THE IMPACT OF MARKET SENTIMENT INDEX ON STOCK RETURNS: AN EMPIRICAL INVESTIGATION ON KUALA LUMPUR STOCK EXCHANGE

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ABSTRACT

Modern finance theory documents that investor sentiment should not be priced. This is due to an element of mispricing where sentiments can be removed when rational investing and arbitrage occurs. Nevertheless, in research during the decades, it shows that sentiment induces uniformed demand of stock and cost of arbitrage is high, hence investor sentiment cannot be ignored. Prior studies provide conflicting evidences on the impact of sentiment on the financial markets. This study continues the investigation of the role of investor sentiment in the asset pricing mechanism by focusing on Malaysian stock market and using data from January 2000 to December 2010. This research also examines whether the influence of investor sentiment index on stock returns varies according to some characteristics of the firm. The technique of Principal Component Analysis (PCA) is used on market data to construct the investor sentiment index for Malaysian stock market. It is shown that Malaysian investor sentiment index could be measured by an equation of seven market variables. Using regression analysis and controlling for firm size, market-to-book ratio, financial leverage and growth opportunity, this index is shown to be able to predict Kuala Lumpur Composite Index (KLCI) returns in general. Further analyses which are based on portfolios of stocks formed based on size, risk and age show that the influence of the investor sentiment index on stock returns varies according to age and risk, but not size. However, after classifying the period of studies into before and after crisis periods, it is then shown that the significant relationship between the investor sentiment index and stock returns only takes place before the crisis period but not after the crisis period. The relationship between the index and stock returns is shown to differ according to firm age and risk after the crisis period but not before the crisis period. As a whole, the market sentiment is able to predict stock return in Malaysian equity market. The results imply that investor sentiment could be one of the major factors that should be accounted for in recent.

Keywords: Investor Sentiment Index, Behavioural Finance, Principal Component Analysis, stock returns, Malaysian equity stock market.

INTRODUCTION:

Stock markets play an important role to the real economy, and it can be considered as a leading economic confidence indicator which can point the trend of the real economy (Constantinescu, 2012). Nonetheless stock market history is peppered with events whose level of drama seems to defy explanation. They are striking enough to earn names of their own: The Great Crash of 1929, Tronics Boom and Go-Go years of the 1960s, The Nifty-Fifty bubble of the 1970s, Black Monday Crash of October 1987, the Dot.com bubble of the 1990s, 1997's East Asian financial crisis and the global financial crisis of 2008.

According to Constantinescu (2012), the level of confidence in the stock market is important because it influences the investors' willingness to invest their money in the stocks and shares. There are however at least two opposing theories explaining this relationship between investor sentiment and stock return, namely the classical finance theory and the behavioural finance theory.

The traditional finance theory assumed that the prices are not affected by investor sentiment because their demands will be neutralized by the transactions of arbitrageurs and thus discounts the possible effects of sentimental investors (Wang, Li, & Lin, 2009). The behavioural finance theory, on the contrary, believes that stock prices can and will be affected by sentiment (De long, Shleifer, Summers, & Waldmann, 1990; Shleifer & Vishny; 1997).

Investor sentiment can be defined as representing market participants' thinking regarding the future cash flows relative to some objective norms, namely the accurate basic value of the underlying asset (Baker & Wurgler, 2007). Moreover, Sehgal, Sood, and Rajput (2010) documented that investor sentiment can represents the confidence of investor or lack of it, and it may serve as a proxy for collective investor behaviour and influence the stock market.

Investor sentiment is an ambiguous concept not directly observable and its measurement is yet to be developed (Sehgal *et al.*, 2010). Due to the ambiguity surrounding the concept of investor sentiment, it is difficult to explain the idea of investor sentiment and its effect on trading in the financial markets. Varied information has been used as investor sentiment's proxy, for instant, Qiu and Welch (2006) employed survey information and Kamstra, Kramer, and Levi (2003) used investor mood. Individual investors with limited experience are more susceptible to sentiment. On this point, Kumar and Lee (2006) applied a measure for sentiment which is regarding on retail investor trading.Researchers have also employed different quantitative means to measure investor sentiment, among others are, mutual fund flows (Frazzini & Lamont, 2005), closed-end fund discounts (Neal & Wheatley, 1998), public offering initial volumes and premiums, and insider trading patterns (Seyhun, Nejat 1998). Bandopadhyaya and Jones (2005) have suggested using a rank of daily return and historical volatility for an equity market sentiment index, while Wang (2003) used current net positions and historical extreme values for the basis of the sentiment index employed.

History has shown that economic downturns, financial crises, political turmoil, and other social factors have caused the stock markets around the world to be unstable and highly volatile for investors (Guiso, Sapienza, & Zingales, 2008). The sub-prime crisis in the U.S. in 2008 has caused the Dow Jones Index to decline by 54.9 % over a period of 2007 to 2009. Many other stock indices around the world were also adversely affected by the crisis. The recent Euro-crisis which started in late 2009 has also affected many stock markets, particularly in the European countries. Malaysia is a non exception whereby for the period of the Asian financial crisis from end-June 1997 to end-August 1998 the Kuala Lumpur Composite Index (FBMKLCI) declined by 72% (Zulkafli, Zingales, & Ismail, 2007).

According to the information by Bursa Malaysia Research and Data Centre (2007), on average, for the period of 1991 to 2003, 91.35% of market participants is made up of individual retail investors who are generally not well - informed and have limited knowledge about stock investment (Yong, 2011). The behavioural finance theory together with several research findings suggest that uninformed investors who generally make their decision based on their feeling can cause securities mispricing (Barber, Odean & Zhu, 2009; Kumar, 2009; Yong, 2011). In addition, Chun and Ming (2007) documented evidence that investment decision of stock market is influenced to a certain extent by behavioural biases, and this support the important role of market sentiment in Malaysian stock market. Nonetheless, the association that the stock market of Malaysia, an emerging market, is inefficient and

possibly irrational, cannot be made without a careful and comprehensive study on the influence of market sentiment on stock prices.

Furthermore, the investor sentiment index is a useful prompter of how investors feel about the economy as well as the financial market. Thus, with the availability of this index, the investor sentiment in the market can be constantly monitored and by knowing the factors that influence this index, effective measures can be taken to improve investor sentiment. It is important to develop a measure of market sentiment and then investigate the relationship between market sentiment and stock return listed on Kula Lumpur stock exchange. Moreover, this study also attempts to examine whether the association between market sentiment index and stock return are influenced by specific characteristics of a firm such as size, risk, and age.

Kuala Lumpur Stock Exchange is one of the biggest financial markets in Southeast Asia (Yeoh, Hooy, & Arsad, 2010). Kuala Lumpur Stock Exchange is also ranked at the top in terms of the market development, as measured by market capitalization, compared to other Asian stock exchanges. To the author's knowledge, there is currently no study on the measure of investor sentiment for the Malaysian equity market. Thus, this study attempts to develop an index of market sentiment based on a comprehensive set of variables or factors suggested by Baker and Wurgler (2006).

