratio, an enhancement of 2 percent occurs in the future stock return during the period of pre-crisis while the increase is 1 percent in future stock return in the full sample, during crisis and after crisis periods. This

clearly showed that stock return in the pre-crisis period is superior to the other two sample periods.

With reference to Figure 2, an upward trend can be seen in the stock market during the pre-crisis period. Therefore, the pre-crisis period demonstrated the characteristics of a bull market where the prices of the securities or commodities in the stock market had risen up in value persistently. As documented in Capaul *et al.* (1993), stock price is an assessment of a firm's future prospect for investors. Investors are often optimistic and confident towards the booming market because of higher expectations towards the firm's future prospect, and this is consistent with the Rational Expectation Theory. Accordingly, the stocks are bought to drive up the stock prices and then sold off at the highest price to gain the profit before the stock prices start to fall. In contrast, post crisis demonstrated the characteristics of a recovery period of the economy as well as the stock market. Since the investors have just undergone the turbulence of the stock market, time is needed to rebuild their confidence towards the stock market. Consequently, the expectation towards the firm's future prospect is not as high as when the market boomed. Whereas in the full sample period, the stock market is summarized as a whole and thus the stock return are depicted on an average basis. This explains the reason that the stock return in the pre-crisis period is greater than the other two sample periods.

The reason that caused the positive significance of both dividend yield and book-to-market ratio is due to its denominator, the stock prices, and thus it should have a positive relationship with the expected return. Besides that, as documented in mispricing view, when stocks are overpriced, the ratios becomes low and thus low

future returns are expected since the prices have returned to its fundamental level. In short, any changes on the stock prices are directly reflected on the ratio. Although all three variables have stock prices as the denominator, the book-to-market ratio portrayed stronger role in explaining future stock return, followed by dividend yield, which was only statistically significant in pre-crisis period, and lastly book-to-market ratio, which remained statistically significant regardless of the economic condition. This result is consistent with the findings of Kheradyar *et al.* (2011) and others.

Dividend yield has been known as a strong empirical predictor that can contribute to stock return predictability in past literatures such as Lewellen (2004), Campbell and Yogo (2006) and etc. However, our results displayed weak explanatory power of dividend yield towards future stock return in pre-crisis period and this is also consistent with the findings of Allen (2009) who used different methods of past studies to examine the explanatory power of dividend yield and dividend price ratio towards stock return and equity premium in different sample periods in Malaysia. There are also several past studies which supported that dividend yield only exhibits strong explanatory power on stock return in certain period of time such as Valkanov (2003), Robertson and Wright (2006), Park (2010), and others. These studies conclusively discovered that dividend yield evidenced strong predictive power during a certain period while weak or no predictive power at other times.

Robertson and Wright (2006) and Boudoukh *et al.* (2007) argued that the inconsistency of the strength of predictive power in different period of time is due to the change of firm's payout policy that have led to the breakdown in the cointegration relation between dividends and stock prices. This is predictable since firms may

consider changing their payout policy from time to time in order to suit economic condition, firm's financial status as well as firms' future plan. In our case, most of the firms in Malaysia might have practiced share repurchase as their payout policy in pre-crisis period since Malaysia was implementing imputation system where dividend paid was subjected to tax before 2008. Subsequently, single tier system was introduced prior to 1ˢᵗ of January 2008 to replace imputation system in Malaysia to overcome the problem of double taxation on firm's income (Lembaga Hasil Negeri Malaysia, 2014). As a result, many firms have changed their dividend policy from share repurchase to dividend cash since shareholders are more likely to receive tax exempt dividend. Figure 3 also proved that an increase in dividend payment has occurred after pre-crisis period, which is year 2008 onwards. This is believed to be partly contributed by the above-mentioned change in payout policy, which then also led to the weak explanatory power on dividend yield in pre-crisis period.

