Investment Decision Making Process for Institutional Investors in The Stock Market Influenced by Overconfidence Bias

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ABSTRACT

Many anomalies had been revealed and tested since the invention of Efficient Market Hypothesis theory by Eugene Fama in 1970. This theory is the main pillar of neoclassical finance that does not recognize the noise trader in the stock market. The EMH hypothesize that all available information in the market reflects the financial asset prices because market participants are rational processors of information. However, based on the empirical evidence found, this theory cannot give adequate information of such irrational behaviour that happen in the market which construct anomaly that one of the anomaly is overconfidence bias.

This anomaly has been widely documented in psychology and has become a central feature in economics and behavioural finance, and it showed that overconfidence have strong impact on investment decision. This overconfident bias has serious impact on markets by affecting pricing form and trading volume in the stock markets. A structured literature review has been carried out that examine published research, evaluates contributions, and summarizes the characteristics of overconfidence bias, institutional investor, methods to recognize overconfidence bias and strategies for investment decision making.

Based on the situation in the stock market and evidence found, this thesis contributes in providing new investment decision making process by examined the occurrence of anomalies in the stock market, and after that choose the best strategy which can maximize the return for institutional investor and increase the efficiency in the stock market.

Keywords: *Behavioural finance, characteristic of overconfidence bias, the role of institutional investor, evidence of overconfidence bias, the method used for investment decision*.

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CHAPTER I - INTRODUCTION

1.1 Problem Description

A referendum was held on 23rd June 2016, and the United Kingdom (UK) voted not to continue the country's membership in the European Union (Raddant, 2016). The results showed that people whom voted to leave won by 51.9% to 48.1%. The referendum turnout was 71.8%, with more than 30 million people voting. This situation had an impact towards the economic condition, especially in UK's stock market. Many people predicted that there will be economic crisis if the UK vote to leave, such as fall in houses prices, an emergency budget would be needed to cover up large cuts in spending (Hunt & Wheeler, 2017).

However, it seems the devaluation of UK stock market was happened because of panic reaction on the uncertainty condition of UK in the future (Raddant, 2016). Newspaper just make it worse to allude the pessimistic prognostications of those who would preferred to stay part of EU, however, Andrea Leadsom stated that "...forecasts of a disaster for sterling, equities and interest rates have not been proven correct" (Finkel, 2016). It is proven that after the Brexit vote stock prices dropped by around 10 percent and have since then slowly returned to mid-June levels (Raddant, 2016).

Based on the example of Brexit case, we need to reconsider on how rational investor could be when make valuation of stock in the market, because for many years, a classic finance perspective had regularly assumed that investors are rational in their investment decision making and therefore, risk-return trade-offs and exploiting value are calculated logically by the investors using the necessary information available in the market. The investors would integrate all of necessary information available in the market to the efficient market hypothesis and are impartial in analysing and choosing winning stock (Bakar & Yi, 2016).

Nonetheless, information in the stock market is limitless and we cannot accept and proceed it all at the same time, thus people or investor made a set of rules to clarify their understanding and decision and by proceeding only some part of available information. Based on the surveys of Fiske and Taylor (1991) and Libby et al. (2002) showed us that individual concentrates on few salient stimuli, especially investors and financial

professionals. This means investors are valued firm based on its profit/loss rather than doing a complete analysis of financial variables (Hirshleifer, Hou, Teoh, & Zhang, 2004).

Despite of the information availability that had a contribution for investor to make investment decision, Shefrin and Statman (1994) argue that information traders act based on fundamental information and process information rationally, however based on the several researches, it founds that trading based on information is profitable but somehow it vice versa in the market because noise trader gains more profit rather that the sophisticated trader. It's probably based on the sentiment that occurs on the market. The evidence of the market irrationality had been summarized by Ramiah et al. (2016) in liquidity trading, hedging, and speculation, and the review showed that markets are not always efficient as indicated by the presence of market anomalies, which can be explained in terms of noise trader risk. Although it has been highlighted on numerous occasions, to this date no attempt has been made to explain a market anomaly by using noise trader risk, apart from the closed-end fund puzzle (Ramiah, Xu, & Moosa , 2015).

According to Huang (2015), the institutional investors have a role as counterbalance of bias in the price of stock which supported by previous studies, such as, Sias et al. (2006), Boehmer and Kelley (2009), that this type of investors help in reducing mispricing and disclose it also exploit arbitraging profit by trading against mispricing. Another argument stated that institutional investors may become the source of price deviation and increase the volatility in the market. Therefore, the problems that affect the efficiency of stock market is not only influenced by an individual investor, but also institutional investor (Huang, 2015).

One of factor that influence investor to conduct mispricing is overconfidence bias. According to Bakar & Yi (2016) the overconfidence bias which is related to the self-attribution bias is the tendency of an individual to attribute his success to his own talent and ability while blaming 'bad luck' for his failure, making himself overestimating his talent. Overconfident have a positive significant impact on investors' decision making rather than other biases which is consistent with the results from the studies of Qadri & Shabbir (2013), Lim (2012), Qureshi et al. (2012) and Bashir et al. (2013) (Bakar & Yi, 2016).

As human tendency that tend to be overconfidence which had been widely documented in psychology and had become a central feature in economics and behavioural finance, it showed that overconfidence have strong impact on investment decision. Many

appearances of overconfidence have been examined through the trend to overestimate our own knowledge (particularly in miscalibration studies), our abilities compared to others (better-than-average effect), or the degree to which we control future events (illusion of control) (Lambert, Bessiere, & N'Goala, 2012).

One example of overconfidence occurs in the IPO (Initial Public Offering) stocks, in Hsu and Shiu (2010) analysis on the performance of 6993 investors bidding in 77 IPO auction in the Taiwan stock market between January 1996 and April 2000, they found that frequent bidders, investor whom trading more often, have lower returns than infrequent bidders. The frequent bidders bid too aggressively and evaluate the IPO firms too optimistically, resulting in inferior or lower performance. Although frequent bidders quite successful in their first few auction bids, but in the meantime, the returns are gradually reduced in following auctions. Further, based on their examination of bidding performance and stock selection performance, the evidence shows that for frequent bidders, performance is inferior than the infrequent bidders in both respects. This found implied that overconfidence causes frequent bidders trading too aggressively, with such overly aggressive bidding leading to paying more to secure the auctioned IPO shares, and thereby lowering their investment performance. Frequent bidders also have inferior stock selection performance, suggesting that they overestimate the future cash flow of the IPO firms, or underestimate the risk of investment in these firms, or both. Thus, frequent bidders' over-optimism inappropriately escalates the feasible sets of positive NPV, leading to erroneous bids at some auctions (Hsu & Shiu, 2010).

