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ABSTRACT

This research examines the impact of foreign ownership on stock performance-risk and macroeconomic factors in countries of the Association of Southeast Asian Nations (ASEAN). To examine our research question, we utilize annual panel data consisting of listed companies (2007 to 2018). We find that foreign ownership enhances stock performance and gross domestic product, but it decreases risk, exchange, and interest rate. Conversely, performance and GDP attract foreign investors, but risk, exchange, and interest rates reduce it. Those results differ in diverse settings and countries.

Keywords: Foreign ownership; Stock performance; Risk; Macroeconomic factors; ASEAN countries.
JEL Classifications: F21; G12; G15; G32; R53.

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I. INTRODUCTION

Market openness to foreign investors is one of the crucial issues in financial studies. It attracts much attention from researchers, policymakers, and investors due to its impact on the capital market and economic growth (Li *et al*., 2011). This paper firstly examines whether stock performance-risk and macroeconomic factors could attract foreign investors to invest in the Association of Southeast Asian Nations (ASEAN)[1] due to reverse causality as the primary motivation (Batten and Vo, 2015). Secondly, many regulators, researchers, and investors have questioned whether foreign ownership provides more advantages than disadvantages (Naufa *et al*., 2019). Given this, we also explore the impact of foreign ownership on those factors in six ASEAN countries. This research adds to our understanding of the literature in the stream of market openness to the foreign investor, known also as financial liberalization or globalization (Vo, 2015).

The earlier research has focused on the impact of foreign investors on certain variables. There is a lack of emphasis on its reversal relationship as the primary notion explicitly (Lee and Chung, 2017). Not only foreign investors affect stock performance-risk and macroeconomic factors, but also those factors may influence foreign investor. Foreign investors invest in stocks with lower return volatility, implying that they prefer to choose stocks with lower risk; however, the reverse causality effect is relatively unexplored (Che, 2018). Those factors are relevant for the foreign investor to invest in stocks (Li *et al*., 2011). Besides, most of the studies explore the effect of foreign ownership on either performance or risk of stock, focusing primarily on only one factor only (Bartram *et al*., 2015; Batten and Vo, 2015). However, we argue that those two factors cannot be separated given their overall financial and macroeconomic importance. Moreover, this literature has not focused on the ASEAN countries (Naufa *et al*., 2019). This is not a minor limitation given that the ASEAN countries are a large part of the global financial system and international trade.

Against this background, our hypothesis is that foreign ownership impacts stock performance-risk and macroeconomic factors. We employ annual panel data from listed firms except financial firms for six countries of ASEAN. Our sample period is 2007 to 2018. Econometrically, we utilize the Generalized Method of Moments (GMM) estimator to test our hypothesis. We prefer GMM because it solves the endogeneity issues. Secondly, we divide our sample into a pre-crisis

[1] The Association of Southeast Asian Nations is a political region composed of 10 countries, but the capital markets from Laos, Cambodia, Brunei, and Myanmar have limited or no stocks. In fact, Yang and Hamori (2014), state that ASEAN countries contribute a significant proportion, are more integrated, and improve rapidly, vis-à-vis the global markets. They have different conditions (developing and developed markets) and regulations on the maximum foreign ownership compared to other regions (Naufa *et al*., 2019). In terms of international portfolio, a foreign investor could have portfolio investment around the world (Vo, 2016), including in ASEAN countries. One country may limit the maximum foreign ownership. For instance, Philippines is up to 39% with A shares for domestic and B shares for the foreign investor (He *et al*., 2013), while some other countries are much more open to foreign ownership, i.e., Indonesia is up to 99% (Rhee and Wang, 2009). Whether foreign ownership should be limited or supported, therefore, it is necessary to provide empirical evidence supports this topic. Although this issue is pivotal, the literature about this topic is limited. Therefore, examining the ASEAN context with a unique setting is pivotal compared to other regions in the world.

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and a post-crisis sub-sample. Thirdly, we separate the market developments (developing vs developed countries). Lastly, we test the hypothesis for each country separately to check the robustness of our findings.

