

Unveiling the Role of Market Sentiment in Explaining Malaysian IPO Aftermarket Share Performance

Evelyn Yee-Foon Kong¹ & Kin-Boon Tang^{1*}

¹*Nottingham University Business School Malaysia, University of Nottingham Malaysia, Malaysia.*

Abstract: Research Question: This study constructs a composite market sentiment index and incorporates behavioral, issue, firm, and market characteristics to examine Malaysian Initial Public Offering (IPO) aftermarket share performance. **Motivation:** Over the past two decades, Malaysia's capital market has undergone significant structural changes, increasing market participant heterogeneity and influencing investment strategies and risk appetites. These shifts may have impacted investor behavior, particularly in terms of risk tolerance and decision-making. **Idea:** This study investigates the influence of market sentiment on Malaysian IPO aftermarket performance and assesses whether IPOs tend to underperform or overperform in the long run. **Data:** The analysis covers 571 IPOs listed on Bursa Malaysia between January 2000 and December 2020. **Methodology:** A multiple regression model is employed to examine the determinants of aftermarket share performance using Buy-and-Hold Adjusted Return (BHAR) as the dependent variable. Market sentiment is captured through three approaches: (1) Baker and Wurgler's (2007) Principal Component Analysis, (2) Jiang et al.'s (2022) Scaled Principal Component Analysis, and (3) Huang et al.'s (2015) Partial Least Squares method. This study extends Kong and Tang's (2024) work on IPO underpricing by focusing on long-run performance. **Findings:** Malaysian IPOs generally underperform between one and 48 months post-listing. Market sentiment plays a significant role in predicting aftermarket share performance, supporting Miller and Reilly's (1987) divergence of opinion hypothesis as a plausible explanation for IPO underperformance. **Contributions:** By integrating behavioral finance concepts, this study recognizes that investor decisions are influenced not only by fundamental factors but also by market sentiment and psychological biases. This novel perspective enhances the understanding of IPO aftermarket share performance in Malaysia.

Keywords: Malaysian IPO, market sentiment, multiple regression model, aftermarket share performance.

JEL Classification: X10, X12, X14

* Corresponding author: Kin Boon Tang. Tel.: 603-89248289. Fax: 603-89248019.
Email: kinboon.tang@nottingham.edu.my

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1. Introduction

Empirical studies document 2 distinct dimensions of post-IPO share performance. Firstly, IPOs often get listed at a significant premium to issue price, resulting in IPO underpricing. Consequently, investors can earn abnormally high rates of return compared to benchmark indices on the listing day (Ibbotson, 1975; Ritter, 1984; Kuklinski, 2003; Purnanandam and Swaminathan, 2004). Secondly, this initial underperformance tends to persist in the long-run. Ritter (1991) and Jaskiewicz *et al.* (2005) find that the underperformance generally persists for up to 3 to 5 years post-listing.

Over the past 2 decades, Malaysia's financial environment has undergone radical changes, particularly in its capital market structure since the millennium era. These changes may have led to increased heterogeneity among market participants and affected investors' risk-taking behavior. Further, such changes in market may also influence the behavior of investors in the long-run. Further, according to the Bursa Malaysia Research and Data Centre, between 1991 and 2003, an average of 91.35% of investors consisted of individual traders who were typically uninformed. Thus, it is crucial to examine the influence of market sentiment on the aftermarket share performance of Malaysian IPOs. The objective of this study is to deepen our understanding of the aftermarket share performance of Malaysian IPO and market sentiment. It is also of interest to examine long-run abnormal returns as they may capture the impact of share trading by investors who did not have an opportunity to buy shares at the initial offering price.

This study makes several contributions to the literature concerning the long-run share performance of IPOs in Malaysia. First, this study focuses on the influence of market sentiment on aftermarket share performance, it also incorporates fundamental factors to complement the market sentiment measures. The long-run market sentiment index has been decomposed using 3 different methods to construct the Malaysian IPO Investor Market Sentiment Index (MIMSI): Baker and Wurgler's (2007) analysis using Principal Component Analysis (PCA), Jiang *et al.*'s (2022) Scaled Principal Component Analysis (sPCA), and Huang *et al.*'s (2015) Partial Least Squares (PLS) methods. Further, empirical studies show that the construction of MIMSI by employing PCA, sPCA and PLS methods have not been employed in any empirical aftermarket share performance (long-run effect) IPO Malaysia studies. This study extends the research conducted by Kong and Tang (2024), which focuses on the IPO underpricing (short-run effect) of Malaysian IPO. Second, in contrast to the research examining the long-run share performance of IPOs in the United States and other developed markets, there has been only very limited research relating to the Malaysian market (Wu, 1993; Paudyal *et al.*, 1998; Jelic *et al.*, 2001; and Corhay *et al.*, 2002). Most studies of new equity issues in Malaysia only examine initial performance, and do so over a relatively short time period (Dawson, 1987; Loughran *et al.*, 1994; Yong, 1997). This study has covered the longest sample period for the past 21 years (post-2000) as compared to the rest of empirical study done for Malaysian IPOs. Additionally, the sample period from January 2000 to December 2020 is selected because these periods are characterised by a significant amount of regulatory, policy, capital market changes are inevitably imparted on investor psychology and stock market development which translate to changes in listing boards. Last but not least, majority of the data in this study are hand-collected extensively from each firm's IPO prospectus and post-listing annual reports from the listing day until end of sample period of this study, which enables the production of accurate and reliable results.

2. Overview of Transformation in Malaysia's Capital Market Structure

Based on Prime Minister of Malaysia Invest Malaysia 2008 Conference held on 25 March 2008, Malaysia government has announced that effective from 3 August 2009 Malaysia's capital market structure has undergone 3 main changes: (i) new board structures, (ii) new regulatory approaches, and (iii) new guidelines and listing rules for IPO market.

The Malaysia stock market contains 3 listing boards namely Main Board, Second Board and Malaysian Exchange of Securities Dealing and Quotation Berhad (MESDAQ). For high revenue growth and technology firms that intend to raise funds from the stock market will be recommended to be listed on MESDAQ. In August 2009, Main Board and Second Board were merged and renamed as Main Market, and MESDAQ was renamed as ACE Market stands for 'Access, Certainty, Efficiency'. ACE Market was established for firms that are technology based with high growth in revenue intend to raise funds via primary market. In December 2017, a new listing board has been introduced by Bursa Malaysia named Leading Entrepreneur Accelerator Platform Market (LEAP) Market. This market is mainly for small and medium firms to raise funds in the capital market which are unable to meet the listing criteria for Main Market and ACE Market (Yaakob and Halim, 2016).

In view of such changes, this study will examine the impact towards IPO market in Malaysia, particularly the aftermarket share performance. Figure 1 shows the changes in Malaysia's capital market structure and Table 1 shows the total number of IPO on Bursa Malaysia from January 2000 to December 2020.

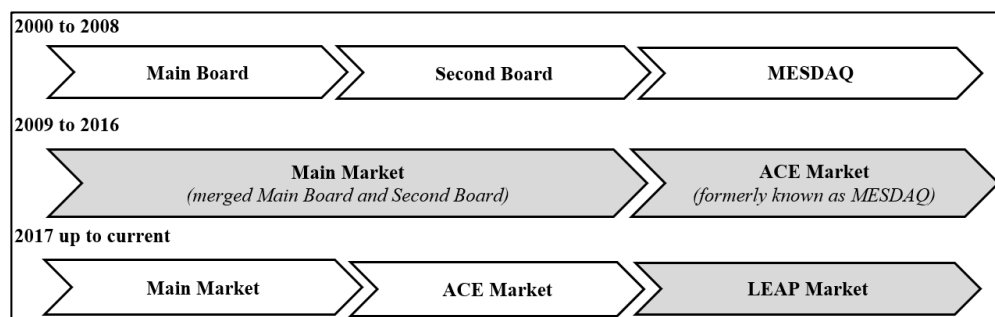


Figure 1: Changes in Malaysia's capital market structure from January 2000 up to current

Table 1: Total number of IPOs in changes board listing of Bursa Malaysia from January 2000 to December 2020

Year	Main Board	Second Board	MESDAQ	Total IPOs
2000	12 (31.58%)	26 (68.42%)	-	38 (100.00%)
2001	6 (30.00%)	14 (70.00%)	-	20 (100.00%)
2002	22 (43.14%)	22 (43.14%)	7 (13.72%)	51 (100.00%)
2003	16 (27.59%)	22 (37.93%)	20 (34.48%)	58 (100.00%)
2004	15 (20.83%)	26 (36.11%)	31 (43.06%)	72 (100.00%)
2005	16 (20.25%)	17 (21.52%)	46 (58.23%)	79 (100.00%)

Table 1 (*continued*)

Year	Main Board	Second Board	MESDAQ	Total IPOs
2006	10 (25.00%)	8 (20.00%)	22 (55.00%)	40 (100.00%)
2007	15 (57.69%)	8 (30.76%)	3 (11.55%)	26 (100.00%)
2008	7 (30.44%)	8 (34.78%)	8 (34.78%)	23 (100.00%)
	Main Market	ACE Market		
2009	11 (78.57%)	3 (21.43%)		14 (100.00%)
2010	23 (79.31%)	6 (20.69%)		29 (100.00%)
2011	17 (60.71%)	11 (39.29%)		28 (100.00%)
2012	14 (82.35%)	3 (17.65%)		17 (100.00%)
2013	16 (94.12%)	1 (5.88%)		17 (100.00%)
2014	12 (80.00%)	3 (20.00%)		15 (100.00%)
2015	9 (69.23%)	4 (30.76%)		13 (100.00%)
2016	7 (58.33%)	5 (41.67%)		12 (100.00%)
	Main Market	ACE Market	LEAP Market	
2017	6 (42.86%)	6 (42.86%)	2 (14.28%)	14 (100.00%)
2018	2 (9.09%)	9 (40.91%)	11 (50.00%)	22 (100.00%)
2019	4 (13.33%)	11 (36.67%)	15 (50.00%)	30 (100.00%)
2020	2 (10.53%)	10 (52.3%)	7 (37.17%)	19 (100.00%)

3. Literature Review

3.1 Empirical Evidences for the Aftermarket Share Performance of Malaysian IPOs

In Malaysia, it has been observed that Malaysian IPOs generally outperform the market over the long-run. However, the findings from empirical research conducted by Malaysian researchers differ from those observed, largely due to variations in measurement methodology, selected market benchmarks, and the sample period (Shari and Hassan, 2024). Table 2 shows the long-run share performance of Malaysian IPOs.

The long-run share performance of Malaysian IPOs has been widely debated, with mixed results due to differences in research methods, sample periods, and market benchmarks. Paudyal *et al.* (1998) examine 95 privatised IPOs on the Main Board from 1984 to 1995 and find that these IPOs outperformed the market for 3 years after listing, although the level of outperformance was below the levels reported by Jelic *et al.* (2001) for 182 IPOs listed from 1980 to 1995. This difference highlights how variations in sample periods and market benchmarks can influence the findings.

Corhay (2002) shows that IPOs from both Main Board and Second Board significantly outperformed the FTSE Bursa Malaysia KLCI over a 3-year period from 1992 to 1996. However, Ahmad-Zaluki and Lim (2012) find significant aftermarket share underperformance listed on MESDAQ from 2002 to 2005, particularly for high-tech firms, suggests that the sector composition of these IPOs may have played an important role.