LITERATURE REVIEW

INVESTOR SENTIMENT DEFINITION:

The general definition of sentiment is an attitude, thought, or judgment prompted by feeling (Merriam-webster, 2013). The term is being used extensively not only in the field of psychology and sociology, but also in the field of finance. For example, Zweig (1973) explained that sentiment is generally related to cognitive comparisons made by investors in their investment. In other words, investors rely on cognitive factors as well as their experience in making investment decisions. This is supported by Lee, Shleifer and Thaler (1991) who claimed that the economic fundamentals alone cannot justify the probability regarding the return of assets as part of the sentiment. Baker and Wurgler (2006) proposed a dimension when they defined sentiment as the investor tendency or inclination to speculate in the stock market. This is parallel with Smidt (1968) and Baker et al. (2007) who asserted that investors speculate due to the presence of sentiment among the investors.

Finally, Zouaoui, Nouyrigat and Beer (2010) defined sentiment as the view about financial market "personality", the behavioral of financial market approach recognizes that investors are irrational but normal and that systematic biases in their beliefs induce them to trade on non-fundamental information. The investors' sentiment is defined according to Bennet and Selvam (2011) as investors' feeling and belief towards investing, particularly stocks investing in the financial markets.

FORECASTING POWER OF STOCK RETURN:

Brown and Cliff (2004) studied the association between investor sentiment and stock market returns, using secondary and primary data. They used principle component analysis (PCA) to formulate their composite sentiment measures based on investor intelligence; and technical indicators such as Arms index (advance decline ratio), margin borrowing, the percentage change in short interest, the ratio of specialist's short sales to total short sales and several other proxies. The regression analysis results that are based on weekly and monthly stock returns show that investor sentiment is unable to forecast short-term market returns. However, the study by Brown and Cliff (2005) found that investor sentiment is able to predict long-term returns during the interval of two to three years. The researchers explained that the findings are due to the limited arbitrage opportunity in the long-run compared to the short term.

In another study, Kaniel & Sheridan (2004) studied how individual investor sentiment predicts stock return in New York Stock Exchange (NYSE). They formulated a daily measure for investor sentiment as the difference between the value of shares bought and the value of shares sold, divided by the average daily dollar volume in the calendar year. The sample includes all common stocks listed in the NYSE for the period of January 2000 to December 2002. The results show that the individual investor sentiment is a powerful predictor for future stock return with a probability value of 0.007.

Kumar and Lee (2006) used direct measures when observing the retail investor sentiment changes. They suggested that the sentiment measures can significantly explain stock returns for lower-priced stocks and also returns of portfolios that belong to small investors. The portfolio was sorted based on size, and the data covers the period from 1991 to 1996. The results showed that investor sentiment is able to forecast stock returns in the cross-section and in the aggregate. Furthermore, they documented that investor sentiment has a significant correlation and relationship with co-movements of stock returns with high retail investor concentration. However, based on the regression analysis, the findings indicated that investor sentiment influences the movement of stock prices and, in turn, affects the expected returns. However, Baker and Wurgler (2004) have different opinion when they proposed that investor sentiment can predict asset prices in the cross-section. They found that those stocks get high future returns in the low sentiment period.

In addition to examining the normal market conditions, there are studies which looked at the stock markets during crisis periods. For example, Chung and Ley (2007) examined the relationship between investor sentiment and market fluctuation for the Taiwan stock market during the crashes period occurring in 1990, 1997 and 2000[1]. Five investor sentiment proxies were selected to measure sentiment, and these proxies are highest-lowest spreads, market turnover, price earning (P/E) ratio, margin purchase to market value (MM) ratio and short sales to margin borrowing (SM) ratio, the data covers the period from 07/01/1993 to 08/26/1997. The researchers discovered that the increase in the variance of investor sentiment frequency leads the increase in stock index variance as the market comes close to a crash. In addition, the researchers concluded that the investor sentiment proxies can also be used to predict the time of a crash, especially for liquidity measure (highest-lowest spreads and turnover), investment risk measure (PE ratio), and bullish indicator of the market (MM ratio).

Asem, Chung and Tian (2009) examined whether stock liquidity and investor sentiment have interactive effect on Seasoned Equity Offers (SEO) price discounts in Australia. The primary measure of investor sentiment was a composite index constructed in the spirit of Baker and Wurgler's (2006) variables to construct the Australia composite index for investor sentiment. PCA was used to formulate the sentiment index using the data which covered the period of January 2002 to December 2008. Based on regression analysis, however, they found that investors become gradually more concerned about illiquidity as their sentiment turn down. It can be observed that when the sentiment index goes up, the investors are supposed to be more concerned about the liquidity of the stocks.

In another international setting, Finter *et al.* (2010) investigated whether investor sentiment account for the stock return on the German stock market. Investor sentiment index was constructed based on trading volume, net fund flow, IPOs return, equity debt ratio, and put-call ratio. The sample period includes all variables from 1993 to 2005. Using similar approach by Baker and Wurgler (2006), PCA was used to formulate investor sentiment index. Regression analysis was used to investigate whether investor sentiment predict future stock return. Their results also revealed another similar finding that investor sentiment index is not a predictive power for future stock returns (Adj. R^2= 11.70%). This is in line with the fact that sentiment is of slightly less importance on the stock market characterized by a low fraction of retail investors. However, Oirsouw (2007), using survey to measure sentiment to study the German market, found that investor sentiment explains return patterns in German financial markets.

Sehgal *et al.* (2010) developed an investor sentiment index for Indian market where they examined the association between investor sentiment index and market performance by constructing market sentiment index based on market and economic- related variables. The economic variables are prime lending rate, real GDP, corporate profits, liquidity in the economy and inflation. The market variables used for formulating the market sentiment index are price to earnings ratio (P/E ratio), advance decline ratio and put-call ratio. Based on the data from 2005 to 2007, the PCA technique was used for both market and economic variables to formulate investor sentiment index and they suggested that the investor sentiment index and market returns exhibit bilateral causality.

RESEARCH METHODOLOGY:

[1] According to Chung *et al.* (2007), Taiwan's market crash in 1990 emanated from "the real estate bubbles and saw market capitalization lose 5.9 trillion NTD; then 1997 crash swathe stock market lose 6 trillion NTD; the 1998 crash result from the bursting of the technology bubble and saw market capitalization lose 8.5 trillion NTD."

The objective of this study is to formulate an index of market sentiment based on a set of proxies suggested in many previous studies. This study uses the approach that has been applied by Baker and Wurgler (2006, 2007); Brown and Cliff (2004, 2005); and Sehgal et al. (2010) as sentiment variables because these variables can significantly explained and determine the sentiment index (Baker & Wurgler, 2006; Chung et al., 2007; Campbell et al., 2009; Yumei & Mingzhao, 2009; Gupta & Samdani, 2009; Glushkov, 2009; Yoshinaga & Junior, 2012; Ong et al., 2010; Sehgal et al., 2010; Yu & Yuan, 2011). The independent variable is market sentiment index derived from the sentiment proxies namely are Kuala Lumpur stock exchange share turnover, number of IPOs, first-day return on IPOs, dividend premium, equity share in new issues, price to earnings ratio for the market index, and the advance decline ratio.

