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# INDONESIAN CAPITAL MARKET REVIEW

## Examining Causality Effects On Stock Returns, Foreign Equity Inflow, and Investor Sentiment: Evidence From Indonesian Islamic Stocks

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*Our study aims to examine the relation of stock return, foreign equity inflow, and investor sentiment in Indonesian Islamic stocks. We use monthly data from 2012 to 2018 and 109 firms with 9,156 total observations. Considering heterogeneity and endogeneity assumption, our models are estimated by the system generalized method of moment. Our research found a positive bi-directional effect between stock return and investor sentiment on the contemporaneous period and the uni-directional effect in which investor sentiment negatively impacts stock return. Our research also found a between stock return and foreign investor inflow. Last but not least, those imply to asset pricing, trading strategy, and portfolio management in Islamic shares.*

**Keywords:** stock return; foreign equity flow; investor sentiment; Indonesian Islamic stocks; bi-directional effect; system generalized method of moment

**JEL Classification:** G12, G41, C33, C36

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## Introduction

The role of sentiment and foreign equity flow in stock valuation has been increasingly essential in the aftermath of global financial crises. Economic bubble, one of the crisis symptoms, is caused by irrational asset pricing and it prompts financial market growth abnormally. Until economic agents realize their mispricing, the bubbles burst and trigger market crash around the world. To recover financial soundness, many developed countries, such as

the United States and other high-income countries, adopt monetary easing by lowering policy rates, thus boosting capital flight into emerging economies (Lim & Mohapatra, 2016; Miyakoshi et al., 2017). Even though the presence of foreign investors in host countries creates financial market stability, it can lead to a reversal effect if they pull money out of the countries suddenly (Han et al., 2015; Naufa et al., 2019).

Most of the recent studies document the role of investor sentiment in shaping the market value of equity (Liston-Perez et al., 2018;

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Qadan & Aharon, 2019; Seok et al., 2019; Yao & Li, 2020). Representing investor confidence, sentiment toward stock price movement affects investment decisions, portfolio selection, and market timing (Statman, 2014). At a higher level of investor sentiment, stock prices are argued to deviate from its fundamental values. Hence, it drives arbitrageurs to rebalance their portfolio by buying (selling) stocks at low (high) prices simultaneously. Moreover, sentiment and stock return might be positively correlated at the contemporaneous period but negatively at the lagged period. On the other hand, some studies examine reverse causality or bi-directional effect (Brown & Cliff, 2004; Cagli et al., 2020; Fisher & Statman, 2000; Liston-Perez et al., 2018; Spyrou, 2012; Y. H. Wang et al., 2006). High stock return induces investors' optimism about future performance.

The interaction between domestic stock returns and net foreign flow is related to the feedback trading hypothesis, risk-rebalancing theory, and momentum strategy (Albuquerque et al., 2007; French & Vishwakarma, 2013; Griffin et al., 2004). In the feedback trading hypothesis, foreign capital inflow (outflow) leads to an increase (decrease) in stock return so as there are positive and negative feedback trading. Meanwhile, an increase in foreign equity flow is responded negatively to future local stock returns since international investors rebalance their portfolios to adjust their currency exposure. Other studies also stated that foreigners' informational disadvantage to emerging markets drives them to employ local returns in a trading decision (Richards, 2005; Ülkü, 2015). Hence, foreign inflow might be explained by domestic stock returns. These findings suggest the presence of a bi-directional effect between local returns and foreign inflow.

Concerning investor sentiment and foreign equity flow, French & Li (2017) examine bi-directional relations, but their work lacks theoretical background. On the one hand, it was proven that global and national-level and firm-specific sentiments affect foreign capital flight to emerging countries (Li et al., 2019; Liew et al., 2018; Tsai et al., 2019). On the other hand, whether foreign investors create or cons with

noise trading is still questionable (Albuquerque et al., 2009; Liew et al., 2018; Mendel & Shleifer, 2012). If foreign traders are uninformed outsiders, they only rely on price movement. Otherwise, global private information might be available so that foreigners could exploit noise prices to take profit.

In 2015, a research analyst at Morgan Stanley classified Indonesia and other emerging economies (Turkey, Brazil, India, and South Africa) as "Five Fragile" that are the most vulnerable to shock in foreign capital flow (Chadwick, 2019). However, it is still debatable whether foreign trading activity affects the Indonesian stock market or not (Agarwal et al., 2009; Arroisi & Koesrindartoto, 2019). Besides, investor sentiment is relatively essential for asset pricing practice in the emerging market due to cultural characteristics, low institutional involvement, inadequate investor protection, and lack of qualified information (Anusakumar, Ali, & Wooi, 2017; Cagli et al., 2020; Corredor, Ferrer, & Santamaria, 2013; Dash & Mahakud, 2012; Zhang, Lei, Ji, & Kutan, 2019). Most importantly, low law supremacy and shareholder protection issues are still a central problem in some Asian emerging economies. (Klapper & Love, 2004; La Porta et al., 2000), especially Indonesia (Imamah et al., 2019). Meanwhile, previous studies discussed the effect of foreign equity flow and investor sentiment on Indonesia's stock pricing relatively limited.

