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The Effect of Foreign Portfolio Investment on the Volatility of the Sharia Infrastructure Sector Index

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Abstract

The large gap in the ability to finance domestic infrastructure projects makes the need for foreign investment important. The contribution of foreign portfolio investment to strengthen the domestic capital market and its infrastructure will increase the allocation of domestic capital. This study aims to examine the impact of foreign portfolio investment inflows, especially on Islamic infrastructure stocks. A sampling of 17 issuers was carried out using the purposive sampling technique during the research period from 03 January 2017 to 28 April 2022. The method used was the GARCH model. Trading in foreign portfolio investment has a statistically significant effect on the volatility of the sharia infrastructure sector index. The results of this study can be a source of information for the government to consider sound monetary policy and stronger supervision in the financial system as well as macroeconomic variables, particularly exchange rates that affect foreign investment flows in Indonesia. Policies aimed at attracting more capital at the same time consider possible negative effects, such as sudden outflows of capital or short-term reversal of capital flows.

Keywords: Volatility; foreign portfolio investment; Sharia infrastructure sector; Indonesia Sharia Stock Index

1. Introduction

Risk diversification is important for investors due to minimizing risk without having to reduce the return received. International investment increases the flow of capital from foreign investors to developing countries due to diversification motivation. The increase in cross-border asset trading in the last two decades has shaped the evolution of capital markets (Balli, 2019).

The increasing trend of international financial integration around the world facilitates a significant increase in foreign portfolio investment in emerging markets (Vo, 2020). The increase in foreign portfolio investment in developing countries is due to significant stock market growth, economic liberalization, high investment returns, trade openness, and developments in communication and technology globally (Shabbir, 2019). Foreign investors commonly trade in large volumes because of their large holdings relative to the small size of emerging markets. Foreign investors tend to follow each other to buy or sell shares (herding) which has a strong impact on stock prices.

Information asymmetry in emerging stock markets is high due to the lack of a strong financial system, monitoring by weak policymakers, and severe ownership concentration which will ultimately affect the quality of the market and trading environment (Chung, 2017). Indonesia is a country with developing market economies that are excessively dependent on foreign investment hence when a global crisis occurs or poor information on the stock market will cause concern for foreign investors and consequently the withdrawal of investment flows in the capital market. The graph below shows portfolio growth in Indonesia from 2016 to 2021, which is dominated by domestic investors.

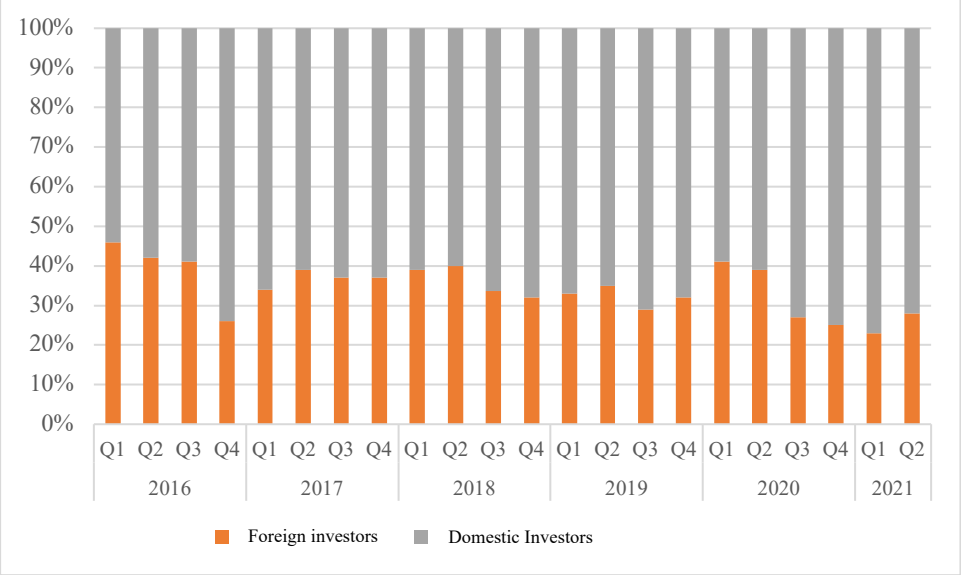

Figure 1. Portfolio Investment in Indonesia (% of total market, selling + buying)
Sumber: IDX, 2022