STOCK EXCHANGE SHARE TURNOVER:

Baker and Stein (2004) documented that turnover is one of the factors that determine market sentiment index. In conclusion, however, the higher liquidity ratio gives greater market liquidity. Following the suggestion of Amihud, Mendelson and Lauterbach (1997), Baker and Stein (2004), and Jones (2001), this study defines turnover as the logarithm of turnover as follow.

$$Turn_{it} = \log \frac{\sum_t V_{it}}{\sum_t R_{it}} \quad \text{..... (1)}$$

Where,

$Turn_{it}$ = Turnover Ratio
V_{it} = The Volume Index
R_{it} = The Return on Stock Index

THE NUMBER AND THE AVERAGE FIRST-DAY RETURNS ON IPOS:

The number of IPOs and their average first-day returns are another sentiment proxy used by several researchers (Baker & Wurgler, 2006; Cornelli, Goldreich, & Ljungqvist, 2006; Glushkov, 2009). The term "initial public offering" (IPO) of equity can be described as when a particular firm for the first time start selling common stock to the public. In other words, there is no activity in the public market for the stock at the time of IPOs (Reilly & Brown, 2006). McKenzie (2007) explained how stock market and business condition variables are able to significantly explain the listing activities in the developed countries. Above all, the listing activity is the most influential variable. However, McKenzie (2007) stated that these findings may not be applicable to the emerging markets. Campbell *et al.* (2009) found that the underpricing has a positive correlation with investor sentiment. For this study, the Number of Initial Public Offerings (NIPO) is the total number of IPO for the particular month, and it is calculated as follow:

NIPO = The number of IPO for the particular month ..... (2)

The initial returns of Initial Public Offerings (RIPO) represents the average initial first day return on that month's offerings, also commonly known as the "underpricing". Several studies have been conducted on different stock markets worldwide that provide adequate information on the existence of abnormal positive initial underpricing among new listings. Nevertheless, the degree of underpricing can be significantly different across stock markets (Ritter, 1998; Ibbotson *et al.,* 1994; Garfinkle, Malkiel & Bontas*.,* 2002; Ritter & Welch, 2002). To calculate the initial return on IPO, closing price of the first day less the offer price divided by the offer price. It is calculated according to the methodology used (Aggarwal, Leal & Hernandez, 1993; Chi & Padgett, 2005; Baker & Wurgler, 2006, Chan, Wang & Wei, 2004). The returns on IPO can be calculated as follow:

$$RIPO = \frac{p_{i1} - p_{i0}}{p_{i0}} \quad \text{..... (3)}$$

Where,

RIPO	The return on IPO
p_{i1}	The first day closing price
p_{i0}	The offer price.

THE EQUITY SHARE IN NEW ISSUES:

According to Baker, Wurgler and Yuan (2011) the equity share in new issues is linked to various measures of investor optimism. The results of their study have shown that there is a strong correlation between changes in the equity share and changes in aggregate insider sales of stock. Moreover, they found that there is a negative relationship between equity share in new issues and the value weighted closed-end fund discount. Furthermore, the results also showed that the equity share in new issues has a positive relationship with changes in consumers' expectations of business conditions. For this study the equity share in new issues is calculated as follow:

$$Equ = \frac{E}{E+D} \quad \text{.....} \quad (4)$$

Where:

Equ	=	Equity share in new issue
E	=	The new equity issue
D	=	The new long and short term debt issue

THE DIVIDEND PREMIUM:

Tangjitprom (2011) measured investors demand by the dividend premium. On other words, investors demand can be measured as the logarithm difference between the average market to book ratio of dividend payers and non-payers. This measurement is basically identified as dividend premium. In this study, the dividend premium can be calculated as follow:

$$Div = Log(Average\ MtB_{payers}) - Log(Average\ MtB_{non\text{-}payers}) \quad \text{.....} \quad (5)$$

Where,

Div	=	Dividend premium
MtB	=	Market to book ratio

P/E RATIO FOR MARKET INDEX:

Ong *et al.* (2010) have studied the connection between P/E ratio and the performance of Kuala Lumpur stock exchange index. They discovered that the P/E ratio is a good as well as a useful predictor of the performance of KLCI. Whereby, it reveals the investors' sentiment towards the value of the stocks. Investors should find out if the existing P/E ratio of the stock is attractive enough. The P/E ratio for the market is calculated as follow:

$$P/E = \frac{\text{Total Market Capitalization (TMC)}}{\text{Total Earnings (TE)}} \quad \text{.....} \quad (6)$$

Where,

P/E	=	price earnings ratio for market Index
TMC	=	price multiplied by number of shares
TE	=	earnings per share multiplied by number of shares

ADVANCE DECLINE RATIO:

Based on Kuala Lumpur stock exchange, the cumulative advancers and decliners is considered important to capture the market perception. In addition, the advance decline indicator is also considered one of the best indicators of market movements as a whole (Investopedia report, 2008). The frequency of cumulative advancers and decliners stocks in every month is to make up the advancers to the decliners' ratio in monthly samples. The ARMS index is calculated as follows:

$$ADVDC_t = \frac{Numberofadvancers_t}{Numberofdecliners_t} \quad \text{(7)}$$

Where,

ADVDC = The advance decline ratio

THE FRAMEWORK ON THE EFFECT OF MARKET SENTIMENT INDEX ON STOCK RETURNS:

Another objective of this study is to investigate the relationship between market sentiment index and stock returns. The independent variable in this study is the market sentiment index and the dependent variable is the stock returns.

DEPENDENT AND INDEPENDENT VARIABLES:

The dependent variable in this study is the stock returns, while the independent variable is market sentiment index derived from the first framework. To test the association between market sentiment index and stock return, this study firstly sorts firms into equal weighted portfolio based on several firm characteristics (size, age and risk). This is followed by a regression approach to investigate which sentiment indicators are able to explain and predict the stock return.

CONTROL VARIABLES:

This study follows several previous related studies in controlling for firm level variables. Firm level controls include firm size, market to book ratio, financial leverage, and growth opportunity (Glushkov, 2006; Yoshinaga & Junior, 2012).