Overconfidence is one of the most noticeable bias in the stock market which relies on the core of volatile beliefs (Jlassi, Naoui, & Mansour, 2014). This bias has serious impact on markets by affecting pricing form and trading volume in the stock markets. Overconfidence bias may result in leading investors to pay a significant amount of commissions because of the aggressive trading behaviour of investor. Thus, to help determine does overconfidence bias occurs in the market, one of the methods that can be used is annual turnover formula by Tecke and Yilmaz (2015) which calculates twelve times the average monthly turnover compared with the mean turnover ratio in the literature at 1.3 from a sub sample of US investors (Tecke & Yilmaz, 2015).

In conclusion, there is a need in literature to investigate the method used by institutional investors in investment decision making and condition in the stock market

influenced by overconfidence bias. Therefore, this thesis will study deeper into the method to minimize the occurrence of overconfidence bias to support the efficiency or to decrease the level of irrationality in stock market.

1.2 Research objectives

The scope of this study set on the investment decision making on the stock market which influenced by overconfidence bias. Therefore, the objective of this study is to choose the best possible methods which will help institutional investor in making investment decision more rational within stock market and take advantage from irrationality in the stock market. Furthermore, we have a reason underlying the importance of our objective that concentrate on this particular bias, which is overconfidence, because of this bias likely to arise through evolutionary selection (Daniel & Titman, 2000). Thus, helping investor to choose the best possible method in investment decision making will increases rationality level in the stock market and recognized earlier the overconfidence bias in the stock market. When the rationality level in the stock market increase, then the efficiency of stock price reflection with information available in the market contribute on decreasing the risk of abnormal return (Ramiah, Xu, & Moosa , 2015). It will reduce the level of overconfident occurred (Liu, Chuang, Huang, & Chen, 2016). Additionally, it may stabilize the bias of stock pricing in stock market (Huang, 2015).

1.3 Research question

Based on the background above the researcher will focus on the methods used for institutional investors in managing their investment portfolio effectively which mostly influenced by overconfidence bias. Also, by reviewing and analysing the report regarding behavioural finance in the stock market to investigate and review upon overcoming identified challenges and barriers and drive the following questions as to follows:

Which methods for institutional investors can give high return and can make rational investments decisions in a stock market influenced by overconfidence bias?

This analysis is also addressing the following sub-questions:

a. *What is the role of institutional investor in stock market?* In order to understand the importance of institutional investor in the stock market, we need to examine what is the role of them and their impact towards the stock market.

b. *What instruments are used for making investment decision in stock market?* To provide the answer of instruments used for making investment decision, we need to examine the methods used by investor to make investment decision, and then, determine the advantage and disadvantage of each method.

c. *What are the characteristics of overconfidence bias?* After we know the method used by investor, we determine the characteristic of overconfidence bias which influence the investor's decision making, however we will examine the theory of Efficient Market Hypothesis which can addressing the decision making that should be made by investor.

d. *What models are available to determine the occurrence of overconfidence bias?* Then, after understanding the characteristic of overconfidence bias, we will determine which can helps to recognize the appearance of overconfidence bias in the stock market, so these tools might influence better decision making for the institutional investor.

1.4 Methodology

Type of research

For this thesis, researcher will be used an archival analysis. An archival analysis is an analysis that drives the researcher to find an answer for their research problem by analysing existed archival data, it can be used to answer research questions like who, what, where, why and how. Also, it can be used when the researcher has introduced the prevalence of a phenomenon as a goal (Henriksson & Nyberg, 2005).

Selection Criteria

First, we put key words below into search engines to find relevant articles, books, news, and reports. Identification of all keywords were gained when reading relevant sources. Then the selection of articles is performed based on the relevancy of the abstract with our topic. When the abstract is relevant, we use it to support our study. The elimination of articles

happens when the articles are published before 2000 and not mention any aspect that can support to answer the question of the research. Our study uses the most recent articles to keep the reliability and relevancy of our study.

Identification of key words

The following key words and abbreviations have been used in order to regain the relevant articles: *Behavioural finance, characteristic of overconfidence bias, the role of institutional investor, evidence of overconfidence bias, the method used for investment decision*.

Selection of search engines:

In order to recognize the abstract of relevant articles we use the following search engine:

a. Google scholar.
b. Online databases of Saxion University of Applied Sciences.
c. Scopus.
d. Web of Science.
e. Emerald.

The selection in search engines have selected several articles related to the key words. The selection of these relevant articles was eliminated by period of time, such as after 2000, and then the articles were selected through its abstracts, and conclusion to determine the relation with the problem that our study want to be answered.

In addition to answer questions in this paper, we have collect relevant materials and data from the following range of media:

- Articles from journals,
- Reports, and
- Newspaper.

1.5 Thesis Structure

The structure of this paper is organized as follows. Chapter 2 provides a brief explanation to answer the sub questions, followed in Chapter 3 by analysis and discussion which will lead to answering the main questions of this research. Then, the conclusions drawn from this research are presented and summarized in Chapter 4. And finally, the policy of the author also limitation while writing the research will be presented in Chapter 5 and Chapter 6.

CHAPTER II - THEORETICAL FRAMEWORK

In this chapter, we will give explanation to answer the sub questions. This research is based on the literature review about investment decision with the influence of overconfidence bias in the stock market. Thus, it can help answering the main question of this research.

2.1 What is the role of institutional investor in stock market?

The limited knowledge of institutional knowledge in the previous study is difficult to determine which role of institutional investor that might increase the efficiency in the stock market. According to Choi et, al. (2015), empirical evidence on the trading behaviour between individual and institutional investors is mixed, therefore it is quite difficult to determine the difference from it. However, some report explained that institutional investor flows are generally positively correlated with market returns, while individual is not (Choi, Kedar-levy, & Yoo, 2015).

Despite the limited knowledge about the role of institutional investor in the market, it is important to interpreting institutional trading activity with the potential effects of investor flow. As stated by Coval and Stafford (2007), that correlated investor flows into institutional portfolios with common investment objects can cause relatively price-pressures and subsequent loses, thus, the institutional investors' trading that they found incomprehensible derived from beneficial investors rather than managers' portfolio (Edelen, Ince, & Kadlec, 2016). In contrast, Huang (2015) stated that there are two arguments which define the institutional investors have a role as counterbalance of bias in the price of stock supported by previous studies, such as, Sias, Starks and Titman (2006), Boehmer and Kelley (2009), that this type of investors help in reducing mispricing and disclose it also exploit arbitraging profit (Huang, 2015).

