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The effect of foreign ownership on stock return volatility, with government ownership as a moderator

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Abstract
This research aims to determine the relationship between foreign institutional ownership and the stock return volatility, as well as the moderating effect of the state-owned enterprises on this relationship. This study uses two proxies of return volatility, namely total and idiosyncratic volatility. The research sample was determined by the purposive sampling method and analysis was conducted by OLS and moderated regression analysis. The number of samples in this study was 181 companies with 342 observations of data for the period 2014-2018. The analysis shows that share ownership by foreign institutional investors has a significant negative effect on the total and idiosyncratic return volatility. Ownership of shares by the government in state-owned enterprises has a moderating effect on such a relationship. The control variables of trading turnover and book-to-market ratio show a significant effect on volatility. Meanwhile, other control variables, which include ownership by domestic institutional and individual investors and free float ratio, do not show the effect on both total and idiosyncratic volatility. Robustness checks by quantile regression come into the same results. The results indicated the important role of foreign investors in the Indonesian capital market in providing market stability and thus stimulating investment climate.

Keywords: Stock return volatility; idiosyncratic volatility; foreign institutional ownership, state owned enterprise

Introduction

The globalization of the world financial market has led to cross-border capital movements marked by capital inflows from developed to emerging markets (Bandono et al., 2011). In many markets, foreign investors often play a role as the main driver of the capital market, for they have strong characteristics in investing that it is able to conduct large number of stock transactions and tend to initiate trade (Chandra, 2010). These characteristics encourage the emergence of allegations that foreign investors can influence the volatility of stock prices in emerging markets. Volatility of stock prices, henceforth affects the volatility of stock returns or commonly known as the stock return volatility.

Stock return volatility in financial markets is related to the speed of stock price fluctuations (Aitken and Frino, 1996). The higher the volatility, the faster the price changes, the faster the stock return changes. Stock return volatility is calculated by using the standard deviation of stock returns during a certain period (Skinner, 1989). Standard deviation is a measure of risk, therefore stock return volatility reflects stock risk. Bekaert and Harvey (1997) state that compared to developed countries, emerging markets have higher stock return volatility. Nevertheless, a high level of volatility has the potential to produce high returns. The Indonesian capital market, which continues to grow, is one of the attractive investment destinations, both for domestic and foreign investors. The Indonesian market is classified as a category of emerging markets in the world that offers high potential returns (Chandra, 2010).

Institutional investors are becoming an important player in the modern capital market with the increasing activity of stock trading. Ali and Hashmi (2018) indicate that the relationship between institutional ownership and volatility in stock returns arises because of trading activity. In the trading activity hypothesis, a large proportion of ownership will encourage institutional investors to conduct transactions aggressively and continuously in large numbers on their portfolios. Therefore, the higher the institutional ownership, the higher the stock return volatility (Darrat et al., 2003, Huang and Masulis, 2003). Chen et al. (2013) conducted a similar study by separating two other types of institutional investors that are foreign and domestic institutional investors. The results show that it is foreign institutional investors who

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are responsible for the increase of stock return volatility. Che (2018) even shows that the positive effect of foreign ownership is not only on total volatility but also on idiosyncratic or firm-specific volatility.

The effect of institutional ownership on stock return volatility is strongly influenced by the type of institution (Lakonishok et al., 1992, Choi et al., 2010). Ownership of shares by the government will reduce the volatility. O'Brien and Bushan (1990) show that ownership of block holders, including government, will result in companies being exposed more frequently and having a high degree of analyst coverage. This condition will lead to the asymmetry of information in companies whose shares are owned by the state to be low which leads to lower stock return volatility.

Based on the previous description, the purpose of this study is to examine the effect of foreign institutional ownership on the stock return volatility, both total and idiosyncratic volatility. This research also seeks out the role of state ownership in moderating the effect of foreign institutional ownership on volatility.