Table 2: Summary of long-run share performance in Malaysia IPO market

Authors (Year)	Sample size	Sample period	Approach	Portfolio of IPOs	Benchmark	Aftermarket performance measure	Abnormal returns	Aftermarket performance up to
Paudyal <i>et al.</i> (1998)	95 IPOs	1984-1995	Event-time	EW	Market index	CAAR	+8.90%	36 months
Jelic <i>et al.</i> (2001)	182 IPOs	1980-1995	Event-time	EW	Market index	CAAR BHAR WR	+21.93%	36 months
Corhay (2002)	258 IPOs	1992-1996	Event-time	EW	Market index	CAAR BHAR WR	+41.70%	36 months
Ahmad-Zaluki <i>et al.</i> (2007)	454 IPOs	1989-2000	Event-time Calendar-time	EW VW	Market index Size-matched company	CAAR BHAR WR FF model	+28.20%	36 months
How <i>et al.</i> (2007)	322 IPOs	1989-2000	Event-time	EW VW	Market index	CAAR BHAR	+28.20%	36 months
Ahmad-Zaluki and Lim (2012)	93 IPOs	2002-2005	Event-time	EW VW	Market index Size-matched company	CAAR BHAR	-41.74%	36 months
Zarafat and Vejzagic (2014)	166 IPOs	2004-2007	Event-time	EW	Market index	CAAR BHAR WR	-32.80%	36 months
Siti and Norliza (2021)	271 IPOs	2004-2020	-	-	-	-	-8.67%	15 th day of initial returns
Shari and Hassan (2024)	334 IPOs	2002-2010	Event-time	EW	Market index	BHAR	+91.27%	60 months

Notes: CAAR denotes Cumulative average adjusted returns. BHAR denotes Buy-and-Hold abnormal returns. WR denotes Wealth relative. FF model denotes Fama-French model. EW denotes Equally weighted. VW denotes Value weighted.

On the other hand, Ahmad-Zaluki *et al.* (2007) show that investors who subscribed to IPO shares in Malaysia and held them for 3 years from 1990 to 2000 could earn significant abnormal returns, which is consistent with Jelic *et al.* (2001). They also found that larger IPO firms performed worse in the long-run compared to smaller firms. However, their findings did not support the fad hypothesis (Ritter, 1991) or the over-reaction hypothesis (De Bondt and Thaler, 1985). Shari and Hassan (2024) finds that Malaysian IPOs outperform the market over the long-run from 2002 to 2010.

Siti and Norliza (2021) investigate 271 IPOs listed on the Main Market and ACE Market of Bursa Malaysia from 2004 to 2020 in the pre- and post-market demonstrate that sentiment significantly and positively impact initial returns on the first and fifteenth days of listing. Investor attention, proxied by Google Search Volume Score, emerges as a critical factor. However, no prior research has used aggregate market-based sentiment indices to construct market sentiment measures for analysing the long-run share performance of IPOs in Malaysia. This study aims to bridge that gap.

3.2 Paradigm Shift to Behavioral Finance

Empirical literature suggests that most of the IPO explanations on financial anomalies are based on the assumptions that the market is efficient, and investors are rational. However, starting from the millennium era, the signs of future shift to behavioral approach appeared.

Baker and Wurgler (2000) state neoclassical finance affirms that investors are rational who intend to maximise wealth by taking into consideration fundamental factors such as financial ratios and macroeconomic indicators, and firms' intrinsic values. Macroeconomic variables such as money supply, inflation rates, gross domestic product, interest rates, and exchange rates, are the fundamentals that drive market movements and each of these variables is perceivable to be unbiased (Francis and Soffer, 1997). According to Chang and Dong (2006), the corporate variables refer to intrinsic value of firms which is determined by its accounting information such as revenue, profits, assets and liabilities. This value can be found and seen as financial ratios such as return on assets, return on equity, book-to-market and liquidity cash flows ratios. As such, fundamental factors comprise both macroeconomic variables and corporate variables.

Shefrin (2000) states that behavioral finance is the study of how psychology affects decision making process and financial markets. Psychology is a study of the mind and behavior. It explores human behavior, welfare and judgement and provides pertinent facts about how human actions can be different from traditional economic assumptions. Raiffa (1968) and Kahneman and Tversky (1979) state that the behavior of individual investors in theory differs from the reality, and classical financial theories cannot completely explain all the financial decisions. Therefore, the economic rationality of human beings in its behavioral finance is criticised reasonably.

3.3 Market Sentiment and IPO Aftermarket Share Performance

Dorn (2009) states that due to unique characteristics of market sentiment, it is uneasy to measure sentiment accurately. Previous studies use various proxies to gauge market sentiment, such as subscription rate for public tranche (Derrien, 2005); the number of news headlines (Cook *et al.*, 2006); willingness to overpay for IPOs in the when-issued market (Dorn, 2009); the market condition before IPOs (Derrien, 2005); and the discount rate of closed-end funds (Lee *et al.*, 1991).

Derrien (2005) investigates the impact of book-building demand by individual investors on French IPOs, shows that it significantly increases IPO prices on the listing day while negatively affecting long-run performance. Cornelli *et al.* (2006) expand this analysis to 486 IPOs across 12 European countries, demonstrating that high grey market prices, reflecting individual investor over-optimism, result in elevated IPO prices on the first trading day, followed by a long-run price reversal. The studies by Derrien (2005) and Cornelli *et al.* (2006) are supported by Dorn (2009), who uses trade size transactions during the book-building process as a proxy for individual investor sentiment in the German market. His study reveals that individual investor sentiment drives IPO aftermarket prices above fundamental levels, leading to high first-day returns. Similarly, Chan (2010) examines the United States IPO market, using trade size to measure investor participation in IPOs, and concludes that IPO aftermarket share prices are primarily influenced by individual investor sentiment.

The search volume index is used by Da *et al.* (2011) to measure investor attention, finding a positive correlation with IPO initial returns but a negative association with long-run returns. Similarly, the subscription rate for the public tranche is used by Jiang and Li (2013) as a proxy for investor sentiment in a study of 567 IPOs listed between 1999 and 2009. Their research demonstrates that individual investor sentiment significantly influences IPO prices during both the pre-market and aftermarket stages in Hong Kong. The impact of

individual investor overvaluation on high initial IPO returns in the Chinese market is highlighted by Song *et al.* (2014). By analysing 948 Chinese IPOs from 2006 to 2011, their study indicates that the first-day closing price tends to be more inflated by investor sentiment than underwriters underprice the offer price. Jiang and Li (2013) also find that investor sentiment is positively associated with initial returns. Collectively, these findings support the overvaluation hypothesis, suggesting that IPOs are initially overpriced due to high investor optimism which tends to dissipate, leading to long-run price reversals.

Besides, Norliza and Yoshiyuki (2021) analyse the impact of investor sentiment, proxied by Google Search Volume Index (GSVI), on Japanese IPO aftermarket performance from 2010 to 2019. Their findings show that optimistic sentiment leads to overpriced IPOs at listing, driving higher initial returns and trading volumes due to uninformed investor preferences. However, consistent with the overvaluation hypothesis, share prices reverse over time, causing long-run underperformance. Similarly, Poonam *et al.* (2023) analyse investor attention in Indian IPOs, separating initial returns into voluntary premarket underpricing and post-market mispricing. Using GSVI from Google Trends and the subscription rate as proxies, they find a significant positive relationship between investor attention and initial returns, supporting attention theory. BHARs indicate long-run price reversals, highlighting how investor biases in the pre-market phase drive inefficiencies and volatility.

3.4 Theoretical Explanations for Long-Run IPO Share Performance

The fads theory is also known as “impresarios” and is attributed to Shiller (1990). This theory evidences that underwriters are acting as impresarios deliberately underpriced the IPOs offerings in order to create excess demand and to attract investors. As a result, the excess demand is overwhelmed the market price will decrease, and issuing firms record the highest IPO underpricing would have the lowest long-run post-listing initial returns. According to Goetzman and Ibbotson (1994), a fad occurs when share prices are moving abnormally after listing. They state that during a fad it is expected to record a low cross-sectional variation, and also state that this condition is likely to occur during a panic or crash with investor mass pessimism. This is supported by Bikhchandani *et al.* (1992) who states fads cannot forecasted and predicted. Herding and fads are interconnected in reality, and fads could be the resultant of herding.

Miller and Reilly (1987) theory evidences that aftermarket share price increases the degree of divergence of opinion. This statement gives a perception that divergence of opinion should be positively related to the aftermarket share price because it proxies for the optimists’ opinion. The ‘divergence of opinion’ explains that great uncertainty has created overoptimism of buyers in the aftermarket share performance for IPOs. The release of timely information and transparency disclosure about a firm will reduce or disappear the differences between optimists and pessimists, and eventually this would lead to a decrease in market price and underperformance in the long-run (Miller, 1977; Levis, 1993). The above scenarios are supported by Ritter (1991), De Bondt and Thaler (1985), and Thaler (1988) as it is consistent with the ‘overreaction’ hypothesis which evidence that issuing firms with the highest IPO initial returns often recorded the poorest share performance in the long-run.

This study examines the role of market sentiment in explaining the aftermarket share performance of Malaysian IPO by employing the MIMSI. The MIMSI is constructed using 3 distinct methods: PCA as outlined by Baker and Wurgler (2007), sPCA by Jiang and Huang *et al.* (2022), and PLS by Huang *et al.* (2015). This study extends the research conducted by Kong and Tang (2024) which focuses on the IPO underpricing (short-run effect) of Malaysian IPO. By using the MIMSI, this study aims to provide a more accurate

reflection of market conditions as opposed to previous Malaysian empirical studies that use sentiment proxies to represent the sentiment index.

4. Data and Methodology

4.1 Data and Sample Selection

This study analyses a sample of 571 IPOs listed on Bursa Malaysia from January 2000 to December 2020. The rationale behind this selection of sample is because this period captures substantial changes within the IPO market. Following data collection, the data are subjected to statistical analysis to thoroughly investigate the determinants and trends of long-run share performance of IPOs in Malaysia.

In this study, all the sample data of IPOs issuing firms selection must be based on the following conditions. First, the sample data of IPOs identified for this study were from Main Board and Second Board, which subsequently merged into Main Market after August 2009, and MESDAQ renamed as ACE Market. Second, the eligible offerings considered in this study are limited to those conducted through public issues, offers for sale, or a combination of both, specifically involving the issuance of shares. This is consistent with prior study conducted by Abdul-Rahim and Yong (2008), and Yong (2007), certain types of IPOs are excluded from the final sample. These exclusions encompass restricted offer-for-sale, restricted public issue, restricted offer-for-sale to eligible employees, restricted offer-for-sale to Bumiputera investors (referring to Malaysia and other indigenous people in Peninsular and East Malaysia), special and restricted issues to Bumiputera investors, tender offers, and special issues. The rationale behind these exclusions is to avoid including Malaysian companies with a typical types of issuances that may yield less meaningful outcomes in the analysis. Third, this study also excludes the firms from Real Estates Investment Trusts (REITs) sector, and firms listed on the LEAP market of Bursa Malaysia for analysis because of their distinctive and non-comparable nature as compared to the entire sample firms in this study.

The data collection process are completed following these steps. The first step is to collect all the names of IPO issuing firms that went for listing from January 2000 to December 2020 which are identified from Bursa Malaysia's database available on Bursa Malaysia's website. In the second step, hand collected data were extracted from each of the IPO firm's prospectus and annual reports such as IPO price, offer size, listing date, listing board, underwriters reputation, firm age, board size, and major ownership shareholdings. In the third step, the secondary historical financial and market data were extracted from Bloomberg such as FTSE Bursa Malaysia Kuala Lumpur Composite Index. Finally, the data for Consumer Sentiment Index (CSI) and Business Condition Index (BCI) are obtained from Malaysian Institute of Economic Research (MIER)'s reports.