Indonesia is a potential market for Islamic equity investment. Dominating with 51.55% of the total market capitalization (approximately USD 258.60 billion), the Indonesian Islamic stock market is a highly promising portfolio (OJK, 2018). It is inseparable from screening mechanisms combining Islamic values and financial aspects. Stocks that comply with sharia include halal industries and fulfill financial screening (low interest-bearing leverage and revenue). Under those specifications, Indonesian Islamic stocks have a different profile on risk, return, and performance from non-Islamic counterparts empirically, thus arguably offers diversification benefits for both domestic and international investors (Lusyana & Sherif, 2017; Majdoub et al., 2016; Qoyum et al.,

2020). However, it is inconclusive whether Islamic shares are exposed to noise pricing or not (Khan et al., 2019; Dash & Maitra, 2018; Hammoudeh et al., 2014; Merdad et al., 2015; Perez-Liston et al., 2016)

On account of a greatly prospective market, diversification benefit, pricing issues for Islamic equities, this study aims to investigate the bi-directional effect among investor sentiment, foreign equity flow, and stock returns in Indonesian Islamic stocks at a contemporaneous and lagged level. Hereinafter, this study brings about the contribution in two ways. First, due to inconsistent results in the presence of sentiment-driven mispricing on the Islamic portfolio, we concern on the problem. To our knowledge, the role of foreign trading on Islamic stock appraisal is rarely investigated so as we fill the research gap.

We use monthly data from 2012 to 2018 and 109 firms with 9,156 total observations. There are two types of sentiment measures: firm-specific and wide-market sentiments (Ahmed, 2020; Anusakumar et al., 2017). We employ about firm-specific sentiment indicators consisting of market-to-book value, market turnover, and price-to-earning (Baker & Stein, 2004; French & Li, 2017) to construct investor sentiment index by principal component analysis. For the reason that our data is longitudinal, heterogeneity and endogeneity assumption must be satisfied. Therefore, we utilize the system generalized method of moment (Arellano & Bover, 1995; Blundell & Bond, 1998) and conduct the robustness check with panel Granger-causality test (Abrigo & Love, 2016).

Overall, there are bi-directional effects between stock return and foreign equity flow and between stock return and investor sentiment at the contemporaneous level. We find consistent results in panel Granger-causality. The findings shed light on either investor sentiment or foreign trading on equity valuation in the Indonesian Islamic stock market. Moreover, those have implications for asset pricing and portfolio management in Islamic shares.

This paper is organized as follows: It begins with a literature review on investor sentiment, stock returns, foreign equity flow, and ends up

with their respective hypotheses. Further, the subsequent section of this paper will discuss the research methods, results and discussions, and conclusions.

## Literature Review

We study previous literature on the relationship of investor sentiment, stock returns, and foreign equity flow. The following sections discuss the theoretical background and empirical evidence.

### *Investor sentiment and stock returns*

First of all, many studies investigate the association between investor sentiment and stock returns. The concept of investor sentiment comes from behavioral finance in answering the traditional view's inability to explain market anomalies, noisy traders, limit to arbitrages, and other market psychological aspects. As regards past studies, investor sentiment is investor confidence in the financial market. Hence, that leads to an over (under) reaction to a specific stock or portfolio, speculative behavior to future cash flow based on noise trading, and particular norms' expectations (Aggarwal, 2019; Baker et al., 2012; Baker & Wurgler, 2007; Brown & Cliff, 2004). The presence of investor sentiment creates noise in valuing stock or portfolio so that the price deviates from its fundamental value. In the matter of valuing a stock or portfolio, investors feeling excessively optimistic (pessimistic) boost positive (negative) sentiment then stock return increase (decrease) significantly.

Empirically, the effect of investor sentiment on stock returns might be inter-temporally shifted in which tends to be positive at the contemporaneous level (Ryu et al., 2017; Yang & Zhou, 2015; Zhang et al., 2019) but negative at the lagged level (Huang et al., 2015; Liston-Perez et al., 2018; Qadan & Aharon, 2019). The results are related to how noise and rational investors react to stock mispricing. In the short run, the first ones benefit from noise information to earn positive returns. It causes an increased positive sentiment, at the same time,

prompts a share price to go beyond fundamental value. However, in the long run, rational investors will eliminate the overvalued stock through an arbitrage transaction. That is why excessive positive sentiment would be followed by low stock return at a one-step-ahead period (Miwa, 2016; Stambaugh & Yuan, 2017)

Previous studies investigating the relationship between investor sentiment and stock return found reversal and bi-directional effects (Brown & Cliff, 2004; Cagli et al., 2020; Fisher & Statman, 2000; Spyrou, 2012; J. Wang, 2007). The excessive sentiment is spurred by investors' excessive optimism or pessimism based on current information. For instance, the good news about the high return of a stock can be responded to by noise investors with shock demand for the stock to be more traded. Therefore, we arrange a hypothesis for investor sentiment and return as follow:

H1: There is a bi-directional effect between investor sentiment and stock returns