Firm size is defined as the natural logarithm of the total market capitalization. Glushkov (2006) and Baker and Wurgler (2006) documented that smaller firms are difficult to short. Mahawanniarachchi (2006) also documented that the relationship between firm size and stock returns is significant. Firm size can be calculated as follow:

$$\text{Firm Size} = \ln(Market\ Capitalization) \quad \text{(8)}$$

Market to book ratio is defined as the market value of a firm's equity divided by the book value of firm's equity. Market to book ratio can be used to capture the firm level stock misvaluation. The stock is likely to be more overvalued when its market to book ratio is high (Yoshinaga & Junior 2012). Market to book ratio can be also a measure of firm's investment opportunity set. A value firm with low growth opportunity has low Market to book ratio than a growth firm. Market to book ratio can be calculated as follow:

$$MtB = \frac{\text{Market Value of a Firm's Equity}}{\text{Book Value of Equity}} \quad \text{(9)}$$

Where,

MtB = Market to Book ratio

Financial leverage is another control variable. Korteweg (2004) stated that expected stock returns should increase with financial leverage. Previous researches indicated that the amount of debt and its

capital structure is a rising function of the company's cost of equity capital and higher debt is, therefore, correlated with higher volatility of future earnings (Gebhardt, Lee & Swaminathan, 2001; Hail, 2002). Dimitrov and Jain (2005), Nhu (2009) and Johnson *et al.,* (2011) reported that the association between financial leverage and stock returns is negative.

Financial leverage ratio can be calculated as follow:

$$\text{Lev} = \frac{\text{Total Debt}}{\text{Market Value of Outstanding Equity}} \quad \text{.....(10)}$$

Where,

Lev = Financial Leverage Ratio

The growth opportunity can be measured by Tobin's Q, the ratio of the sum of the market capitalization and book value of total liabilities to the book value of total assets (Yoshinaga *et al.,* 2012). Cheung (2005) documented that there is a positive linkage between growth opportunity and stock return. Nhu (2009) found that growth opportunity is positively correlated with stock return in Finland. Growth opportunity can be calculated as follow:

$$\text{Tobin's Q} = \frac{\text{Market Capitalization} + \text{Book Value of Total Liabilities}}{\text{Book Value of Total Assets}} \quad \text{.....(11)}$$

DATA ANALYSIS AND RESEARCH FINDING:
CONSTRUCTING MARKET SENTIMENT INDEX:

Based on previous studies, several variables are identified and tested to measure the investor sentiment through the construction of a sentiment index. This study follows the same tests adopted by Baker and Wurgler (2006), Brown and Cliff (2004), Finter, Niessen and Ruenzi (2010), and Yoshinga and Junior (2012) to formulate a sentiment index for this study. The variables tested are advance decline ratio, dividend premium, equity share in new issues, number of IPOs, P/E ratio of market index, the first-day returns on IPOs, and share turnover.

PRINCIPAL COMPONENTS ANALYSIS:

To estimate the sentiment index, the multivariate technique of Principal Component Analysis (PCA) is chosen which is under the technique of factor analysis. One of the major issues of constructing a sentiment index is that the proxies may have a non contemporaneous relationship with sentiment. Baker and Wurgler (2006) suggested that the changes of some proxies may not reflect the simultaneous shift of sentiment, and these proxies may need longer time to fully reveal the true fluctuation of sentiment. To address this issue, the PCA is executed on the seven proxies and their first lags. This procedure follows other researchers as close as possible to allow comparability (Baker & Wurgler, 2006 & 2007; Finter, Niessen & Ruenzi, 2010; Yoshinga & Junior, 2012). The first principal component provides 14 loadings to these proxies and lags. After that, the original proxies and their lags can be transformed into a first-stage index through the first principal component. This process can be presented as:

$$\textbf{Sentiment Index} = \beta_1 (\text{Turn})_t + \beta_2 (\text{NIPOs})_t + \beta_3 (\text{RIPOs})_t + \beta_4 (\text{Div})_t + \beta_5 (\text{Equ})_t + \beta_6 (\text{P/E})_t + \beta_7 (\text{AdvDec})_t + \beta_8 (\text{Turn})_{t-1} + \beta_9 (\text{NIPOs})_{t-1} + \beta_{10} (\text{RIPOs})_{t-1} + \beta_{11} (\text{Div})_{t-1} + \beta_{12} (\text{Equ})_{t-1} + \beta_{13} (\text{P/E})_{t-1} + \beta_{14} (\text{AdvDec})_{t-1}$$

Table 4.2 shows the results of the PCA for the original sentiment variables and their lags. The results show that there are seven components extracted from the fourteen variables used in the analysis. However, researchers suggested that the first principal component should be chosen as loading factors

for the fourteen variables (Baker & Wurgler, 2006 & 2007; Finter, Niessen & Ruenzi, 2010; Yoshinga & Junior, 2012). Therefore, the first stage index is constructed as follows:

First Stage Index= $0.136\,(AdvDec)_t - 0.099\,(Div)_t - 0.572\,(Equ)_t - 0.637\,(NIPOs)_t - 0.325\,(P/E)_t - 0.524\,(RIPOs)_t + 0.240\,(Turn)_t - 0.027\,(AdvDec)_{t-1} - 0.098\,(Div)_{t-1} + 0.525\,(Equ)_{t-1} + 0.639\,(NIPOs)_{t-1} + 0.382\,(P/E)_{t-1} + 0.525\,(RIPOs)_{t-1} + 0.290\,(Turn)_{t-1}$

Table 4.2: Principal Components Analysis for the Original Variables and their Lag

Variables	Component*						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Advance Decline Ratio	**.136**	.247	.843	.070	.182	-.095	-.108
Dividend Premium	**-.099**	.433	-.001	-.214	-.065	.642	.081
Equity Share In New Issue	**-.572**	.408	.007	-.474	-.058	-.310	-.169
Number of IPO	**-.637**	.010	-.022	.218	.518	.299	-.003
PE ratio	**-.325**	.167	.477	-.502	-.226	.035	-.126
First Day Return on IPO	**-.524**	.095	.373	.489	-.400	.054	.178
Turnover	**.240**	-.193	.068	.530	-.030	-.106	-.647
Lag Advance Decline Ratio	**-.027**	.087	-.804	.018	-.307	-.018	.069
Lag Dividend Premium	**-.098**	-.402	.201	.040	.257	-.383	.621
Lag Equity Share In New Issue	**.525**	-.341	.262	.006	-.015	.523	.161
Lag Number of IPO	**.639**	.059	.225	-.192	-.537	-.115	.144
Lag PE Ratio	**.382**	.728	-.013	.399	.128	-.108	.051
Lag First Day Return on IPO	**.525**	-.002	-.077	-.528	.492	-.047	-.139
Lag Turnover	**.290**	.781	-.098	.182	.174	-.066	.247

Extraction Method: Principal Component Analysis.
* 7 components extracted.

Table 4.3 shows the total variation explained by PCA. This table shows the total variation explained in two stages. In the initial stage, it illustrates the factors and their relevant eigenvalues, the percentage of variation explained and the cumulative percentage. In reference to the eigenvalue, it would be expected that seven factors would be extracted because of the eigenvalues of the seven factors are greater than one[2]. The second stage shows the extraction sums of squared loadings. However, the first PCA of the sentiment variables explains 79.93% of the sample variance.