4.2 Methodology

Previous studies on Malaysian IPOs focus on aftermarket share performance including, underwriter's reputation and management earnings forecast (Jelic *et al.*, 2001), earnings management (Ahmad-Zaluki *et al.*, 2009), liquidity (Ramlee and Ali, 2012; Sopian *et al.*, 2013; Al-Masawa *et al.*, 2020), board governance (Dwaikat *et al.*, 2020). With regard to the IPO aftermarket share performance in Malaysia, only a few studies have investigated investor behavior. These include examinations of herding behavior (Dehghani and Sopian, 2014), divergence of opinion (Narayanasamy, 2017), and market behavior long-term performance (Wong *et al.*, 2017). Nonetheless, none of these empirical studies have concurrently analyses fundamental factors along with behavioral theories in the context of Malaysia.

Further, PCA method with market variables such as advance decline ratio, dividend premium, equity share in new issue, number of IPO, price-earnings ratio, first-day return on IPO, and turnover are used to construct the investor sentiment index for Malaysian stock market but not for Malaysia IPO market (Bashar, 2015). Besides, empirical studies for instance Zhu and Niu (2016), Han and Li (2017), and Li (2020) employ Baker and Wurgler's PCA method; Song *et al.* (2023) applies Jiang and Huang *et al.*'s (2022) sPCA method, while Li and Ran (2020) and Gong *et al.* (2022) use Huang *et al.*'s (2015) PLS method to examine the impact on asset prices and stock returns. However, there remains a significant gap as no empirical studies have applied these methodologies specifically to the aftermarket IPO markets in Malaysia. This study aims to address this gap, representing the first empirical investigation in this area within Malaysia context.

Based on the earlier discussions, there are few studies that have analysed the Malaysian IPO market using behavioral theories and the constructed market sentiment index has not yet been tested in the aftermarket share performance in Malaysian IPOs. Therefore, this study fills these gaps by constructing the MIMSI specifically tailored for the Malaysian stock market. This study has employed 3 different methods: Baker and Wurgler's (2007) analysis using PCA, Jiang *et al.*'s (2022) sPCA, and Huang *et al.*'s (2015) PLS method.

PCA is a multivariate method that reduces several unified quantitative variables describing observations into a single variable through dimensionality reduction. PCA aims to extract and highlight the most significant information from the data by compressing and simplifying it without losing crucial details (Abdi and Williams, 2010). A novel dimension reduction technique for supervised learning, sPCA was proposed by Huang *et al.* (2022). This method scales each predictor based on its predictability for the target variable. Compared with the conventional PCA, sPCA enhance the predictability of the target variable by capturing its inherent useful information. Huang *et al.* (2022) demonstrate that sPCA effectively filters out noisier predictors by assigning shrinking weights to them, allowing the target variable to guide the dimension reduction process. They provide evidence that sPCA improves index predictability over conventional PCA. Similarly, in the context of Malaysian IPO markets, sPCA enhances the forecasting performance of the index. Additionally, Huang *et al.* (2015), and Kelly and Pruitt (2014) found that compared to PCA, the PLS can isolate common noises irrelevant to the target variable from proxies, thus, leading to a more effective prediction.

4.2.1 Construction of Malaysian IPO Market Sentiment Index for Long-Run Effect

Kong and Tang (2024) examine the influence of market sentiment and IPO underpricing in Malaysia stock market using 571 IPO firms listed on Bursa Malaysia. In this study, Baker and Wurgler (2007) sentiment indicators are adopted as baseline regression because it is extensively accepted in various empirical studies. This study follows the same market-based sentiment measure adopted by Baker and Wurgler (2007) to formulate IPO market sentiment index namely, natural log of Share Turnover (TURN) representing the ratio of the trading volume to the total share capital, Number of IPOs (NIPO) representing the number of IPOs, First-day Returns of IPOs (RIPO) representing the first-day returns of IPOs, Dividend Premium (PDND) in this study, due to the availability of data in Malaysia the dividend premium was calculated using the fraction of net income of an issuing firm pays to its shareholders in the form of dividends, instead of the firm's dividend premium payable into between payers and non-payers at the end of financial year as explained by Baker and Wurgler (2007), and natural log of Equity Shares in New Issues (ESNI) representing total number of total equity and debt issues by all firms. The proxy of Close-End Fund Discount rate (CEFD) has been excluded in this study because there is only one close-end fund company listed on Main Market of Bursa Malaysia. Therefore, it could create biasness to

analysis results. According to Naik and Padhi (2016), survey-based sentiment measure are commonly used in combination with market-based sentiment measure. In this study, we have selected two survey-based sentiment measure namely, business conditions index (BCI), and consumer sentiment index (CCI). The data of TURN, NIPO, RIPO, PDND, ESNI, BCI and CCI are compiled based on quarterly basis in accordance with an IPO firm's listing date.

The predictive regression in constructing of MIMSI for short-run effect is as follows:

$$\text{SENT}_{it} = \beta_1 \text{TURN}_{it} + \beta_2 \text{NIPO}_{it} + \beta_3 \text{RIPO}_{it} + \beta_4 \text{PDND}_{it} + \beta_5 \text{ESNI}_{it} + \beta_6 \text{BCI}_{it} + \beta_7 \text{CCI}_{it} + \varepsilon_{it} \quad (1)$$

For the construction of MIMSI for long-run effect, this study following the study done by Ding *et al.* (2019) to decompose the original investor sentiment index into short-run effect and long-run effect. The long-run market sentiment was computed using 24-month moving average of the original sentiment index as a crude yet intuitive measure for the long-run sentiment component. More specifically, at each time t , the long-run sentiment component ($\rho_{LR,t}$) is the moving average of the original sentiment index over a 24-month period between $[t - 25, t - 2]$. While the choice to use a 24-month period might seem random, it is partially motivated by the observation that times of high or low sentiment in the stock market often last about 24 months. For example, in the United States stock market, there was a lot of excitement about new stocks from 1961 to 1962, high investor sentiment for firms with strong growth potential between 1967 to 1968, and a lot of excitement about gambling-related stocks in 1977 and 1978. When there are bubbles or market crashes, it usually takes about 24 months for share prices to return to normal. After the high-tech bubble in the early 1980s, for example, investors' demand shifted to stocks that pay dividends from 1987 to 1988.

4.2.2 Measurement of IPO's Long-Run Share Performance

There are 2 main approaches to compute the IPO's long-run performance; (i) event-time approach, and (ii) calendar-time approach. The event-time approach is the most common method to compute the long-run IPO share performance because it measures the post-listing share price behavior surrounding specific events (Kothari and Warner, 1997).

According to Barber and Lyon (1997), the event-time approach mainly 'buy-and-hold abnormal returns' are more representative of investor experience than the calendar time approach. Therefore, this study adopts event time approach to measure the long-run IPO share performance. The event time approach is consisting of 3 methods (i) Cumulative Average Abnormal Returns (CAAR), (ii) Buy-and-Hold Abnormal Returns (BHAR), and (iii) Wealth Relatives (WR).

The following are the explanation of different methods (CAAR, BHAR, and WR) used to compute the long-run IPO share performance based on the event-time approach. For each benchmark, monthly abnormal returns are computed for up to 48 months after listing (excluding the month of initial new issue), firms with a minimum of 12 monthly observations post-listing.

4.2.2(a) Cumulative Average Abnormal Returns

Ritter (1991) states the CAAR are computed for two periods: (i) the initial return period, and (ii) the aftermarket returns period. The initial returns period is denoted by 'month 0' and refer to the first-day returns after the listing. However, the aftermarket returns period is denoted by 'month 1 to 48' and defined as the 4 years' period returns of IPO after the listing

date excluding of the initial returns period. Based on Ritter (1991), and Allen *et al.* (1989), the aftermarket period returns are computed as follow:

$$R_{it} = \frac{P_{i1}}{P_{i0}} - 1 \quad (2)$$

where R_{it} is the aftermarket returns of IPO firm 'i' in the event month 't', consist of month 1 up to 48. P_{i1} is the closing price of IPO share on the last day of event month 't' and P_{i0} is the closing price of IPO share on the first day of event month 't'. Similarly, the benchmark adjusted return is calculated as follow:

$$AR_{it} = R_{it} - R_{mt} \quad (3)$$

where AR_{it} is the market benchmark adjusted returns of firm 'j' in the event month 't', while R_{it} is the IPO firm 'i' raw return in the event month 't'. R_{mt} is the market return calculated from the opening and closing value of market index, i.e. FTSE Emas Index, for each firm in the event month 't'. Similarly, the average market benchmark adjusted returns for the portfolio of IPO firms are calculated as follow:

$$AAR_t = \frac{1}{n} \sum_{t=1}^n AR_{it} \quad (4)$$

while AAR_t is the equally-weighted average market benchmark-adjusted return on a portfolio of n stocks for event month t. AR_{it} is the market adjusted returns of firm 'j' in the event month 't'. Similarly, the cumulative benchmark-adjusted return for the event 'month 1 to 48' are computed from the summation of average market adjusted returns (AAR_t) in the event month 't'. The cumulative average adjusted returns ($CAAR_{it}$) from month 1 to month t are given as:

$$CAAR_{it} = \sum_{i=1}^t AAR_t \quad (5)$$

According to Fama and Eugene (1998), the decision to use equally-weighted (EW) or value-weighted (VW) returns depends on the researcher's objectives. Lyon *et al.* (1999) suggested that if the researcher's focus is on investigating potential stock market mispricing, then equally weighted returns would be more appropriate. On the other hand, Brav *et al.* (2000) argued that when the researcher aims to calculate the average wealth change of investors following an event, a value-weighted scheme should be employed. The value-weighted market-adjusted returns (AAR_t) is given below:

$$AAR_t = \sum_{t=1}^n W_j * AR_{it} \quad (6)$$

while AAR_t is the value-weighted average market benchmark-adjusted return for event month t. AR_{it} is the market adjusted returns of firm 'I' in the event month 't'. The W_j is the value-weight, computed as the market capitalisations of firm 'I' at offer price immediately after the listing, divided by the total market capitalisation of the entire IPO sample. The

value-weighted $CAAR_{1t}$ from month 1 to month t are the sum of value-weighted market-adjusted returns (AAR_t) are as follow:

$$CAAR_{1t} = \sum_{i=1}^n AAR_t \quad (7)$$

4.2.2(b) Buy-and Hold Abnormal Returns

The buy-and-hold strategy is an investment approach where an investor purchases stocks and holds them for an extended period. Kooli and Suret (2004) argued that buy-and-hold returns effectively capture the investor's experience. Gompers and Lerner (2003) further explained that buy-and-hold returns provide more accurate results compared to CAAR when the market experiences higher volatility. Specifically, compounding short-run returns to obtain long-run buy-and-hold returns better reflects the long-run investor experience. As such, as an alternative measure to CAAR, the BHAR, which is defined as a strategy where a stock is purchased at the first closing market price after going public and held until its time period T .

$$R_{iT} = \prod_{t=1}^T (1 + r_{it}) - 1 \quad (8)$$

where R_{iT} is the buy-and-hold returns of the IPO firm 'i' at time T , while T is the number of months for which investors hold the IPO stocks. Here, T is 48 months, as this study is examining the long-run IPO share performance up to 4 years period of time. r_{it} is the total raw return of IPO firm 'i' at the event month 't'. Similarly, the benchmark adjusted buy-and-hold returns are computed as follow:

$$BHAR_{it} = \left[\prod_{t=1}^T (1 + r_{it}) - 1 \right] - \left[\prod_{t=1}^T (1 + r_{mt}) - 1 \right] \quad (9)$$

where $BHAR_{it}$ is the buy-and-hold adjusted returns of firm 'i' at the event month 't'. r_{it} is the raw return of firm 'i' at the event month 't', however, r_{mt} is the market return at the time of event month 't'. The mean equally-weighted BHAR of all the firm at the event month 't' is computed as:

$$ABHAR_{it} = \frac{1}{n} \sum_{t=1}^{nt} BHAR_{iT} \quad (10)$$

$ABHAR_t$ is the equally-weighted average buy-and-hold adjusted returns on a portfolio of n stocks for event month t . $BHAR_{it}$ is the buy-and-hold adjusted returns of firm 'j' in the event month 'T'. Similarly, the value-weighted BHAR is shown below:

$$ABHAR_t = W_j \sum_{i=1}^{nt} BHAR_{iT} \quad (11)$$

while $ABHAR_t$ is the value-weighted average buy-and-hold adjusted returns for event month t . $BHAR_{iT}$ is the market adjusted buy-and-hold returns of firm 'j' in the event month

‘T’. The W_j is the value-weight, computed as the market capitalisations of firm i at offer price immediately after the listing, divided by the total market capitalisation of the entire IPO sample.