### ***Foreign equity flow and stock return***

Since financial and monetary crises crippled several South-East-Asia economies in 1998, the effect of foreign capital inflow to financial development has been the most prominent and debated issue among policymakers and scholars. Together with Turkey, Brazil, India, and South Africa, Indonesia was considered one of the "Five Fragile" markets, the most vulnerable to unanticipated capital flight by a research analyst at Morgan Stanley in 2015. (Chadwick, 2019). On the other hand, due to a series of quantitative easing (QE) policies by the Federal Reserve to heal economic soundness post-global financial crises 2008, there have been global risk aversion changes. It prompts potentially foreign capital inflow to and subsequently positively affects stock markets in developing countries (Lim & Mohapatra, 2016; Miyakoshi et al., 2017). Furthermore, foreign investors' presence leads to financial market stability (Han et al., 2015) and liquidity (Naufa et al., 2019) as they trade more frequently with a significant number of volumes than domestic investors. Hence, it is true that Richards (2005)

analogize foreign equity in an emerging market as "big fish in small ponds". The entry and exit of foreign investors have a significant impact on the host equity market.

Many previous researchers study the relation between foreign inflow and stock market performance in the matter of return (Agarwal et al., 2009; Albuquerque et al., 2007; Arroisi & Koesrindartoto, 2019; French & Li, 2017; Griffin et al., 2004; Kim et al., 2009; Pavabutr & Yan, 2007; Ülkü, 2015; Vo, 2017; Yan & Wang, 2018). Overall, those examine bi-directional relations at the contemporaneous and lagged periods. The term bi-directional relation states that foreign equity flow affects stock market return and vice versa. First, the effect of foreign equity flow on stock returns can be explained by the feedback hypothesis. The economic explanation is based on the assumption that foreign investors are not well-informed on the local private information. In contrast, host investors have more informed than foreign ones. (Albuquerque et al., 2009; Dvořák, 2005). When local private information exists, foreign traders react more strongly to the signal than local traders. Further, they prefer buying rather than selling local stocks so that it leads to positive feedback trading. Therefore, the foreign equity inflow will likely make shares overpriced.

Second, to arrange efficient global portfolios, foreign investors might apply momentum strategy (return chasing) and rebalance currency risk (Guo, 2016; Onishchenko & Ülkü, 2019; Porras & Ülkü, 2015; Xie et al., 2020). Local stock or portfolio returns could promote capital inflow as foreign investors chase high returns by purchasing well-performing stocks. However, when foreigners hold a domestic portfolio that outperforms their home portfolio, they could pull their capital out to reduce foreign exchange exposure (Anggitawati & Ekaputra, 2020; Hau & Rey, 2006). Then, overperforming domestic equity might be negatively responded to by the foreign investor. Concerning previous studies mentioned above, we hypothesize the relation between foreign equity flow and stock return as follow:

H2: There is a bi-directional effect between foreign equity inflow and return

### *Investor sentiment and foreign equity flow*

Recently, there is a lack of research examining the association between investor sentiment and foreign equity flow. As far as we could trace, French & Li (2017) investigate the directly potential bi-directional effect. Still, their work too emphasizes empirical evidence but did not enclose theoretical explanation enough. Using implied volatility index as a negative global-sentiment indicator, Liew et al. (2018) argue that global sentiment prompts capital flight from a developed economy to an emerging market. Li et al. (2019) explores conceptual framework and empirical evidence from the effect of country-level sentiment on foreign direct investment (FDI) and found that negative sentiment affects more greatly the FDI than positive sentiment. Dai & Yang (2018) test the effect of investor sentiment on domestic feedback traders' behavior and conclude that the abnormal sentiment induces investors to buy at a high price and sell at a low price. High share turnover that is one of the positive sentiment measures (Baker & Stein, 2004) drives foreign investors to chase returns in the host equity market (Tsai et al., 2019). Therefore, high investor sentiment leads to high foreign capital inflow.

Next, whether foreign investors might create noise price is necessary to be studied further. We begin to classify types of investors: insiders who are informed and trade rationally, noise traders who are more exposed to sentiment shocks and rely on those, and then outsiders who are uninformed, only watch on price movement and trade rationally (Mendel & Shleifer, 2012). The outsiders always face severe conditions in which they follow informed insiders and are counter with noise traders. On the one hand, foreign investors commonly trade with high volume and could be a sophisticated but uninformed outsider so as they tend to apply herding strategy (Dvořák, 2005; Vo, 2017). On the other hand, the foreign investor may have local private information valuable for trading in many countries (Albuquerque et al., 2009; Liew et al., 2018). Therefore, the foreign investor may positively or negatively affect local sentiment. Finally, we create the third hy-

pothesis as follow:

H3: There is a bi-directional effect between foreign equity inflow and investor sentiment

### *Benefiting potential diversification of Indonesia Islamic stocks*

Recent studies have proven the decoupling hypothesis between Islamic and conventional stocks. Some concluded that Islamic stocks are profitable (Narayan & Phan, 2019) and less exposed to either fundamental (Ahmed, 2019; Kenourgios et al., 2016) or sentiment (Dash & Maitra, 2018; Ftiti & Hadhri, 2019) risk than conventional counterparts. Others also find that the Islamic portfolio is more stable against foreign exchange risk (Erdogan et al., 2020) and partially segmented to global shock (Zaremba et al., 2018). Those shreds of evidence are caused by sharia-compliance values referring to Islamic law sourced from The Quran, As-Sunnah, and Islamic scholar agreement and embedded in Islamic equity. Some indices providers or authorities (S&P, Morgan Stanley, and Financial Times) provide various criteria, and sharia share constituents. In Indonesia's context, a composite index of sharia share is issued by the Indonesia Stock Exchange (IDX).