Research by Porras (2015) finds positive feedback from individual trading by foreign investors in the Spanish equity market. Whereas negative feedback trading is found on a broad market level, especially by US investors with currency exposure. Onishchenko (2019) shows changes from 2004 to 2015 due to a lack of information on foreign investors in the Korean equity market. Research by Shabbir (2019) shows the short-term and long-term dynamic relationship between foreign portfolio investment (FPI) and Pakistani stock prices.

Research by Kim (2019) investigates the impact and behavior of foreign investment on the prices of the nine companies with the largest capitalization in KOSPI (Korea Composite Stock Price Index) using GARCH (generalized autoregressive conditional heteroscedasticity) to measure return volatility and then vector autoregression (VARS) is used to investigate the dynamic relationship between stock price volatility and the daily behavior of foreign investors. Meanwhile, research by Khanthavit (2020) investigated the behavior of foreign investors on the Thailand Stock Exchange (SET) during the 2019 coronavirus disease (COVID-19) using the event study method and showed significant negative results from abnormal foreign investors' abnormal trading volumes with stock returns.

The relationship between foreign investment is limited to its impact on the stock market. Based on this gap, this study wants to see whether the interaction between foreign investor trade and the infrastructure sector index can reflect information loss. The infrastructure sector is a sector that is influenced by government policies related to gas pricing, toll roads, exchange rate fluctuations, and foreign investment (Andirerei, 2016). Infrastructure projects in several countries are one of the sectors that are in great demand by foreign investors. This is supported by strong foreign investment interest in the airport and port sector in Indonesia given the long-term benefits (HSF, 2021).

2. Literature Review

2.1 *Investment Behavior*

Foreign investors are often blamed for creating chaos and possible panic in the market (Khanthavit, 2020b). This is due to foreign investors tend to be in groups and have large capital in international transactions. In addition, Hasan (2019) explains that some domestic investors tend to replicate securities previously chosen by foreign investors, because they think that foreign investors have skills that enable them to make better investment decisions, thus causing domestic investors to follow the behavior of foreign investors in trading. Therefore, crowd investment behavior, where investors observe the behavior of others to make decisions, can increase instability in the stock market (Bui, 2020). The presence of foreign investors always seems to cause controversy because on some sides foreign investors are expected to bring in capital, while on the other hand, foreign investors are often associated with negative impacts on the domestic market, especially the destabilizing effect of foreign investors (Hanafi, 2020).

2.2 *International Portfolio Diversification*

Global diversification offers investors higher returns and opportunities to hedge against possible risks associated with individual countries and markets (Mushtaq & Shah, 2014). Mushtaq and Shah further explained that instead of investing in one security, investors can reduce unsystematic risk by diversifying assets. The purpose of portfolio diversification is to reduce unsystematic risk (diversifiable risk) hence that portfolio selection means allocating optimal financial securities in different asset classes to maximize portfolio returns and reduce risk levels (Aliu & Knapkova, 2017). Investors are aware of the fact that international stocks have different characteristics, therefore, by diversifying between different countries or industries in the country, portfolio performance will improve (Zonouzi et al., 2014).

2.3 *Hypothesis*

As a result of market liberalization policies, foreign investors spread their investments throughout the world (Hasan, 2019). Foreign investors seek opportunities to profit and reduce risk among investments through cross-border diversification. This policy makes correlations between countries stronger, and the development of integration benefits capital flows in producing more optimal investments (Xu, 2020).