Literature Review

Returns Measurement

Returns are the amount of income derived from an investment that can be measured or expressed in currency or percentage terms. There are two concepts of calculating returns, expected returns and actual returns. In this study, stock returns are calculated using the concept of actual returns, which are formulated as equation (1), with P_i is stock i closing price on a certain trading day, $P_{i,t-1\ is}$ stock i closing price on a previous trading day.

The stock returns volatility illustrates fluctuations in stock prices over a certain period of time (Aitken and Frino, 1996). Bandono et al. (2011) state that volatility is a reflection of the level of risk that must be faced by investors. The higher the volatility, the higher the degree of uncertainty of return that investors will obtain. Stock return volatility is measured using the standard deviation of stock returns. This study utilizes two measures of volatility, namely total return volatility and idiosyncratic return volatility (Che, 2018). Total return volatility contains specific risk components (unsystematic risk) and market risk (systematic risk). Idiosyncratic return volatility only considers firm-specific risks (unsystematic risk). Measurement of total and idiosyncratic return volatility is formulated as follow equation (2)-(3) where $VOLTOT_{i,t}$ is total Volatility of share i at year t; $VOLIDI_{i,t}$ is diosyncratic volatility of share i at year t; $R_{i,d}$ is share i's returns in day d; ΔR_d is ifference in share i's returns and market returns in day d; Rmd is Market retuns in day d; and $\bar{x}_{R_{id}}$ is average daily return of share i in one year; $\bar{x}_{\Delta R_d}$ is average daily difference of returns of shares i and the market in one year; and n is trading days in one year.

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

$$VOLTOT_{i,t} = \sqrt{\frac{\sum_{i=1}^{n}\left(R_{i,d} - \overline{X}R_{i,d}\right)^2}{n-1}} \quad (2)$$

$$VOLIDI_{i,t} = \sqrt{\frac{\sum_{i=1}^{n}\left(\Delta R_d - \overline{X}\Delta R_d\right)^2}{n-1}} \quad (3)$$

$$\Delta R_d = R_{i,d} - R_{m.d} \quad (4)$$

$$FINV_{i,t} = \frac{\sum SFI_{i,t}}{Free\,Float_{i,t}} \quad (5)$$

Foreign Institutional Ownership

Although there are five known types of investors, this research only focuses on two types of them, i.e. foreign institutional ownership and ownership by state. Institutional investors are investors in the form of financial institutions which include banks, investment companies (investment banking), pension funds,

mutual funds, and insurance (Vo, 2016). The measurement of foreign institutional ownership based on investor type is as follows equation (5) in where FINVi,t is he proportion of company i shares owned by foreign institutional investors in year t; SFIi,t is the aggregate of company i shares owned by foreign institutional investors in year t; and Free Floati,t is he number of company i outstanding shares that are available to the public and not held by strategic investors includes the state, corporate, controlling shareholders, and management in the year t.

Foreign institutional investors influence stock return volatility through two mechanisms, namely trading volume and investment horizon (Gallant et al., 1992; Schwert, 1989; Cella et al., 2013). The first mechanism is trading volume, which is the number of shares traded at a certain time. Large trading volume shows the trading of shares in large numbers, meaning, that the shares are in demand by investors. The second mechanism is the investment horizon, which is the investment period, which can be divided into short and long terms.

According to Vo (2016), foreign institutional investors can increase the volatility of returns. Foreign institutional investors are able to form the largest trading volume that drive the increasing number of shares traded. The large trading volume causes prices to change more frequently, which in turn causes the volatility of returns to increase, both total and idiosyncratic volatility. Foreign institutional investors also tend to have the shortest investment horizon. The short investment horizon results in high frequency of transactions of foreign institutional investors, resulting in frequent changes in prices. Stock prices which change to be more frequent will lead to the increase of stock return volatility, both total and idiosyncratic.