We find that foreign ownership enhances stock performance and GDP; it, however, decreases risk, exchange, and interest rate. Conversely, performance and GDP attract foreign investors, but the risk, exchange, and interest rate reduce it. Those results uniquely differ in different settings and countries. Hence, foreign investors are beneficial for the ASEAN financial market.

The contributions of this research are twofold. Firstly, this study offers a new concept of reversal causality of stock performance-risk and macroeconomic factors on foreign ownership that is useful for future research agenda on testing causality on this topic (Kim *et al*., 2019; Qin and Bai, 2014). Secondly, this paper by studying the ASEAN with different market conditions (developing vs developed countries), sub-samples (crisis vs non-crisis), and proxies, offers policy makers a guide towards rethinking policies regarding the regulation of foreign investment given the importance of foreign investors as in our findings (Aebi *et al*., 2012; Alquist *et al*., 2019).

We organize the rest of this paper as follows. Section II discusses the data and methodology. Section III has results and discussions. The last section provides conclusions, implications, and suggestions for future research.

II. DATA AND METHODOLOGY

A. Data

We use annual panel data for six ASEAN countries. More specifically, our data includes 502 Indonesian stocks, 803 Vietnamese stocks, 674 Thailand stocks, 658 Singapore stocks, 1,057 Malaysian stocks, and 265 Philippine stocks. We exclude financial firms from our dataset due to stricter regulations (see Liu and Hsu, 2014; Nguyen, 2012; Vo, 2015). Additionally, our data spans the period 2007 to 2018. More specifically, the main variables considered in our study include Foreign Ownership (*FO*), Return on Asset (*ROA*), Return on Equity (*ROE*), Earnings-per-Share (*EPS*), Price-to-Earnings (*PER*), Tobin's Q, Z-score, Asset Risk (*SDROA*), Equity Risk (*SDROE*), market capitalization (*Size*), total debt to total equity ratio (*Lev*), turnover of shares (*TO*), age of the shares – starting since the year of IPO (*Age*), Exchange Rate (*ER*), Interest Rate (*IR*), and growth form of Gross Domestic Product (*GDP*). Detailed information on each variable is provided in Table 1.

Table 1.
Data Description

This table provides a detail data description of all variables considered in this study.

Variable	Definition	Source
Stock_FS	Stock owned by foreign shareholders	Osiris database
TS	Total shares recorded	Osiris database
FO	Foreign ownership is the percentage of stock in each country owned by foreign investors based on the Osiris database country classification: $FO = \frac{\sum Stock\_FS}{\sum TS}\ x\ 100\%$	Authors calculation
ROA	Return on asset (in percent) which is net income divided by the total asset: $ROA = \frac{Net\ Income}{Total\ Asset}\ x\ 100\%$	Osiris database
ROE	Return on equity ratio (in percent) is the net income divided by total equity: $ROE = \frac{Net\ Income}{Total\ Equity}\ x\ 100\%$	Osiris database
EPS	Earnings-per-share is the portion of a company's profit allocated to each share of common stock: $EPS = \frac{Net\ Income}{Number\ of\ Outstanding\ Shares}$	Osiris database
PER	The price-to-earnings ratio is the ratio for valuing a company that measures its current share price relative to its per-share earnings: $PER = \frac{Stock\ Price}{Earnings\ per\ Shares}$	Osiris database
Tobin's Q	$Tobin's\ Q = \frac{Market\ Value\ of\ Company}{Replacement\ Value\ of\ the\ Firm's\ Asset}$	Osiris database
Z-score	Z-Score is the Altman Z-Score formula which is the output of a credit-strength test that helps gauge the likelihood of bankruptcy for a publicly-traded company: *Z-score*= 0.012X1+0.014X2+0.033X3+0.006X4+0.999X5 where *X*1 is working capital/total asset; *X*2 is retained earnings/total assets; X3 is earnings before interest and taxes/total assets; *X*4 is market value equity/book value of total debt; and *X*5 is sales/total asset.	Osiris database
SDROA	Asset risk is the standard deviation of return on quarterly asset (ROA): $SDROA = \sqrt{\frac{\sum(ROA - \overline{ROA})^2}{n}}$	Authors calculation (Variables used for computation are downloaded from Osiris database)
SDROE	Equity risk is the standard deviation of return on quarterly equity (ROE): $SDROE = \sqrt{\frac{\sum(ROA - \overline{ROE})^2}{n}}$	Authors calculation (Variables used for computation are downloaded from Osiris database)
Size	The market capitalization of each stock in each country (Billion LC)	Osiris