Indonesia is a potential market for sharia equity investment due to the highly prospective market. At the end of 2019, the Indonesian stock market has reached a 51.55% of total market capitalization (approximately USD 258.60 billion). Sharia-compliance firms do not allow running businesses classified to pork, alcohol, tobacco, pornography industries, consisting of gambling, speculation and interest-based contracts, and all other transactions prohibited. Besides, those who have to meet financial screening in which the ratio of interest-based debt to total assets do not exceed 45% and interest-based revenue and other forbidden income is not more than 10%. Based on business and financial screening, Islamic share concern on the ethical and moral economy and tends to be less leveraged and then less financially distressed.

Some studies examine risk-return differences between sharia and its counterpart equities on the Indonesian stock market. Majdoub et al.

Table 1. Variables Description

Variable	Definition	Source
$RET_{it}$	Rate of return on a share listed in ISSI	Thomson & Reuters
$NETFOR_{it}$	Ratio of net foreign flow to total trading volume. Net foreign volume is the difference between the net foreign buy and net foreign sell.	Thomson & Reuters
$MTB_{it}$	Market-to-book value ratio. Market value is market capitalization, whereas book value is shareholder equity.	Thomson & Reuters
$TURN_{it}$	Share turnover is a ratio of trading volume to market capitalization	Thomson & Reuters
$PER_{it}$	Price-to-earnings ratio	Thomson & Reuters
$RRF_t$	Rate of risk-free securities proxied by policy rate of Bank Indonesia	Bank Indonesia
$RM_t$	Rate of return on Indonesia Composite Index	Thomson & Reuters
$EXCR_t$	IDR/US \$ exchange rate in per cent	Thomson & Reuters
$LNVI_{it}$	Natural log of CBOE volatility index as a proxy of the global sentiment index	Thomson & Reuters
$EXRET_{it}$	$RET_{it} - RRF_t$	
$EXRM_t$	$RM_t - RRF_t$	

Source: Author's estimate (2020)

(2016) found that the Indonesian stock market (either Islamic or conventional) has a weak correlation with the developed market. It is suggested that investors should put their money on the emerging market for international diversification. Lusyana & Sherif (2017) concluded that including sharia principles positively affect the stock market, and a portfolio constituted of sharia-compliant equities outperforms its conventional counterpart. Last but not least, Qoyum et al. (2020) suggested that integrating sharia and socially responsible values on investing has better performance than its conventional counterpart.

Compared to conventional stocks, the unique risk and return features of Islamic stocks can lead to differences in sensitivity to investor sentiment. Based on previous studies (Khan et al., 2019; Hammoudeh et al., 2014; Merdad et al., 2015), we sum up the two opposite reasons. The Islamic portfolio is produced from a convincing and periodic screening process, thus less mispriced at either bullish or bearish market. In the opposite view, the process actually hinders short selling (Miller, 1977) and arbitrage (Shleifer & Vishny, 1997) so that it makes sharia stocks vulnerable to noise pricing. Hence, it is critical to conduct further study related to sentiment-driven mispricing on Islamic portfolio.

## Research Methods

In investigating simultaneous effect among stock return, net foreign flow, and investor sen-

timent in Indonesia Sharia Stock Index (ISSI), we collect data from ISSI constituents by purposive sampling. This study selects firms with the following criteria: 1) consistently listed in ISSI from January 2012 to December 2018; 2) non-negative shareholder equity; 3) actively traded by foreign investors. Based on our sample criteria, we have 109 firms, 84 months, and 9.156 observations. Table 1 reports the definition of variables and sources of data.

### Constructing investor sentiment index

Previous studies documented many measures to capture the sentiment of investors. Our work refers to Baker & Stein (2004), Baker & Wurgler (2007) and, French & Li (2017) and utilizes market-to-book value ratio, share turnover, and price-to-earning as investor sentiment proxies. We expect that all sentiment factors have the same direction. To generate the investor sentiment index, we use principal component analysis (PCA) so that all information included in those factors is embraced to a new variable. The following steps describe how to construct investor sentiment index:

Estimating loading factors ( $\theta$ ) that represent represents the contribution of a single sentiment indicator to the composite form. Generally, PCA can be expressed as follow:

$$\begin{aligned}
 p_1 &= \theta_{11}z_{11} + \theta_{12}z_{12} + \theta_{13}z_{13} \\
 p_2 &= \theta_{21}z_{21} + \theta_{22}z_{22} + \theta_{23}z_{23} \\
 p_3 &= \theta_{31}z_{31} + \theta_{32}z_{32} + \theta_{33}z_{33}
 \end{aligned} \tag{1}$$

