

# Herding And Market Overreaction: Evidence from Shariah-Compliant Stocks in Malaysia

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## Abstract

**Purpose:** This study aims to examine the existence of herding and its relationship with market overreaction in Shariah and non-Shariah portfolios in Malaysian stock market. It also seeks to explore the herding tendency between Shariah and non-Shariah portfolios.

**Design/methodology/approach:** Stocks are categorized into winner and loser portfolios based on 12 months formation period using average excess cumulative return. Grand average excess cumulative return is measured to detect the existence of contrarian profit for arbitrage portfolio. The data is ranged from 2016 to 2020.

**Findings:** The results show that herding exists in overall, Shariah and non-Shariah portfolios except for the non-Shariah loser portfolio. It indicates investors mimic and shadow the investment decision of other investors. Herding tendency is found to be stronger in non-Shariah stocks compare to Shariah stocks because non-Shariah stocks are most risky investments, which relate to riba, gharar or doubtful transactions, gambling and so on. Therefore, this study proves that investors aggressively herd in non-Shariah winner portfolio but remain conservative on loser portfolio to seek higher return.

Furthermore, market overreaction is correlated to herding in all portfolios except for the non-Shariah loser portfolio. Nonetheless, the winner portfolio results in negative return until week 12 and turns positive from week 24 to week 52. The loser portfolio yields positive return after formation period.

**Research limitations/implications:** The result shows that investors react differently to Shariah stocks and non-Shariah stocks.

**Practical implications:** The existence of contrarian profit suggests investors sell off winner portfolio and purchase loser stocks.

**Originality/value:** The result of this study contributes to the academician and practitioners in understanding and awareness of the existence of herding in Shariah and non-Shariah stocks. This study shows that the stock market misprices securities due to overreaction.

**Keywords:** Overreaction, Herding, Shariah, Behavioural Finance

## Introduction

Herding is a common phenomenon in market in explaining the behaviour of certain investors that follows the footsteps of other investors to trade. The evidence of herding is documented in many countries such as Pakistan (Yousaf, Ali and Shah, 2018), United States (Clements, Hurn and Shi, 2017) and India (Satish and Padmasree, 2018). Nonetheless, the consequence of

herding is often overlooked and revealed in academic research. It has posted a doubt to academicians and practitioners in questioning the effect of herding. Is herding bringing good or bad impact to investors?

Meanwhile, another market behavior namely overreaction was first documented by De Bondt and Thaler (1985) who argued that securities are mispriced in market due to investor overreaction to news. Brown, Wei and Wermers (2014) also argue that mutual funds overreacted when institutional investors herd towards the analyst recommendation. Nonetheless, no studies are looking at the relationship between market overreaction and herding for the stocks listed in market.

For Malaysian market, contradictory pieces of evidence have been documented for herding (Zheng, Li and Chiang, 2017 and Kumar, Badhani, Bouri and Saeed, 2020). Nevertheless, overreaction in the Malaysian market is proven in many studies (Ali, Nassir, Hassan and Abidin, 2009 and Ahmad and Hussain, 2001). This market that is made up of both shariah and non-shariah compliant stocks would be a good testing ground to investigate if there is a relation between herding and overreaction.

More specifically, investors may react differently toward the Shariah stocks and non-Shariah stocks (Kumar, Badhani, Bouri and Saeed, 2021) due to some special characteristics of shariah stocks such as prohibition of *riba*, *gharar* or doubtful transaction, gambling and so on. Therefore, this study examines the possible existence of herding and how it relates to overreaction in Shariah and non-Shariah stocks in Malaysia.

## **Literature Review and Hypothesis Development**

### ***Herding***

Numerous papers have been devoted to the study of herding in examining the determinants (Allam, Abdelrhim and Mohamed, 2020; Ahmad Sabir, Mohammad and Kadir Shahar, 2019) and the existence of herding (Economou, Hassapis and Philippas, 2018).

Nonetheless, studies on the consequence of herding mainly focus on financial crisis. In the study of Bowe and Domuta (2004), they examine herding in 1997 Asian Crisis and argue that the tendency of herding increases following the emergence of the crisis. Likewise, Wu, Yang and Zhao (2020) investigate the herding during COVID-19 in Chinese stock market. They show that herding is stronger during upside market condition of crisis. Nonetheless, academic research on the consequence of herding during a normal period is still limited.

For Malaysian market, contradictory shreds of evidence are being documented for herding. Yao and Tangjitprom (2019) and Kumar et al. (2020) argue that the evidence of herding is not detected in Malaysia among the other ASEAN markets. Nonetheless, this result is contradictory to Zheng et al. (2017) and Brahmana, Hooy and Ahmad (2012) in proving the existence of herding in Malaysia. Hence, there is a need to relook into the existence of herding in the Malaysian stock market.

Malaysia is one of the world's largest Islamic financial markets. However, limited studies have been done to determine the existence of herding in Shariah stocks. Mand et al. (2018) argue that herding existed for Shariah and conventional stocks from 1995 to 2016. Nevertheless, a contradictory result is documented in the studies of Aziz, Jalan, Matkovskyy and Bouraoui (2020) in which they show that herding exists in Shariah stocks but no evidence of herding is detected in conventional stocks.

Furthermore, investors observe Shariah stocks as a more ethical, stable and less risky investment compare to non-Shariah stocks. Kumar et al. (2021) argue that the herding tendency of Shariah stocks is stronger compared to non-Shariah stocks. Similarly, Medhioub and Chaffai (2019) show that Islamic Gulf Cooperation Council markets are exposed to herding due to the influence of non-Shariah stocks. This is because Shariah stocks attract more investors to trade,

which can lead to herding due to heterogeneous information. Nevertheless, limited studies emphasize examining the existence of herding and its tendency in the Malaysian market.