[2] If a given eigenvalue is greater than 1, the vectors are stretched in the direction of the responding eigenvector; if less than 1, they are shrunken in direction

Table 4.3: Total Variation Explained by Principal Component Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.398	17.130	17.130	2.398	17.130	17.130
2	1.918	13.700	30.830	1.918	13.700	30.830
3	1.904	13.602	44.432	1.904	13.602	44.432
4	1.605	11.461	55.893	1.605	11.461	55.893
5	1.258	8.985	64.878	1.258	8.985	64.878
6	1.075	7.676	72.553	1.075	7.676	72.553
7	1.034	7.385	79.938	1.034	7.385	79.938
8	.799	5.706	85.644			
9	.588	4.199	89.843			
10	.458	3.270	93.114			
11	.383	2.737	95.850			
12	.231	1.647	97.497			
13	.194	1.387	98.884			
14	.156	1.116	100.000			

Extraction Method: Principal Component Analysis.

After constructing the first stage index, the correlation analysis is computed between the first stage sentiment index and the seven variables and their lag. However, the result of the correlation analysis leads to the selection of only seven among the fourteen variables, either the original variables or their lag which is based on whichever has a higher significant correlation with the first stage index; for example, either turnover or lag turnover, either number of IPOs or lag number of IPOs and so on. Table 4.4 shows the results of the correlation analysis between the variables and the first stage index.

Table 4.4: Correlation Analysis between First Stage Index and the Variables

Variables		First Stage Index
Advance Decline Ratio	Pearson Correlation	0.082
	Sig. (2-tailed)	0.352
	N	132
Dividend Premium	Pearson Correlation	-0.053
	Sig. (2-tailed)	0.544
	N	132
Equity Share In New Issue	Pearson Correlation	-.366**
	Sig. (2-tailed)	0
	N	120
Number of IPO	Pearson Correlation	-.800**
	Sig. (2-tailed)	0
	N	132
PE Ratio	Pearson Correlation	-.339**
	Sig. (2-tailed)	0

	N	132
First Day Return on IPO	Pearson Correlation	-.301**
	Sig. (2-tailed)	0
	N	132
Turnover	Pearson Correlation	0.13
	Sig. (2-tailed)	0.137
	N	132
Lag Advance Decline Ratio	Pearson Correlation	0.078
	Sig. (2-tailed)	0.376
	N	132
Lag Dividend Premium	Pearson Correlation	-0.066
	Sig. (2-tailed)	0.454
	N	132
Lag Equity Share In New Issue	Pearson Correlation	.264**
	Sig. (2-tailed)	0.003
	N	121
Lag Number of IPO	Pearson Correlation	.814**
	Sig. (2-tailed)	0
	N	132
Lag P/E ratio	Pearson Correlation	.355**
	Sig. (2-tailed)	0
	N	132
Lag First Day Return on IPO	Pearson Correlation	.260**
	Sig. (2-tailed)	0.003
	N	132
Lag Turnover	Pearson Correlation	.234**
	Sig. (2-tailed)	0.007
	N	132
**. Correlation is significant at the 0.01 level (2-tailed).		

Based on the table above, it can be seen that the lag variables have higher correlation than the original variables except lag advance decline ratio and lag dividend premium which have lower correlation than the advance decline ratio and dividend premium respectively. The correlation results indicate that the sentiment index is jointly measured by advance decline ratio, dividend premium, lag equity share in new issue, lag number of IPO, lag P/E ratio, lag first day return on IPO and lag turnover. Therefore, the market sentiment index can be constructed as follows:

$$\text{Market Sentiment Index} = B_1 (\text{AdvDec})_t + B_2 (\text{Div})_t + B_3 (\text{Equ})_{t-1} + B_4 (\text{NIPO})_{t-1} + B_5 (\text{P/E})_{t-1} + B_6 (\text{RIPO})_{t-1} + B_7 (\text{Turn})_{t-1}$$

After the relevant variables for formulating market sentiment index have been selected (advance decline ratio, dividend premium, lag equity share in new issue, lag number of IPO, lag P/E ratio, lag first day return on IPO, lag turnover), the PCA is performed again using only these important variables in order to measure as well as to construct the market sentiment index. Table 4.5 demonstrated the results of the PCA for the seven variables.

Table 4.5: Principal Components Analysis of the Seven Variables

Variables	Component*	
	1	2
Advance Decline Ratio	0.44184	0.143903
Dividend Premium	0.227681	-0.18154
Lag Equity Share In New Issue	0.127709	0.740855
Lag Number of IPO	0.381201	0.631445
Lag P/E ratio	0.858661	-0.28492
Lag First Day Return on IPO	0.284469	0.52311
Lag Turnover	0.821046	-0.31877

Extraction Method: Principal Component Analysis.
* 2 components extracted.

The results show that there are 2 components extracted for the seven variables. However, researchers recommended that the first principal component should be chosen as loading factors for the seven important variables (Baker & Wurgler, 2006 & 2007; Finter, Niessen & Ruenzi, 2010; Yoshinga & Junior, 2012). Therefore, the market sentiment index is constructed after rescaling the coefficient with its loading as follows:

$$\text{Market Sentiment Index} = 0.4418(\text{AdvDec})_t + 0.2276(\text{Div})_t + 0.1277(\text{Equ})_{t-1} + 0.3812(\text{NIPO})_{t-1} + 0.8586(\text{P/E})_{t-1} + 0.2844\,(\text{RIPO})_{t-1} + 0.8210(\text{Turn})_{t-1}$$

The maximum value reached by the market sentiment index is 85.8% for the lag of P/E ratio for the market index. The positive coefficients signs of all variables in the equation are as expected.

Table 4.6 shows the total variation explained by principal component analysis. This table displays the total variance explained in two stages. At the initial stage, it shows the factor and their associated eigenvalues, the percentage of variance explained and the cumulative percentage. The principle component analysis identified the market sentiment variables which explained 47.98% of the total variation; this result is consistent with Baker *et al.* (2006) and Yoshinaga *et al.* (2012), who recorded that the market sentiment variables which explained 49% and 49.03% respectfully of the total variation.

Table 4.6: Total Variation Explained by Principal Component Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.901	27.157	27.157	1.901	27.157	27.157
2	1.458	20.824	47.982	1.458	20.824	47.982
3	.967	13.810	61.791			
4	.901	12.878	74.669			
5	.838	11.975	86.644			
6	.661	9.441	96.085			
7	.274	3.915	100.000			

Extraction Method: Principal Component Analysis.

Based on the results thus far, it can be inferred that the variables that are significant in constructing market sentiment index are: advance decline ratio, dividend premium, lag equity share in new issue, lag

number of IPO, lag PE ratio, lag first day return on IPO, lag turnover, as far as the Malaysian equity market is concerned.

It is possible that some of sentiment variables which make up the sentiment index above are associated to the economic situation. Hence, there is a possibility that the market sentiment index constructed above is influenced by macroeconomic variables. Therefore, to ensure that the results are not being influenced by economic cycle, the market sentiment index is adjusted for the effects of economic cycle. This study follows Baker and Wurgler (2006), Finter, Niessen and Ruenzi (2010), and Yoshinga and Junior (2012), in using the macroeconomic variables such as growth rates in industrial production, inflation rate, interest rate, and retail trade to remove the effect of economic cycle on the market sentiment index.