Further, based on previous study Rashid Ameer (2010) agree that institutional investors are more methodical and better when evaluating managerial performance of company compared to individual investor (Rashid, 2010). This implies the stock prices may be driven by institutional investor which is supported by evidence that found by Huang (2015) about mispricing tend to be conducted by individual investor because they realized the gain too fast and hesitant to realize their losses, further, hold on under-diversified portfolios and even trade based on noise or sentiment (Huang, 2015).

In institutional investors, there are two aspects which had influence toward stock price, which are institutional ownership and institutional trading volume. However, the attention to study the influence of these aspect was not balanced, mostly focused on how much of shares outstanding held by institutional ownership to determine the percentage of anomalies that occur in the market, but not cover how much trading volume occurred. This may give greater impact because international trading directly moves stock prices but not institutional ownership (Shu, 2013).

Moreover, based on the previous practice, the decision making of institutional investor may drive from how well they monitor the uncertainty in order to minimize the risk for a given level of expected return by choosing various assets carefully. Hutchinson et, al. (2015) use a sample of Australian Firms and found that there is positive association between firm-specific risk, risk-management policy, and performance with increasing institutional shareholdings. But, this is significantly depending on the institutional investor's ability to influence management, further, depends on the size of ownership and whether the investee does not have potential business dealing with the investor (Hutchinson, Seamer, & Chapple, 2015).

Despite on the institutional investor's ability to monitor the uncertainty and influence management, the institutional trading volume can have a significant impact on stock price efficiency and therefore help reducing stock market anomalies. Specifically, because of institutional trading volume measures how actively institutions trade a stock. Institutional investors are generally considered more sophisticated traders than individuals. For example, Nofsinger and Sias (1999) find a strong positive relationship between change in institutional ownership and future stock returns, and the results suggesting that institutional investors have the ability to predict stock returns. While Barber and Odean (2000) found that individual investors lose significantly from their trading and suffer several behavioural biases when they trade. If institutions are more sophisticated than individuals, then institutional investor participation can speed up information circulation into stock prices and improve stock price efficiency. As a result, institutional investor participation will reduce the degree of observed stock market anomalies if these anomalies are associated with price inefficiency (Shu, 2013).

However, to support the argumentation of Shu (2013) which explained the possibility of institutional investor had role in reducing market anomalies, Huang (2015) found evidence that institutional investors act as rational investors, who provide liquidity and trade against

mispricing, and individual investors act as noise traders when hold and trade in closed-end funds (Huang, 2015).

With the important role held by institutional investor, it is important to encourage them for making decision carefully so there is no mispricing that usually occur because of they are too optimistic. According to Liu et, al. (2016) from the calculation of GARCH model, it shows that institutional investor trade overconfidently in high market return regimes than in low. This suit to the finding that the return volatility is also higher in high market regimes compared to low one (Liu, Chuang, Huang, & Chen, 2016).

Finally, we know that institutional investor helps in reducing mispricing, disclose it and exploit arbitraging profit, also this type of investor has a possibility to increase the efficiency for stock market in order to move accordingly based on the information available. A lot of considerations which determined whether institutional investor have a role in reducing market anomalies and increased market efficiency, first, it is important to interpreting institutional trading activity with the potential effects of investor flow, second, there are two aspects which had influence toward stock price, which are institutional ownership and institutional trading volume, and finally, institutional investor's ability to monitor the uncertainty in order to minimize risks and influencing management.

Further, there are two assumptions, first, institutional investors considered more sophisticated traders than individuals. This assumption has been proved by Barber and Odean (2000) which found that individual investors lose significantly from their trading and suffer several behavioural biases when they trade. If institutions are more sophisticated than individuals, then institutional investor participation can speed up information circulation into stock prices and improve stock price efficiency and this is supported by evidence found by Huang (2015) that institutional investors act as rational investors. And the second assumptions which stated that that institutional investors are more methodical and better when evaluating managerial performance of company compared to individual investor. This premise has implication that the stock prices may be driven by institutional investor, and thus, Huang (2015) found the evidence about mispricing tend to be conducted by individual investor because they realized the gain too fast and hesitant to realize their losses, further, hold on under-diversified portfolios and even trade based on noise or sentiment.

Therefore, it is important to encourage institutional investors, for making decision carefully so there is no mispricing that usually occur because of they are too optimistic Further, to understand how investment decision has been made, we will elaborate several methods used for investment decision making in the next section.

2.2 What instruments are used for making investment decision in stock market?

a. Momentum strategy

One way to predict the stock return is based on the past price information (performance). Among them momentum investment strategy has been documented used by investors in their buy and sell recommendations (Liu, Liu, & Ma, 2011). According to Lin C., et al (2016) the momentum strategy that widely adapted and a traditional method in the literature is Jegadeesh and Titmand's (1993) price momentum (Lin, Ko, Feng, & Yang, 2016). Momentum strategy describes the predictability of future price trend of stocks based on its past own performance or rather a system in which buying stock which have had high returns over the past few months or a year and selling stocks which have had poor return over the same period or shorter, and respectively, the movement of the stock price will based on the trend in the market (Investopedia, 2017).

For practitioners in finance, especially investors, momentum strategy is interesting to forecast asset prices and develop profitable trading strategies. When a stock price forms a trend, it tends to keep the trend, for example, past winner stocks are likely to outperform past loser stocks in the future. Exploiting the prediction based on the market trends, it is obvious for investors, who want to implement the momentum strategy, to buy the past winners and short-sell the past losers. However, it is not easy to detect the price trends from noisy data in practice especially when there is a risk of losing money which always exists if the unsophisticated strategy is implemented without any deep understanding in the source of the price momentum. In these senses, more thorough analysis on the price momentum is indispensable and finding potential momentum factors is an important task to both academics and practitioners. One easy approach to make it easy to understand the origins and seeking profitable trading strategies is to implement momentum strategy using alternative stock selection rules which are potential momentum-driving factors. The several

factors which considered in the literature are expected return by a time series model, trading volume, liquidity, 52-week high price, physical momentum, maximum drawdown and recovery and reward-risk measures (Choi, Kim, & Mitov, 2015).

Based on the evidence found in Shi and Zhou (2017) study on the Time Series Momentum effect (TSMOM) or momentum strategy, it shows that the TSMOM profitability derived from different firm-specific. The finding of this profitability is similar to the findings on the cross-sectional momentum effects in Chinese stock market. Specifically, the TSMOM strategies with higher price (including the closing and adjusted price), higher market value and lower trading volume are more profitable and therefore likely to be more statistical significant (Shi & Zhou, 2017).