4.2.2(c) Wealth Relative

Ritter (1991), Ahmad-Zaluki *et al.* (2007), Agathee *et al.* (2014), Loughran and Ritter (1995), and Brav and Gompers (1997) used WR to measure long-run performance of IPOs. In accordance with Ritter’s study in 1991, WR is defined as the ratio between the end-of-period wealth obtained from holding a portfolio of issuers and the end-of-period wealth acquired from holding a portfolio of matched companies or benchmarks. The formula for calculating this ratio is as follows:

$$WR = \frac{1 + \text{Average four years total BHAR on IPOs}}{1 + \text{Average four years total BHAR on benchmark}} \quad (12)$$

$$WR_t = \frac{\frac{1}{n} \sum_{i=0}^n \prod_{t=1}^T (1 + R_{it})}{\frac{1}{n} \sum_{i=0}^n \prod_{t=1}^T (1 + R_{mt})}$$

where WR_t is the wealth relative ratio for the period between $t = 1$ and $t = T$. R_{it} is the market return of firm i in month t , R_{mt} is the return on the stock index and n is the number of IPOs.

If the WR is greater (smaller) than 1, it signifies that the IPO firm’s performance surpasses (falls behind) the performance of the benchmark.

In assessing long-run share performance of IPOs, researchers often employ measures such as raw (absolute) performance or performance relative to a benchmark, known as abnormal returns (Ritter and Welch, 2002). However, relying solely on raw returns may not be the most suitable approach for evaluating whether an IPO’s performance aligns appropriately with the associated risks and returns (Bessler and Thies, 2007). To thoroughly analyse the long-run IPO share performance following their listing, adjustments were made to raw returns using various benchmarks, and event-study methodology was also utilised. Monthly abnormal returns were calculated for a period of up to 48 months post-listing.

A WR exceeding 1 can be interpreted as an indication that IPOs have outperformed a portfolio of comparable companies or market benchmarks. Conversely, a WR below 1 indicates that IPOs have underperformed compared to their matched companies or benchmarks.

This study adopts BHAR (VW) as a dependent variable to investigate the long-run share performance. In addition, other independent variables and description are explained in Table 3.

This study estimates the aftermarket share performance by using multiple regression model as set out below:

Ordinary least square regression model:

$$\begin{aligned} \text{BHAR}_{it} = & \beta_0 + \beta_1 \text{SENT}_{it} + \beta_2 \text{IR}_{it} + \beta_3 \text{OSIZE}_{it} + \beta_4 \text{FAGE}_{it} + \beta_5 \text{BSIZE}_{it} \\ & + \beta_6 \text{MAJOR}_{it} + \beta_7 \text{MVL}_{it} + \beta_8 \text{OVER}_{it} + \beta_9 \text{DUREP}_{it} + \beta_{10} \text{DHOT}_{it} \\ & + \beta_{11} \text{DBLIST}_{it} + \epsilon_{it} \end{aligned} \quad (13)$$

where, BHAR_{it} is the buy-and-hold adjusted returns of firm i . SENT_{it} is the Malaysian IPO market sentiment index was constructed using 3 different methods including PCA, sPCA,

and PLS methods. IR_{it} is calculated as the closing price of the stock_i at the end of the first day of trading minus the IPO_{it} offer price of the stock_i as stated in the IPO prospectus. $OSIZE_{it}$ is the natural log offer size calculated as total gross proceeds from the IPO. $FAGE_{it}$ is calculated as the age of the firm since incorporation. $BSIZE_{it}$ is calculated as the total number of board of directors. $MAJOR_{it}$ is calculated as the proportion of shares for the major shareholders prior to IPO. MVL_{it} is calculated as the standard deviation of daily FTSE Bursa Malaysia KLCI market returns over the three months before the closing date of subscription. $OVER_{it}$ is calculated as the magnitude of response from investors to an IPO, which is estimated as the ratio of the application size to the issue size (in volume). $DUREP_{it}$ {underwriter dummy equals ‘1’ if the lead underwriter includes one of the Tier 1 financial institutions, CIMB Bank, Maybank and RHB Bank and ‘0’ if otherwise}. $DHOT_{it}$ {hot issue market was identified as issue year using IPO volume and first-day return, where number of IPOs and average first-day return are greater than the sample’s average. Dummy variable, which denotes ‘1’ for hot issue market and ‘0’ for otherwise}. $DBLIST_{it}$ {board listing is to determine Main Market (established listing company) and ACE Market (young and growing company). Dummy variable, which denotes ‘1’ for Main Market and ‘0’ for ACE Market}. β_0 is the intercept of the equation. ε_i is the error term of the equation.

Table 3: Summary of variables for long-run IPO share performance

Factors	Variables	Variables measurements	Authors (Year)	Expected sign	Theory
Dependent variable	Buy-and-Hold Abnormal Return (BHAR): 3-month, 6-month, 12-month, 24-month, 36-month, and 48-month	$BHAR_t = W_j \sum_{i=1}^{nt} BH$ The value-weighted average buy-and-hold adjusted returns for event month t. $BHAR_{it}$ is the market adjusted buy-and-hold returns of firm ‘j’ in the event month ‘T’. The W_j is the value-weight, computed as the market capitalisations of firm i at offer price immediately after the listing, divided by the total market capitalisation of the entire IPO sample	Ritter and Welch (2002); Schultz (2003); Teoh <i>et al.</i> (1998); Kooli and Suret (2004); Ahmad-Zaluki <i>et al.</i> (2007)	-	-
Independent variable	(i) Behavioral Characteristics Malaysian IPO Market Sentiment (SENT)	2-year moving average of market sentiment constructed using PCA, sPCA, and PLS methods using sentiment proxies including share turnover, number of IPOs, first-day returns of IPOs, dividend premium, and equity shares in new issues, consumer confidence index, and business conditions index	Boulton <i>et al.</i> (2011); Ritter and Welch (2002); Song <i>et al.</i> (2014)	Positive	Divergence of opinion / Overreaction hypothesis Impresarios / Fad hypothesis

Table 3 (*continued*)

Factors	Variables	Variables measurements	Authors (Year)	Expected sign	Theory
(ii) Issue Characteristics					
Initial return (IR)		$\frac{P_{11} - P_{10}}{P_{10}} \times 100$	Shiller (1990); Carter and Manaster (1990); Kutsuna <i>et al.</i> (2008); Cai <i>et al.</i> (2008); Ahmad-Zaluki <i>et al.</i> (2007)	Negative	Divergence of opinion / Overreaction hypothesis
		P_{10} = the IPO offer price of the stock _i as stated in the IPO prospectus			Impresarios / Fad hypothesis
		P_{11} = the closing price of the stock _i at the end of the first day of trading			
Offer size (OSIZE)		Natural log of total gross proceeds from the IPO	Alanazi and Al-Zoubi (2015); Chi and Padgett (2005); Yu and Tse (2005)	Positive	Window of opportunity hypothesis
Underwriter reputation (UREP)		Underwriter dummy equals '1' if the lead underwriter includes one of the Tier 1 financial institutions, CIMB Bank, Maybank and RHB Bank and '0' if otherwise	Carter <i>et al.</i> (1998); Chan <i>et al.</i> (2005); Brav and Gompers (2000); Booth and Smith (2000); Chemmanur and Fulghieri (1994)	Positive	Underwriter reputation hypothesis Divergence of opinion / Overreaction hypothesis
(iii) Firm Characteristics					
Firm age (FAGE)		Age of the firm since incorporation	Ritter (1984); Kirkulak and Davis (2005); Loughran <i>et al.</i> (1994)	Positive	Agency costs and asymmetric information
Board size (BOARD)		Total number of board of directors	Pfeffer and Salancik (1978); Peng and Luo (2000); Certo <i>et al.</i> (2001)	Positive	Divergence of opinion / Overreaction hypothesis
Major shareholder ownership (MAJOR)		Proportion of shares for the major shareholders prior to IPO	Holderness (2003)	Positive	Divergence of opinion / Overreaction hypothesis

Table 3 (*continued*)

Factors	Variables	Variables measurements	Authors (Year)	Expected sign	Theory
(iv) Market Characteristics					
	Market volatility (MVL)	Standard deviation of daily FTSE Bursa Malaysia KLCI market returns over the three months (90 calendar days) before the closing date of subscription	Paudyal <i>et al.</i> (1998); Omran (2005); Ekkayokkaya and Pengniti (2012); Menyah <i>et al.</i> (1995)	Positive	Divergence of opinion / Overreaction hypothesis
	Oversubscription ratio (OVER)	Indicates magnitude of response of the investors for an IPO. Estimated as the ratio of application size to the issue size (in volume)	Agarwal <i>et al.</i> (2008); Kandel, <i>et al.</i> (1999); Chowdhry and Sherman (1996)	Positive	Divergence of opinion / Overreaction hypothesis
	Hot issue market (HOT)	Hot issue market was identified as issue year using IPO volume and first-day return, where number of IPOs and average first-day return are greater than the sample's average. Dummy variable, which denotes '1' for hot issue market and '0' for otherwise	Lowry <i>et al.</i> (2010); Samarakoon (2010); Alli <i>et al.</i> (2010)	Positive	Window of opportunity hypothesis
	Board listing (BLIST)	Board listing is to determine Main Market (established listing company) and ACE Market (young and growing company). Dummy variable, which denotes '1' for Main Market and '0' for ACE Market	Chen <i>et al.</i> (2004); Gounopoulos <i>et al.</i> (2007)	Negative	Divergence of opinion / Overreaction hypothesis

5. Results and Discussion

Overall, the findings show that the IPOs are underperformed aftermarket across all the time periods from January 2000 to December 2020. This means that investors earned negative abnormal returns by investing in IPOs 4 years after listing.

5.1 Aggregate Long-Run IPO Share Performance

Paudyal *et al.* (1998) and Jelic *et al.* (2001) have employed various methods to investigate the long-run share performance of IPOs in Malaysia. In this study, an event-time approach such as CAAR, BHAR, and WR are considered, using abnormal returns to examine the aftermarket share performance of Malaysian IPOs. Given that an IPO represents a significant event for an issuing firm, the event-time approach is deemed appropriate for this analysis as set out below.

The long-run IPO share performance is measured based on CAAR, BHAR, and WR. This study calculated all the three returns by using the EW and VW schemes. An EW index weighs each firms equally regardless of its market capitalisation or size of the firm. The VW computed as the market capitalisation of the firm at offer price immediately after the listing, divided by the total market capitalisation of the entire IPO sample. The following subsections explain the long-run IPO share performance as measured by CAAR, BHAR, and WR based on EW and VW schemes.