Therefore, there is a need to investigate the existence of herding and its relationship with market overreaction in the Malaysian stock market more specifically on Shariah and non-Shariah stocks. In this context, this study proposes the following hypothesis:

*H1. Herding exists in Malaysian stock market*

*H1(a). Herding tendency of Shariah compliant stocks is stronger than non-Shariah compliant stocks*

*H1(b). Herding tendency of non-Shariah compliant stocks is stronger than Shariah compliant stocks*

### **Market Overreaction**

Studies on market overreaction are not new in the field of behavioural finance. Parveen, Satti, Subhan and Jamil (2020) examine the market overreaction in emerging markets and show that investors overreacted to the information in market. They claim that overconfident investors can lead to overreaction. Similar evidence is documented in the study of Piccoli, Chaudhury, Souza and da Silva (2017) in which they claim that overreaction is stronger during extreme market condition.

For Malaysian market, Ali, Ahmad and Anusakumar (2011) show that investors overreacted in Malaysian market with winner portfolio turns to negative returns from 2000 to 2010. Nonetheless, contradictory evidence is documented in Ali et al. (2009) in arguing that Malaysian market is inconsistent with overreaction hypothesis. Therefore, this research gap needs to be addressed.

The existence of market overreaction is correlated to herding. In the study of Chen, Hua and Jiang (2018), they argue that contrarian profit is attributed to overreaction in Chinese market, which subsequently leads to herding. Moreover, Firoozabadi and Rastegar Sorkheh (2019) show that herding can affect the return of stocks in Tehran stock market and support the contrarian strategy in dealing with market overreaction. Nonetheless, no studies look at the examination of the relationship between market overreaction and herding in Malaysia.

Hence, this study aims to examine the relationship between market overreaction and herding in the Malaysian stock market more specifically in Shariah stocks. This is because this area has not been examined in previous studies and it allows this study to conclude the consequence of herding. In this context, this study proposes the following hypothesis:

*H2. There is signification relationship between market overreaction and herding in Malaysian stock market*

*H2(a). There is signification relationship between market overreaction and herding in Shariah compliant stocks*

*H2(b). There is signification relationship between market overreaction and herding in non-Shariah compliant stocks*

### **Methods**

#### **Herding**

In detecting the existence of herding, this study adopts the Cross-Sectional Absolute Deviation (CSAD) as outlined in the study of Chiang and Zheng (2010). CSAD is a market-wide herding measurement. The CSAD is modified from Cross-Sectional Standard Deviation (CSSD) as in Christie and Huang (1995) to rectify CSSD's sensitivity towards outliers. The CSAD is expressed as:

$$CSAD_{i,t} = \frac{1}{N} \sum_{i=1}^N |R_{i,t} - R_{m,t}| \quad (1)$$

$$CSAD_{i,t} = \gamma_0 + \gamma_1 R_{m,t} + \gamma_2 |R_{m,t}| + \gamma_3 R_{m,t}^2 + \varepsilon_t \quad (2)$$

Where, CSAD is the cross-sectional absolute deviation of stock  $i$  at time  $t$ ,  $N$  is the number of stocks,  $R_{i,t}$  is the observed stock return of stock  $i$  at time  $t$  and  $R_{m,t}$  is the market return. The absolute term of market return ( $|R_{m,t}|$ ) measures the dispersion of return starting from value 0. FTSE Bursa Malaysia KLCI index is used as a proxy to determine market return ( $R_{m,t} = (KLCI_t - KLCI_{t-1}) / KLCI_{t-1}$ ).

The negative coefficient of  $R^2_{m,t}$  in Equation (2) indicates that herding exists in the market. Capital Market Pricing Model (CAPM) shows that risk and return is linearly correlated if investors are rational. In this context, Chiang and Zheng (2010) argue that the non-linear term of market return ( $R^2_{m,t}$ ) shall be used to detect herding. This is because investors are not homo economicus to expect them always make rational decision in stock markets. Therefore, the significant negative coefficient of  $R^2_{m,t}$  shows that investors herd towards the market return. This is a phenomenon where some investors mimic and shadow the investment decision of other investors.

### Average Excess Cumulative Return

One of the methods to measure market overreaction is the average excess cumulative return (AECR). AECR converts the stock price data into cumulative return over a period through a simple percentage calculation (Reddy, Qamar, Mirza and Mirza, 2020). The cumulative return is expressed as:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \quad (3)$$

$$CR_{i,t} = \prod_{j=1}^t (1 + R_{i,j}) = [(1 + R_{i,1})(1 + R_{i,2}) \dots (1 + R_{i,t})]^{1/n} - 1 \quad (4)$$

Where,  $P_{i,t}$  is the stock price of stock  $i$  at time  $t$  and  $R_{i,j}$  is the weekly return of stock  $i$  in week  $j$ . The cumulative return is calculated by geometric mean instead of arithmetic mean. This is because geometric mean does not rely on the stock price, but focuses on the percentage changes in the return of stocks. The errors caused by the bid-ask spread can also be minimized (Krejčí and Stoklasa, 2018). This study also adopts the practice in the study of Ali et al. (2011) to examine market overreaction in eight different weeks from week 1 to week 52. The stocks listed in Bursa Malaysia are categorized into winner portfolio and loser portfolio. The formation period of the portfolio is 12 months. The average excess cumulative returns for winner portfolio and loser portfolio are written as:

$$ECR_{i,t} = CR_{i,t} - CR_{m,t} \quad (5)$$

$$AECR_{W,t} = \frac{\sum_{j=1}^N ECR_{w,i,t}}{N}; t = 1,2,3 \dots 52 \text{ weeks} \quad (6)$$

$$AECR_{L,t} = \frac{\sum_{j=1}^N ECR_{L,i,t}}{N}; t = 1,2,3 \dots 52 \text{ weeks} \quad (7)$$

Where,  $ECR_{i,t}$  is the excess cumulative return of stock  $i$  at time  $t$ ,  $CR_{i,t}$  is the cumulative return of stock  $i$  at time  $t$ ,  $AECR_{W,t}$  and  $AECR_{L,t}$  are average excess cumulative return for winner and loser portfolios. The winner portfolio consists of the stocks with positive excess cumulative return and loser portfolio has stocks with negative excess cumulative return. The AECR allows this study to examine the percentage changes of the stock return over time after the formation period. If a market is overreacted, the winner portfolio shall have negative return and the loser portfolio shall have positive return in near future.