**Figure 3: Average of Cash Dividend of Firms in Malaysia in Pre-Crisis, During Crisis and Post Crisis**
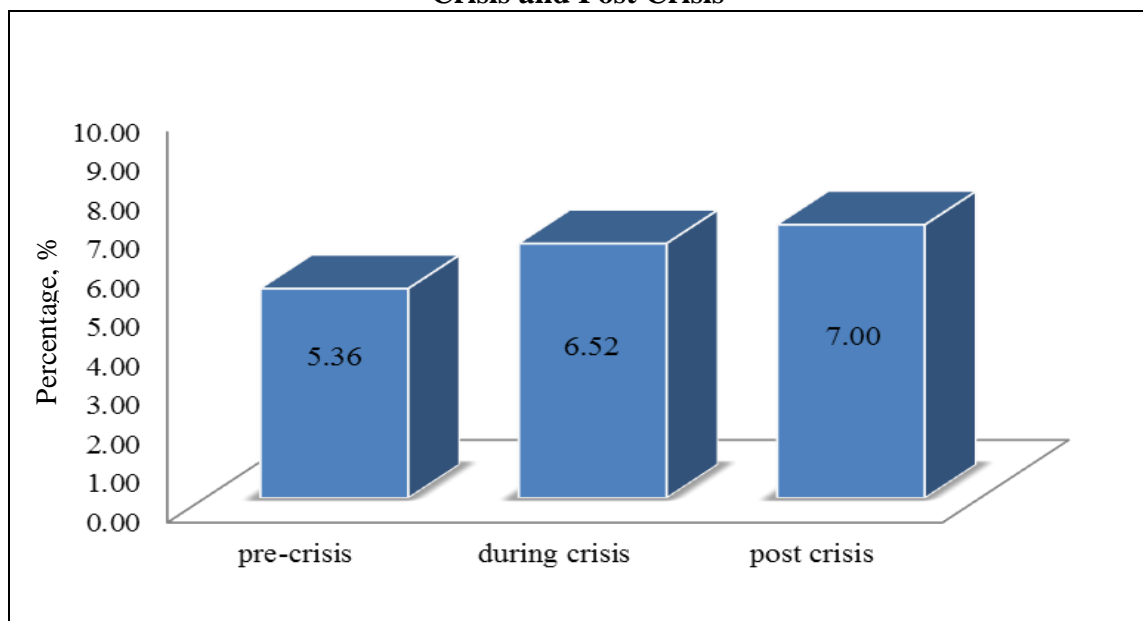


Source: Interim reports of the firms in Bursa Malaysia (2014).

The relationship between book-to-market ratio and future stock return has been verified by some prior studies such as Lewellen (2004), Daniel and Titman (2006), Chen *et al*. (2010) and many more. Besides consisting of explanatory power on future stock return, Peterkot and Nielsen (2005) also found out that book-to-market ratio contains information about risk. Moreover, the rational pricing theory reported that the ratios track time-variation in discount rates, which means that the ratios are low when the discount rates are low and vice-versa. Consequently, it allows for stock return prediction since it captures the information about risk premium. Our results showed that book-to-market ratio is significant regardless of the economic conditions. In other words, it means that book-to-market ratio is a useful indicator for prediction of future stock return at all times.

Auret and Sinclaire (2006) claimed that the positive relationship between book-to-market ratio and future stock return is due to the natural desire of humans to aim for greater profit and thus investment in high risk portfolios. The rationale behind this is that stock with high book-to-market ratio is considered as a risky stock and hence superior returns are essential to tempt investors to procure risky stocks. As indicated in our results, book-to-market ratio exhibited significant positive relationship towards future stock return in all sample periods. This has verified that most investors in Malaysia are aiming for greater profit from their investment and thus they are willing to place their investment even during the economic downturn.

As a final point, the results also proved that the Malaysian market is not efficient. This study was conducted by using all the publicly available information and both dividend yield and book-to-market ratio were confirmed as useful to predict

future stock return, but it contradicted that the market belonged to semi-strong form of market efficiency. This is not consistent with the findings of Ahmed, Hussin and Teoh (2010) which showed that Malaysia belongs to semi-strong form efficiency after studying the announcement effect of both dividend and corporate earnings on stock prices. Hence, it is believed that there is a possibility for the investors to outperform the market.