5.1(a) Cumulative Average Abnormal Returns

CAAR are calculated for two distinct periods: (i) the initial return period, and (ii) the aftermarket returns period. The initial return period, referred to as ‘month 0’, captures the first-day returns immediately following the listing of an IPO, specifically the closing price on the first day. On the other hand, the aftermarket returns period spans ‘month 1 to 48’, encompassing a 4-year period after the IPO listing date, and represents the cumulative returns during this extended period.

Table 4 presents the CAAR over a span of 4 years (48 months) for Malaysian firms that conducted IPOs from January 2000 to December 2020. The CAAR for a portfolio consisting of ‘N’ firms during the event period ‘month 1 to 48’ are calculated as the arithmetic mean of the market-adjusted returns. The monthly average returns, expressed in percentage, are accompanied by corresponding *t*-statistics and indicators of statistical significance. Here, ‘N’ represents the total number of firms included in the portfolio for each respective month. In the entire sample, only 469 firms completed their 4-year anniversary after the listing with complete data. The monthly count of firms is lower than the total sample of 571 firms due to various reasons such as the unavailability of share price data and missing data for other independent variables because the firms could have been delisted.

Table 4 indicates that IPOs generated positive returns (overperformance) for CAAR (EW) and negative returns (underperformance) for CAAR (VW) from month 1 to 48 relative to the benchmark. The result as given in Table 3 is statistically significant under EW scheme the highest overperformance under CAAR (EW) is 208.51% in the 44-month period, while the lowest overperformance is 17.52% in the 1-month after listing. On the other hand, the highest underperformance under CAAR (VW) is -5.75% in the 48-month period, while the lowest overperformance is -0.10% in the 1-month after listing.

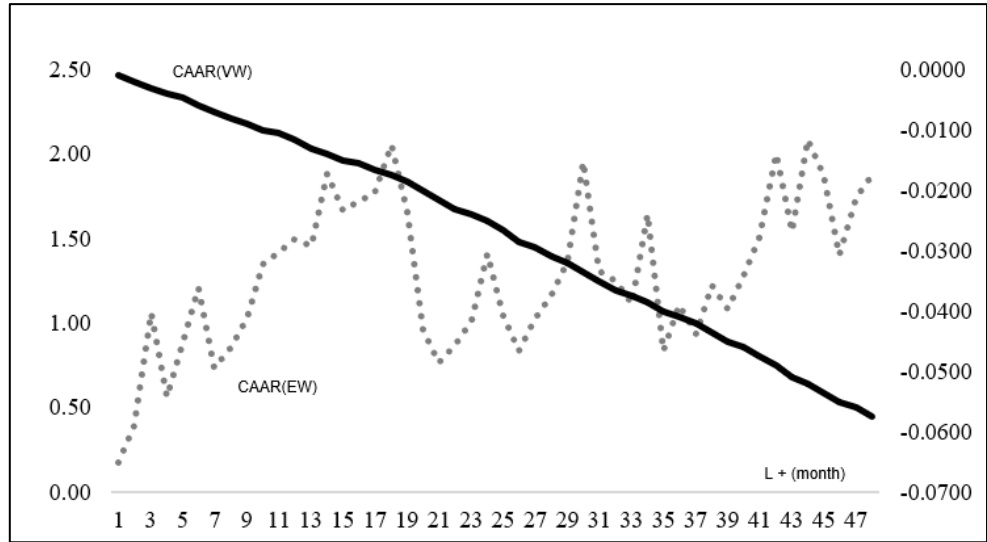


Figure 2: Cumulative average abnormal returns

Table 4: Cumulative average abnormal returns

Month	N	Equally Weighted			Value Weighted		
		CAAR	t-statistics	p-value	CAAR	t-statistics	p-value
1	525	0.1752	4.1030***	0.0000	-0.0010	-5.3745***	0.0000
2	525	0.3950	4.1120***	0.0000	-0.0021	-7.7930***	0.0000
3	525	1.0629	3.0970***	0.0021	-0.0029	-8.5830***	0.0000
4	521	0.5653	3.8040***	0.0002	-0.0039	-10.6380***	0.0000
5	521	0.8843	3.3090***	0.0010	-0.0045	-10.4115***	0.0000
6	520	1.2099	3.0740***	0.0022	-0.0059	-12.2910***	0.0000
7	517	0.7364	3.6950***	0.0002	-0.0071	-14.1260***	0.0000
8	517	0.8595	3.6810***	0.0003	-0.0081	-15.9185***	0.0000
9	517	1.0322	3.7230***	0.0002	-0.0089	-17.0945***	0.0000
10	516	1.3512	3.4570***	0.0006	-0.0097	-17.9610***	0.0000
11	515	1.4207	3.4650***	0.0006	-0.0107	-19.1655***	0.0000
12	514	1.4998	3.5060***	0.0005	-0.0116	-19.9425***	0.0000
13	512	1.4568	3.7210***	0.0002	-0.0128	-20.6765***	0.0000
14	512	1.8877	3.4610***	0.0006	-0.0140	-21.1710***	0.0000
15	510	1.6681	3.3720***	0.0008	-0.0151	-22.8715***	0.0000
16	509	1.7235	3.3740***	0.0008	-0.0155	-23.7195***	0.0000
17	508	1.7702	3.3480***	0.0009	-0.0163	-24.6260***	0.0000
18	506	2.0531	3.1750***	0.0016	-0.0173	-25.4260***	0.0000
19	503	1.6573	2.7480***	0.0062	-0.0185	-27.2735***	0.0000
20	500	0.9605	2.4210***	0.0158	-0.0200	-29.7880***	0.0000
21	499	0.7636	2.7280***	0.0066	-0.0214	-31.4930***	0.0000
22	499	0.8702	2.7950***	0.0054	-0.0228	-33.0500***	0.0000
23	499	1.0157	2.8500***	0.0046	-0.0239	-34.8185***	0.0000
24	499	1.4124	2.6620***	0.0080	-0.0251	-35.5890***	0.0000
25	497	1.0451	2.5260***	0.0119	-0.0267	-38.6270***	0.0000
26	496	0.8371	2.7840***	0.0056	-0.0284	-40.7810***	0.0000
27	496	1.0261	2.9420***	0.0034	-0.0296	-42.1715***	0.0000
28	495	1.1740	3.0310***	0.0026	-0.0308	-43.4300***	0.0000
29	495	1.3681	3.1050***	0.0020	-0.0321	-43.9170***	0.0000
30	495	1.9570	2.9920***	0.0029	-0.0334	-43.5805***	0.0000
31	491	1.3093	2.7380***	0.0064	-0.0348	-44.2205***	0.0000
32	490	1.2503	2.6770***	0.0077	-0.0363	-45.8565***	0.0000
33	487	1.1299	2.8620***	0.0044	-0.0376	-45.2670***	0.0000
34	486	1.6411	2.6630***	0.0080	-0.0383	-44.9985***	0.0000
35	483	0.8359	2.7390***	0.0064	-0.0397	-47.1110***	0.0000
36	483	1.1068	2.5990***	0.0096	-0.0407	-47.5325***	0.0000
37	482	0.9408	2.9640***	0.0032	-0.0419	-47.7280***	0.0000
38	482	1.2276	2.7790***	0.0057	-0.0434	-48.4890***	0.0000
39	481	1.0860	3.1820***	0.0016	-0.0447	-49.5495***	0.0000
40	481	1.2775	3.3250***	0.0010	-0.0459	-50.9680***	0.0000
41	479	1.5071	3.4220***	0.0007	-0.0473	-50.6785***	0.0000
42	479	2.0004	3.2580***	0.0012	-0.0492	-50.3975***	0.0000
43	477	1.5429	3.3920***	0.0008	-0.0507	-51.2050***	0.0000
44	476	2.0851	3.2870***	0.0011	-0.0518	-51.3770***	0.0000
45	474	1.8764	3.0910***	0.0021	-0.0534	-51.4745***	0.0000
46	472	1.4043	3.2100***	0.0014	-0.0549	-53.6190***	0.0000
47	471	1.7445	3.1300***	0.0019	-0.0561	-55.9120***	0.0000
48	469	1.8810	3.0080***	0.0028	-0.0575	-56.8450***	0.0000

Notes: Table 4 represents the cumulative average abnormal returns (CAAR) given in percentage, along with t-statistics for the 48 months after listing, CAAR is given based on equally weighted and value weighted schemes. The significance level of t-statistics as follows: *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Unlike the EW scheme, the result of VW shows that the IPOs generate a lower negative returns during the first 48 months after listing. The decreasing trend in the CAAR based on VW scheme regardless market capitalisation of firms can be observed from Figure 3. In the first 12 months underperformance is -1.15%, in the 1-month (-0.10%), 3-month (-0.29%), 6-month (-0.59%), and 9-month (-0.89%) all the results are statistically significant at 1%

level. The results in Table 4 show that underperformance is statistically significant, which indicates that there is significant difference between the performance of IPO firms and the market benchmark in 4 years after listing. The results evidence that the long-run share performance measure is sensitive to the weighting scheme employed to calculate abnormal returns. The lower reported CAAR when the value-weighting is used evidence that large IPO firms perform less well than small IPO firms.

The overall CAAR of IPOs in Malaysia for 4 years after listing are show in Table 5.

Table 5: Summary of the CAAR of IPOs in Malaysia

Period (months)	N	Equally Weighted			Value Weighted		
		CAAR	t-statistics	p-value	CAAR	t-statistics	p-value
1 month (0 to 1)	525	0.1752	4.1027***	0.0000	-.0010	-5.3757***	0.0000
3 months (0 to 3)	1,575	0.5444	4.5382***	0.0000	-.0020	-12.6704***	0.0000
6 months (0 to 6)	3,137	0.7146	6.9838***	0.0000	-.0034	-22.6748***	0.0000
12 months (0 to 12)	6,233	0.9396	10.9105***	0.0000	-.0063	-46.0014***	0.0000
24 months (0 to 24)	12,289	1.1815	14.6032***	0.0000	-.0123	-93.1202***	0.0000
36 months (0 to 36)	18,183	1.1949	17.3447***	0.0000	-.0194	-139.6410***	0.0000
48 months (0 to 48)	23,906	1.2789	20.3894***	0.0000	-.0266	-176.3988***	0.0000

5.1(b) Buy-and-Hold Abnormal Returns

Gompers and Lerner (2003) state that CAAR tends to misrepresent performance when returns are highly volatile. Therefore, further evidence on the long run share performance of Malaysian IPOs is presented in Table 6 and Table 8 using buy-and-hold abnormal returns and wealth relative measures, respectively.

The BHAR strategy involves purchasing a share at its first closing market price after going public and holding it until a specified time 'T'. In this study, the long-run IPO share performance is measured over a period of up to 4 years, with 'T' spanning from 'month 1 to 48'. Table 5 presents evidence of the long-run IPO share performance in Malaysia based on BHAR. The average BHARs for a portfolio consisting of 'N' firms during the event 'month 1 to 48' are calculated as the arithmetic mean of the market abnormal returns. The monthly average returns, expressed in percentage, are provided along with conventional t-statistics. However, it is important to note Barber and Lyon (1997) point out that BHAR often exhibit a positive skew, which can lead to conventional t-statistics yielding overstated significance levels.