Furthermore, according to Miffre & Rallis (2007) the momentum strategies buy the commodity futures that outperformed in the recent past, sell the commodity futures that underperformed and hold the relative-strength portfolios for up to 12 months. This evidence also builds on the research of Erb and Harvey (2006) who show that a momentum strategy with a 12-month ranking period and a 1-month holding period is profitable in commodity futures markets (Miffre & Rallis, 2007).

To understand more about the momentum phenomenon in order to gain high return while using momentum strategy, Lin C., et al. (2016) stated there are three hypotheses proposed. The hypotheses propose that the three models all predict that conditioning on past ascend market states, momentum profits are higher when the market continues in the ascend state than when it transits to the descend state. Following descend market states, the DHS model hypothesizes that because overconfidence is due to price declines following sells, the magnitude of overconfidence persists when the market continues in the descend state, leading to higher momentum profits when the market continues in the descend state than when it transits to the ascend state. The HS and SS models, however, both predict higher momentum profits when subsequent market state is ascended, regardless of the past market state. Asem and Tian (2010) result is thus in favour of the DHS model and rejects the HS and SS models in explaining momentum profits (Lin, Ko, Feng, & Yang, 2016).

There are strong rationales for implementing momentum strategies in commodity futures markets rather than in equity markets. The commodity-based long–short strategies minimize transaction costs, and trade liquid contracts with nearby maturities, are not subject to the short-selling restrictions that are often imposed in equity markets and focus on 31 commodity futures only. It is therefore unlikely that the abnormal returns we identify will be eroded by the costs of implementing the momentum strategy or will be a compensation for a lack of liquidity (as in Lesmond et al., 2004). On a less positive note, institutional investors who implement momentum strategies in commodity futures markets should, first, post initial margins, monitor margin accounts daily, roll-over contracts before maturity, and then, pay margin calls. As they are not born by equity asset managers, such costs should be weighed against the benefits of implementing momentum strategies in commodity futures markets. The margin calls and roll-over risk, however, should not be overstated: As the momentum strategies buy backwardated contracts and sell contangoed contracts, little to no cash will be required for margin calls and the roll-over trades will be more often, than not profitable (Miffre & Rallis, 2007).

b. Closed-end fund pricing

The pricing of closed-end funds (CEFs) is an important topic in finance because this is one case where the company fundamental values are directly observable and accurately valued. CEFs have predominantly been priced at a discount to Net Asset Value (NAV), an observation that seemingly runs counter to the law of one price. As expounded by Lee et al. (1991), fluctuations in prices relative to NAV are driven by changes in investor sentiment. Hence, it is not surprising that the average equity CEF discount (measured as price relative to NAV) is a component in the Baker-Wurgler (2006, 2007) index of investor sentiment (Alexander & Peterson, 2017).

Thus, closed-end funds serve as a unique research tool for testing asset pricing theories because the intrinsic value of a closed-end fund's underlying asset is relatively easy to gauge. A fund's NAV closely represents the intrinsic value or the fundamental value of this fund. Many empirical studies use discount/premium, the relative difference between a fund's market price and its NAV, as a proxy of mispricing (Huang, 2015).

According to Ross (2002), in equilibrium, some CEFs will sell at a discount while others will sell at a premium. Specifically, the size of the discount will be smaller or possibly even negative (i.e., the CEF will sell at a premium) for those CEFs that either; (a) hold securities whose arbitrage costs are lower, or (b) hold more illiquid assets, or (c) are managed by people with greater security selection ability. Hence, in an efficient market there are offsetting factors that can lead to one CEF consistently selling at a price that is below its NAV while another CEF consistently sells at a price above its NAV. This refers to theory collectively as the neoclassical theory of CEF pricing (Alexander & Peterson, 2017).

Furthermore, Closed-end funds provide an ideal laboratory in which to test for mispricing. Daily data on fund prices and the value of the underlying assets (the net-asset value or NAV) are available for funds quoted on the London Stock Exchange. The NAV provides a benchmark for the fund price which obviates the need to specify an asset-pricing model. Fuertes and Thomas (2006) used the term 'abnormal price behaviour' to signify fund-price changes that are significantly larger or smaller than contemporaneous movements in the NAV. In instances where the fund price falls more than the NAV, the fund discount (premium) will widen (narrow) and vice versa (Fuertes & Thomas, 2006).

c. Markov Decision Process + Genetic Algorithm

According to Chang & Lee (2017) there are two forms of stock investment analysis that exist, one is a mathematical theory-based approach that tries to represent stock trading behaviour by creating a stock market model to identify an interpretable profit. However, traditional mathematical theories are inadequate to explain the problem of non-linear, complex, and multi-targeted models and thus successfully profit from the stock market. Then, second method is based on artificial intelligence studies that forecast stock values via machine learning to construct a model and help investors make investment decisions, such as artificial neural networks. However, input factors of artificial neural networks are difficult to define and select. The implied parallel processing space search capabilities offer fast speed, high reliability, and flexibility due to the space search speed of genetic algorithms, and thus offer entirely new computational methods. Based on their powerful search skills and combinatorial optimization solving ability, genetic algorithms can help solve complex

problems such as portfolio selection and capital allocation in relation to stock investments. The Markov decision process involves the use of mathematical theory to achieve a forecast by sequential derivation function in the Markov chain. Markov decision process, which is capable of prediction, is suitable to solve stock investment problems, in terms of prediction to adjust investors' portfolio and investment decision making (Chang & Lee, 2017).

Chang & Lee (2017) confirmed that the Markov decision process can help investors solve timing problems. Based on their research, they found that this method differs from the technical indicators traditionally used to forecast market timing, which Markov chain can predict whether investors must adjust their portfolios and the optimal trading strategy. Further, Genetic algorithms have powerful spatial parallel search capabilities. Such algorithms can be coupled with Markov process and genetic algorithms to improve stock selection and capital allocation for stock investment strategy. It results in the better rate of return that the buy and hold strategy, proved in the Taiwan Market Index and TWN50, also this strategy has ratio of 83% can beat Buy and Hold strategy (Chang & Lee, 2017).

d. Contrarian strategy

De Bondt and Thaler (1985) stated that one implicit assumption of the contrarian investment strategy is the mean reversion property of asset prices toward a fundamental value path. That is, when asset prices are mean-reverting, one may obtain excess returns by short-selling assets that have performed well and buying assets with relatively poor past performance (Kim, 2009). Because contrarian that goes against prevailing market trends by buying poorly performing assets and then selling when they perform well, a contrarian investor believes the people who say that the market is going up do so only when they are fully invested and have no further purchasing power. At this point, the market is at a peak; when people predict a downturn, they have already sold out, at which point the market can only go up (Investopedia, 2017).