## 5.3    Policy Implication

A positive return has always been the main purpose of an investment. Consequently, identifying the right financial ratio with the signalling power towards future stock returns for a given stock is a continuing quest for investors who aim for higher returns. Since the Malaysian stock market is one of the emerging markets in Asia, it has the potential to gain higher profits through investment. Therefore, this has whetted the interest of both local and foreign investors to find out how the financial ratios can affect future stock return in Malaysia in different market conditions. This information is essential for them to act or respond accordingly before they make the decision on to either buy or sell the shares based on the market conditions.

Our findings suggest that the book-to-market ratio consists of predictive power towards future stock return in all sample periods while dividend yield consists of weak predictive power in pre-crisis period. This implies that the information carried by both dividend yield and book-to-market ratio of the listed firms in Malaysia

aids in profitable trading strategy in this three market conditions. Thus, investors can fully utilize the publicly available information to predict for future stock return.

Since Malaysian market is found to contradict with semi-strong forms of market efficiency, therefore Bursa Malaysia should consistently monitor the activities in the stock market in order to ensure no continuous market beat.

## 5.4    Limitations and Recommendation of the Study

Firstly, there is a difficulty in obtaining the data. The data available in the data stream is not consistent with numbers in the quarterly report of the firm. Therefore, a lot of time and effort was taken to track with the numbers in order to upkeep data accuracy. Besides that, there was data constraint for some of the firms too. Data was not available for all listed firms since some used to be delisted for some periods. As a result, those firms with incomplete data were eliminated from the sample. Different results could have been reached if all the firms were included.

Secondly, the findings of this study are only able to provide a picture of the market as a whole throughout the full sample period of 2005 until 2011 and three subsample periods, which were pre-crisis, during crisis and post crisis periods. It will be able to bring more contributions as well as provide useful insights if the samples of the study can be further categorized by market capitalization, sectors, industries, ranking of pay-out ratio or others for the same study period. However, this can only be reserved for future study. Moreover, if the variables used can be further decomposed into details components, then it is believed that the findings can present a

better notion for investors which might be more useful for them to better manage their

portfolio. Again, this can be extended for future research.