In order not to include economics variables that are highly correlated with each other, the process starts from examining the presence of relationship between the chosen economic variables through correlation analyses as shown in Table 4.7

Table 4.7: Correlation Analysis between Macroeconomic Variables

	Inflation Rate	Interest Rate	Growth Rates in Industrial Production	Retail Trade
Inflation Rate	1.0000			
Interest Rate	-0.0685	1.0000		
Growth Rates in Industrial Production	0.8011**	0.1869**	1.0000	
Retail Trade	0.3871**	0.4741**	0.6254**	1.0000

**. Correlation is significant at the 0.01 level (2-tailed).

The presence of high correlations (generally 0.90 and above) is the first indication of substantial multicollinearity problem (Hair, Black, Babin, & Tatham, 2006; Hair, Black, Babin & Anderson, 2010), however, the results show that the highest correlation reached 0.801 which is less than 0.90, indicating that the macroeconomic variables are not highly correlated with each other.

An orthogonalized market sentiment index is then constructed. The process of orthogonalization is that each sentiment variable is regressed on the growth rates in industrial production, inflation rate, interest rate, and retail trade, the residuals from these regressions, labeled with a superscript ⊥. The residual results for each sentiment variable are the orthogonolized sentiment variables. The finalized market sentiment index is made up of the orthogonalized proxies following the same procedure as it done before in PCA. Therefore, the orthogonolized market sentiment index is constructed as follow:

$$\text{Market sentiment Index}^{\perp} = B_1 (\text{AdvDec})^{\perp}_{t} + B_2 (\text{Div})^{\perp}_{t} + B_3 (\text{Equ})^{\perp}_{t-1} + B_4 (\text{NIPO})^{\perp}_{t-1} + B_5 (\text{P/E})^{\perp}_{t-1} + B_6 (\text{R IPO})^{\perp}_{t-1} + B_7 (\text{Turn})^{\perp}_{t-1}$$

After the relevant orthogonolized variables for formulating the orthogonolized market sentiment index have been selected (orthogonolized advance decline ratio, orthogonolized dividend premium, orthogonolized lag equity share in new issue, orthogonalized lag number of IPO, orthogonolized lag PE ratio, orthogonolized lag first day orthogonolized return on IPO, and orthogonolized lag turnover) the PCA is performed again using only these orthogonolized sentiment variables in order to measure as well as to construct the orthogonolized market sentiment index. Table 4.8 shows the results of the PCA for the orthogonalized sentiment variables.

Table 4.8: Principal Components Analysis of the Seven Orthogonolized Variables

Orthogonalized Variables	1	2	3
Advance Decline Ratio$^{\perp}$	**0.432**	0.12	-0.215
Dividend Premium$^{\perp}$	**-0.05**	0.215	0.898
Lag Equity Share In New Issue$^{\perp}$	**0.191**	0.739	0.093
Lag Number of IPO$^{\perp}$	**0.431**	0.597	0.045
Lag PE ratio$^{\perp}$	**0.849**	-0.342	0.111
Lag First Day Return on IPO$^{\perp}$	**0.313**	0.48	-0.356
Lag Turnover$^{\perp}$	**0.806**	-0.372	0.146
Total Variance Explained	62.186%		

Table 4.8 shows the results of the PCA for the relevant orthogonalized sentiment variables chosen to construct the orthogonalized market sentiment index. The first principle component identifies the orthogonalized market sentiment variables which explained 62.186% of the total variation. This result is in line with Baker *et al.* (2006) and Yoshinaga *et al.* (2012) who found that the first principal component explains 53% of the total variation for the orthogonalized sentiment variables. The results show that there are three components extracted for the seven variables. However, previous studies recommended that the first principal component can be chosen as loading factors for the orthogonalized sentiment variables (Baker *et al.,* 2006 & 2007; Finter *et al.,* 2010; Yoshinga *et al.,* 2012). Therefore, the orthogonalized market sentiment index is constructed after rescaling the coefficient with its loading as follows:

$$\text{Market sentiment Index}^{\perp} = 0.432(\text{AdvDec})^{\perp}_{t} - 0.05\ (\text{Div})^{\perp}_{t} + 0.191\ (\text{Equ})^{\perp}_{t-1} + 0.431\ (\text{NIPO})^{\perp}_{t-1} + 0.849\ (\text{P/E})^{\perp}_{t-1} + 0.313\ (\text{RIPO})^{\perp}_{t-1} + 0.806(\text{Turn})^{\perp}_{t-1}$$

The maximum value reached by the orthogonalized market sentiment index is 84.9% for the orthogonalized lag of P/E ratio for the market index. The signs of the values in the equation above are similar to the previous studies (Baker *et al.,* 2006; Yoshinaga *et al.,* 2012).
Figure 4.2 shows the orthogonalized market sentiment index trend series of Malaysian equity market during the period of January of 2000 to December 2010. Based on the results it can be observed that the index can both be positive or negative.

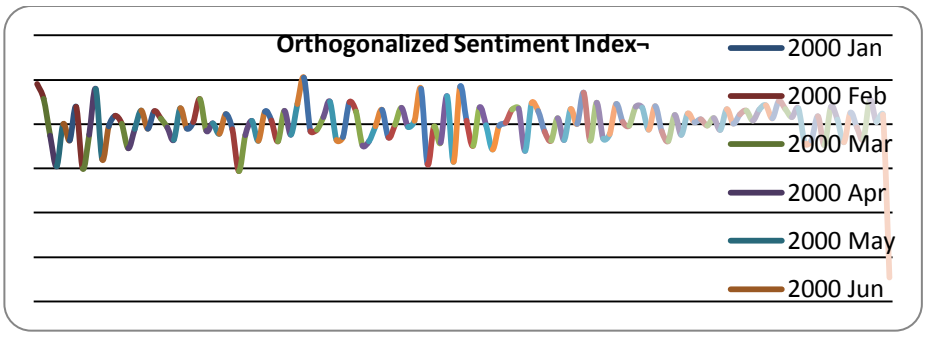

Figure 4.2 : ***Orthogonalized Market Sentiment Index for Malaysian Equity Market***

THE RELATIONSHIP BETWEEN MARKET SENTIMENT INDEX AND STOCK RETURN:

In analysing the relationship between market sentiment index and stock market return, KLCI composite index is used as a proxy of stock return and, firm size, market to book ratio, financial leverage, and growth opportunity are used as control variables. The equation of regression is shown as follows:

$$KLCI_{return} = c + \beta_1 Sentiment^{\perp}_{t-1} + \beta_2 FS_t + \beta_3 MtB_t + \beta_4 Lev_t + \beta_5 GO_t + \varepsilon_{it}$$

REGRESSION ANALYSIS:

Table 4.11 shows the results of the influence of market sentiment index on Kuala Lumpur composite index return (KLCI). The coefficient of determinations (R^2) value of 0.22 implies that on average the variability in the sentiment index constructed for this study together with the control variables selected, can explain 22% of the variability in the KLCI return.