Furthermore, contrarian investment profit has been attributed to investors' overreactions to both good and bad news. Lakonishok, J., et al., (1994) found that value strategies produce higher returns because they contrast with the "naive"

strategies followed by other investors. At the same time, in correlation with the conventional risk–return trade-off, contrarian investors consider the risks of government intervention policies when they make investment decisions during a financial crisis. Liu, J., et al., (2016) model suggests that when the policy risk is low and there is a high probability that the market will improve subsequent to government intervention, the optimal solution for investors is to make an investment. Conversely, when the policy risk is high and there is a high probability that the market will get worse, the optimal investment decision is to exit. (Liu, Tao, Hou, & Zhang, 2016).

Ramiah, V., et al., (2011) found evidence of substantial contrarian profits during the period from 1992 to 2006 that a zero-cost portfolio which goes long past losers and short past winners earns, on average, up to 8.01% per month. They also report that returns for dually-traded stocks were consistently higher than those for the Hong Kong only listed firms and can thus conclude that contrarian profits in Hong Kong are mainly driven by dually-traded stocks (Ramiah, Cheng, Orriols, Naughton, & Hallahan, 2011).

Furthermore, Yao, Y. (2012) found the evidence suggesting that long-term contrarian is due entirely to the January size effect. The return autocorrelation analysis suggests that after controlling for the January effect the overwhelming long-term negative return autocorrelations become unreliable and unstable. The decomposition analysis on the profitability of the long-term contrarian strategy further confirms the findings. The January contrarian strategy is extraordinarily profitable, whereas the contrarian strategy outside of January is economically and statistically unprofitable. These findings are robust to different subperiods. However, the study highlights the fact that long-term contrarian is non-existent outside of January, and that it is the result of the January effect, even though the cause of abnormal return in the January effect remain to be unclear (Yao, 2012).

As a closure, based on the explanation about the characteristics of contrarian (buying losing stock and then selling when they perform well) and momentum (buy past winning stock, selling losing stock) strategies, this could help investor determines when they can use these two strategies in the stock market to gain more returns, but, they need to be patient carefully determine when they need to buy/sell a stock. Further, in the matter of cost efficiency and time consuming, investors can use computation methods based on Markov

Decision Process and Genetic Algorithm which capable of prediction that suitable to solve stock investment problems, in terms of prediction to adjust investors' portfolio and investment decision making. However, before try to gain maximum return while trading stock in the market, investors need to determine the fundamental value of the company and do pricing with closed-end fund pricing models which concern on Net Asset Value (NAV), closely represents the intrinsic value or the fundamental value of the stock. With these understanding of methods used for investment decision making, next we will elaborate the anomaly which mostly held by institutional investor when they are making decision in the next section.

2.3 What are the characteristics of overconfidence bias?

In order to understand the characteristics of overconfidence bias, first, we need to understand on classical finance theory which become the initiator on how stock market supposed to be work which is efficient based on the information in the market (Efficient Market Hypothesis), but in fact, a lot of evidence shows there are other factors that influence the trend of stocks in the market, one of them is bias called overconfidence.

What is efficient market hypothesis theory?

On the process of pillars that was created neoclassical finance, it tells us the following principles which are: (i) the fundamental value must be aligned with market value of an asset; (ii) new information in the market will be reflected on the market price quickly; (iii) prices in the market are following a random process that resulting from the random arrival of information; and (iv) investor will not regularly gain any abnormal return beyond the risk carried on. But its gain criticism during financial crisis because it cannot provide valid explanation regarding the perpetual of market anomalies (Ramiah, Xu, & Moosa, 2015).

Investors' behaviour do not behave as rational as they supposed to be, behavioural finance studies revealed that human beings affected by their psychological feelings in decision making, therefore research was conducted to fill the gap in differences of geographical location and demographic profile within Malaysian stock market between local people and foreigners by analysing the impact of psychological factors in investors decision making (Bakar & Yi, 2016).

Statman (1999) stated that people are rational and they are behaved normally in regards of neoclassical finance, on the contrary, behavioral finance models allow for the possibility that investor can make mistakes in their valuations or there is cognitive bias. However, the models constructed in evaluating the biases occur on investor behavior are similar with the traditional model except with some differences observed. The following principles are: (i) investors do not simply look at mean-variance configurations to make investment decisions as they may be influenced by other non-statistical characteristics such as taste, preference and other psychological factors; (ii) investors may perceive trends even though no obvious pattern is present; (iii) imperfect information exists in the presence of trader heterogeneity; (iv) different investors tend to have different investment opportunities, depending on taste, while herding behavior may result in a common taste; and (v) the market is not necessarily in equilibrium, and while arbitrage opportunities exist they may be subject to market sentiment (Ramiah, Xu, & Moosa, 2015).

In the recent theory of finance, a good starting theory is that of efficient capital markets or efficient market theory. The term "efficiency" implies the fact that investors have no opportunity of obtaining abnormal profits from capital market transactions as compared to other investors, they cannot beat the market. So, the only way an investor may obtain a larger profit is by investing in higher risk assets (Titan, 2015).

According to Titan A. (2015) in 1970, Eugene Fama published in his article, besides the definition of efficient markets, also the distinction between the three forms of efficiency – weak, semi-strong and strong. First, the weak form of EMH was presented as the state of fact in which the current prices of financial assets incorporate, at any moment, all the existing historical financial information. As a result, the theory supports the idea that investors cannot obtain abnormal profits from investing in these financial assets. This EMH form implies that prices will exhibit random walk. Second, the semi-strong form assumes that financial assets' prices reflect, at any moment, all the information existent on a market, including historical prices and other historical information (which means this form incorporates also the weak form of EMH), and, additionally, the prices change rapidly and without biases to incorporate any other new public information released on the market. In case semi-strong form of EMH is present on a capital market, neither technical nor fundamental analysis can determine the way an investor should split his funds so that the obtained profitability is higher than that achieved in case of investment in a random portfolio of financial assets. And the last, the strong form

of EMH assumes that prices incorporate all the available information on a market, which includes: historical financial information (weak form), all new public information (semi-strong form) and all private information regarding a financial asset (Titan, 2015).