### Grand Average Excess Cumulative Return

Grand average excess cumulative return does not categorize stocks into winner and loser portfolio (Reddy et al., 2020). On the contrary, it combines all the stocks in the winner and loser portfolio to calculate the mean of return. This method allows this study to have a

comprehensive view of the market overreaction and act as a comparative analysis to winner and loser portfolios. Grand average excess cumulative return is expressed as:

$$GAECR_W = \frac{1}{n} \sum_{T=1}^N AECR_{W,t} \quad (8)$$

$$GAECR_L = \frac{1}{n} \sum_{T=1}^N AECR_{L,t} \quad (9)$$

$$DG_{L-W} = GAECR_L - GAECR_W \quad (10)$$

Where,  $DG_{L-W}$  is the average return of the arbitrage portfolio (winner and loser). If the result of the grand average excess return is positive, it shows that contrarian profit exists and suggest investing against the market trend to generate profit (Abd Halim, Jusoh, Elias and Kamil, 2019). This is because the market is overreacted and herding can lead to mispricing in the stock market. Therefore, investors are advised to invest against the winner and loser portfolios.

In this study, t-statistic is calculated to measure the size of the difference relative to the variation in the sample data. The t-statistic of AECR and grand average excess return are written as:

$$t_W = \frac{AECR_W}{S_W/\sqrt{N}} \quad (11)$$

$$t_L = \frac{AECR_L}{S_L/\sqrt{N}} \quad (12)$$

$$t_D = \frac{DG_{L-W}}{S_D/\sqrt{N}} \quad (13)$$

Where,  $t_W$ ,  $t_L$  and  $t_D$  are the test statistics of winner portfolio, loser portfolio and arbitrage portfolio;  $S_W$ ,  $S_L$  and  $S_D$  are the standard deviation of different portfolios. The t-statistic allows this study to conclude the existence of contrarian profit.

In short, the average excess cumulative return is used to determine the market overreaction in the Malaysian stock market. The measurements are also included in the CSAD equation to determine its impact on causing herding in the Malaysian stock market with Shariah and non-Shariah stocks. On the other hand, grand average excess cumulative return is used to determine the existence of contrarian profit of arbitrage portfolio.

### Control Variables

Five control variables are selected in this study, which are cash over total asset, debt over total debt, firm size, volatility and volume. Following the Securities Commission Malaysia – Shariah Advisory Board, cash over the total asset and debt over total asset must be maintained less than 33 percent to maintain the Shariah status. The calculation of cash over total debt only includes the cash placed in conventional accounts and excludes the cash in Islamic accounts and financing instruments. Similarly, Islamic financing and Sukuk are excluded from calculating the debt over the total asset.

For measuring firm size, the market capitalization of each company is calculated by using stock price multiples the total number of outstanding shares. Volatility is calculated based on the

realized volatility, which represents the historical prices ( $RVol_{i,t} = \sqrt{\sum_{i=1}^N r_{i,t}^2}$ ). Besides, the

total volume traded is used to represent volume as a control variable in this study. In measuring the impact of market overreaction on herding, Equation (2) is modified to include market overreaction and control variables as shown below:

$$CSAD_{i,t} = \gamma_0 + \gamma_1 R_{m,t} + \gamma_2 |R_{m,t}| + \gamma_3 R_{m,t}^2 + \gamma_4 MO_{i,t} + \gamma_5 CTA_{i,t} + \gamma_6 DTA_{i,t} + \gamma_7 FS_{i,t} + \gamma_8 Vol_{i,t} + \gamma_9 VO_{i,t} + \varepsilon_{t,\tau} \quad (14)$$

Where,  $MO_{i,t}$  is the market overreaction, which is measured average excess cumulative return of stock  $i$  at time  $t$ ,  $CTA_{i,t}$  is the cash over total asset of stock  $i$  at time  $t$ ,  $DTA_{i,t}$  is the debt over