State Ownership Definition and Measurement

State ownership is government ownership or control over companies (Kerry, L., 2018). In Indonesia, a company that the shares mostly owned by the government is called a State-Owned Enterprises (BUMN/SOEs). Law No. 40/2007 states that SOEs are companies that, at least, 51% of it shares owned by the state. In the Indonesian capital market, SOEs are not only driven by profit-oriented motives but also have a social function. As a result, SOE is the form of enterprise that is most frequently covered by media and analyzed by experts. This is in turn reduces information asymmetry on SOEs. The low information asymmetry results in the relatively low stock return volatility of SOEs (O'Brien and Bushan, 1990). Moreover, the government as a block holder can encourage the implementation of a long-term investment perspective that can encourage the intensity of information flow from companies to their investors and ultimately reduce information asymmetry (Hope et al., 2009). In this study, state ownership is measured as a dummy variable with a value of 1 for SOE and 0 for non-SOE.

Other Types of Ownership

We utilize other types of share ownership as control variables. The domestic institutional investors are the types of investors which have the potential to reduce stock return volatility. Domestic institutional investors generally invest with a buy and hold strategy, or in other words have a long investment horizon (Vo, 2016). A long investment horizon does not cause an increase in trading transactions, resulting in a more stable price. A more stable price will eventually reduce the level of both stock return volatility. In addition, domestic investors in a country's stock exchange are needed to protect the market from the uncertainty of the withdrawal of foreign capital when returns do not satisfy foreign investors (Mutua, 2015). When foreign investors decide to withdraw their portfolio, at that time domestic investors can replace the position of foreign investors on the stock exchange. This will cause the stock price to become more stable so that it will reduce the level of stock return volatility, both total and idiosyncratic return volatility. The domestic individual investors have the potential to reduce stock return volatility. These kind of investors usually exhibit the lowest volume of trading with the longest horizon of investment (Markowitz, 1991, Vo, 2015). These mechanisms discourage the increase in the volume of trade transactions resulting in prices not changing frequently or are more stable. This will ultimately reduce the level of volatility of returns. Domestic institutional and individual ownership is calculated by the following equations (6)-(7).

$DINV_{i,t}$ is the proportion shares owned by domestic institutional investors; $DIND_{i,t}$ is the proportion of shares owned by domestic individual investors; $SDI_{i,t}$ is he aggregate of shares owned by domestic institutional investors; $SIND_{i,t}$ is the aggregate of shares owned by domestic institutional investors; $FreeFloat_{i,t}$ is the number of company i outstanding shares that are available to the public and not held by strategic investors includes the state, corporate, controlling shareholders, and management in the year t.

$$DINV_{i,t} = \frac{\sum SDI_{i,t}}{Free\ Float_{i,t}} \quad (6)$$

$$DIND_{i,t} = \frac{\sum SIND_{i,t}}{Free\ Float_{i,t}} \quad (7)$$

Other Factors Affecting Volatility

Other factors that influence stock return volatility, and also become control variables in this study, are trading turnover, book-to-market value, and free float ratio. Trading turnover is the number of shares that are traded by investors during a certain period (Che, 2018). Trading turnover can also refer to the level of trading activities carried out by investors. Increasingly active investor action resulted in a high level of trading turnover. Stocks with high turnover are traded more often, which causes the reduction of information asymmetry in the market. This, in turn, causes returns to be less volatile. Trading turnover measurements are formulated as follows (8). $TO_{i,t}$ is the trading turnover of firm i shares in a certain year t; $VOL_{i,t}$ is the number of company i shares traded; and $OS_{i,t}$ is he number of company i outstanding shares.

The book-to-market (B/M) ratio is a ratio of book and market value of equity (Ross et al. 2018). The lower B/M ratio reflects the high company's growth opportunity. A high B/M ratio indicates a lower growth opportunity that will drive the lower investor's interest in the stock. This will cause the stock's trading to become less frequent and increase information asymmetry. The result is more the volatile returns. B/M ratio measurements are formulated as follows (9). $B/M_{i,t}$ is book to market ratio of firm i at year t; $TE_{i,t}$ is total equity of firm i; and $MC_{i,t}$ is market Capitalization of firm i at the end of year t.