The Efficient Market Hypothesis, which was created during the 1960s and the 1970s, asserts that financial markets are "informationally efficient" (Jovanovic, 2008, 2010). It suggests that stock prices reflect all available information, and that, consequently, a security's current price is equal to its intrinsic value (also called fundamental value). In addition, because new information arrives randomly, stock prices fluctuate randomly. While the consequence of the fact that stock prices reflect all available information (i.e. the actual price of a security is equal to its intrinsic value) is constitutive of the Efficient Market Hypothesis, courts have mainly focused on the first aspect of the theory only (that an efficient market means that all available information is reflected in prices), ignoring its second aspect (that price is equal to the fundamental value), which was the primary reason for the theory's creation by financial economists. The definition of an efficient market that is generally used nowadays comes from Fama's 1970 article: "a market in which prices always 'fully reflect' available information is called 'efficient" (1970,383). It is the definition on which courts based their own definitions of the Efficient Market Hypothesis in Cammer (1989) and Basic (1988) cases; it is also the definition adopted in Polymedica (2005) case. Although this definition is often quoted, in particular by economists, it has created many theoretical and practical difficulties (Titan, 2015).

Furthermore, markets are not efficient is confirmed by the results from the research and the findings are in alignment with the findings for China and Taiwan regarding to emerging economy with collectivist characteristic is exhibit to behavioural biases and affected by demographic factors, also have impact on the performance of trading activity of investors. The results have significant impact in price formation in accordance with the personal and cultural differences (Tekce, Yilmaz, & Bildik, 2016).

Efficient Market Hypothesis (EMH) cannot be valid anymore when there are anomalies occurs, this means neoclassical finance cannot gives adequate information of such irrational behavior that happen in the market which explained on the following anomaly occur in the market: (a) momentum profit that exist over various stock markets, it is challenging the EMH theory. (b) contrarian profit which produce because of investor only pay attention on current information. (c) overreaction that exists when the information being

overweight or underweight either in past or present information, but the noise trader is not appear in this anomaly. (d) underreaction occurs when the investor not fully consolidating between asset pricing and information published. (e) information pricing errors lead by overconfidence and self-attribution bias. (f) technical analysis just used as determination of illusory correlation (Ramiah, Xu, & Moosa , 2015).

What is overconfidence bias?

According to Daniel et al., (2004) Overconfident investors overestimate the precision of their own valuation abilities, in the sense that they overestimate the precision of their private information signal (Zaiane, 2013). Further, Gervais and Odean (2001) proposed that Overconfidence may unconsciously be nourished behind the self-applause model that investors might trade more aggressively in the hope to gain more profit if they exaggerate their investment ability to contribute to the returns from general market increases, causing investors to trade more actively and speculatively after market gains in order to accumulate wealth rapidly (Liu, Chuang, Huang, & Chen, 2016).

Bakar S., & Yi A. (2016) found that is overconfident have a positive significant impact on investors' decision making rather than other biases which is consistent with the results from the studies of Qadri & Shabbir (2013), Lim (2012), Qureshi et al. (2012) and Bashir et al. (2013). Furthermore, the results for other factors were similar with previous research by Lim (2012) and Kengatharan (2014) in conservatism factor and herding factor, and Qureshi et al. (2012) in availability factor (Bakar & Yi, 2016).

According to Zaiane (2013), researcher had developed theory and testable implication concealed by two assumptions, investors are overly overconfident about the precision of their private information, and that biased self-attribution causes the degree of overconfidence to vary with realised market outcomes (Zaiane, 2013). To put it simple, Gervais and Odean (2001) put hypothesis about overconfident trading: high market returns are followed by high trading volume. (Liu, Chuang, Huang, & Chen, 2016)

Further, based on study conducted by Mischra and Metilda (2015) that there are several results about the impact of investors towards overconfidence bias, the results showed that: (a) the level of overconfidence increases as investor's experience in investment increases, (b) the level of overconfidence increases with the level of education, and (c) men

are more overconfident than women. This study confirms the presence of bias among mutual fund investors. Investor experience, level of education, and gender do have an impact on investor bias. Thus, controlled experimental studies can throw further insights on the relationship between the variables. This study contributes to the existing literature on bias, especially the influence of demographic variables on overconfidence and self-attribution bias. From the investors' perspective, an understanding of the psychology and emotions underlying investment decisions can help both financial advisors and individual investors in formulating their financial goals better (Mishra & Metilda, 2015).

One example of the occurrence of overconfidence bias is that the U.S President election which won by Donald Trump. As stated by Matthews (2016), the Dow Futures market have fallen more than 800 points just few hours after the election was closed, this were indication of the scepticism and uncertainty with which global investors will greet a possible Donald Trump's administration. Not only was Trump's increasingly likely victory unexpected, but it puts into question what American economic policy will be for the next two years, in ways that are particularly unsettling to investors (Matthews, 2016).

However, on the post-election day, other sectors of stock market were gained a robust from Donald Trump's victory, such as, The S&P 500 index, which climbed up to 6% since election day, this rise based on the expectation to loosen regulations, reduce taxes and flare the economic growth. These factors encouraged hopes that interest rate will begin to rise quicker, especially in the term of overall economy sensitivity for banks (Samson, Wigglesworth, & Bullock, 2017). Further, Biotech stocks was improved sharply the day after the election and continued to climb for around a week after. This was after the defeat of Hillary Clinton on the pricing policy of pharmaceutical companies, her defeat suggests that the regulatory environment for chemist could be more compliant than many expected pre-election, that was the assumption driving gains at first. But then one prominent drug company CEO recently noted that drug prices are a constitutional issue, which means investors may be getting ahead of themselves if they think Donald Trump is going to leave the companies alone (Kiersz, 2016).

In conclusion, market is not rational as it describes on Kahneman theory (Efficient Market Hypothesis theory). This theory suggests that stock prices reflect all available information, and that, consequently, a security's current price is equal to its intrinsic value (also called fundamental value). It had three forms of efficiency, which are: weak, semi-

strong and strong forms, however, markets are not efficient that confirmed from the results of previous researches and findings by the occurrence of behavioural bias in the market such as overconfidence in the stock market and it had influenced on the investor's decision making. Overconfidence corresponds to individuals who are too confident and exaggerate in estimating their own competence and underestimate risk. Such psychological pitfalls trigger an autocorrelation in investor's errors beliefs about stocks' intrinsic values, which accelerates stocks mispricing.

2.4 What models are available to determine the occurrence of overconfidence bias?

There are several models which can help investor determine the existence of overconfidence bias in the stock market, such as:

a. To measure overconfidence, Tecke and Yilmaz (2015) use annual turnover which calculates twelve times the average monthly turnover. For each monthly turnover is calculated based on the following formula:

$$Monthly\ Turnover_t = \frac{\frac{\sum_{i=1}^{n} X_{it} * P_{it}}{W_t}}{2}$$
X_{it} : the amount of stock purchased or sold in month t
P_{it} : the beginning of the month price of the stock purchased or sold
W_t : is the total stock portfolio value of the investor at the beginning of the month.