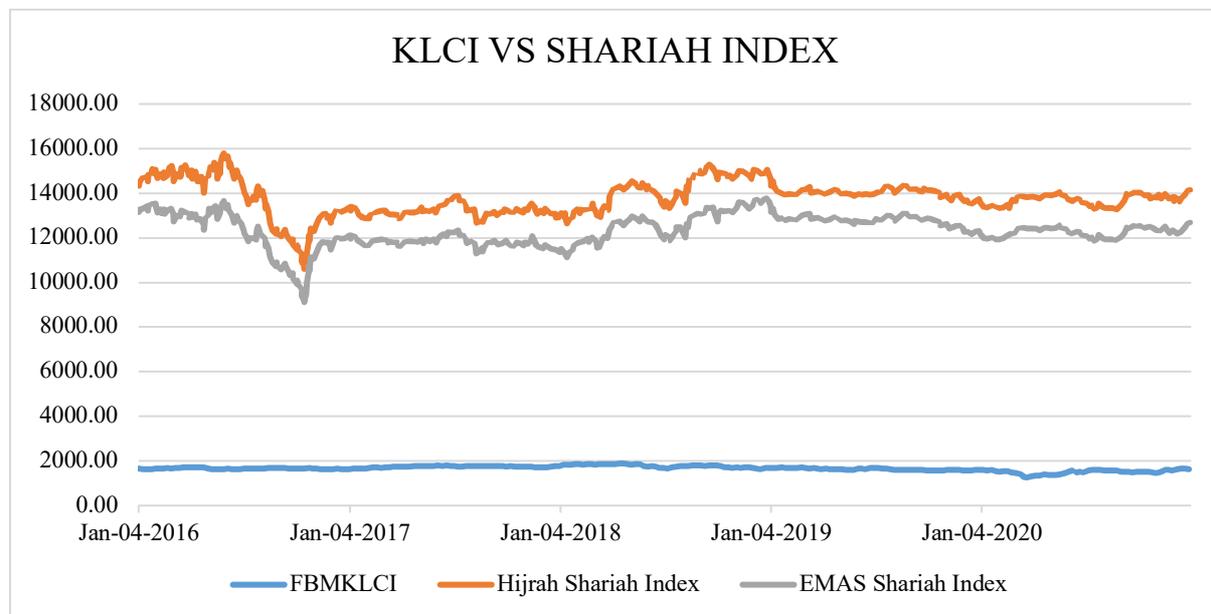
total asset of stock  $i$  at time  $t$ ,  $FS_{i,t}$  is the firm size of stock  $i$  at time  $t$ ,  $Vol_{i,t}$  is the volatility of stock  $i$  at time  $t$  and  $VO_{i,t}$  is the volume of stock  $i$  at time  $t$ .

## Findings

### Descriptive Statistic

In this study, the data range is from 1-Jan-2016 to 31-Dec-2020. For sampling, only stocks listed in Main Market, Bursa Malaysia are selected. Warrant, real estate investment trust and funds are not included. A total number of 688 listed companies are selected with 597 Shariah stocks and 91 non-Shariah stocks.

Figure 2 shows the index values of FTSE Bursa Malaysia KLCI Index, FTSE Bursa Malaysia Hijrah Shariah Index and FTSE Bursa Malaysia EMAS Shariah Index from 2016 to 2020. Hijrah Shariah Index is a tradeable index, which comprises the 30 largest market capitalization listed companies from KLCI index that meets the requirements of Shariah compliance. Emas Shariah Index is derived from the Top 100 and Small Cap index that fulfils the criteria of Shariah compliance. As shown in Figure 2, the Shariah indexes have a higher level of fluctuation than KLCI index. The performance of EMAS Shariah Index is in line with Hijrah Shariah Index.



The classification of Shariah stocks is decided by the Shariah Advisory Council of Securities Commission Malaysia. A Shariah stock shall not have more than 5 percent or 20 percent contribution of Shariah non-compliant activities to total revenue and profit before tax depending on the industry. Furthermore, a Shariah stock shall maintain less than 33 percent of cash over the total asset and debt over total asset after excluding Islamic instruments.

The descriptive statistic of all variables is shown below:

**Table 1: Descriptive Statistic of Variables**

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
CSAD (Shariah)	2.09	1.82	7.30	0.33	1.05	1.37	5.60
CSAD (Non-Shariah)	2.85	2.66	8.89	0.66	1.49	1.11	4.55

$R_{m,t}$	-0.12	-0.12	0.13	-0.44	0.22	-0.28	1.66
AECR (Shariah)	0.01	-0.01	0.25	-0.15	0.02	3.53	14.80
AECR (Non- Shariah)	0.01	0.01	0.18	-0.11	0.01	0.76	14.96
Cash Over Total Asset	0.12	0.08	0.68	0.02	0.10	1.76	7.07
Debt Over Total Asset	0.18	0.15	0.72	0.00	0.15	0.73	2.91
Firm Size	-0.51	-0.47	1.15	-3.71	0.55	-0.81	5.92
Volatility	0.34	0.33	1.01	0.00	0.17	0.49	2.93
Volume	-0.31	-0.38	1.96	-1.78	0.75	0.67	3.15

Note: AECR represents the average excess cumulative returns to measure market overreaction

Table 1 shows that the non-Shariah portfolio has a higher mean value of CSAD compared to the Shariah portfolio. It indicates that the non-Shariah portfolio has higher dispersion between stock return and market return. For average excess cumulative returns, the Shariah portfolio has a slightly higher value of standard deviation compared to the non-Shariah portfolio. It shows that the Shariah portfolio has higher fluctuation in return.

### Estimate of Herding in Malaysian Stock Market

As outlined in research methodology, the existence of herding is determined by the non-linear squared term of market return in Equation (2). The significant negative coefficient of  $R^2_{m,t}$  indicates investors herd towards the market trend to mimic the investment decision of a larger group of investors, whom they perceived as informed investors. The result of Equation (14) for overall stocks (Shariah and Non-Shariah) is tabulated below:

**Table 2: Herding in Overall Win-Lose Portfolio**

Overall – Winner Portfolio								
Week	1	2	3	4	12	24	36	52
Constant	0.26	0.19	0.32	0.19	0.20	0.59	0.68*	0.29
<b>Independent Variables</b>								
$R_{m,t}$	4.31*	4.24*	4.28*	4.22	4.12*	4.09*	4.22*	4.31*
$ R_{m,t} $	14.4*	14.4*	14.0*	14.4*	14.44*	14.46*	14.21*	14.30*
$R^2_{m,t}$	-17.78*	-17.98*	-17.03*	-18.01*	-18.11*	-18.58*	-17.31*	-17.35*
AECR	0.12*	0.11*	0.13*	0.11*	0.10*	0.31*	0.23*	0.11*
<b>Control Variables</b>								
CTA	0.77	0.77	0.63	0.34	0.33	-0.09	0.78	0.66
DTA	1.01*	1.10*	1.05*	0.01	0.01	0.17	0.97*	1.07*
Firm Size	0.02	0.02	0.01	-0.25*	-0.24*	-0.51*	0.01	0.01
Volatility	0.98*	1.02*	0.97*	1.47*	1.44*	1.68*	0.87*	0.93*
Volume	-0.59*	-0.65*	-0.58*	-0.78*	-0.78*	-1.13*	-0.61*	-0.56*
Overall – Loser Portfolio								
Constant	-0.28	-0.01	-0.33	0.24	0.01	1.25*	1.17*	0.13
<b>Independent Variables</b>								
$R_{m,t}$	3.67*	3.52*	3.52*	2.99*	2.99*	2.97*	3.32*	3.86*
$ R_{m,t} $	14.86*	14.60*	14.15*	13.93*	13.35*	12.77*	12.78*	14.63*
$R^2_{m,t}$	-21.08*	-21.28*	-20.26*	-20.99*	-19.86*	-18.86*	-17.82*	-20.02*
AECR	0.21*	0.29*	0.17*	0.38*	0.23*	0.61*	0.57*	0.27*

<b>Control Variables</b>								
CTA	0.89	0.64	0.93	0.92	1.13	0.71	0.87	1.05
DTA	1.34*	1.16*	1.27*	1.24*	1.42*	1.31*	1.41*	1.25*
Firm Size	-0.13	-0.13	-0.15	-0.14	-0.15	-0.14	-0.12	-0.14
Volatility	1.52*	1.51*	1.46*	1.43*	1.40*	1.27*	1.21*	1.35*
Volume	-1.92*	-1.96*	-1.95*	-2.03*	-1.87*	-1.86*	-1.84*	-1.79*

Note: \* represents statistic significant at the 5% level

The result in Table 2 shows that the coefficient of  $R^2_{m,t}$  is significant and negative in winner and loser portfolios. It proves that herding exists in Malaysian stock market from week 1 to week 52 after the formation period. Furthermore, market overreaction, which is measured by the average excess cumulative relative, is found to be significant at the 5 per cent level. It shows that market overreaction is correlated to herding for winner and loser portfolios.

The herding result of this study is consistent to the studies of Loang and Ahmad (2020) and Muharam, Dharmawan, Dharmawan and Robiyanto (2021) in which they show that herding exists in Malaysian stock market. Nevertheless, Yao and Tangjitprom (2019) argue that no evidence of herding is detected in Malaysia. One of the possible explanation is that this study adopts the market data from 2016 to 2020, which is different from the study to focus from 2009 to 2016.

Besides, the evidence on the relationship between market overreaction and herding is consistent to the studies of Hoitash and Krishnan (2008) and Brown et al. (2014). They argue that market overreaction and herding are correlated and the winner stocks heavily bought by herds tend to result in underperformance.

For control variables, volatility and volume are found to be significant from week 1 to week 52. Debt over total asset and firm size are significant to CSAD in certain weeks. Cash over total asset is found to be insignificant in winner and loser portfolios. Nonetheless, these control variables are not the focus of this study and remained constant to better examine the impact of marker overreaction on herding.

In short, the evidence of herding is detected in Malaysian stock market. Market overreaction is also proven to be correlated to corresponding returns. Nonetheless, more evidence shall be gathered to provide a holistic review in justifying the relationship between market overreaction and herding.

### ***Estimate of Herding in Shariah and Non-Shariah Stocks***

For robustness, this study aims to examine the relationship between market overreaction and herding in Shariah and non-Shariah stocks as approved by Securities Commission Malaysia. The result of the winner and loser portfolios of Shariah stocks are shown below:

**Table 3: Herding in Shariah Portfolio (Win-Lose)**

<b>Shariah – Winner Portfolio</b>								
<b>Week</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>12</b>	<b>24</b>	<b>36</b>	<b>52</b>
Constant	0.24	0.18	0.29	0.01	0.01	0.35	0.65*	0.27
<b>Independent Variables</b>								
$R_{m,t}$	4.31*	4.24*	4.28*	4.29*	4.28*	4.21*	4.21*	4.31*
$ R_{m,t} $	14.46*	14.4*	14.03*	14.41*	14.45*	14.23*	14.21*	14.31*
$R^2_{m,t}$	-17.78*	-17.98*	-17.03*	-17.63*	-17.72*	-17.51*	-17.31*	-17.35*
AECR	0.12*	0.11*	0.13*	0.03*	0.03*	0.14*	0.24*	0.11*
<b>Control Variables</b>								
CTA	0.77	0.77	0.63	0.72	0.68	0.65	0.78	0.65

DTA	1.02*	1.11*	1.05*	1.05*	1.05*	1.12*	0.97*	1.07*
Firm Size	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.01
Volatility	0.98*	1.02*	0.97*	1.02*	1.02*	0.95*	0.86*	0.93*
Volume	-0.59*	-0.65*	-0.58*	-0.61*	-0.59*	-0.63*	-0.61*	-0.56*
<b>Shariah – Loser Portfolio</b>								
Constant	-0.26	0.01	-0.31	0.26	0.03	0.36	1.19*	0.15
<b>Independent Variables</b>								
$R_{m,t}$	3.67*	3.52*	3.52*	2.99*	2.99*	4.20*	3.32*	3.86*
$ R_{m,t} $	14.86*	14.61*	14.14*	13.93*	13.34*	14.23*	12.78*	14.63*
$R^2_{m,t}$	-21.08*	-21.28*	-20.26*	-20.99*	-19.86*	-17.50*	-17.82*	-20.02*
AECR	0.21*	0.29*	0.17*	0.39*	0.23*	0.15*	0.57*	0.28*
<b>Control Variables</b>								
CTA	0.89	0.64	0.92	0.92	1.13	0.64	0.87	1.05
DTA	1.34*	1.16*	1.27*	1.24*	1.42*	1.13*	1.41*	1.25*
Firm Size	-0.12	-0.13	-0.15	-0.14	-0.15	0.01	-0.13	-0.14
Volatility	1.51*	1.51*	1.46*	1.43*	1.40*	0.95*	1.21*	1.35*
Volume	-1.92*	-1.96*	-1.95*	-2.04*	-1.87*	-0.63*	-1.84*	-1.79*