Table 6 reveals a significant underperformance of IPOs, leading to negative returns, during the 48 months following their listing under BHAR (EW) scheme. Figure 4 also displays a decreasing trend in underperformance based on BHAR (EW). In the 1st year (12 months) after listing, IPOs exhibited an underperformance of -14.24%. This underperformance escalated to -20.35% in the second year (24 months), reaching -22.92% in the third year (36 months), and -21.52% in the fourth year (48 months). The underperformance of IPOs persisted throughout the entire sample period of 4 years and was statistically significant at the 1% level. The highest underperformance (-22.96%), based on BHAR (EW), was observed at the 35th month, while the lowest underperformance was -14.24% in the 1st month.

Table 6: Average buy-and-hold abnormal returns

Month	N	Equally Weighted			Value Weighted		
		BHAR	t-statistics	p-value	BHAR	t-statistics	p-value
1	525	-0.1424	-16.7010***	0.0000	-0.0205	-2.5410***	0.0114
2	525	-0.1428	-16.4640***	0.0000	-0.0250	-2.2830***	0.0228
3	525	-0.1444	-16.6920***	0.0000	-0.0207	-3.1820***	0.0016
4	521	-0.1517	-18.6660***	0.0000	-0.0193	-3.3990***	0.0007
5	521	-0.1525	-18.5260***	0.0000	-0.0178	-3.6170***	0.0003
6	520	-0.1568	-18.9620***	0.0000	-0.0177	-2.5070***	0.0125
7	517	-0.1620	-20.3670***	0.0000	-0.0183	-3.7290***	0.0002
8	517	-0.1650	-20.7290***	0.0000	-0.0157	-3.5420***	0.0004
9	517	-0.1656	-20.8310***	0.0000	-0.0195	-3.7410***	0.0002
10	516	-0.1669	-20.2300***	0.0000	-0.0194	-3.3410***	0.0009
11	515	-0.1695	-20.3390***	0.0000	-0.0156	-3.0090***	0.0027
12	514	-0.1683	-20.3630***	0.0000	-0.0182	-3.4930***	0.0005
13	512	-0.1678	-19.7090***	0.0000	-0.0240	-2.9040***	0.0038
14	512	-0.1688	-19.4280***	0.0000	-0.0131	-3.5780***	0.0004
15	510	-0.1729	-19.9500***	0.0000	-0.0192	-3.0820***	0.0022
16	509	-0.1687	-18.8900***	0.0000	-0.0129	-2.5900***	0.0099
17	508	-0.1705	-18.5110***	0.0000	-0.0164	-2.9310***	0.0035
18	506	-0.1726	-18.4480***	0.0000	-0.0083	-2.6430***	0.0085
19	503	-0.1788	-19.3020***	0.0000	-0.0156	-2.8040***	0.0052
20	500	-0.1883	-20.8720***	0.0000	-0.0167	-2.6250***	0.0089
21	499	-0.1921	-22.0330***	0.0000	-0.0181	-2.9010***	0.0039
22	499	-0.1970	-22.8180***	0.0000	-0.0186	-3.0990***	0.0020
23	499	-0.2011	-23.1620***	0.0000	-0.0165	-2.9330***	0.0035
24	499	-0.2035	-23.5960***	0.0000	-0.0160	-2.5900***	0.0099
25	497	-0.2097	-24.9860***	0.0000	-0.0160	-2.4800***	0.0135
26	496	-0.2148	-25.4070***	0.0000	-0.0169	-3.3610***	0.0008
27	496	-0.2182	-25.8780***	0.0000	-0.0262	-3.1880***	0.0015
28	495	-0.2172	-24.9660***	0.0000	-0.0143	-2.6410***	0.0085
29	495	-0.2168	-23.9340***	0.0000	-0.0171	-3.2430***	0.0013
30	495	-0.2162	-23.1110***	0.0000	-0.0170	-2.9940***	0.0029
31	491	-0.2232	-24.9510***	0.0000	-0.0165	-3.0340***	0.0025
32	490	-0.2232	-25.3160***	0.0000	-0.0133	-3.2320***	0.0013
33	487	-0.2235	-25.2770***	0.0000	-0.0163	-3.2880***	0.0011
34	486	-0.2237	-24.1200***	0.0000	-0.0204	-2.7340***	0.0065
35	483	-0.2296	-25.4440***	0.0000	-0.0196	-3.0900***	0.0021
36	483	-0.2292	-24.8410***	0.0000	-0.0187	-3.1910***	0.0015
37	482	-0.2275	-24.2100***	0.0000	-0.0188	-2.8170***	0.0050
38	482	-0.2277	-23.8120***	0.0000	-0.0207	-2.8770***	0.0042
39	481	-0.2242	-23.4770***	0.0000	-0.0092	-2.8930***	0.0040
40	481	-0.2211	-22.6740***	0.0000	-0.0186	-3.3850***	0.0008
41	479	-0.2198	-21.9320***	0.0000	-0.0118	-2.9730***	0.0031
42	479	-0.2183	-21.7180***	0.0000	-0.0129	-2.7770***	0.0057
43	477	-0.2201	-22.4000***	0.0000	-0.0125	-2.7300***	0.0066
44	476	-0.2152	-21.1350***	0.0000	-0.0101	-1.9270***	0.0546
45	474	-0.2132	-21.1980***	0.0000	-0.0134	-1.9030***	0.0576
46	472	-0.2181	-22.2040***	0.0000	-0.0086	-1.7660***	0.0780
47	471	-0.2161	-21.4040***	0.0000	-0.0150	-3.5430***	0.0004
48	469	-0.2152	-21.1570***	0.0000	-0.0125	-2.6620***	0.0080

Notes: Table 6 represents the average Buy-and-Hold Abnormal Returns (BHAR) given in percentage, along with *t*-statistics for the 48 months after listing. BHAR is given based on the equally weighted and value-weighted schemes. The significance level of *t*-statistics are as follow: *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

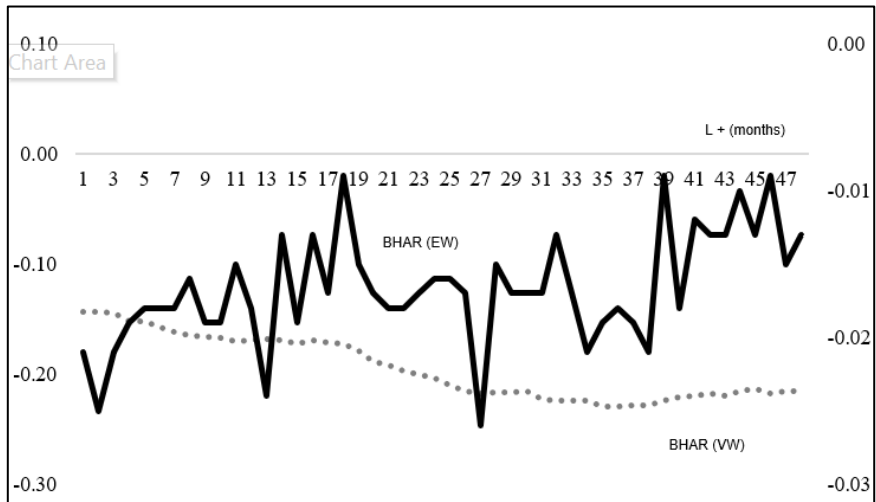


Figure 3: Average buy-and-hold abnormal returns

The result of BHAR under VW scheme indicates that there is persistent underperformance from the 1st month until the 48th month. Table 6 provides insights into the underperformance of IPOs based on BHAR (VW). In the 1st year (12 months) following the IPO listing, the underperformance was recorded at -2.05%. This underperformance increased to -1.60% in the 2nd year (24 months), and further escalated to -1.87% in the 3rd year (36 months), and -1.25% in the 4th year (48 months). It is noteworthy that all BHAR returns under the VW scheme were statistically significant at 1%. The highest underperformance, based on BHAR (VW), was observed at -2.62% in the 27th month, while the lowest underperformance was -0.86% in the 46th month.

When comparing the results obtained using CAAR and BHAR, we notice that Malaysian IPOs seem to perform much better in the long-run with BHAR. This is consistent with Fama and Eugene (1998), Mitchell and Stafford (2000), and Gompers and Lerner (2003) highlight that BHAR can magnify under or overperformance, even if it occurs in only a single period. Nonetheless, using CAAR the results show much larger long-run underperformance.

The overall average BHAR of IPOs in Malaysia for 4 years after listing are shown in Table 7.

Table 7: Summary of average BHAR of IPOs in Malaysia

Period (months)	N	Equally Weighted			Value Weighted		
		BHAR	t-statistics	p-value	BHAR	t-statistics	p-value
1 month (0 to 1)	525	-0.1424	-16.7003***	0.0114	-0.0205	-2.5404***	0.0114
3 months (0 to 3)	1,575	-0.1432	-28.8012***	0.0000	-0.0221	-4.3926***	0.0000
6 months (0 to 6)	3,137	-0.1484	-43.2040***	0.0000	-0.0202	-6.6209***	0.0000
12 months (0 to 12)	6,233	-0.1573	-65.8216***	0.0000	-0.0190	-10.2414***	0.0000
24 months (0 to 24)	12,289	-0.1693	-96.5598***	0.0000	-0.0176	-14.1240***	0.0000
36 months (0 to 36)	18,183	-0.1859	-127.4990***	0.0000	-0.0177	-17.4622***	0.0000
48 months (0 to 48)	23,906	-0.1940	-148.6330***	0.0000	-0.0167	-19.6180***	0.0000

5.1(c) *Wealth Relative (WR)*

Ritter (1991) introduced the concept of wealth relatives, which is the ratio of the end-of-period wealth generated from holding a portfolio of IPO issuers to the end-of-period wealth generated from holding a portfolio of matched companies or benchmarks. A WR is greater than 1 indicates that IPOs outperformed the market benchmarks over the long-run. However, a WR of less than 1 indicates that IPOs underperform relative to the benchmark. The WR is calculated based on EW and VW schemes.