$$TO_{i,t} = \frac{VOL_{i,t}}{OS_{i,t}} \quad (8)$$

$$B/M_{i,t} = \frac{TE_{i,t}}{MC_{i,t}} \quad (9)$$

$$Free\ Float\ Ratio_{i,t} = \frac{Free\ Float_{i,t}}{OS_{i,t}} \quad (10)$$

Free float ratio is the ratio between free float and the number of shares outstanding. Free float is defined as the sum of all shares outstanding and available to the public for trading, but does not include shares that are already owned by strategic investors including the state, corporate, controlling shareholders, and management (Chen et al., 2013). The lower the free float ratio the more concentrated the ownership structure. A lower free float ratio can mean the least number of shares outstanding in the market, which causes the stock to become illiquid. This causes price fluctuations to be high which then will increase the level of volatility. Free float ratio measurements are formulated as follows (10). Free Floati t is free float of company i in year t; and $OS_{i,t}$ is outstanding shares of company i in year t.

By considering the previous explanations we formulate the following hypotheses

H_1 : Foreign institutional ownership has a positive effect on total volatility.

H_2 : State ownership moderates the positive effects of foreign institutional ownership on total volatility.

H_3 : Foreign institutional ownership has a positive effect on idiosyncratic volatility.

H_4 : State ownership moderates the positive effects of foreign institutional ownership on idiosyncratic volatility.

Research Method

Data and Sample

The population is all companies listed on the IDX. The research sample was determined by using the purposive sampling method. We utilized the following criteria: 1) Firms published the annual reports

for the 2014-2018 period and provide data on share ownership by various types of investors including foreign institutions, domestic institutions, foreign individuals and domestic individuals; 2) Companies that publish annual reports for the 2014-2018 period and provide data on strategic investor ownership including state, corporate, controlling shareholders and management; 3) Publish financial statements expressed in rupiah; and 4) have all the information needed in this study. Based on these criteria, a sample of 181 was obtained with 342 observations. Data was obtained from the company's annual report, the Indonesian Capital Market Directory, and The Wall Street Journal.

Research Model

This study used OLS and moderated regression analysis techniques with the aim to determine the effect of foreign institutional ownership on stock return volatility and the moderating effect of SOEs as well. This research model is as follows equations (11) and (12).

$$\text{VOLTOT}_{i,t} = \beta_0 + \beta_1 \text{FINS}_{i,t-1} + \beta_2 \text{SOE}_{i,t-1} + \beta_3 \text{FINS}_{i,t-1}\text{XSOE}_{i,t-1} + \beta_4 \text{DINST}_{i,t-1} + \beta_5 \text{DIND}_{i,t-1} + \beta_6 \text{TO}_{i,t-1} + \beta_7 \text{B/M}_{i,t-1} + \beta_8 \text{FFR}_{i,t-1} + \beta_n DYear_t + \varepsilon_i \quad (11)$$

$$\text{VOLIDI}_{i,t} = \alpha_0 + \alpha_1 \text{FINS}_{i,t-1} + \alpha_2 \text{SOE}_{i,t-1} + \alpha_3 \text{FINS}_{i,t-1}\text{XSOE}_{i,t-1} + \alpha_4 \text{DINST}_{i,t-1} + \alpha_5 \text{DIND}_{i,t-1} + \alpha_6 \text{TO}_{i,t-1} + \alpha_7 \text{B/M}_{i,t-1} + \alpha_8 \text{FFR}_{i,t-1} + \alpha_n DYear_t + \varepsilon_i \quad (12)$$

Description:

$\text{VOLTOT}_{i,t}$: Total Volatility of share i in year t
$\text{VOLIDI}_{i,t-1}$: Idiosyncratic Volatility of share i in year t
$\text{FINST}_{i,t-1}$: Proportion of share ownership of foreign institutional investors in company i in year t-1
$\text{SOE}_{i,t-1}$: Dummy for state owned enterprises i in year t-1. It is 1 for SOE
$\text{DINST}_{i,t-1}$: Proportion of share ownership of domestic institutional investors in company i in year t-1
$\text{DIND}_{i,t-1}$: Proportion of share ownership of domestic individual investors in company i in year t-1
$\text{TO}_{i,t-1}$: The trading turnover of company i shares in year t-1
$\text{B/M}_{i,t-1}$: The book to market ratio of company i shares in year t-1
$\text{FFR}_{i,t-1}$: The free float ratio of company i shares in year t-1
DYear_t : Year dummy

Result and Discussion

Descriptive

Table 1 shows descriptive of study. The lowest VOLTOT and VOLIDI values are 0.5% and 0.8% respectively, while the highest values are 42.96% and 42.95%, with an average of 3.34% and 3.32%.