Figure 1. (Tecke & Yilmaz, 2015, page 40)

In this formula, if the result of monthly turnover is high that implies high overconfidence compared with the mean turnover ratio in the literature at 1.3 from a sub sample of US investors for men is 0.77 turnover ratio and for women is 0.53. Since both theoretical and empirical findings from previous research for annual turnover that they are robust, this model is used as the main proxy to measure overconfidence.

b. There was also possible to add more factors in our analysis such as demographic factor, Tecke and Yilmaz (2015) run a regression analysis to determine how each demographic factor affects overconfidence as follows:

$Overconfidence = \alpha\, Age + \beta\, Male + \gamma\, Experience + \delta_1 Wealth_Low + \delta_2 Wealth_High + \theta_1\, Marmara + \theta_2\, Southeast\,.$
Age : the age of the investor and is a continuous variable
Male : a dummy variable for gender, which equals one for male investors
Experience : the year the account has been opened and is a continuous variable
Wealth_Low : a dummy variable, which equals one for portfolio wealth levels up to (for example) 10,000 TL (Top Left)
Wealth_High : a dummy variable and is equal to one for portfolio wealth levels higher than (for example) 100,000 TL
Marmara : a dummy variable, which equals one for the Marmara (most developed) region
Southeast : a dummy variable, which equals one for the Southeast Anatolia (least developed) region

Figure 2. (Tecke & Yilmaz, 2015, page 41)

With Monthly Turnover as the main measures of overconfidence. Other proxies such as the ISE30 ratio and the small M cap ratio are also used for robustness checks. Since explanatory variables are categorical, three additional regression models have been utilized for robustness checks. In these models, wealth is a dummy variable which equals 1 either for each portfolio wealth level up to 10,000 TL for low and to represent High portfolio wealth level that takes the value 1 for portfolio wealth levels higher than 100,000 TL, and takes value 0 if it is not reach those level. In these models, experience is either continuous, a variable that has an infinite number of possible values, or is a dummy variable which equals one for each experience level presented. (Tecke & Yilmaz, 2015).

c. Jlassi M., et al. (2014) was implemented Chuang and Lee's (2006) methodology. They are decomposing the trading volume into two components. The first is associated with investor's overconfidence (OVER), whilst the second is not associated (NONOVER), as described in the following equations:

$V_t = \alpha + \sum_{j=1}^{p} \beta_j r_{t-j} + \varepsilon_t = \left[\sum_{j=1}^{p} \beta_j r_{t-j}\right] + [\alpha + \varepsilon_t]$	(1)
$V_t = OVER_t + NONOVER_t$	(2)
V_t : the detrended market trading volume at time *t* (empirically estimated by the natural logarithm of number of shares traded in a day to the number of shares outstanding at the end of that day)	
r_{t-j} : market return at time *t-j*,	
β_j : a coefficient capturing the relationship between lagged stock return and actual trading volume,	
a : a constant term,	
p : measures the number of lags,	
ε : an error term	

Figure 3. (Jlassi M., et al., 2014, page 129-130)

d. It also possible to use Parkinson formula as stated below (Makokha, 2015):

$\sigma_{i,t} = \sqrt{12}\sqrt{\frac{ln\left(\left(H_i \frac{t}{L_{i,t}}\right)^2\right)}{4ln(2)}}$
$\sigma_{i,t}$= measure of overconfidence bias
12 = number of months in the year of study
H = Highest volume traded in year of study
L = Lowest volume traded in the year of study
i = high or low volume traded that, in this study, comes from NSE (Nairobi Securities Exchange) might obtain after one month in survey *t*
t = number of survey
In = natural logarithm

Figure 4. (Makokha K., 2015, page 20-21)

Lastly, to determine the occurrence of overconfidence bias in the stock market, we can use four possible methods which are, first, annual turnover used by, Tecke and Yilmaz (2015) that assumed, if the result of monthly turnover is high that implies high overconfidence compared with the mean turnover ratio in the literature at 1.3 from a sub sample of US investors. Second, add demographic factor in our analysis, like Tecke and Yilmaz (2015) that run a regression analysis to determine how each demographic factor

affects overconfidence. Third, decomposing the trading volume into two components. The first is associated with investor's overconfidence (OVER), whilst the second is not associated (NONOVER), and the last, use Parkinson formula.

CHAPTER III - ANALYSIS AND DISCUSSION

In this chapter, we will deliver the conclusion of literature review of each sub questions that will lead into answer into the main question, which methods for institutional investors can give advantage and can make rational investments decisions in a stock market influenced by overconfidence bias.

At last, institutional investor help in reducing mispricing, disclose it and exploit arbitraging profit, also this type of investor has a possibility to increase the efficiency for stock market in order to move accordingly based on the information available. A lot of considerations which determined whether institutional investor have a role in reducing market anomalies and increased market efficiency, first, it is important to interpreting institutional trading activity with the potential effects of investor flow, second, there are two aspects which had influence toward stock price, which are institutional ownership and institutional trading volume, and finally, institutional investor's ability to monitor the uncertainty in order to minimize risks and influencing management.

Further, there are two assumptions which institutional investors considered more sophisticated traders than individuals. This assumption has been proved by Barber and Odean (2000) which found that individual investors lose significantly from their trading and suffer several behavioural biases when they trade. If institutions are more sophisticated than individuals, then institutional investor participation can speed up information circulation into stock prices and improve stock price efficiency. As a result, institutional investor participation will reduce the degree of observed stock market anomalies if these anomalies are associated with price inefficiency, and this is supported by evidence found by Huang (2015) that institutional investors act as rational investors. And second assumptions which stated that that institutional investors are more methodical and better when evaluating managerial performance of company compared to individual investor. This premise has implication that the stock prices may be driven by institutional investor, and thus, Huang (2015) found the evidence about mispricing tend to be conducted by individual investor because they realized the gain too fast and hesitant to realize their losses, further, hold on under-diversified portfolios and even trade based on noise or sentiment. Therefore, it is important to encourage institutional investors, for making decision carefully so there is no mispricing that usually occur because of they are too optimistic.

Based on the characteristic and role of institutional investor, we understand that this type of investor had the capability in pricing stock better than individual investor because the availability of information regarding stock market (Rashid, 2010), it means that they already have the advantage to gain more return rather than others. Further to gain more return in the stock market which influenced by overconfidence bias.