Table 2. Correlation matrix for the validation of component analysis

	$SENT_{it}$	$TURN_{it}$	$PER_{it}$	$MTB_{it}$
$SENT_{it}$	1			
$TURN_{it}$	0.9264***	1		
$PER_{it}$	0.0623***	0.0225**	1	
$MTB_{it}$	0.4955***	0.1331***	0.0374***	1

\*, \*\*, \*\*\* denote significant at 10%, 5%, and 1%

Source: Author's estimate (2020)

Choosing the components ( $p$ ) that has the highest eigenvalues and generating sentiment index by following equation.

$$SENT_{it} = 0.6713TURN_{it} + 0.6862MTB_{it} + 0.2802PER_{it} \quad (2)$$

According to Table 2, it is confirmed that all sentiment factors are positively correlated with each other. Similarly, those are positively associated with the composite sentiment index. Therefore, we have a valid investor sentiment index.

### Estimation method

Our research aims to examine the bi-directional relationship between excess stock return (EXRET), net foreign flow (NETFOR), and investor sentiment (SENT). Previous researches revealed that those factors could be simultaneously associated with either contemporaneous or lagged periods. We also add exogenous factors, excess market return (EXRM), foreign currency exchange rate (EXCR), and global sentiment index (LNVIX), on every function. Some studies found that those exogenous factors are associated with the excess return (Ahmed, 2019; Erdogan et al., 2020; Guo, 2016; Xie et al., 2020), net foreign inflow (Anggitawati & Ekaputra, 2020; Gonçalves & Eid, 2017; Guo, 2016), and investor sentiment (Liew et al., 2018; Tsai et al., 2019). Therefore, the estimation model can be expressed by the following functions:

$$EXRET_{it} = \alpha_1 + \beta_{11}EXRET_{it-1} + \sum_{S=1}^2 \delta_{1s}NETFOR_{it+1-s} + \sum_{S=1}^2 \varphi_{1s}SENT_{it+1-s} + \sum_{S=1}^2 \theta_{1s}EXRM_{it+1-s}$$

$$+ \sum_{S=1}^2 \varrho_{1s}EXCR_{it+1-s} + \sum_{S=1}^2 \omega_{1s}LNVIX_{it+1-s} + \mu_i + \varepsilon_{1,it} \quad (3)$$

$$NETFOR_{it} = \alpha_1 + \beta_{12}NETFOR_{it-1} + \sum_{S=1}^2 \delta_{2s}EXRET_{it+1-s} + \sum_{S=1}^2 \varphi_{2s}SENT_{it+1-s} + \sum_{S=1}^2 \theta_{2s}EXRM_{it+1-s} + \sum_{S=1}^2 \varrho_{2s}EXCR_{it+1-s} + \sum_{S=1}^2 \omega_{2s}LNVIX_{it+1-s} + \mu_i + \varepsilon_{2,it} \quad (4)$$

$$SENT_{it} = \alpha_3 + \beta_{13}SENT_{it-1} + \sum_{S=1}^2 \delta_{3s}EXRET_{it+1-s} + \sum_{S=1}^2 \varphi_{3s}NETFOR_{it+1-s} + \sum_{S=1}^2 \theta_{3s}EXRM_{it+1-s} + \sum_{S=1}^2 \varrho_{3s}EXCR_{it+1-s} + \sum_{S=1}^2 \omega_{3s}LNVIX_{it+1-s} + \mu_i + \varepsilon_{3,it} \quad (5)$$

In equation (3) – (5), EXRET, NETFOR, and SENT are dependent on each other or even associated with their lagged values and fixed effects ( $\mu_i$ ) representing unobserved firm factors are correlated to lagged explained variables. Therefore, the function leads to potential endogeneity problem, and estimation with the ordinary least square can produce bias parameters.

Considering the mentioned estimation methods issues above, we utilize dynamic panel GMM to estimate parameters in the model. There are two types of GMM in dynamic panel analysis, namely, the difference GMM (Arellano & Bond, 1991; Holtz-Eakin et al., 1988) and system GMM (Arellano & Bover, 1995; Blundell & Bond, 1998). In order to estimate more efficient and unbiased parameters, we apply system GMM (SYS-GMM, henceforth) in our primary analysis. Principally, SYS-GMM