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**Appendix**

### Table A: Summary of Reviews on Stock Return and Financial Ratios – Developed Countries

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Wolf (2000) | <ul><li>Sub Sampling Method</li><li>Descriptive Statistics</li><li>Regression Analysis</li></ul> | New York (1926-1995) | <ul><li>No evidence was found for predictability for short and medium horizons but only little evidence on the long horizon which is subjected with doubts.</li></ul> |
| Pinfold, Wilson & Li (2001) | <ul><li>Ordinary Least Square (OLS)</li></ul> | New Zealand (2000:12-2001:3) | <ul><li>The size effect and book-to market did not predict the stock return</li><li>Beta was significance on stock return.</li></ul> |
| Cremers (2002) | <ul><li>Descriptive Statistics</li><li>Regression Analysis</li></ul> | US (1954:1-1988:12) | <ul><li>Implied posterior probabilities were more supportive for stock return predictability than the priors.</li><li>Six variables were clearly identified by the used of Bayesian methodology for instance past returns, dividend yields and earnings/price ratios perform relatively poorly in this study.</li><li>Out-of-sample results for the Bayesian average models have enhanced the forecasts towards the classical statistical model selection methods and it was in line with the in-sample results with little evidence of predictability.</li></ul> |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Lam (2002) | • Fama and MacBeth (1973)'s Cross-Sectional Regression Analysis | Hong Kong (1980:7-1997:6) | • Beta failed to consistently justify the average monthly stock return.<br>• Even though the ability in capturing cross-sectional variation in average monthly returns for book leverage and market is certified, their effect will be dominated by the other three ratios if all the ratios are taken into account. |
| Lewellen (2004) | • Ordinary Least Square (OLS)<br>• Descriptive Statistics | US Dividend yield (1946:1-2000:12) Book to market and Earning price ratio (1963-2000) | • Dividend yield is found to predict market returns during the period of 1946-2000 and also in other sub-samples.<br>• Book to market and earnings price ratio are also found to predict returns during 1963-2000 which is shorter period compared with dividend yield. |
| Campbell & Yogo (2006) | • $t$-test with Bonferroni Correction<br>• $Q$-test with Bonferroni Correction | US (1871-2002), (1926-2002), (1926:1-2002:4), (1926:1-2002:12) | • Discovered evidence for predictability where conventional t-test are invalid for both dividend-price and smoothed earnings-price ratios.<br>• Earnings-price ratio is found to predict returns at various frequencies which are annual to monthly whereas dividend-price ratio predicts returns only at annual frequency. |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Daniel & Titman (2006) | • Decomposition<br>• Correlation test<br>• Fama-MacBeth Regression Analysis<br>• Time-Horizon Robustness Check | US (1968:7-2003:12) | • The decomposition method proposed in their study is able to beat the findings in the previous literature.<br>• No relationship between future stock return and the past performance of the firm.<br>• There is a strong negative relationship between future returns and intangible information.<br>• Moreover, book-to-market ratio and composite equity issuance measure is a good proxy to forecast future stock returns. |
| Ang & Bekaert (2007) | • Regression Analysis<br>• Variance Decomposition | Long sample: US (1935:6-2001:12) UK (1953:6-2001:12) German (1953:6-2001:12) Short sample: US, UK, France and Germany (1975:2-2001:12) | • Excess return can only be predicted by dividend yields at short horizons together with the short rate and it did not have any long-horizon predictive power.<br>• The short rate is found to predict returns negatively at short horizons.<br>• Both the discount rate and short rate movements play significant role in explaining the variation in dividend yields through the utilization of present value model.<br>• Earning yields has extensively predicted future cash flows. |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Jiang & Lee (2007) | • Augmented Dickey-Fuller (ADF), Phillips and Perron (PP) and Kwaitkowski, Philips, Schmidt and Shin (KPSS)<br>• Vector Autoregressive (VAR)<br>• Ordinary Least Square (OLS)<br>• Diebold and Mariano (DM) test | US (1946-2004) | • The proposed log linear cointegration (LLCI) model can better explain the predictive power of dividend yield and book-to-market ratio in excess stock returns than log linear dividend yield model and log linear book-to-market model which study the relationship towards excess stock returns alone. |
| Campbell & Thompson (2008) | • $R^2$ statistic<br>• $t$-statistic<br>• Ordinary Least Square (OLS) | US (1927:1-2005:12 1927-2005) | • Key forecasting variables of the out-of-sample performance can be improved by simple restrictions on predictive regressions which are in line with investment theory.<br>• Investors could gain their wealth by using market timing strategies. |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Aono & Iwaisako (2010) | • Descriptive Statistics<br>• Correlations<br>• Single Variable Regressions<br>• Multivariable Regressions | Japan (1980:1-2009:12) | • The forecasting ability of price-earnings ratio is weaker for Japan as well as price dividend ratio.<br>• Lagged stock returns and interest rates are useful tools in forecasting Japanese stock returns.<br>• Interest rates performed well in early subsamples whereas lagged stock returns performed better in 2000s because of the scarce of variability in interest rates in relation with the zero interest policy of Japan Bank's operation ever since the late 1990s.<br>• The combination of all the variables is superior in predicting the stock return for Japanese market. |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Ferreira & Santa-Clara (2011) | • Descriptive Statistics<br>• Correlation test<br>• Sum-of-the-Parts (SOP) Method<br>• Decomposition | US (1927-2007) | • SOP methods worked well on both the data of UK and Japan whereby the predictive power is greater than US.<br>• Both dividend-price ratio and earnings growth are found to have equal predictive power on stock returns.<br>• SOP method also able to generate better gain for investors besides having better performance in out of sample than historical mean or predictive regressions.<br>• The reason for generating better gain by utilizing SOP method is because of the absence of estimation error.<br>• SOP method can be applied in the calculation of cost of capital for project and firm valuation. |