Note: \* represents statistic significant at the 5% level

Table 3 shows that  $R^2_{m,t}$  is significant to CSAD with negative value from week 1 to week 52. It indicates that herding exists in Shariah stocks regardless of the winner and loser portfolios. This result is similar to the overall winner and loser portfolios. This is because the total number of Shariah stocks occupies 87 per cent of the total sample. Besides, market overreaction is found to be significant in all weeks in winner and loser portfolios.

The result of this study is consistent to study of Kumar et al. (2021) and Zakie and Rafik (2017) in which they show that herding exists in Shariah stocks. Nonetheless, previous literature on examining the relationship between market overreaction and herding on Shariah stocks is limited. The result of this study provides new insight and evidence to show that market overreaction is correlated to herding in Shariah portfolio.

Other than the Shariah stocks, this study also determines the relationship between market overreaction and herding in non-Shariah portfolio. The result of the existence of herding is tabulated below:

**Table 4: Herding in Non-Shariah Portfolio (Win-Lose)**

<b>Non-Shariah – Winner Portfolio</b>								
<b>Week</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>12</b>	<b>24</b>	<b>36</b>	<b>52</b>
Constant	0.23	0.21	0.16	0.19	0.33	0.18	0.22	0.20
<b>Independent Variables</b>								
$R_{m,t}$	4.08*	4.44*	4.43*	4.45*	4.12*	4.40*	4.57*	4.37*
$ R_{m,t} $	14.26*	17.02*	16.27*	16.78*	15.39*	16.53*	17.85*	17.01*
$R^2_{m,t}$	-18.86*	-23.03*	-21.04*	-21.71*	-20.13*	-21.49*	-23.17*	-22.28*
AECR	0.17*	0.31*	0.31*	0.31*	0.23*	0.26*	0.30*	0.27*
<b>Control Variables</b>								
CTA	0.19	0.38	0.49	0.33	0.29	0.36	0.22	0.30
DTA	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Firm Size	-0.80*	-0.80*	-0.80*	-0.81*	-0.80*	-0.81*	-0.81*	-0.81*
Volatility	1.95*	2.02*	2.09*	2.10*	1.95*	2.02*	1.99*	2.04*
Volume	-0.91*	-0.89*	-0.90*	-0.87*	-0.91*	-0.89*	-0.89*	-0.89*

<b>Non-Shariah – Loser Portfolio</b>								
Constant	0.15	0.11	0.01	0.03	0.33	0.16	0.22	0.17
<b>Independent Variables</b>								
$R_{m,t}$	3.17*	3.35*	3.48*	3.33*	3.45*	3.21*	3.22*	3.61*
$ R_{m,t} $	10.19*	10.96*	11.94*	11.55*	12.88*	9.81*	9.97*	12.32*
$R^2_{m,t}$	-9.16	-10.21	-11.61	-11.36	-13.44*	-8.45	-8.71	-11.05*
AECR	-0.02	0.02	0.07	0.04	0.11	-0.03	-0.02	0.07
<b>Control Variables</b>								
CTA	1.86*	1.89*	1.82*	1.91*	1.98*	1.87*	1.86*	1.93*
DTA	0.45	0.51	0.57	0.56	0.72	0.44	0.46	0.59
Firm Size	-0.50*	-0.51*	-0.51*	-0.51*	-0.52*	-0.49*	-0.51*	-0.49*
Volatility	0.63	0.65	0.72	0.67	0.74	0.62	0.62	0.72
Volume	-0.97*	-0.97*	-0.97*	-0.97*	-0.98*	-0.98*	-0.98*	-0.97*

Note: \* represents statistic significant at the 5% level

The result of Table 4 shows that the coefficient of  $R^2_{m,t}$  is significant with a negative value in all weeks in the winner portfolio. It indicates that herding exists in the non-Shariah winner portfolio. Market overreaction is significant to corresponding returns for all weeks. This result shows that market overreaction is correlated to herding in the non-Shariah winner portfolio.

Nonetheless, the result of the non-Shariah loser portfolio documents different results as compared to the winner portfolio. The  $R^2_{m,t}$  is found to be insignificant in weeks 1, 2, 3, 4, 24 and 36 of the loser portfolio. The evidence of herding is only detected in week 12 and week 52. Furthermore, market overreaction is found to be insignificant to all weeks in the loser portfolio at the significant level of 5 percent. It proves that market overreaction is not correlated to herding in the non-Shariah loser portfolio.

In measuring herding tendency, the non-Shariah winner portfolio has a higher coefficient value of  $R^2_{m,t}$  compared to Shariah winner portfolio. Furthermore, no evidence of herding is detected in the non-Shariah loser portfolio, unlike the herding that exists in the Shariah loser portfolio. The result of this study shows that investors are extreme in trading non-Shariah stocks. Investors aggressively herd in non-Shariah winner portfolio but conservative to trade non-Shariah loser portfolio.

One of the explanations is that non-shariah stocks are dealing with riba, gharar or doubtful transactions, gambling and so on. The business activities are perceived as risky investment, which also means higher returns for investors. Therefore, investors are inclined to herd in the winner portfolio but sell off their shares in the loser portfolio to pursue lucrative profit. Jaiyeoba, Abdullah and Ibrahim (2019) also argue that the Malaysian stock market comprises of majority individual investors. Individual investors tend to react differently to herding. In this context, investors may adopt an aggressive trading strategy to seek a higher return in non-Shariah stocks.