Table 8: Wealth relative

Equally Weighted					Value Weighted				
Month	N	WR	t-statistics	p-value	Month	N	WR	t-statistics	p-value
1	525	0.8795	117.6441***	0.0000	1	525	0.001588	5.9037***	0.0000
2	525	0.8788	114.7801***	0.0000	2	525	0.00161	5.8658***	0.0000
3	525	0.8758	114.0851***	0.0000	3	525	0.001621	5.8152***	0.0000
4	521	0.8684	121.5546***	0.0000	4	521	0.001544	5.7354***	0.0000
5	521	0.8668	118.9710***	0.0000	5	521	0.001553	5.6913***	0.0000
6	520	0.8634	117.8217***	0.0000	6	520	0.001541	5.6913***	0.0000
7	517	0.8584	122.5445***	0.0000	7	517	0.001546	5.7207***	0.0000
8	517	0.8561	122.3749***	0.0000	8	517	0.001548	5.7310***	0.0000
9	517	0.8557	122.8314***	0.0000	9	517	0.001555	5.6820***	0.0000
10	516	0.855	117.9511***	0.0000	10	516	0.001559	5.6710***	0.0000
11	515	0.8529	116.3470***	0.0000	11	515	0.001553	5.6901***	0.0000
12	514	0.8547	116.8898***	0.0000	12	514	0.001582	5.6722***	0.0000
13	512	0.857	113.5068***	0.0000	13	512	0.001579	5.6893***	0.0000
14	512	0.8565	110.6241***	0.0000	14	512	0.001592	5.7011***	0.0000
15	510	0.8541	111.7031***	0.0000	15	510	0.001609	5.6137***	0.0000
16	509	0.8595	109.1409***	0.0000	16	509	0.001641	5.5820***	0.0000
17	508	0.8586	106.0790***	0.0000	17	508	0.001676	5.5344***	0.0000
18	506	0.8568	104.4768***	0.0000	18	506	0.001682	5.5557***	0.0000
19	503	0.8522	106.3662***	0.0000	19	503	0.001671	5.6062***	0.0000
20	500	0.8441	108.6882***	0.0000	20	500	0.001676	5.5529***	0.0000
21	499	0.8405	112.6630***	0.0000	21	499	0.001669	5.4011***	0.0000
22	499	0.8368	114.1332***	0.0000	22	499	0.001679	5.3906***	0.0000
23	499	0.8333	112.3274***	0.0000	23	499	0.001674	5.4039***	0.0000
24	499	0.8316	112.3512***	0.0000	24	499	0.00168	5.3971***	0.0000
25	497	0.826	116.0309***	0.0000	25	497	0.001677	5.3828***	0.0000
26	496	0.8226	114.8782***	0.0000	26	496	0.001672	5.3802***	0.0000
27	496	0.8212	115.6065***	0.0000	27	496	0.001679	5.3386***	0.0000
28	495	0.8236	112.7481***	0.0000	28	495	0.001697	5.3716***	0.0000
29	495	0.8245	108.2213***	0.0000	29	495	0.0017	5.3893***	0.0000
30	495	0.8258	104.1769***	0.0000	30	495	0.001692	5.4513***	0.0000
31	491	0.8195	109.5879***	0.0000	31	491	0.001709	5.3714***	0.0000
32	490	0.8182	110.3141***	0.0000	32	490	0.001713	5.2890***	0.0000
33	487	0.8171	109.4642***	0.0000	33	487	0.001731	5.2111***	0.0000
34	486	0.818	104.0292***	0.0000	34	486	0.001745	5.2063***	0.0000
35	483	0.8124	107.7452***	0.0000	35	483	0.001754	5.1458***	0.0000
36	483	0.8132	105.4173***	0.0000	36	483	0.00178	5.0801***	0.0000
37	482	0.8148	103.5025***	0.0000	37	482	0.001791	5.0594***	0.0000
38	482	0.8142	100.5028***	0.0000	38	482	0.001774	5.1321***	0.0000
39	481	0.8159	100.7731***	0.0000	39	481	0.001784	5.1106***	0.0000
40	481	0.8188	97.8057***	0.0000	40	481	0.0018	5.0799***	0.0000
41	479	0.8202	94.5564***	0.0000	41	479	0.001841	4.9891***	0.0000
42	479	0.8209	94.3602***	0.0000	42	479	0.001853	4.9874***	0.0000
43	477	0.8189	96.1365***	0.0000	43	477	0.001791	4.8308***	0.0000
44	476	0.8233	92.4932***	0.0000	44	476	0.001798	4.8104***	0.0000
45	474	0.8241	93.4560***	0.0000	45	474	0.001827	4.7968***	0.0000
46	472	0.8196	96.1133***	0.0000	46	472	0.001828	4.7448***	0.0000
47	471	0.8207	92.8971***	0.0000	47	471	0.001826	4.7387***	0.0000
48	469	0.8215	92.4911***	0.0000	48	469	0.00181	4.7081***	0.0000

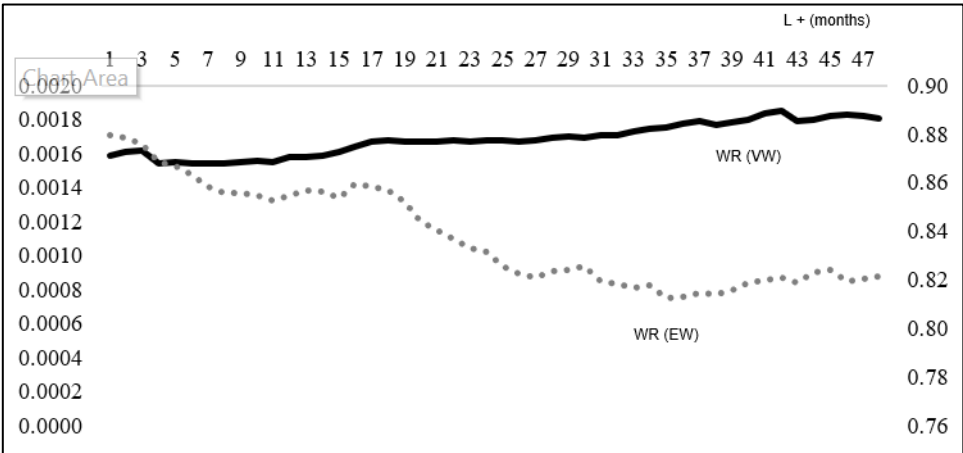


Figure 4: Wealth relative

According to the data presented in Table 8, there is evidence of long-term underperformance in IPOs from the 1-month to 48-month, as indicated by the WR (EW) values being less than 1. However, it is worth noting that there is a period of initial underperformance in the range of 1-month to 6-month, as reflected by the WR (VW) values being lesser than 1.

The overall average BHAR of IPOs in Malaysia for 4 years after listing are shown in Table 9.

Table 9: Summary of WR of IPOs in Malaysia

Period (months)	N	Equally Weighted			Value Weighted		
		WR	t-statistics	p-value	WR	t-statistics	p-value
1 month (0 to 1)	525	0.8795	117.6441***	0.0000	0.001588	5.9037***	0.0000
3 months (0 to 3)	1,575	0.8781	200.1302***	0.0000	0.001606	10.1570***	0.0000
6 months (0 to 6)	3,137	0.8722	287.4895***	0.0000	0.001576	14.1775***	0.0000
12 months (0 to 12)	6,233	0.8639	410.1014***	0.0000	0.001566	19.8978***	0.0000
24 months (0 to 24)	12,289	0.8563	558.2492***	0.0000	0.001608	27.5997***	0.0000
36 months (0 to 36)	18,183	0.8446	672.0575***	0.0000	0.001642	33.0750***	0.0000
48 months (0 to 48)	23,906	0.8386	745.5269***	0.0000	0.001682	36.9395***	0.0000

This study examines the long-run IPO share performance in Malaysia from January 2000 to December 2020. The result shows that 4-year EW for CAAR, BHAR, and WR are -127.89%, -19.40%, and 83.86%, respectively. On the other hand, the 4-year value-weighted (VW) for CAAR, BHAR, and WR are -2.66%, -1.67%, and 0.16%, respectively. As such, the degree of aftermarket underperformance based on VW scheme are less than the EW scheme, indicates that in Malaysia larger firms perform well than smaller firm in the long-run. Given that all the returns based on both EW and VW schemes are statistically significant at 1% level, the results has confirmed that in Malaysian IPO are on average underperformed in the long-run.

Overall, the findings show that the underperformance persists up to 4 years after listing and it is consistent with Ritter (1991) and Jaskiewicz et al (2005). Nonetheless, the findings

of this study contrast with those of Ahmad-Zaluki *et al.* (2007), who observe overperformance in their study on Malaysian IPO issued between 1990 and 2000. Ahmad-Zaluki *et al.* (2007) report significant overperformance using CAAR (EW) and BHAR (EW) measures adjusted against market benchmarks. However, the significance diminished when CAAR (VW) and BHAR (VW) measures and matched firm benchmarks were employed. Ahmad-Zaluki *et al.* (2007) further test performance using the calendar-time methodology (Fama-French three-factor model) and did not find any significant abnormal performance. Further, Ahmad-Zaluki *et al.* (2007) suggest that investors who measure their investment in IPO companies using the event-time approach will conclude that they earn positive returns in the long-run, but if they employ the calendar-time approach they would conclude that do not gain any abnormal returns.

In other studies conducted by How *et al.* (2007), Zarafat and Vejzagic (2014), and Shari and Hassan (2024) indicate that there is a trend of overperformance after listings in Malaysian IPO market. Conversely, research by Ahmad-Zaluki and Lim (2012), and Abu Bakar *et al.* (2019) provide evidence of underperformance after listing in Malaysian IPO market which is consistent with the results of this study.

Based on the above analysis, it appears that there is no consistent pattern that explains the differences in conclusions depending on the applied methodology. However, Gompers and Lerner (2003) concurs that the choice of methodology, performance measures, and benchmarks can significantly impact the conclusions drawn. For instance, in other studies conducted by Kooli and Suret (2004), significant underperformance was identified for Canadian IPOs when using a CAAR (VW) measure. However, the significance diminished when employing a BHAR (VW) measure. Further, when applying the calendar-time methodology, they found significant underperformance based on EW scheme. On the other hand, Ritter and Welch (2002) and Ritter (2003) argue that the characteristics of an IPO sample, in terms of the time period and the selection criteria, also contribute to the observed differences in the findings of studies on the long-run performance of IPOs. Therefore, it is crucial for the outlined methodology to provide detailed explanations for selecting a particular approach over others. The methodology should encompass both theoretical and practical justifications for the adopted performance measures, weighting schemes, and benchmarks. In short, it would appear that the Malaysian environment produces different long-run IPO share performance than typically observed in more developed markets.

Despite empirical variations in long-run IPO share performance across different studies, the findings of this study contributes to the literature on divergence of opinion (Narayanasamy, 2017). For example, Malaysian investors often exhibit behavior known as the disposition effect, where they prematurely sell winning stocks and hold onto losing ones for too long (Shefrin and Statman, 1985). This phenomenon is supported by Bayley *et al.* (2006) and Chong (2009), who argue that individual investors, particularly liquidity or noise traders, quickly dispose of underpriced IPOs due to fear of regret. Ironically, these IPOs tend to yield better post-IPO returns, it offers crucial insights for investors making pre-investment decisions. On the other hand, Dar and Zhu (2006) suggest that investors who trade frequently exhibit a lesser disposition effect, indicates that extensive trading experience may mitigate this bias. Yong (2010), and Chong (2009) demonstrate that frequent trading is prevalent in Malaysia has potentially diminished the impact of the disposition effect in the Malaysian IPO market.

In this study, the aftermarket share performance of Malaysian IPOs is measured using BHAR (VW) adjusted for market capitalisation. According to Lyon *et al.* (1999), BHAR is the appropriate metric for assessing the long-run share performance of IPOs as it accurately reflects the investor's buy-and-hold experience.

Table 10 shows the Pearson correlation coefficients between the variables and their corresponding significance levels. The results indicate that there is no issue of multicollinearity among the variables. All the correlation coefficients between the variables are below 0.7, indicating that there is no high correlation observed between them, except for hot issue market (HOT) has been excluded from the regression results due to high correlation.

Table 10: Correlation matrix (long-run IPO share performance) with SENT^{PCA}, SENT^{sPCA}, SENT^{PLS}

	SENT ^{PCA}	SENT ^{sPCA}	SENT ^{PLS}	IR	OSIZE	UREP	FAGE	BSIZE	MAJOR	MVL	OVER	HOT	BLIST
SENT	1.0000	1.0000	1.0000										
IR	-0.1369	0.1369	0.0897	1.0000									
OSIZE	0.2488	-0.2488	-0.1991	-0.1772	1.0000								
UREP	-0.1217	0.1217	0.0818	0.0242	0.3067	1.0000							
FAGE	0.2206	-0.2206	-0.2017	-0.0826	0.2899	0.0577	1.0000						
BSIZE	-0.0509	0.0509	0.0396	-0.0191	0.2435	0.1888	0.2512	1.0000					
MAJOR	0.0699	-0.0699	-0.0007	-0.1367	0.1929	0.1119	0.0838	0.0587	1.0000				
MVL	0.1690	-0.1690	0.0252	0.0135	-0.1108	-0.0153	-0.0427	-0.0061	0.0052	1.0000			
OVER	-0.0488	0.0488	0.0049	0.3010	-0.2797	-0.0751	-0.1165	-0.0661	-0.0603	0.0589	1.0000		
HOT	-0.1618	0.1618	0.0856	0.6920	-0.1830	-0.0069	-0.1198	-0.0167	-0.1570	0.0149	0.3573	1.0000	
BLIST	-0.1308	0.1308	0.1400	-0.1417	0.4308	0.2731	0.2466	0.2237	0.1422	-0.0747	-0.3255	-0.1462	1.0000

Notes: The variables are given as: IPO market sentiment (SENT), initial return (IR), offer size (OSIZE), underwriter reputation (UREP), firm age (FAGE), board size (BSIZE), major shareholder ownership (MAJOR), market volatility (MVL), oversubscription ratio (OVER), hot issue market (HOT), and board listing (BLIST).