Table 4.11: Regression Results on the Influence of Market Sentiment Index on KLCI Return With and Without Controlling Factors

	Without Control Variables		With Control Variables		Selected Variables	
	p-value	Beta	p-value	Beta	p-value	Beta
Sentiment Index$^{\perp}$	(.000*)	.017	(0.030*)	0.014	(.000*)	.017
Firm Size			(0.011*)	0.38	(.000*)	.289
MtB Ratio			(0.008*)	-0.00	(.027*)	-.004
Financial Leverage			(0.006*)	-0.52	(.007*)	-.564
Growth Opportunity			(0.355)	-0.06		
Constant	(.244)	.005	(0.012)	-1.77	(.000)	-1.352
F- Statistic	16.205		6.12		10.441	
R^2	.111		0.22		.247	
Adjusted R^2	.104				.224	
Durbin-Watson	1.687				1.918	
Collinearity	VIF < 10		VIF < 10		VIF < 10	
Heteroscedasticity	No		Yes		No	

* Sig at level 5%

The sentiment index variable is found to be positively and significant related to KLCI return, with a coefficient of 0.017 and probability value of 0.000. The results also show that the sentiment index variable is found to be positively and significant related to KLCI returns, with a coefficient of 0.0149 and a p-value of 0.030. This implies that, keeping other control variables constant, a 1 percentage point increase in the sentiment index will result in a 0.0149 percentage point increase, an average, in the KLCI return; vice versa. Of all the control variables included in the regression, only growth opportunity is not significant. Firm size has a coefficient of 0.3810, with a p-value of 0.011, market to book ratio has a coefficient of -0.0044, with a p-value of 0.008 and financial leverage has a coefficient of -0.5257, with a p-value of 0.006. Moreover, when growth opportunity is excluded from the model due to its insignificance relationship with stock returns, the sentiment index is still found to be positively and significant related to KLCI return, with a coefficient of 0.017 and probability value of 0.000. These findings are consistent with the results of previous studies which found that the sentiment indicator significantly effects stock return (Charoenrook, 2003; Brown & Cliff, 2005; Kumar & Lee, 2006; Glushkov, 2006; Schmeling, 2006; Schmeling, 2008; Yumei & Mingzhao, 2009; Grigaliuniene & Cibulskiene, 2010).

Therefore, ***the hypothesis that there is a significant relationship between market sentiment index and stock return is accepted.***

THE INFLUENCE OF MARKET SENTIMENT INDEX ON PORTFOLIO RETURN ACCORDING TO SIZE FACTOR:

The portfolio that is formed based on size is analyzed based on quintiles. The firms that fall in the bottom quintile is tagged with low value (small) and those firms that fall in the top quintile are tagged as high values (big). The intermediate quintiles Q(2), Q(3), and Q(4) are discard, because the reality that investors in the stock market can easily identify firms with extreme value, although Q(2), Q(3), and Q(4), which are all in the intermediate quintiles, may not be clearly distinguished by them in terms of value of each representative stock market. There are controlling variables that are used in the equation of regression which are shown as below.

$$R_{Big} - R_{Small} = c + \beta_1 \text{Sentiment}^{\perp}_{t-1} + \beta_2 FS_t + \beta_3 MtB_t + \beta_4 Lev_t + \beta_5 GO_t + \varepsilon_{it}$$

REGRESSION RESULTS:

Table 4.16 shows the results of the influence of market sentiment index on the differential between big and small portfolio returns.

Table 4.16: The Influence of Market Sentiment Index on the Differential between Big and Small Portfolio Returns

	Without Control Variables		With Control Variables		Selected Variables	
	P-value	**Beta**	**P-value**	**Beta**	**P-value**	**Beta**
Sentiment Index$^{\perp}$	(0.537)	-.002	(0.411)	-0.003	(0.555)	-.002
Firm Size			(0.019*)	0.109	(0.512)	-.005
MtB Ratio			(0.097)	-0.001		
Financial Leverage			(0.263)	0.135		
Growth Opportunity			(0.911)	-0.002		
Constant	(0.001)	.012	(0.011)		(0.098)	.019
F- Statistic	0.384		2.539		0.407	
R^2	0.003		0.095		0.007	
Adjusted R^2	-0.005		0.058		-0.01	
Durbin-Watson	1.633		1.723		1.624	
Collinearity	VIFs < 10		VIFs< 10		VIFs< 10	
Heteroscedasticity	No		No		No	

* Sig at level 5%

The results show that the overall model is inadequate due to a low F-statistic (.384) and low (R^2) (0.003). None of the independent variables is statistically related to the differential between big and small portfolio returns except firm size which has a significant coefficient of 0.109 with a probability value of 0.019. This implies that, the influence of market sentiment on stock returns do not varies according to firm size; the sentiment index cannot predict the stock return and the control variables do not influence the market sentiment index except the firm size. Furthermore, when the control variables are included, the sentiment index variable is found to be insignificant, with a negative coefficient of 0.002 and probability value of 0.537. Moreover, when firm size is only included in the model, the market sentiment index is found also to be insignificant, with a negative coefficient of 0.002 and probability value of 0.555.

Therefore, ***the hypotheses mentioned that is the effect of market sentiment index on stock return is varies according to the size is rejected.***

THE INFLUENCE OF MARKET SENTIMENT INDEX ON PORTFOLIO RETURN ACCORDING TO AGE FACTOR:

REGRESSION ANALYSIS:

The portfolio formed based on age factor is analyzed based on quintiles. The firms that fall in the bottom quintile is tagged with low value (young) and those firms that fall in the top quintile are tagged as high values (old). The intermediate quintiles Q(2), Q(3), and Q(4) are discard, because the reality that investors in the stock market can easily identify firms with extreme value, although Q(2), Q(3), and Q(4), which are all in the intermediate quintiles, may not be clearly distinguished by them in terms of value of each representative stock market. This study used the following control variables namely, firm size, market to book ratio, financial leverage, and growth opportunity, these control variables are shown in the regression equation below.

$$R_{Old} - R_{Young} = c + \beta_1 \text{Sentiment}^{\perp}_{t-1} + \beta_2 FS_t + \beta_3 MtB_t + \beta_4 Lev_t + \beta_5 GO_t + \varepsilon_{it}$$

REGRESSION RESULTS:

Table 4.21 shows the results of the influence of market sentiment index on the differential in the returns of old and young portfolio firms.