In a nutshell, the result of this study indicates that herding exists in Shariah winner and loser portfolios as well as the non-Shariah winner portfolio. Nonetheless, the evidence of herding is not detected in the non-Shariah loser portfolio. The herding tendency in non-Shariah stocks is found to be higher than Shariah stocks. It indicates that investors aggressively trade in non-Shariah stocks to herd in winner portfolio but remain conservative on loser portfolio to pursue higher returns. Besides, market overreaction is found to be correlated to corresponding returns for all portfolios except for the non-Shariah loser portfolio.

### Market Overreaction

The previous section determines the existence of herding and the correlation between market overreaction and herding. Nonetheless, the existence of market overreaction can also be determined by the return of the portfolio after the formation period. In this context, this study adopts average excess cumulative return to determine the existence of market overreaction. Furthermore, grand average excess cumulative return is measured to determine the contrarian profit of the arbitrage portfolio. The result of the market overreaction and t-statistics are shown below:

**Table 5: Market Overreaction from Week 1 to Week 52**

	Week 1	Week 2	Week 3	Week 4	Week 12	Week 24	Week 36	Week 52
<b>Overall Portfolio</b>								
AECR Win Mean	0.08	-0.20	-0.26	-0.07	-0.25	0.11	0.08	0.04
<i>T-Statistic</i>	6.23	-15.60	-20.26	-5.90	-33.53	24.00	16.00	9.72
AECR Lose Mean	1.79	1.79	1.61	1.29	0.78	0.75	0.66	1.46
<i>T-Statistic</i>	21.32	1.00	5.70	4.60	-5.38	17.57	18.69	5.97
GAECR Mean	1.80	1.74	1.94	1.60	0.89	0.62	0.66	0.83
<i>T-Statistic</i>	16.70	12.31	18.01	8.06	23.16	4.22	7.18	5.75
<b>Shariah Portfolio</b>								
AECR Win Mean	0.10	-0.16	-0.25	-0.04	-0.22	0.11	0.08	0.02
<i>T-Statistic</i>	8.63	-13.04	-20.62	-3.76	-29.49	25.02	17.48	4.52
AECR Lose Mean	1.82	1.83	1.63	1.27	0.78	0.77	0.67	1.47
<i>T-Statistic</i>	20.32	1.56	5.40	4.01	-6.00	16.87	18.90	5.80
GAECR Mean	0.27	0.19	0.34	0.09	0.17	0.02	0.04	0.07
<i>T-Statistic</i>	13.24	9.36	18.23	6.06	18.10	2.63	5.91	4.51
<b>Non-Shariah Portfolio</b>								
AECR Win Mean	-0.01	-0.35	-0.28	-0.19	-0.37	0.10	0.05	0.12
<i>T-Statistic</i>	-0.47	-23.89	-19.32	-11.64	-48.76	20.61	10.26	27.45
AECR Lose Mean	0.56	0.13	0.15	0.18	0.03	0.17	0.06	0.11
<i>T-Statistic</i>	42.48	-10.83	11.29	12.06	3.51	35.89	16.60	9.35
GAECR Mean	0.57	0.22	0.43	0.36	0.40	0.07	0.01	-0.01
<i>T-Statistic</i>	30.97	10.91	22.86	19.86	43.23	11.06	2.75	-1.17

Table 5 shows that overall and Shariah winner portfolios have negative returns from week 2 to week 12. Due to the existence of market overreaction, the winner portfolios have turned to become negative returns. It indicates that investors are overreacted to the winner portfolio and the portfolio eventually generates negative returns after the market adjustment. Nevertheless, the non-Shariah winner portfolio has a negative average excess cumulative return from week 1 to week 12. On the other hand, a positive return is documented in weeks 24, 36 and 52 for all winner portfolios.

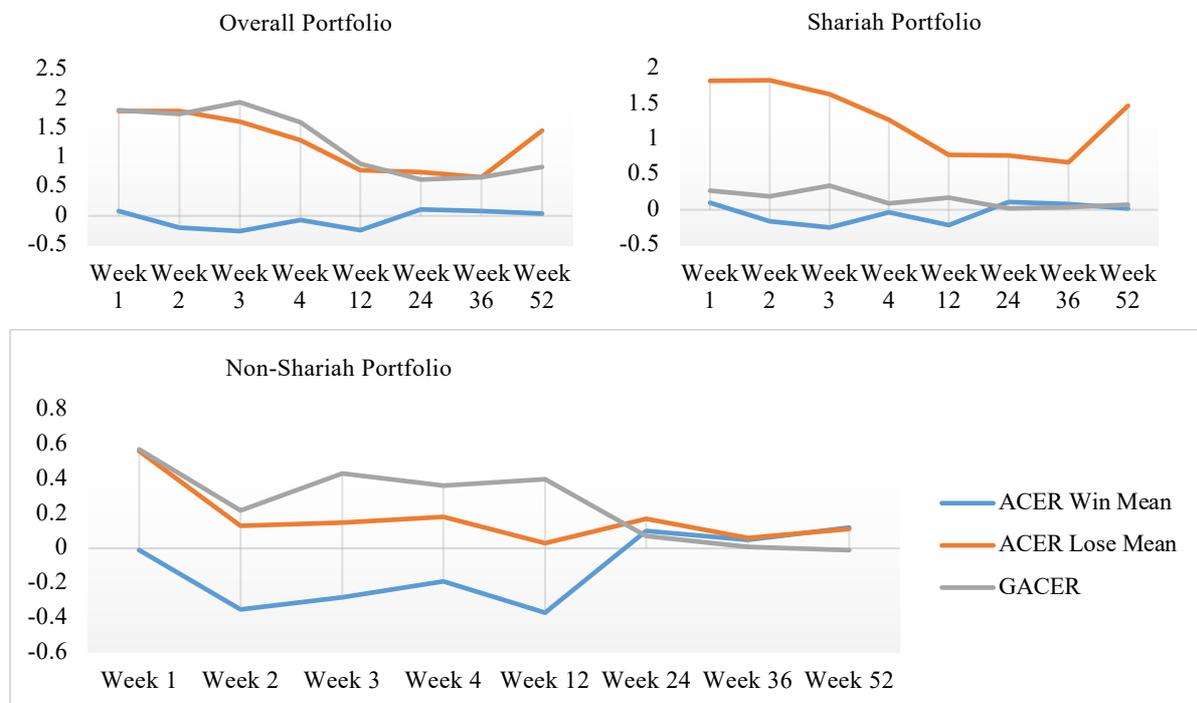
The result of this study is consistent with the studies of Ali et al. (2011) and Ali, Nassir, Hassan and Abidin (2011) in which they show that investors are overreacted in the Malaysian stock market. A similar result is documented to prove that winner and loser portfolios experience reversal return after the formation period. Nonetheless, the result of this study records a positive return after week 12, which is contradictory to a full negative return during the observation period.