Table 1. Descriptive Statistic

	Minimum	Maximum	Mean	Std. Deviation
VOLIDI	0.00795	0.42963	0.03316	0.03423
VOLTOT	0.00511	0.42952	0.03342	0.03413
FINST	0.00000	0.97256	0.41512	0.31078
SOE	0.00000	1.00000	0.12573	0.33203
DINST	0.00000	0.98442	0.23556	0.25805
DIND	0.00004	0.99311	0.23266	0.24131
TO	0.00000	1.16506	0.15500	0.20602
B/M	0.01213	4.70145	0.91913	0.89169
FFR	0.01743	0.94975	0.37948	0.18037
Valid N	342			

This means that the level of stock return volatility or uncertainty faced by investors is not too high. The average of share ownership by the foreign institutional investors (41.5%) is the highest compared to domestic institutional and individual investor types. Turnover ratio shows that the average trading volume is smaller than outstanding shares. In Indonesia, the market value of shares of certain firm tends to be higher than the book value, with the average share that can be actively traded is 37.95%.

Spearman's rho shows that volatility is correlated with all types of ownership. However, there are differences in these correlation patterns. Volatility is positively correlated with domestic ownership, but negative with foreign one. As a result, a negative correlation is formed between ownership of foreign institutions and domestic ownership, both institutional and individual. These conditions indicate that the foreign institutional investors perform as a counterbalance factor for actions taken by domestic investors, vice versa. This then impacts on the absence of correlation between volatility and turnover.

Table 2. Correlations Matrix

	VOLIDI	VOLTOT	FINST	SOE	DINV	DIND	@TO	BM	FFR
VOLIDI	1								
VOLTOT	0.993**	1							
FINST	-0.299**	-0.278**	1						
SOE	-.159*	-.224**	.128*	1					
DINST	0.238**	0.244**	-0.391**	.188**	1				
DIND	0.130*	0.109*	-0.579**	-.138*	-[illegible]**	1			
TO	-0.070	-0.069	-0.058	.104	-0.035	0.091	1		
B/M	0.120*	0.111*	-0.144**	-.078	-0.073	0.303**	0.060	1	
FFR	-0.113*	-0.106*	0.129*	.034	-0.020	-0.107*	0.074	0.187**	1

Hypothesis Test and Analysis

OLS and MRA results are shown in Table 3. The predictor in Model 1 is total volatility, while Model 2 is idiosyncratic volatility. The A and B models are models without and with moderator variables. In all models, foreign institutional has a negative relationship with volatility, both total and idiosyncratic. This shows that foreign institutional ownership can reduce the stock return volatility on the Indonesian stock exchange. Moderated regression analysis shows that the negative relationship is stronger for SOEs. The results of this study indicate that the higher the institutional ownership, the less volatile the share price, and such a relationship becomes stronger in SOEs. The results of this study support the findings of Vo (2015) in Vietnam but contradict to those of Che et al. (2018) and Chen et al. (2013) on the Chinese capital market.

Table 3 reports the results from OLS. The dependent variable of Model 1 is Total Volatility and Model 2 is Idiosyncratic Volatility. The values of t-statistics are in parentheses. The asterisks: *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. The classical assumption test shows that the Kolmogorov Smirnov test significance value is above 5%. For all variables the VIF value is below 10 and Tolerance is above 0.1, meanwhile the significance value of the Spearman Rank correlation between independent variables and residuals is above 5%.

Source: SPSS output.