**Table A: Summary of Reviews on Stock Return and Financial Ratios –
Developed Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Jiang & Lee (2012) | • Augmented Dickey-Fuller (ADF) and Philips-Perron tests<br>• Kalman filter method<br>• Ordinary Least Squares (OLS) | US (1926:1Q-2008:4Q) | • The decomposed financial ratios are able to predict future stock return and fundamentals in both long and short haul which is contradict with the previous findings.<br>• The out-of-sample prediction resulted that cyclical component of earnings yield can better predict market return while stochastic trend component of book-to-market ratio can better predict fundamentals.<br>• Prediction using cyclical components of financial ratios is able to enhance the returns and vice-versa for the stochastic trend components.<br>• Cyclical components mirrored local mean reversion effect whereas the stochastic trend component showed long-run persistence effect and this has supported the poor predictability of financial ratios in the short run which is on account of the offsetting effect. |

**Table B: Summary of Reviews on Stock Return and Financial Ratios –
Developing Countries**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Aydogan & Gursov (2000) | • Seemingly Unrelated Regressions (SUR) <br> • Descriptive Statistics <br> • Fama and MacBeth (1973)'s Cross-Sectional Regression Analysis | Turkey (1986-1999) | • Both P/E and book-to-market ratios had predictive power of future return, especially over longer time periods. <br> • It can be used as tools in forming a market timing and asset allocation strategy in emerging equity markets. |
| Auret & Sinclaire (2006) | • Ordinary Least Square (OLS) <br> • Pairwise Correlation | South Africa (1990:7-2000:6) | • Significant positive relationship between book-to-market ratio and stock return. <br> • Book-to-market ratio has almost completely subsumes the effect of size and price-to-earnings in both bivariate and three-variable regressions. |
| Chairatanawan (2008) | • Ordinary Least Square (OLS) | Thailand (1997:Q1-2004:Q4) | • There is no relationship between stock return and all the key financial ratios which includes gross profit margin, earnings before interest and tax over net sales, return on equity, return on asset, current ratio, liquid ratio, gearing ratio, debt to equity, interest coverage, dividend yield, price earnings ratio and price to book value. <br> • There is a strong linear relationship between market capital and all the key financial ratios. |

**Table B: Summary of Reviews on Stock Return and Financial Ratios –
Developing Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Lee & Lee (2008) | • Augmented Dickey-Fuller (ADF), Philip-Perron (PP), and Kwaitkowski, Philips, Schmidt and Shin (KPSS) tests<br>• Ordinary Least Square (OLS) | Malaysia (1995:1-2005:12) | • Dividend yield has stronger predictive power than earnings yield.<br>• The combination of dividend yield and capital gain as well as the combination of earnings yield and capital gain are able to provide valuable information regard trading strategy. |
| Allen & Bujang (2009) | • Descriptive Statistics<br>• Augmented-Dickey Fuller (ADF), Phillips Perron (PP) test and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) test<br>• Mincer-Zarnowitz (1969) regression analysis | Malaysia (1990:1-1996:12, 1997:1-1998:12, 1999:1-2007:12) | • Consistent with the earlier study of Fama and French (1988) which confirm the predictive power of both dividend yield and dividend price ratio towards stock returns and equity premium.<br>• The forecasting result presented poor performances in all pre, during and post financial crisis and this is in line with the findings of Ang and Bakaert (2001), Goyal and Welch (2003, 2006) and Cochrane (2006). |