Table 3. Summary of descriptive statistics and correlation matrix

Variable	Mean	SD.	Min.	Max.	S-W	
Panel A : Summary of descriptive statistics						
$EXRET_{it}$	-0.0016	0.1226	-0.9619	1.4213	15.940***	
$NETFOR_{it}$	0.0042	0.1340	-0.3246	0.3492	18.350***	
$SENT_{it}$	2.2111	1.1185	0.0984	5.4321	12.859***	
$MTB_{it}$	2.6380	6.1934	0.0673	90.6670	16.769***	
$TURN_{it}$	25.9200	58.0900	0.0001	1520	13.541***	
$PER_{it}$	0.0290	0.2957	-0.9664	10.2620	22.035***	
$EXRM_t$	0.0007	0.0380	-0.1266	0.0615	15.638***	
$EXCR_t$	0.0055	0.0219	-0.0680	0.0606	15.401***	
$LVIX_t$	2.7087	0.2290	2.2523	3.3474	12.175***	
Panel B : Correlation matrix						
	$EXRET_{it}$	$NETFOR_{it}$	$SENT_{it}$	$EXRM_t$	$EXCR_t$	$LVIX_t$
$EXRET_{it}$	1					
$NETFOR_{it}$	0.0949***	1				
$SENT_{it}$	0.1305***	0.0335**	1			
$EXRM_t$	0.2946***	0.0124	0.0302***	1		
$EXCR_t$	-0.1861***	-0.0286***	0.0133	-0.5084***	1	
$LVIX_t$	-0.0658***	0.0241**	0.0379***	-0.2567***	0.1253***	1

This table reports descriptive statistics and correlation matrix. Panel A consists of mean, standard deviation (SD), minimum (Min.), maximum (Max.), and normality test with Shapiro-Wilks (S-W). Panel B contains a correlation matrix. \*, \*\*, \*\*\* denote significant at 10%, 5%, and 1% Source: Author's estimate (2020)

is proposed to overcome the problem of over-identification and moment restrictions. To satisfy moment restriction (zero conditional means of idiosyncratic error), it must be created over-identification which instruments outnumber regressors (Greene, 2018). The instrument's validity is revealed by testing that the instrument is correlated with endogenous variables but not with the error term (Wooldridge, 2010). As it is so hard to find appropriate instruments that adopting SYS-GMM can comply with the condition. Technically, SYS-GMM combines level and first-difference equations in a system.

In more detail, each equation is estimated by two-stage regression in which the lagged level variables are used as an instrument in the first-differenced regression, while the lagged first-differenced variables are used as the instrument in the level equation. Also, we apply two-step GMM and robust standard error to tackle finite-sample correction and heteroskedasticity (Windmeijer, 2005). Some past studies used vector autoregressive (VAR) and Granger-causality test to investigate bi-directional effect (Arroisi & Koesrindartoto, 2019; Coşkun et al., 2017; French & Li, 2017; Porras & Ülkü, 2015), but those cannot test contemporaneous causal. Meanwhile, we aim to test zero-to-one lag causality. In its implementation, SYS-GMM can

test the intertemporal effect and account for endogeneity problems caused by the presence of reverse causal (Leszczensky & Wolbring, 2019; Roodman, 2009). Therefore, we choose SYS-GMM as our baseline analysis. To confirm the result of SYS-GMM, we conduct the Granger-causality test as a robustness check. The test copes with the limitation of SYS-GMM because it can examine the bi-directional relationship simultaneously.

There are two specification tests: the Hansen and Arellano-Bond (AR) test (Roodman, 2009). The Hansen test's null hypothesis is that all instruments are uncorrelated to the error term or meet instrument validity. Meanwhile, the AR test is to examine the presence of either first-order or second-order autocorrelation. If the AR test's null hypothesis is rejected, it is implied to the inconsistency of SYS-GMM. Many previous pieces of research emphasized second-order autocorrelation instead of first-order one. Besides, it is crucial to ensure that the model does not contain a spurious relationship, then all variables have to be stationary at level. Therefore, we conduct a Fisher-type unit root test for the panel (Choi, 2001; Maddala & Wu, 1999). Then, as the exogenous factors are time-series data, those are tested by Augmented Dickey-Fuller.

Table 4. Result for Stationary Test

	Inv. chi2	Inv. Norm.	Inv. logit	ADF Stat.
Panel A: Fisher-type panel unit root test				
$EXRET_{it}$	2582.63***	-44.57***	-68.23***	
$NETFOR_{it}$	2126.75***	-40.16***	-58.39***	
$MTB_{it}$	878.17***	-19.90***	-22.29***	
$TURN_{it}$	1821.04***	-33.58***	-48.01***	
$PER_{it}$	880.47***	-20.29***	-22.33***	
$SENT_{it}$	995.82***	-22.95***	-26.03***	
Panel B: Time-series unit root test				
$EXRM_t$				-4.64***
$EXCR_t$				-3.55***
$LNVIIX_t$				-2.39***

This table reports the unit root test to examine stationary conditions. We divide testing methods into panel and time-series unit root. We show three parameters for panel unit root, namely, Inverse  $\chi^2$  (Inv.  $\chi^2$ ), Inverse Normal (Inv.Norm.), Inverse logit (Inv.logit) whereas in time series setting, it used Augmented-Dickey-Fuller statistics (ADF stat.).  $H_0$  for time-series (panel) unit root test is that there is no unit root (within panels). \*, \*\*, and \*\*\* denote significant at 10%, 5%, and 1% respectively

Source: Author’s estimate (2020)