In contrast to Che (2018) and Chen et al (2013), share ownership by foreign institutional investors has a significant negative effect on both total and idiosyncratic volatility. This occurs because the presence of foreign investors will encourage companies to be more open in disclosing information. Moreover, the existence of blockholders in the form of foreign institutional investors will cause companies to become more frequent objects of coverage and analysis. This will encourage the lower information asymmetry in these companies. The low asymmetry of information on companies with greater foreign institutional ownership will ultimately reduce the volatility of stock returns (Van Ness et al., 2001). The negative relationship of foreign institutional ownership with stock return volatility also indicates that, in emerging markets like Indonesia, the trade volume of foreign institutional investors is not high with a relatively long investment horizon. Data from the Financial Services Authority (the OJK), for the period 2014-2018 shows that the volume of foreign investor trading is not greater than 50%. The highest trading volume of foreign investors occurred in 2018, amounting to 40.58%. The investment horizon of foreign institutional investors is relatively long due to Indonesia's relatively stable economic conditions. This can be seen from the level of economic growth, inflation rate, and the Composite Stock Price Index (CSPI).

Based on data from the Central Statistics Agency (BPS) Indonesia's economic growth tends to increase by an average of 5.03% per year. The World Bank even predicts that Indonesia will become the fourth largest economy in the world in 2024 after China, India and the USA. The inflation rate for the 2014-2018 period also has a downward trend of reaching 3.13% in 2018. Meanwhile the Indonesia Capital Market (The IDX) composite index has an upward trend to reach the level of 6,194 in 2018. These conditions encourage foreign institutional investors to tend to invest in the long term which results in the reduction of

information asymmetry and an impact on lower volatility.

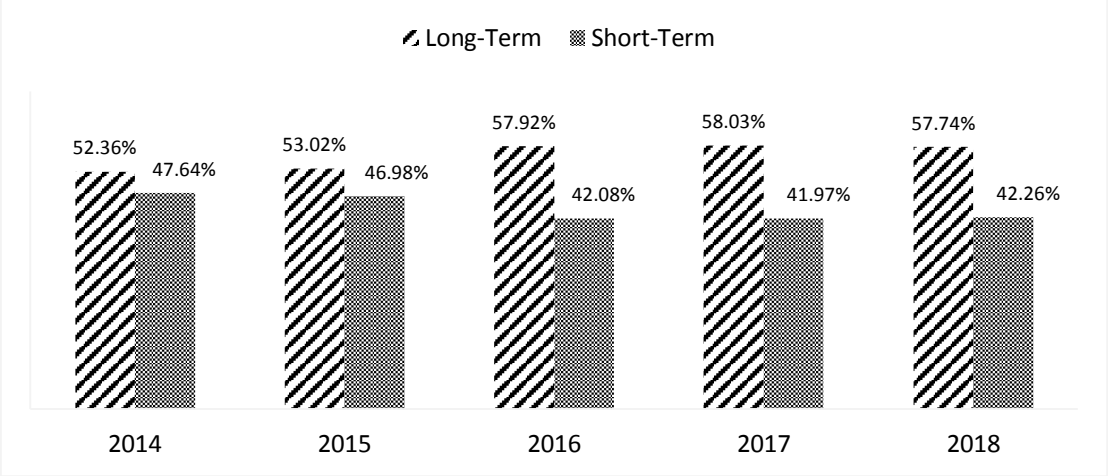
Table 3. Output of Regression on Stock Return Volatility

	Model 1A	Model 1B	Model 2A	Model 2B
Constant	-1.798***	-1.824***	-1.784***	-1.792***
	(-20.888)	(-19.993)	(-21.286)	(-20.257)
FINST	-0.075***	-0.071***	-0.084***	-0.079***
	(-3.007)	(-2.866)	(-3.491)	(-3.262)
SOE		0.012		0.045
		(0.257)		(0.575)
FINSTxSOE		-0.085*		-0.093**
		(-1.796)		(-2.037)
DINST	-0.003	-0.006	-0.007	-0.007
	(-0.185)	(-0.350)	(-0.462)	(-0.453)
DIND	-0.032	-0.046*	-0.017	-0.033
	(-1.240)	(-1,721)	(-0.677)	(-1.290)
TO	-0.056***	-0.053***	-0.065***	-0.061***
	(-3.158)	(-3.360)	(-4.227)	(-3.985)
B/M	0.067***	0.066**	0.072***	0.071**
	(3.326)	(1.969)	(2.220)	(2.201)
FFR	0.033	0.029	0.021**	0.017
	(0.539)	(0.467)	(0.351)	(0.281)
Year fixed effect	Yes	Yes	Yes	Yes
R^2	0.135	0.145	0.168	0.185
F	4.548***	4.088***	5.903***	5.482***