**Table B: Summary of Reviews on Stock Return and Financial Ratios –
Developing Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Floros *et al.* (2009) | <ul><li>Ordinary Least Squares (OLS)</li><li>Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model</li><li>Error Correction Model Generalised Autoregressive Conditional Heteroscedasticity (ECM-GARCH)</li><li>Augmented-Dickey Fuller (ADF)</li><li>Johansen Cointegration Test</li><li>Root mean Square (RMSE), Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE)</li></ul> | Greece (1992:2-2004:12) | <ul><li>ECM-GARCH model is the best model for predicting future stock return.</li><li>Confirmed the predictive power of dividend yield, price earnings ratio and book-to-market ratio.</li></ul> |

**Table B: Summary of Reviews on Stock Return and Financial Ratios – Developing Countries (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Pour (2011) | • Regression Analysis | Malaysia (1991:1-2011:1) | • Confirmed the moderating effect on the relationship between future stock return and dividend yield.<br>• Evidenced that the addition of moderation variable can enhance the explanation power of the model. |
| Khan *et al.* (2012) | • Generalized Least Squares (GLS) | Pakistan (2005:2011) | • Both earnings yield and dividend yield are positively related with stock return while book-to-market ratio is negatively related with stock return.<br>• Book-to-market ratio has stronger predictive power than both dividend yield and earnings yield.<br>• The combination of financial ratios can enhance the predictability of stock returns. |

**Table C: Summary of Reviews on Stock Return and Financial Ratios – Mixed Evidence**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Chen *et al.* (2010) | • Fama and French (1993) Three-Factor Model<br>• Fama and MacBeth (1973) Cross-Sectional Regression | China and US (1995-2007) | • Only book-to-market ratio, net operating assets, R&D spending, asset growth and illiquidity have the predictive power towards stock returns in China.<br>• Ten out of eighteen predictors are found to predict the stock returns of US.<br>• Weaker predictability in the Chinese market.<br>• It does not indicate market inefficiency, but it is due to high price inefficiency and the homogeneousness of return predictors in China. |

**Table C: Summary of Reviews on Stock Return and Financial Ratios – Mixed Evidence (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Park (2010) | • Augmented-Dickey Fuller (ADF) test<br>• Nyblom's test<br>• *t*-test with Bonferroni Correction<br>• *Q*-test with Bonferroni Correction | Austria (1974:1-2006:11)<br>Belgium (1974-2006:11)<br>Canada (1974-2006:10)<br>Chile (1990:6-2006:11)<br>Denmark (1974-2006:11)<br>Finland (1989:3-2006:11)<br>France (1974-2006:11)<br>Greece (1990:12-2006:11)<br>Hong Kong (1981:10-2006:10)<br>India (1990:12-2006:10)<br>Indonesia (1991:3-2006:11)<br>Italy (1974:1-2006:11)<br>Japan (1974:1-2006:10)<br>Korea (1988:9-2006:11)<br>Malaysia (1987:1-2006:10) | • The predictive power of dividend-price ratio only exist when both future stock return dividend-price ratio are non-stationary<br>• It will lose its predictive power when dividend-price ratio is stationary.<br>• The predictability of dividend-price ratio change accordingly with its persistency.<br>• It is advised for careful used of dividend-price ratio for portfolio choices adjustment by considering on its persistency beforehand. |

**Table C: Summary of Reviews on Stock Return and Financial Ratios – Mixed Evidence (cont')**

| Author(s) (Year) | Methodology | Country (Period) | Important Findings |
|---|---|---|---|
| Park (2010) cont' | | Mexico (1990:5-2006:11) | |
| | | Netherlands (1974-2006:11) | |
| | | Norway (1981:1-2006:11) | |
| | | Philippines (1988:12-2006:11) | |
| | | Portugal (1991:1-2006:10) | |
| | | Singapore (1974:1-2006:10) | |
| | | South Africa (1974-2006:10) | |
| | | Spain (1988:2-2006:11) | |
| | | Sweden (1983:1-2006:11) | |
| | | Switzerland (1974:1-2006:11) | |
| | | Thailand (1988:1-2006:11) | |
| | | Turkey (1991:3-2006:11) | |
| | | UK (1974:1-2006:11) | |
| | | US (1974:1-2006:11) | |