## Results and Discussions

### Descriptive statistics

The descriptive statistics and correlation matrix of endogenous variables ( $EXRET_{it}$ ,  $NETFOR_{it}$ , and  $SENT_{it}$ ) and exogenous variables ( $EXRM_t$ ,  $EXCR_t$ , and  $LNVIIX_t$ ) are reported in Table 3. Panel A discusses the descriptive statistics for each variable. On average, Islamic stocks get a negative excess return and positive net foreign flow. Even though their return performance is lower than the risk-free rate, Islamic stocks record net inflow in which foreign investors prefer to take a long position rather than a short position to the Islamic portfolio. Meanwhile, Panel B reports a simple pairwise correlation to investigate the contemporaneous association, especially for endogenous factors. The positive correlation between  $EXRET_{it}$  and  $NETFOR_{it}$  indicates that the entry of foreign investors increases Islamic stock performance. Similarly,  $SENT_{it}$  is positively correlated to  $NETFOR_{it}$  and  $EXRET_{it}$  so positive investor sentiment pushes foreign inflow and Islamic stock return. These results need to be confirmed with controlling financial market conditions such as capital market, foreign exchange market, and global sentiment. Also, we want to explore the relationship between endogenous in the long run.

According to Table 4, the Fisher-type unit root test report that all parameters are signifi-

cant at 1%. Similarly, Augmented-Dickey-Fuller statistics (ADF stat.) for exogenous factors are significant at 1%. We conclude that all variables are stationary at level. Therefore, we do not worry about spurious relationships in the system GMM regressions and the Granger-causality test.

### System GMM estimation

In Table 5, we show a regression result and specification test. The presence of second-order autocorrelation can be seen at AR(2) values, which are insignificant. It can be concluded that there is no misspecification and invalidated estimators. The values of Hansen J statistics are insignificant, then the null hypothesis for over-identifying restriction is not rejected. Therefore, as our results satisfy the model specification, the coefficients and t-statistics can be interpreted.

We divide the interpretation of bi-directional relations into the contemporaneous and lagged period and summarize the main results in Graph 1. On contemporaneous relation, NETFOR and SENT affect positively at 5% and 1% significant level respectively to EXRET so that an increase in foreign equity inflow and investor sentiment is followed by an increase in stock return. In other words, stock performance is caused by the increasing gap between foreign buying and foreign selling. Also, excessive positive sentiment towards a stock pushes its return abnormally. Meanwhile, EXRET affects

Table 5. The result of system GMM estimation

	$EXRET_{it}$	$NETFOR_{it}$	$SENT_{it}$
Panel A: Regression results			
$EXRET_{it}$		0.103*** (4.551)	1.186*** (11.097)
$NETFOR_{it}$	0.068** (2.526)		-0.034 (-0.459)
$SENT_{it}$	0.078*** (10.451)	-0.004 (-1.375)	
$EXRET_{it-1}$	-0.000 (-0.011)	-0.014 (-0.885)	-0.214* (-1.866)
$NETFOR_{it-1}$	-0.009 (-0.360)	0.026 (1.148)	0.036 (0.312)
$SENT_{it-1}$	-0.064*** (-8.776)	0.008*** (2.922)	0.823*** (40.924)
$EXRM_t$	0.769*** (15.159)	-0.058 (-1.425)	0.481*** (2.664)
$EXRM_{t-1}$	0.153*** (3.049)	0.001 (0.013)	0.743*** (3.679)
$EXCR_t$	-0.102 (-1.493)	-0.146** (-2.058)	0.426 (1.413)
$EXCR_{t-1}$	-0.052 (-0.778)	0.166** (2.261)	0.391 (1.431)
$LNVIIX_t$	-0.021*** (-3.031)	0.015** (2.039)	0.114*** (4.268)
$LNVIIX_{t-1}$	0.042*** (4.882)	-0.001 (-0.126)	-0.064** (-2.055)
C	-0.088*** (-3.667)	-0.044* (-1.788)	0.235*** (3.368)
Panel B: Specification tests			
Obs.	9047	9047	9047
AR(1) stat.	-7.454	-6.437	-7.366
AR(1) p-val.	0.000	0.000	0.000
AR(2) stat.	0.004	0.474	1.584
AR(2) p-stat	0.997	0.635	0.113
Hansen J stat.	102.61	97.75	104.99
Hansen p-val.	1.000	1.000	1.000

This table reports system generalized method of moments (SYS-GMM) regressions. Panel A shows coefficients and t-statistics in parentheses. Panel B shows specification tests such as Arellano-Bond (AR), and Hansen J statistics. \*, \*\* and \*\*\* denote significant at 10%, 5%, and 1% respectively.

Source: Author's estimate (2020)

positively at 1% significant level to NETFOR and SENT. Then, we can say that foreign investors' decision to buy rather than sell and highly positive sentiment is determined by current excellent stock performance.

Hereafter, on lag period, SENT affects NETFOR positively but negatively to EXRET at 1% significant level. These results are fascinating. First, it is found causal effect between SENT and NETFOR in the one-step-ahead period but not in the contemporaneous period. For a foreigner, the decision to invest in local shares is determined by high positive sentiment in the previous month. Second, the impact of SENT to EXRET has the opposite direction with the

prior result at the same period. It is due to stock price adjustment by arbitrageurs. They buy (sell) under (over)valued shares in the current period and sell (buy) them in the coming period. Therefore, we confirm the bi-directional relation between EXRET-NETFOR and EXRET-SENT.