Table 4.21: The Influence of Market Sentiment Index on the Different between Old and Young Firm Return

	Without Control Variables		With Control Variables		Selected Variables	
	p-value	Beta	p-value	Beta	p-value	Beta
Sentiment Index$^{\perp}$	(0.005*)	-.196	(0.014*)	-.159	(0.006*)	-.191
Firm Size			(0.067)	2.072		
MtB Ratio			(0.499)	.184		
Financial Leverage			(0.136)	3.767		
Growth Opportunity			(0.001*)	-2.93	0.272	1.347
Constant	(0.942)	-.005	(0.108)	-9.63	(0.375)	-.093
F- Statistic	8.239		4.278		4.736	
R^2	0.062		0.15		0.071	
Adjusted R^2	0.054		0.115		0.056	
Durbin-Watson	1.882		1.989		1.918	
Collinearity	VIFs < 10		VIFs < 10		VIFs< 10	
Heteroscedasticity	No		No		No	

* Sig at level 5%

The F-statistic and R^2 in the regression is higher than the previous regression, which recorded a value of 8.239 and 6.2% respectfully. Furthermore, the sentiment index has a significant negative coefficient of - 0.196 with a probability value of 0.005. The significant negative influence of market sentiment remains even after control variables were added to the regression model. The results provide strong evidence that the influence of market sentiment on stock returns varies according to the age of the firms and that the influence is more for young firms since the coefficient is negative

Therefore, ***the hypotheses mentioned that is the effect of market sentiment index on stock return is varies according to the age is accepted.***

THE INFLUENCE OF MARKET SENTIMENT INDEX ON PORTFOLIO RETURN ACCORDING TO RISK FACTOR:

REGRESSION ANALYSIS:

The portfolio that is formed based on age factor is analyzed based on quintiles. The firms that fall in the bottom quintile is tagged with low value (low risky) and those firms that fall in the top quintile are tagged as high values (high risky). The intermediate quintiles Q(2), Q(3), and Q(4) are discard, because the reality that investors in the stock market can easily identify firms with extreme value, although Q(2), Q(3), and Q(4), which are all in the intermediate quintiles, may not be clearly distinguished by them in terms of value of each representative stock market. This study used the following control variables namely, firm size, market to book ratio, financial leverage, and growth opportunity, these control variables are shown in the regression equation below.

$$R_{\text{High Risky}} - R_{\text{Low Risky}} = c + \beta_1 \text{Sentiment}^{\perp}_{t-1} + \beta_2 FS_t + \beta_3 MtB_t + \beta_4 Lev_t + \beta_5 GO_t + \varepsilon_{it}$$

REGRESSION RESULTS:

Table 4.26 shows the results of the influence of market sentiment index on portfolio return that is sorted according to risk factor.

Table 4.26: The Influence of Market Sentiment Index on Portfolio Return (Risk)

	Without Control Variables		With Control Variables		Selected Variables
	p-value	Beta	p-value	Beta	
Sentiment Index$^{\perp}$	(0.003*)	.016	(0.003*)	.017	
Firm Size			(0.761)	.029	
MtB Ratio			(0.809)	.000	
Financial Leverage			(0.233)	-.179	
Growth Opportunity			(0.665)	.014	
Constant	(0.874)	-.001	(0.788)	-.121	
F- Statistic	9.053		2.211		
R^2	0.067		0.082		
Adjusted R^2	0.059		0.045		
Durbin-Watson	1.641		1.676		
Collinearity	VIFs < 10		VIFs < 10		
Heteroscedasticity	No		No		

* Sig at level 5%

The results in Table 4.26 show that the coefficient of determinations (R2) value is 0.067. This implies that on average the variability in the sentiment index constructed for this study together with the control variables selected, can explain 6.7% of the variability in the portfolio return that is formed based on risk. The sentiment index has a significant positive coefficient of 0.016 with a probability value of 0.003. Furthermore, when the control variables are included, the sentiment index is found to be positively and significant related to the portfolio return that is formed based on risk factor, with a coefficient of 0.017 and probability value of 0.003.

Therefore, ***the hypotheses mentioned that is the effect of market sentiment index on stock return is varies according to the risk is accepted.***

Theoretically, this study has made important contributions in enhancing the understanding that the investor sentiment needs to embrace into behaviour finance. The behaviour finance is an important part

of the decision making process for maximizing the level of investment in the financial market.
Furthermore, this study has extended the body of knowledge on behavioural finance particularly on how the investors' sentiment affects stock return. Since investors are boundedly rational (Hong & Stein, 1999), they are unable to quickly process fundamental news and information, therefore resulting in incongruence between the fair value and the market value of stocks.
The results of this study also further verified the propositions of limited investors' attention (Barberis & Shleifer, 2003; Peng & Xiong, 2006) and collective trades of uninformed investors[3] (Kumar & Lee, 2006), both of which can cause stock price mispricing and also return predictability. The findings of this study also further strengthen the conjecture made by Baker *et al.,* (2006) and Swell (2010) whereby investors sentiment leads to speculative mispricing, which explains the stock price fluctuations when investor sentiment changes. By examining the relationship between market sentiment index and portfolio return in the Malaysian equity market, this study has contributed to not only the current literature on investor sentiment index, but also on stock return as well. The specific gap that is filled by this study is the construction of the investor sentiment index in Malaysia.
In addition to filling in the gap in the literature, this study has provided a methodological contribution via the construction of investor sentiment index in Malaysia because there is hardly any study which has specifically constructed an investor sentiment index in Malaysia.
The findings of this study have an implication to the practitioners such as the fund managers and investors, as well as to the policy makers such as the stock bourses and central banks, both regional and international. Specifically, the sentiment index constructed can be used as an indicator to predict stocks return in general, with an added dimension of selected firm's characteristics, namely size, age and risk. Scrutinizing the proxies of the sentiment index also can enhance the understanding of the factors that are significant in influencing investors sentiment.
The finding of this study may help investment managers who can use such investment strategies to invest, for the stock that are hard to value and riskier to arbitrage in order to gain more return when the market follows a downward trend.

CONCLUSION:

In the classical theory of finance, investor sentiment is generally not considered as an important variable that directly explain stock return. This study refutes this idea and therefore it is conducted to construct a market sentiment index and to examine the relationship between the sentiment index and portfolio return in Malaysia.
The theoretical framework for the study picking up on the relevant empirical evidence from previous studies. Based on principal component analysis technique, the variables which are statistically significant in the construction of investor sentiment index in the Malaysian equity market are advance decline ratio, dividend premium, lag equity share in new issue, lag number of IPO, lag PE ratio, lag first day return on IPO and lag turnover. Based on this finding, the hypotheses stated that there are market variables that can significantly explain and determine sentiment market index in Malaysian equity market is accepted.
Based on the findings, most of the hypotheses developed in the study are accepted. The hypothesis documented in previously that there is a significant relationship between market sentiment index and stock return is rejected for the portfolios that are formed based size and age factors, while accepted for the portfolios that are formed based on risk factor.
However, the hypothesis mentioned previously that the effect of market sentiment index on stock return varies according to the size is rejected, while the effect of market sentiment index on stock return varies according to the risk and age are accepted.
Future studies may also add certain measures that are unique only to emerging markets but not relevant to developed markets. In addition, different or additional portfolios that are formed based on different firms characteristics can be sorted and employed in order to test the impact of sentiment index on that portfolio return. It is suggested that future research should consider investigating the ability of market

[3]Those who trade on sentiment rather than fundamental value.

sentiment index in predicting the future economic condition as well as the financial crisis.

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