The moderating effect of SOE can occur because of the relatively low information asymmetry on SOEs. Low information asymmetry occurs because SOE is the type of company that is most often the subject of coverage and analysis. SOE in Indonesia is also often assigned by the government to carry out long-term projects that encourage the intensity of information exchange with stakeholders, including their investors. This result contradicts the findings of Liu et al. (2018) in China's capital market. In our study, the existence of foreign institutional investors encourages wider information disclosure on SOEs, resulting in a stronger negative relationship between institutional ownership and stock return volatility.

Table 3 shows that the ownership by domestic institutional and individual investors do not show any influence on volatility. This is consistent for both types of volatility (total and idiosyncratic). Two control variables consistently show a significant effect on volatility, i.e. trading turnover and B / M. This study shows that the influence of foreign institutional investors on stock return volatility in developing capital markets is different from results from similar studies in developed countries (Brandt et al., 2010, Foucault et al., 2011, Che, 2018).

Share ownership by domestic institutional investors (DI) has no effect on total and idiosyncratic return volatility, although there is a positive correlation between them. This happens because of the diversity of the investment horizons of domestic institutional investors in Indonesia. Figure 1 shows the comparison of investment horizons of domestic institutional investors. For 5 years, there were around 50% of investors from total domestic institutional investors who tended to make long-term investments, namely insurance companies and pension funds. Meanwhile, the remainder which includes mutual fund companies, securities companies and financial institutions tends to make short-term investments.



Source: Financial Services Authority (www.ojk.go.id)

Figure 1. Share Ownership Based on the Investment Horizon of Domestic institutional Investors in Indonesia for the 2014-2018 Period

Table 4. Quantile Regression Output for Total Volatility

	OLS	Q .10	Q .25	Q .50	Q .75	Q .90
Constant	-1.696***	-1.833***	-1.771	-1.684***	-1.639***	-1.467***
FINST	-0.070***	-0.073	-0.082***	-0.072***	-0.066**	-0.069**
DINV	-0.002	0.001	-0.009	-0.002	-0.001	0.001
DIND	-0.021	-0.019	-0.025	-0.002	-0.032	0.013
TO	-0.033***	-0.007	-0.012	-0.030*	-0.064***	-0.057***
B/M	0.083***	0.143***	0.119***	0.078**	0.101***	0.002
FFR	-0.089**	0.039	-0.021	-0.115	-0.144**	-0.121*

Table 4 reports the results from quantile regression analysis on Total Volatility. The asterisks sign: *, **, *** indicate the significance at the 10%, 5%, and 1% levels, respectively.
Source: SAS output

Table 5. Quantile Regression Output for Idiosyncratic Volatility

	OLS	Q .1	Q .25	Q .5	Q .75	Q .9
Constant	-1.709***	-1.913***	-1.796***	-1.728***	-1.625***	-1.428***
FINST	-0.078***	-0.084**	-0.085***	-0.073***	-0.054**	-0.064**
DINV	-0.005	-0.012	-0.020	-0.008	-0.004	0.006
DIND	-0.007	-0.003	-0.003	-0.011	-0.005	0.026
TO	-0.040***	-0.014	-0.024**	-0.039**	-0.070***	-0.055***
B/M	0.082***	0.130***	0.118***	0.119***	0.096***	-0.007
FFR	-0.102**	-0.069	-0.014	-0.1255	-0.145***	-0.102