### Discussion

Overall, our empirical evidence supports the first hypothesis (H1) and the second hypothesis (H2) but reject the third hypothesis (H3). The first hypothesis, which examines bi-directional relation between sentiment investor and stock

Figure 1. Causality direction



Sources: Author’s estimate (2020)

Table 6. Granger causality test

Equation	Excluded	$\chi^2$	df	Prob. $\chi^2$
EXRET	NETFOR	6.763	1	0.009
	SENT	12.073	1	0.001
	ALL	20.395	2	0.000
NETFOR	EXRET	3.975	1	0.046
	SENT	3.646	1	0.056
	ALL	5.836	2	0.054
SENT	EXRET	3.869	1	0.040
	NETFOR	0.621	1	0.431
	ALL	4.930	2	0.085

This table reports the Granger-causality test. If  $\chi^2$  (chi-square) is significant then null hypothesis, the excluded variable does not Granger-cause equation variable, is rejected.

Source: Author’s estimate (2020)

return, is accepted in the contemporaneous period. Furthermore, investor sentiment affects positively stock return (Ryu et al., 2017; Yang & Zhou, 2015; Zhang et al., 2019) and high stock return prompt positive investor sentiment (Brown & Cliff, 2004; Cagli et al., 2020; Fisher & Statman, 2000; Spyrou, 2012; Y. H. Wang et al., 2006). Also, on the lagged period, we find the uni-directional relation that investor sentiment negatively affects stock return. In the short run, uninformed investors, benefiting noise news to obtain a positive return, drive the stock price to go beyond its fundamental value. However, in the long run, an arbitrageur would eliminate the overvalued stock to decrease incrementally (Miwa, 2016; Stambaugh & Yuan, 2017).

Besides supporting the second hypothesis, our findings also confirm foreign positive-feedback trading and momentum strategy (Guo, 2016; Onishchenko & Ülkü, 2019; Porras & Ülkü, 2015). Since foreign investors have less private information than local ones, they tend to overreact to new signals or information. Further, they prefer buying rather than selling local stocks, and the price of local shares increase subsequently (Agarwal et al., 2009). To maximize international diversification, foreign

investors tend to apply momentum strategy to buy local shares that are excellent performance.

Despite no bi-directional relation in the third hypothesis, our results report the uni-directional effect in which lagged investor sentiment positively affects foreign equity inflow. When local investors’ trading behavior shows an abnormality, which they buy at a high price and sell at a low price (Dai & Yang, 2018), foreign investors are encouraged to chase return in the host equity market (Tsai et al., 2019). Therefore, high investor sentiment leads to high foreign capital inflow.

**Robustness check**

The result of the system GMM needs to be confirmed by the granger-causality test. We utilize the Granger-causality test derived from panel vector autoregressive (PVAR) proposed by Abrigo & Love (2016). Based on chi-square ( $\chi^2$ ), we test whether the excluded variable does not Granger-cause equation variable or not. A significant 5% level, EXRET does Granger cause NETFOR and vice versa. Besides, SENT also does Granger cause EXRET and vice versa. Meanwhile, SENT does not Granger cause NETFOR and vice versa. In sum, causality ef-

fects exist between EXRET and NETFOR and then between EXRET and SENT. This finding is consistent with the system GMM regression.

## Conclusions

The history of the global financial crisis in 2008 provides us learning that economic bubbles caused by irrational asset pricing create financial market growth exponentially. Still, those can be crises symptom when the bubble burst and then trigger market crashes around the world. On the one hand, as a part of economic recovery programs in many developed countries, quantitative easing policy pushes capital inflow to and brings about financial stability in emerging economies, especially Indonesia. On the other hand, it can have the opposite effect, as analysts from Morgan Stanley said in 2015. However, it is essential to study how investor sentiment and foreign equity inflow affect equity pricing and financial market development subsequently.

Our research investigates how stock price, foreign equity inflow, and local investor sentiment are dependent on each other. First, we find a positive bi-directional effect between stock return and investor sentiment on the contem-

poraneous period and the uni-directional effect in which investor sentiment negatively impacts stock return. Those findings confirm noise traders' presence due to excessive sentiment and the role of arbitrageurs to exploit them. Second, our works report the bi-directional effect between stock return and foreign investor inflow. Those confirm that foreign investors prone to be positive-feedback traders and apply a momentum strategy to chase return. Last but not least, local investors' abnormal trading activity drives foreigners to buy a local share to make a profit.

In the Islamic financial market, foreign trading behavior and local investor sentiment can explain price movement on Islamic stock. Although the performances of Islamic shares pull foreign equity into the domestic stock market, their price, in the short run, is affected by noise trading and then deviates from its fundamental value. However, in the long run, the arbitrageur will exploit the noise price to profit by selling the overvalued stocks and buying the undervalued stocks. Regarding our work, foreign equity inflow and local investor sentiment need to be considered in Islamic stock pricing. For Islamic mutual fund managers, knowing foreign investor behavior and local investor sentiment is essential to decide when to buy or sell stocks.

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