Based on the background, problem formulation, literature review, and previous research, the hypothesis in this study are as follows:

H1 = The behavior of foreign portfolio investors has a significant effect on the return volatility of the Indonesian sharia infrastructure sector index

3. Methods

3.1 Data and Variables

This study uses secondary data with 1285 days of observation from January 3, 2017 to April 28, 2022. Daily data was chosen since it is more accurate to measure volatility than weekly or monthly data. In addition, daily data is also better able to explain the volatility of the stock market. The independent variables, the dependent variable, and the control variables in this study are the behavior of foreign portfolio investors, the sharia stock infrastructure sector index, and the Indonesian sharia stock index.

The data is collected by adjusting the date due to missing observations due to differences in data from each website. This is due to non-trading transactions on a specific date. Data on foreign investment trade volume, sharia infrastructure index, and Indonesia sharia stock index are matched with each other every day. The data collection method in this study is by accessing the relevant data source, namely the Indonesia Stock Exchange website to obtain daily data on foreign investment trading volumes. Data on ISSI closing prices are obtained from id.investing.com.

Data from the sharia infrastructure sector index were obtained through yahoo finance; for closing prices and financial statements of each company; for the number of shares outstanding. The criteria for the sample issuers in the infrastructure index are selected based on the classification of the infrastructure sector determined by the IDX based on the IDX-IC classification. Furthermore, it is re-selected with the criteria of issuers that have never left the ISSI index during the observation date of January 3, 2017 to April 28, 2022.

The sharia stock infrastructure index is calculated based on the index calculation methodology in the IDX Fact Book Handbook using the weighted average methodology based on the number of listed shares or the Market Value Weighted Average Index. The base value in this calculation is based on days starting on January 3, 2017. The base value will be adjusted if there is a corporate action such as additional shares, stock splits, devidend, and delisting.

Table 1. Issuers of Sharia Stock Infrastructure Sector

No.	Kode	Issuers
1	ADHI	Adhi Karya (Persero) Tbk.
2	BUKK	Bukaka Teknik Utama Tbk.
3	CMNP	Citra Marga Nusaphala Persada
4	EXCL	XL Axiata Tbk.
5	IDPR	Indonesia Pondasi Raya Tbk.
6	ISAT	Indosat Tbk.
7	JKON	Jaya Konstruksi Manggala Prata
8	KARW	ICTSI Jasa Prima Tbk.
9	META	Nusantara Infrastructure Tbk.
10	NRCA	Nusa Raya Cipta Tbk.
11	PBSA	Paramita Bangun Sarana Tbk.
12	POWR	Cikarang Listrindo Tbk.
13	PTPP	PP (Persero) Tbk.
14	SSIA	Surya Semesta Internusa Tbk.
15	TLKM	Telkom Indonesia (Persero) Tbk
16	TOTL	Total Bangun Persada Tbk.
17	WIKA	Wijaya Karya (Persero) Tbk.

3.2 Data analysis technique

This research uses time series regression analysis technique. The data obtained is then processed using EViews software. In this study, using the GARCH method to see the impact and behavior of foreign investment variance modeling for time series regression which will be explained in the following sub-chapter.

3.3 Calculation of Foreign Portfolio Investment

$$the\ Foreign\ nett\ transaction = \sum buy\ foreign - \sum sell\ foreign$$

$Foreign\ nett\ transaction$ = Accumulated value based on buy and sell calculations by foreign investors
$the\ \sum buy\ foreign$ = total buy by foreign investors
$\sum sell\ foreign$ = total buy by foreign investors

3. 4 Volatility Modeling

This study uses the GARCH (Generalized Autoregressive Conditional Heteroscedasticity) model. GARCH is a general form or generalization of the ARCH model proposed by Tim Bollerslev in 1986. A new idea emerged that included the term conditional variance left behind as an autoregressive term. However, the ARCH model is not significant if the lag formed to overcome the symptoms of heteroscedasticity is too high. To overcome the high lag in the ARCH model, the GARCH model was developed. In the GARCH model, the residual variance (h_t) is not only influenced by the residuals of the previous period but also the residual variance of the previous period.