Table 5 reports the results from quantile regression analysis on Idiosyncratic Volatility. The asterisks: *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Throughout the quantile, it appears that domestic investor ownership is not related to total volatility. In addition, control variables do not consistently show a relationship with total volatility across quantiles. Ownership of shares by domestic individual investors (DIND) is positively correlated with total and idiosyncratic return volatility. Nevertheless, OLS analysis shows that the influence of domestic individual investors on stock return volatility is not significant. This is due to the low level of ownership and differences in the characteristics of domestic individual investors leading to a diversity of investment horizons. The international ORC survey in 2019 stated that generations born between 1979-1986 or what is commonly referred to as generation X tend to make long-term investments, while millennials born between 1980-2000 tend to make short-term investments. In addition, the low level of individual investor literacy (Meidiaswati, 2017) and the large composition of foreign ownership in Indonesia will affect the behavior of domestic individual investors to tend to be followers who do not affect the volatility of returns.

Trading turnover is negatively related to stock return volatility. The higher trading turnover results in information about stocks becoming more available and easier to access. The availability of information will reduce the asymmetry of information in the market and, then, reduce return volatility. This finding is in line with Brandt et al. (2010) and Che (2018). Book to market ratio has a positive effect on total and idiosyncratic volatility. A high book to market ratio indicates the company's low growth opportunities. Companies with low growth opportunities tend not to be attractive to investors. The frequency and volume of stock trading transactions with low growth opportunities will also tend to be low, which prompt the widening of information asymmetry. This in turn will drives high stock return volatility. This finding is in line with the results of research by Malkiel and Xu (2003) and Hotchkiss and Strickland (2003).

Robustness Check

We conducted robustness tests using the quantile regression method developed by Koenker and Bassett (1978). The use of quantile regression analysis allows researchers to explore the marginal effects of the conditional distribution of the dependent variable. Tables 4 and 5 show the results of quantile regressions. Table 4 shows that in quantile 10% foreign institutional ownership has no effect on total volatility. The relationship between the two occurs at 25% to 90% quantile, with regression coefficient values that tend to decrease. The results of the analysis indicate that the relationship between foreign institutional ownership and total volatility does not always occur. The results also showed a decrease in the influence of foreign institutional ownership in line with the increase in total volatility.

Table 5 shows that foreign institutional ownership is consistently related to idiosyncratic volatility in all quantiles. The results also reveal a tendency of the weakening influence of foreign institutional ownership throughout the quantile. Domestic institutional and individual ownership do not show a relationship with idiosyncratic volatility in all quantiles. In addition, in line with the previous analysis, the control variable does not consistently affect idiosyncratic volatility. Overall the results of the quantile regression analysis support the OLS results.

Conclusions, suggestions and limitations

This study aims to seek out the foreign institutional ownership relationship with stock return volatility in the Indonesian stock market, as well as the role of state ownership in moderating such influence. In contrast with previous studies in China, share ownership by foreign institutional investors is negatively related to total and idiosyncratic volatility. This phenomenon is caused by the lowering of the information asymmetry of companies with high institutional ownership, both as a result of increased coverage and analysis and the impact of a relatively long investment horizon. The results also indicated that the negative effect is greater for SOEs. Ownership of shares by domestic institutional and individual investors does not affect the total and idiosyncratic return volatility. The diversity of characteristics of domestic investors, both institutional and individual, results in variations in the volume of trading and the time horizons of investment. Further research is needed to ensure that the findings of this study are consistent with other developing capital markets.

The results of the study provide an insight of the importance of the existence of foreign investors in capital markets in emerging countries such as Indonesia. Besides being able to stimulate the investment climate, foreign investors are also needed as market stabilizers. Based on the findings of this study, the government is expected to create a conducive capital market investment climate for foreign investors. The government must also encourage its public participation in the capital market. This can be started by increasing financial literacy, especially capital market literacy for the people of Indonesia.

This study uses a standard deviation to measure volatility. This measurement technique does not explain the error term innovation in the model. To overcome this problem, further research can utilize different risk measurement models, such as GARCH.

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