As we explained before, market is not rational as it describes on Kahneman theory (Efficient Market Hypothesis theory). This theory suggests that stock prices reflect all available information, and that, consequently, a security's current price is equal to its intrinsic value (also called fundamental value). It had three forms of efficiency, which are: weak, semi-strong and strong forms, however, markets are not efficient that confirmed from the results of previous researches and findings by the occurrence of behavioural bias in the market such as overconfidence in the stock market and it had influenced on the investor's decision making. Overconfidence corresponds to individuals who are too confident and exaggerate in estimating their own competence and underestimate risk. Such psychological pitfalls trigger an autocorrelation in investor's errors beliefs about stocks' intrinsic values, which accelerates stocks mispricing.

Accordingly, institutional investor might use several strategies, which are, contrarian (buying poorly performing assets and then selling when they perform well) and momentum (buying stock which have had high returns over the past few months or even a year and selling stocks which have had poor return over the same period or shorter) strategies, this could help investor determines when they can use these two strategies in the stock market to gain more returns, however, they need to be patient and carefully determine when they need to buy/sell a stock. Moreover, in the matter of cost efficiency and time consuming, investors can use computation methods based on Markov Decision Process and Genetic Algorithm which capable of prediction that suitable to solve stock investment problems, in terms of prediction to adjust investors' portfolio and investment decision making. Nonetheless, before try to gain maximum return while trading stock in the market, investors need to determine the fundamental value of the company and do pricing with closed-end fund pricing models which concern on Net Asset Value (NAV), it closely represents the intrinsic value or the fundamental value of the stock.

Therefore, based on each trait of the strategies we can determine that to gain more return in the stock market influenced by overconfidence bias are depend on the condition and

preference of the investors, because each strategy has different benefit such as time series model (contrarian and momentum strategies), or based on net asset value (closed end fund pricing), or cost efficiency and forecasting accuracy (Markov Decision Process + Genetic Algorithm), therefore, investor need to examine the condition of the stock market, especially determining the occurrence of overconfidence bias. Therefore, it gives us an idea that institutional investors need to determine the the occurrence of bias, which is overconfidence bias, in order to help institutional investor understands more the situation in the stock market, and as a result, gains more return with the help of model that we explained (annual turnover and regression analysis using demographic factors (Tecke and Yilmaz, 2015), decomposing the trading volume into two components (Jlassi M., et al., 2014), and use Parkinson formula (Makokha, 2015)). It helps them aware about the market inefficiency and determine which strategy best used for that kind of market.

CHAPTER IV - CONCLUSION

For many years, a classic finance perspective had regularly assumed that investors are rational in their investment decision making and therefore, risk-return trade-offs and exploiting value are calculated logically by the investors using the necessary information available in the market. However, in fact, there is anomaly occurs in the market such as BREXIT case, which predicted that there will be economic crisis if the UK vote to leave although the price moves into its fundamental value in the mid-June, this indicates that not all of investor make decision rationally.

As in the example of Brexit case, one of the results of investor which not make decision rationally is the occurrence of overconfidence bias. Thus, our focus is to determine which method can give advantage based on the influence of overconfidence bias in the stock market towards institutional investor decision making, therefore we need to understand the characteristic of overconfidence bias. Overconfident investors overestimate the precision of their own valuation abilities, in the sense that they overestimate the precision of their private information signal. This bias has a positive significant impact on investors' decision making rather than other biases, there are also several results about the impact of investors towards overconfidence bias, the results showed that: (a) the level of overconfidence increases as investor's experience in investment increases, (b) the level of overconfidence increases with the level of education, and (c) men are more overconfident than women.

One example of overconfidence occurrence was in the IPO (Initial Public Offering) stocks that investors evaluating the IPO firms too optimistic, resulting in inferior or lower performance. Therefore, with the impact of overconfidence bias toward investor's decision making, we suggest institutional investor to determine the occurrence of overconfidence bias by using four models, which are, annual turnover and regression analysis using demographic factors (Tecke and Yilmaz, 2015), decomposing the trading volume into two components (Jlassi M., et al., 2014), and use Parkinson formula (Makokha, 2015).

Further, based on the level of occurrence of overconfidence bias in the market, institutional investor might choose the strategies we proposed that have their own benefit, as described, time series model (contrarian and momentum strategies), or based on net asset

value (closed end fund pricing), or cost efficiency and forecasting accuracy (Markov Decision Process + Genetic Algorithm).

Based on the role of institutional investors that can reduce mispricing, disclose it and exploit arbitraging profit, also this type of investor has a possibility to increase the efficiency for stock market in order to move accordingly based on the information available. Therefore, we suggest that determining the occurrence of bias is important to help investor winning stock trading. It helps them aware about the market inefficiency and determine which strategy best used for that kind of market, and for making decision carefully so there is no mispricing that usually occur because of they are too optimistic.

CHAPTER V - POLICY

In the case of Britain Exit from European Union, this situation had an impact towards the economic condition, especially in UK's stock market. Many people predicted that there will be economic crisis if the UK vote to leave, such as fall in houses prices, an emergency budget would be needed to cover up large cuts in spending. However, it seems the devaluation of UK stock market was happened because of panic reaction on the uncertainty condition of UK in the future. Newspaper just make it worse to allude the pessimistic prognostications of those who would preferred to stay part of EU, but, it is proven that after the Brexit vote stock prices dropped by around 10 percent and have since then slowly returned to mid-June levels.

Based on the example of Brexit case, researchers need to conduct studies or surveys which help propose new decision-making process which can handle the occurrence of anomaly and give high return for investors, especially for institutional investor which had role in reducing mispricing and disclose it also exploit arbitraging profit. Therefore, we propose that (a) institutional investor should take that role, which help increasing the efficiency and reduce volatility or risk in the stock market, (b) Financial manager or director should take that role and follows our suggestion to prove that they can gains high stock return, and last, (c) we suggest new process in investment decision making by including the methods to recognize the anomaly in the market to increase the possibility of gaining high stock return.

Chapter VI - LIMITATION

While writing this thesis, we acknowledge some limitation occurred when doing our research. First, our study consists only theoretical review rather than practical study. Hence, our study is lack in practical view through the results of implementing new decision-making process for investor and gaining high stock return. Second, since there is short-time to complete the research, we do not have time to review all of the information in the available journals. The time limitation, however, influence the accuracy of our findings. And the last, the limitation of evidence which not take into consideration about the region, and cultures of each stock market that might trigger to different results. These limitations trigger the next question which is: if the new process proposed just give the same results as what investor already done before, and in relation doesn't change the efficiency in the market, therefore, what should investors, either institutional or individual, do to gain more return in the irrational stock market? Thus, Future research is needed in order to answer the question, and this is the topic for future research.

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