Table 11 presents the results of long-term IPO share performance based on various behavioral, firm-specific, and market characteristics. The result concludes that the behavioral characteristics plays a significant role in all models, it shows that SENT^{PCA}, SENT^{sPCA} and SENT^{PLS} are significantly relates to long-run IPO share performance in Malaysian IPO. This is consistent with the studies by Bayley *et al.* (2006) and Chong *et al.* (2011) evidence that the behavioral tendency of trade in IPO market has proven to be significant in the long-run in the Malaysian IPO market. Followed by issue characteristics namely, initial return (IR), offer size (OSIZE), and underwriter reputation (UREP); firm characteristics namely, firm age (FAGE), and board size (BSIZE); market characteristics namely, market volatility (MVL) (except for PLS method), oversubscription ratio (OVER), and board listing (BLIST). Major ownership (MAJOR) has no significance on aftermarket underperformance. Hot issue market (HOT) is excluded from the result analysis because it has high correlation with initial return (IR). However, there is no consistent results to determine the significant factors which influence aftermarket share performance in Malaysia IPOs empirically.

Both SENT^{sPCA} and SENT^{PLS} have negative coefficients represents the negative relationship between market sentiment with long-run abnormal returns. This is consistent with findings by Lowry (2003) but inconsistent with the market sentiment hypothesis. SENT^{sPCA} and SENT^{PLS} have adjusted for target variable, therefore the effects of SENT^{sPCA} and SENT^{PLS} towards abnormal returns are consistent as compared to SENT^{PCA}. In case of IPO market sentiment using PCA method (SENT^{PCA}), the findings reveal that a positive relationship between market sentiment and IPO's long-run share performance in Malaysia. This signifies that in Malaysia, IPOs issued at the time high market sentiment generates positive long-run returns. As such, the market sentiment in Malaysia is widely influenced by market factors. Thus, the positive relationship between market sentiment and IPO's long-run performance in Malaysia is the outcome of considerable economic stability and its optimistic impact on the investor's perception, vice versa. This is consistent with study done by Dimovski and Brooks (2004) and consistent with the market sentiment hypothesis.

Table 11: Long-run IPO share performance determinants based on OLS regression model with $SENT^{PCA}$, $SENT^{sPCA}$, and $SENT^{PLS}$

Independent variables	PCA				sPCA				PLS			
	Dependent variable: BHAR (VW)				Dependent variable: BHAR (VW)				Dependent variable: BHAR (VW)			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
	Behavioral	Behavioral- and-Issue	Behavioral- Issue-and-Firm	Behavioral- Overall	Behavioral	Behavioral- and-Issue	Behavioral- Issue-and-Firm	Behavioral- Overall	Behavioral	Behavioral- and-Issue	Behavioral- Issue-and-Firm	Behavioral- Overall
SENT	.000453 (.55)	.0116*** (14.31)	.0106*** (12.85)	.0142*** (16.21)	-.000453 (-.55)	-.0116*** (-14.31)	-.0106*** (-12.85)	-.0142*** (-16.21)	-.0289*** (-5.47)	-.0852*** (-16.71)	-.0796*** (-15.36)	-.0961*** (-17.95)
IR		-.0125*** (-6.28)	-.0123*** (-6.14)	-.00857*** (-4.15)		-.0125*** (-6.28)	-.0123*** (-6.14)	-.00857*** (-4.15)		-.0134*** (-6.76)	-.0128*** (-6.45)	-.00898*** (-4.36)
OSIZE		-.0394*** (-48.83)	-.0404*** (-47.70)	-.0450*** (-48.83)		-.0394*** (-48.83)	-.0404*** (-47.70)	-.0450*** (-48.83)		-.0391*** (-49.35)	-.0402*** (-48.19)	-.0443*** (-49.29)
UREP		.0320*** (13.97)	.0324*** (14.04)	.0302*** (13.08)		.0320*** (13.97)	.0324*** (14.04)	.0302*** (13.08)		.0308*** (13.62)	.0312*** (13.71)	.0280*** (12.25)
FAGE			-.000624*** (6.83)	.000407*** (4.40)			.000624*** (6.83)	.000407*** (4.40)			.000594*** (6.53)	.000396*** (4.29)
BSIZE			-.000804 (-1.53)	-.000982* (-1.87)			-.000804 (-1.53)	-.000982* (-1.87)			-.000810 (-1.54)	-.00114*** (-2.18)
MAJOR			-.0000191 (-.27)	-.0000489 (-.69)			-.0000191 (-.272)	-.0000489 (-.69)			.0000450 (.64)	.0000274 (.39)
MVL				-1.5970*** (-5.11)				-1.5970*** (-5.11)				-4.500 (-1.48)
OVER				-.0000612** (-2.20)				-.0000612** (-2.20)				-.0000783*** (-2.82)
BLIST				.0250*** (10.36)				.0250*** (10.36)				.0253*** (10.58)
Constant	-.0164*** (-15.99)	.663*** (47.57)	.6740*** (47.53)	.7590*** (47.90)	-.0164*** (-15.99)	.6630*** (47.57)	.6740*** (47.53)	.7590*** (47.90)	.00517 (1.26)	.7200*** (48.11)	-.7260*** (48.07)	.805*** (48.36)
F-statistics (F)	.3100	2495.72	350.66	263.34	.3100	600.34	350.66	263.34	29.90	621.49	362.23	270.17
R-squared (R ²)	.0000	.3853	.1339	.1423	.0000	.1314	.1339	.1423	.0019	.1354	.1377	.1454
Adjusted R ²	.0000	.3851	.1335	.1418	.0000	.1311	.1335	.1418	.0018	.1351	.1373	.1449
Observations (N)	15,932	15,884	15,884	15,884	15,932	15,884	15,884	15,884	15,932	15,884	15,884	15,884

Notes: Table 11 represents the long-run IPO share performance at each level of behavioral-issue-firm-and-market characteristics by using OLS regression model. The above table consists of 4 models: Model 1 consist of behavioral characteristics, Model 2 consist of behavioral-and-issue characteristics, Model 3 consist of behavioral-issue-and-firm characteristics, Model 4 consist of behavioral-issue-firm-and-market characteristics (overall). The dependent variable dichotomous takes the value of '1' if the firm is overperformance and takes the value '0' if the firm is underperformance. t-statistic is given with significance level as follows: *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Overall, the findings shows that market sentiment (SENT) in all models has significantly relates to aftermarket share performance. The results support Miller and Reilly (1987), who suggest that one plausible explanation for the aftermarket share underperformance of IPO is the divergence of opinion hypothesis. This hypothesis posits that investors often exhibit excessive optimism regarding the future cash flows and growth potential of IPO. Such optimism leads investors to overvalue IPO shares relative to their intrinsic worth. As more information becomes available over time, these optimistic investors revise their valuations downward, aligning more closely with the intrinsic values of the shares. This process reduces the disparity between optimistic and pessimistic investors' valuations.

6. Limitations and Policy Implications

Due to distinctive nature of Malaysia, the results of this study may not be generalised to other countries, in particular to developing and developed markets. This study is conducted to examine the IPO market share performance in Malaysia, a developing market. Malaysia is classified as a developing market because of low gross domestic products, low IPO activities, the stock market infrastructure is still immature, and a high number of delisted firms. Whether this prediction of IPO investor sentiment can be applied to developed markets, other emerging markets and developing markets remain an unanswered question.

Additionally, this study considered all the firms which are in operation during the entire sample period of study. However, this study excluded firms for which has incomplete data. Also, firms which are in process of merger and acquisitions, and those delisted by Bursa Malaysia are also excluded from the analysis.

Finally, in this study the market performance of IPO companies was assessed using a single market benchmark, namely the FTSE Bursa Malaysia Emas Index. However, it is worth noting that certain previous studies (Abukari and Vijay, 2011; Ahmad-Zaluki *et al.*, 2007; Moshirian *et al.*, 2010) evaluate long-run IPO share performance have employed multiple market benchmarks instead of relying on a single market benchmark. These empirical studies have revealed diverse outcomes in terms of the long-run IPO share performance based on the use of different market benchmarks. Due to the unavailability of data for Main Board, Second Board and MESDAQ indices at Pre-Changes period; Main Market and ACE Market indices at Post-Changes period, this study has adopted single market benchmark, namely FTSE Bursa Malaysia Emas Index was adopted as market benchmark. FTSE Bursa Malaysia Emas Index comprises of (i) FTSE Bursa Malaysia Top 100 Index, and (ii) FTSE Bursa Malaysia Small Cap Index. Nevertheless, Ahmad-Zaluki (2007) evidence that the long-run IPO share performance does not significantly differ across industrial sectors, and there is also no significant difference between the performance of IPOs listed on the Main Board and the Second Board of Bursa Malaysia.

Likewise, investors should also need to be more careful by holding the shares for a longer time. For example, based on BHAR (EW) as shown in Figure 4, in the long-run negative returns with decreasing trend has improved with lower negative returns in the 2nd month after the first-day of listing. Investors will loss-out the money by selling the shares too early after listing. Most importantly, the results derived from the econometric analysis revealed that besides the issue, firm, and market characteristics, this study also examines the significant level of behavioral characteristics for investors while formulating their long-run investment strategies. Here, investors should exercise caution, as market sentiment plays a significant role in the Malaysia IPO market. It is essential for investors to be mindful and avoid falling into psychological traps when making investment decisions in the IPO market. Investors can avoid speculative markets by identifying sentiment information, which is crucial for the market's self-regulation. Investment managers should track sentiment to address market instability and prevent the misallocation of scarce resources. For issuing

firms, the findings in this study provides them with rooms for price adjustments by reducing information asymmetry in general and between investors. Finally, the results presented in this study may have broader policy implications for many other developing markets similar to Malaysia, which are expanding globally by implementing economic, trade and financial reforms. Therefore, the findings may be also helpful for regulators overseeing other developing markets beyond Malaysia.

7. Conclusions

This study investigates the aftermarket share performance of Malaysian IPO with firms listed on Bursa Malaysia from January 2000 to December 2020. It examines the influence of market sentiment on Malaysian IPO aftermarket share performance. It can be concluded that Malaysian IPO provides evidence of underperformance aftermarket share performance over 48 months after listing. Further, the results show that the aftermarket share performance is significantly to sentiment factor, thus, it supports the divergence of opinion/ overreaction hypothesis, and impresarios/ fad hypothesis. Besides, the results also significant to factors based on issue-related, firm-related and market-related characteristics. It shows that initial return, offer size, underwriter reputation, firm age, board size, market volatility, oversubscription ratio, and board listing are significantly affecting the share price performance 4 years after listing. In contrast, major ownership shareholdings is found to be insignificant to aftermarket share performance. This is primarily because issuing firms must comply with the minimum public shareholding requirement of 25%, with the remaining shares typically held by the founders and their family members in Malaysian IPOs.

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