Table 1.
Data Description (Continued)

Variable	Definition	Source
Lev	Leverage is the ratio of total debt to total equity: $Lev = \frac{Total\ Debt}{Total\ Equity}$	Authors calculation (Variables used for computation are downloaded from Osiris database)
TO	Turnover is the number of shares outstanding in each stock and time	Osiris database
Age	Age is calculated since the year of IPO.	Authors calculation
ER	The exchange rate at which local currency will be exchanged to the US Dollar	World Bank
IR	Interest rate is the rate of interest from central banks	World Bank
GDP	Gross domestic product (Billion) in growth form	World Bank

B. Methodology

To examine the bi-directional relationship between stock performance and foreign ownership, we propose the following two regression models:

$$Perf_{i,t} = \alpha_{o,} + \beta_1 Perf_{i,t-1} + \beta_2 FO_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + e_{i,t}^{Perf} \quad (1)$$

$$FO_{i,t} = \alpha_1 + \beta_1 FO_{i,t-1} + \beta_2 Perf_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + e_{i,t}^{FO} \quad (2)$$

Here, Equation (1) examines the impact of Foreign Ownership (*FO*) on stock performance ($Perf_{i,t}$) whereas Equation (2) examines the impact of $Perf_{i,t}$ on *FO*. In total, we use five proxies for market performance (namely, *ROA*, *ROE*, *PER*, *Tobin's Q*, and *EPS*) for $Perf_{i,t}$, and therefore, we estimate Equations (1) and (2) five times, one model for each of the five proxies of stock performance. Additionally, we include five stock-level, namely market capitalization (*Size*), leverage (*Lev*), TurnOver (*TO*), the Price-to-Book Value (*PBV*), age of a stock (*Age*) of stock *i* at time *t* and three macroeconomic control variables, namely, the Exchange Rate (ER), Interest Rate (*IR*), and an annual growth rate of *GDP* of country *j* at time *t*. The choice of control variables is dictated by prior studies (see for instance, (Alquist *et al*., 2019; Chen *et al*., 2013; Li *et al*., 2011; Naufa *et al*., 2019; Peranginangin *et al*., 2016; Vo, 2016; Xie *et al*., 2019)).

Moreover, we also examine the relationship between stock risk (denoted by *Risk*) and *FO*. Our empirical regression models take the following form:

$$Risk_{i,t} = \alpha_{i,t} + \beta_1 Risk_{i,t-1} + \beta_2 FO_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + \varepsilon_{i,t}^{Risk} \quad (3)$$

$$FO_{i,t} = \alpha_{i,t} + \beta_1 FO_{i,t-1} + \beta_2 Risk_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + \varepsilon_{i,t}^{FO} \quad (4)$$

In Equations (3) and (4), we use three proxies for performance, namely *Z-score*, *SDROA*, and *SDROE* to measure $Risk_{i,t}$, and therefore, both equations are estimated three times, one mode for each proxy of *Risk*. Our choice of proxies for *Risk* is dictated by prior studies (see, for example, Nguyen, 2012). The remaining control variables are defined earlier in Equations (1) and (2).

To estimate Equations (1) – (4), we use Arellano & Bond (1991) GMM estimation approach. Our choice of using the GMM estimation method is simply because it enables us to tackle the problem of endogeneity problem in our regression model.