One of the possible reasons is that the efficiency of the Malaysian stock market has improved due to technological advancement. Lee, Tsai, Chen and Lio (2019) argue that the stock market with high ICT diffusion can increase the market efficiency in reflecting the latest information. In this context, market overreaction can be rectified by the market if new information can be incorporated into share prices as quickly as possible.

Based on Table 5, the overall, Shariah and non-Shariah loser portfolios have positive returns from week 1 to week 52. It indicates that investors are overreacted to the loser portfolio and caused mispricing in the market. The grand average excess cumulative return is used to determine the return of the arbitrage portfolio. All portfolios have shown a positive value of grand average excess cumulative return except for week 52 in the non-Shariah portfolio. A positive value shows that contrarian profit exists and suggests investors invest against the market trend. This is because the stock prices are mispriced due to the existence of market overreaction. The result of this study is consistent with the Reddy et al. (2020) in showing that the market is overreacted and contrarian profit exists for arbitrage portfolio.

Figure 2 shows the trend analysis of all portfolios. It shows that all winner portfolios have started to rebound and generate positive returns starting from week 12. All loser portfolios have positive returns after the formation period. Furthermore, grand average excess cumulative return is found to be positive for all portfolios, which suggests investors invest against the market.

**Figure 2: Trend Analysis of Market Overreaction**



### **Discussion and Conclusion**

The objectives of this study are to examine the existence of herding and its relationship with market overreaction in the Malaysian stock market from 2016 to 2020. This study also seeks to explore the herding tendency between Shariah and non-Shariah stocks. All stocks are categorized into winner portfolio and loser portfolio after 12 months of formation period. Average excess cumulative return is used to determine market overreaction and grand average excess cumulative return is measured to detect the existence of contrarian profit for arbitrage portfolio.

The results show that herding exists in overall, Shariah and non-Shariah portfolios except for the non-Shariah loser portfolio. It indicates investors mimic and shadow the investment decision of other investors in the market. Nonetheless, the herding tendency is found to be stronger in non-Shariah stocks compare to Shariah stocks. This is because non-Shariah stocks are the most risky investments, which relate to *riba*, *gharar* or doubtful transactions, gambling and so on. Thus, investors tend to aggressively herd in the non-Shariah winner portfolio but remain conservative on the loser portfolio to seek higher returns.

Market overreaction is also found to be correlated to herding except for the non-Shariah loser portfolio. Nonetheless, no previous studies look at the relationship between market overreaction and herding in Shariah and non-Shariah stocks.

In examining market overreaction, the result indicates that the Malaysian market is overreacted and the winner portfolio results in negative return until week 12. Nevertheless, the evidence of market overreaction is not detected from week 24 to 52 with a positive return. Besides, all loser portfolios have shown positive returns throughout the observation period. It shows that investors are overreacted to the loser portfolio. The result of the grand average excess cumulative return indicates that contrarian profit exists and suggests investors trade against winner and loser portfolios.

### ***Theoretical Implications***

For implication, the result of this study indicates that herding exists in the Malaysian stock market, which is inconsistent with the Efficient Market Hypothesis (EMH). EMH argues that all information shall be reflected in share prices and there is no room to earn abnormal profit. Nonetheless, the result of this study shows that the market is overreacted with the existence of herding.

### ***Practical and Social Implications***

The result of this study contributes to the academician and practitioners in understanding and awareness of the existence of herding and overreaction in the market. This study shows that the herding tendency of non-Shariah stocks is stronger than Shariah stocks. This is because investors aggressively herd in the winner portfolio but remain conservative in the loser portfolio to seek higher returns. Furthermore, the result indicates that the stock market misprices securities due to the occurrence of market overreaction. Investors are also recommended to invest against the winner and loser portfolios.

### ***Limitations and Suggestions for Future Research***

For limitation, the CSAD herding measurement does not differentiate between individual and institutional investors. It limits this study to conclude the different behaviours as exhibited by different types of investors. Furthermore, the behaviour of domestic and foreign investors towards Shariah stocks cannot be determined as well. Future studies are recommended to examine the relationship between herding and market overreaction across multiple countries to provide in-depth empirical evidence. Future studies may adopt a quantile regression approach to determine the existence of market overreaction in different quantiles. Furthermore,

questionnaires and interview approach can be adopted to examine the different behaviours of investors during pre-pandemic and pandemic.

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