The mean foreign net (NETT) model used is as follows:
$NETTx_t = \alpha + \beta_1 NETT_{t-1} + e_t$

The variance model used for foreign nett:
$hNETT_t = \gamma_0 + \sum_{i=1}^{p} \delta_i\, h_{t-i} + \sum_{j=1}^{q} \gamma_j\, u_{t-j}^2$

Meanwhile, the form of the mean Islamic stock infrastructure index (INFR) model used is as follows:
$INFRx_t = \alpha + \beta_1 INFRx_{t-1} + \beta_2 ISSIx_t + \beta_3 ISSIx_{t-1} + u_t$

Sharia Infrastructure Sector Index Variance:
$h_t = \gamma_0 + \sum_{i=1}^{p} \delta_i\, h_{t-i} + \sum_{j=1}^{q} \gamma_j\, u_{t-j}^2 + \vartheta \log\ hnett_{(t-1)}$

Where:
h_t : residual variance
u_{t-1}^2 : previous period residual
h_{t-1} : previous residual variance
γ, δ : parameter coefficient
u, e : error terms
j, i, p, q : sample period

4. Results

Table 2 below shows the sample descriptive statistics of the variables used, including the mean, median, and standard deviation (Std. Dev). The standard deviation of foreign net data is very large, which means that the distribution of data groups to the mean is quite large. Portfolio investment is vulnerable to sudden and large inflows and outflows in response to both domestic and global sentiment.

Table 2. Descriptive Statistics.

	NETT	INFR	ISSI
Mean	1,713,409,536,626.2	90.464	178.08
Median	1,303,678,178,627	91.044	182.32
Maximum	53,944,256,076,496	116.10	208.18
Minimum	-9,332,238,697,042	58.291	115.95
Std. Dev.	2,730,835,805,148.65	12.680	14.792

Based on the results of table 3, foreign portfolio investment trading in the previous period (β) has a significant effect on foreign portfolio investment trading at the present time. The volatility of the sharia infrastructure sector in the past (β_1) also has a significant influence on the current volatility of the sharia infrastructure sector. Islamic market conditions proxied by ISSI both in the past (β_2) and in the present ((β_3) affect the sharia infrastructure sector at present. ISSI is an Indonesian Islamic market condition whose movement is driven by a sector with large capitalization, such as the infrastructure sector. Genming Zhang and Fujin Ren (2006) in Cao dkk., (2013) found that fluctuations in the industrial sector in the Chinese securities market tend to be stable and have a close relationship with the characteristics of each industry.

Table 3. GARCH Regression Model.

Foreign Nett			Sharia Infrastructure Sector		
	Coefficient	**Prob.**		**Coefficient**	**Prob.**
			Mean equation		
α	7.096683	0.0000*	α	-0.336494	0.2146
β	0.413043	0.0000*	β_1	0.993491	0.0000*
			β_2	0.588023	0.0000*
			β_3	-0.582782	0.0000*
			Variance equation		
γ	0.004648	0.0032*	γ	0.150100	0.0011*
$arch$	0.054151	0.0000*	$arch$	0.107349	0.0001*
$garch$	0.894387	0.0000*	$garch$	0.727449	0.0000*
			ϑ	0.116453	0.0159**

Tingkat Signifikansi ***, **, *: 10%, 5%, 1%

Source: Eviews 10 data processing results

The ARCH and GARCH coefficients were statistically significant at the one percent level. ARCH represents information from the previous period, and GARCH measures the impact of variance from the previous period (Lim & Sek, 2014). This means that shocks and volatility in the previous period affected foreign trade and the sharia infrastructure sector index. These results also show that the current volatility of foreign trade and stock indices often depends on unexpected shocks in the previous period that affect the dynamics of foreign trade and the stock index of the Islamic infrastructure sector. In addition, the magnitude of the GARCH coefficient indicates that the volatility of foreign trade and the sharia infrastructure sector index tends to fluctuate gradually from time to time.