In addition, we also examine the relationship between *FO* and macroeconomic variables and, therefore, propose the following regression models:

$$Macro_{j,t} = \alpha_{i,t} + \beta_1 Macro_{j,t-1} + \beta_2 FO_{i,t} + \sigma_{i,t}^{Macro} \quad (5)$$

$$FO_{i,t} = \alpha_{i,t} + \beta_1 FO_{i,t-1} + \beta_2 Macro_{j,t} + \sigma_{i,t}^{FO} \quad (6)$$

Here, Equation (5) examines the impact of *FO* on macroeconomic factors whereas Equation (6) examines the impact of macroeconomic variables on *FO*. $Macro_{j,t}$ denotes three macroeconomic factors, namely *ER*, *IR*, and *GDP* of country *j* at time *t*. Given we use three proxies for macroeconomic variables, Equations (5) and (6) are estimated three times, one model for each macroeconomic proxy. Once again, we estimate both equations using the GMM estimation method.

III. MAIN FINDINGS

A. Preliminary Analysis

We begin by discussing the summary of our data presented in Table 2. More specifically, we report mean, Standar Deviation (SD), minimum, and maximum values of each of the variables used in this paper. We read selected results from Table 2. We note that the mean value of all variables is positive, except in the case of *EPS*. For instance, the mean value of *FO*, *Tobin's Q*, *Z-score*, *SDROA*, and *SDROE* is 8.28%, 3.24, 2.38, 2.39, 5.83, respectively. Additionally, we document that *Tobin's Q* is the most volatile variable with a SD of 96.81, followed by *TO* (93.51), and *PER* (72.30).

Table 2.
Descriptive Statistics

This table reports selected descriptive statistics of data used in this study. In particular, we report mean, standard deviation (SD), minimum value (Min), the maximum value (Max), and the number of observations (N). We have defined all variables in Table 1.

Variables	N	Mean	SD	Min	Max
FO	39,141	8.28	17.82	0.00	100.00
ROA	37,722	3.82	23.49	-6.82	6.84
ROE	37,658	8.41	51.07	-6.88	6.90
EPS	35,891	-5.87	10.63	-15.34	13.88
PBV	31,618	2.77	5.93	-10.94	10.27
PER	24,680	29.03	72.30	0.00	6.90
Tobin's Q	31,619	3.24	96.80	0.00	9.23
Z-score	37,711	2.38	5.51	-9.46	10.28
SDROA	30,177	2.39	23.54	0.00	8.16
SDROE	29,344	5.83	25.77	0.00	7.85
Size	38,537	8.73	10.19	0.00	13.73
Lev	37,407	59.11	4.66	-6.90	6.91
TO	32,705	35.06	93.51	0.00	6.91
Age	35,419	14.48	17.62	0.00	118.00
ER	44,107	0.35	0.31	0.00	2.00
IR	55,908	4.46	3.55	0.14	13.99
GDP	55,908	5.74	5.32	4.34	6.94
N. Company	55,908	2,330	1,344.94	1.00	4,659
N. Year	55,908	2012	3.45	2007	2018
N. Country	55,908	3.92	1.83	1.00	6.00

Next, we report the correlation coefficient between all variables considered in our study in Table 3. In total, we have 17 variables, leading to 136 pairs of variable combinations for which we report correlation coefficients. We find a positive correlation coefficient in 94/136 (69%) of variable combinations. In the remaining 31% of the cases, correlation coefficients are found to be negative. The main variable, *FO*, is found to be positively correlated with all variables, except in the case of *EPS*, *Z-score*, *Lev*, *ER*, and *IR*, where correlation coefficients are found to be negative.

Table 3.
Correlation Coefficients

This table reports the unconditional correlation coefficient between variables used in this study. All variables are defined in Table 1.