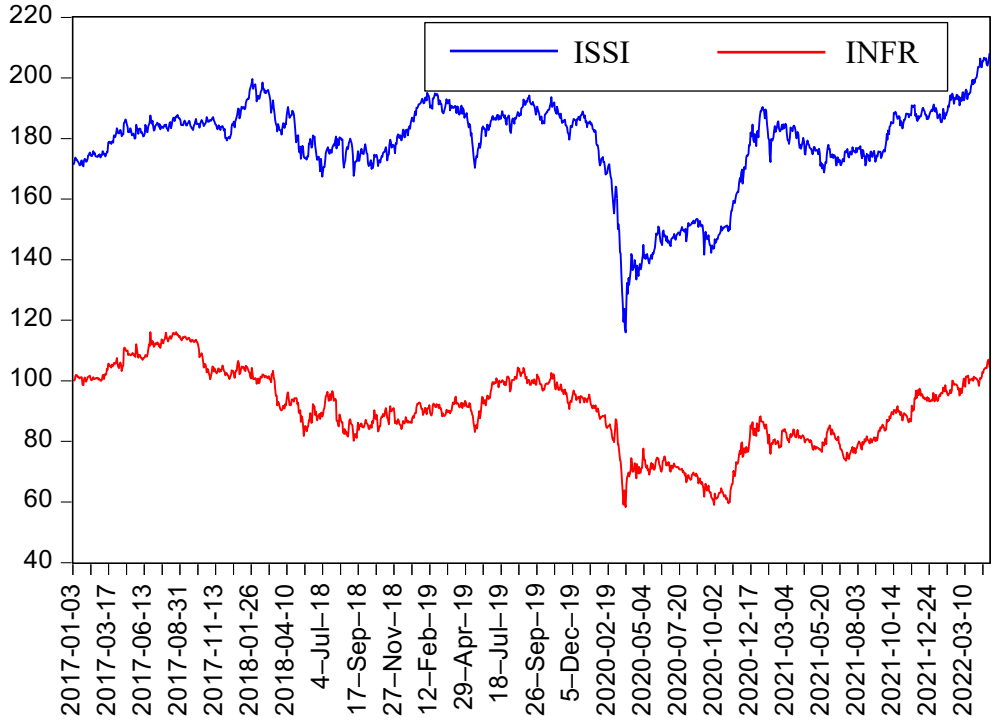

Figure 2. Indonesia Sharia Stock Index and Sharia Infrastructure Sector Index

The Islamic infrastructure index and ISSI move together, which means ISSI is an indicator of the Islamic market and the Islamic infrastructure index is positively correlated. This may be due to the causal relationship occurring in both directions from ISSI to infrastructure shares or vice versa.

The coefficient with a significant positive value means that foreign portfolio investment trade has a statistically significant effect on the volatility of the sharia infrastructure sector index. Study by Kinda (2012) found that there is a correlation between capital flows and significant infrastructure development growth in developing countries. The contribution of foreign portfolio investment to strengthen the domestic capital market and its infrastructure will increase the allocation of domestic capital, and will ultimately help increase the benefits of foreign direct investment (Evans, 2002).

The infrastructure, utilities, and transportation sectors are industries engaged in the business of energy procurement, transportation facilities, telecommunications media, building infrastructure (non-buildings and houses), and their supporting services (IDX, 2022). Domestic infrastructure is a reflection of the process of technological development. Therefore, the infrastructure in a country is important (Pungnirund, 2020).

5. Conclusions

This study aims to analyze foreign portfolio investment into the Islamic stock market in Indonesia and infrastructure sector. The results show that the investment trading portfolio has a statistically significant effect on the volatility of the sharia infrastructure sector index. The Islamic infrastructure sector and ISSI are potential places for foreign investors to invest.

The importance of monetary policy and stronger supervision in the financial system as well as macroeconomic variables that affect foreign investment in Indonesia. Maintaining a stable exchange rate is an effective policy for Bank Indonesia to increase the flow of foreign portfolio investment, particularly the flow of foreign equity through intervention in the currency market (Syarifuddin, 2020). Furthermore, it is important to have policies aimed at attracting more capital while considering possible negative effects, such as sudden capital outflows or short-term reversal of capital flows by maintaining adequate monetary policy.

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