	FO	*ROA*	*ROE*	*EPS*	*PBV*	*PER*	*Tobin's Q*	*Z-Score*	*SDROA*	*SDROE*	*Size*	*Lev*	*TO*	*Age*	*ER*	*IR*	*GDP*
FO	1.00																
ROA	0.08	1.00															
ROE	0.07	0.62	1.00														
EPS	-0.01	-0.01	0.00	1.00													
PBV	0.15	0.39	0.57	0.00	1.00												
PER	0.01	-0.21	-0.16	0.00	0.07	1.00											
Tobin's Q	0.16	0.57	0.45	-0.01	0.77	0.09	1.00										
Z-score	-0.01	0.16	0.02	-0.01	0.01	0.00	0.11	1.00									
SDROA	0.00	0.05	0.03	0.00	0.01	-0.01	0.01	0.01	1.00								
SDROE	0.03	0.16	0.22	0.00	0.17	-0.01	0.08	-0.02	0.04	1.00							
Size	0.09	-0.05	-0.01	0.01	0.01	-0.03	-0.02	-0.06	-0.01	-0.01	1.00						
Lev	-0.02	-0.25	0.07	0.01	0.10	0.02	-0.17	-0.23	-0.01	0.10	0.10	1.00					
TO	0.01	0.02	0.02	0.00	0.03	0.00	0.04	0.01	0.00	0.06	0.04	0.00	1.00				
Age	0.11	-0.01	-0.01	-0.01	0.02	0.00	0.03	0.02	0.00	0.03	0.12	-0.07	0.02	1.00			
ER	-0.06	-0.04	-0.02	0.03	-0.10	-0.04	-0.16	-0.03	0.01	0.04	0.00	0.06	0.04	-0.18	1.00		
IR	-0.06	0.03	0.07	0.01	-0.02	0.01	-0.06	-0.04	0.00	0.00	-0.11	0.12	-0.08	-0.22	0.13	1.00	
GDP	0.28	0.00	0.01	0.03	0.11	0.09	0.15	-0.02	0.00	0.03	0.03	0.00	0.00	0.13	-0.35	0.18	1.00

B. Empirical Findings

In this section, we discuss results obtained by estimating Equations (1) – (6). We begin by discussing results from Table 4. First, by estimating Equation (1), we examine the impact of *FO* on stock performance, proxied using five variables, namely *ROA*, *ROE*, *PER*, *Tobin's Q*, and *EPS*. We document that FO has a positive and statistically significant effect on three out of five proxies of stock performance, namely *ROA*, *PER*, and *EPS*. In the case of the remaining two stock performance proxies (namely, *ROE*, and *Tobin's Q*), *FO* is found to be statistically insignificant. Our findings are consistent with Kim *et al*., (2019) and Alquist *et al*., (2019), where they also document that foreign investment enhances stock performance.

Table 4.
Relationship between Foreign Ownership, Stock Performance, and Stock Risk

In this table, we examine the relationship between stock performance and foreign investment (*FO*) as well as between stock risk and *FO*. We use five proxies to measure stock performance, namely *ROA*, *ROE*, *PER*, *Tobin's Q*, and *EPS* and three proxies for stock risk, namely *Z-score*, *SDROA*, and *SDROE*. To examine the relationship between stock performance and *FO*, we estimate the following two models:

Model 1: $Perf_{i,t} = \alpha_{o,} + \beta_1 Perf_{i,t-1} + \beta_2 FO_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + e^{Perf}_{i,t}$;

Model 2: $FO_{i,t} = \alpha_1 + \beta_1 FO_{i,t-1} + \beta_2 Perf_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + e_{i,t}^{FO}$ and report these results in Panel A. Additionally, to examine the relationship between stock risk and *FO*, we estimate the following two models:

Model 3: $Risk_{i,t} = \alpha_{i,t} + \beta_1 Risk_{i,t-1} + \beta_2 FO_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + \varepsilon^{Risk}_{i,t}$;

Model 4: $FO_{i,t} = \alpha_{i,t} + \beta_1 FO_{i,t-1} + \beta_2 Risk_{i,t} + \beta_3 Size_{i,t-1} + \beta_4 Lev_{i,t-1} + \beta_5 TO_{i,t-1} + \beta_6 PBV_{i,t-1} + \beta_7 Age_{i,t-1} + \beta_8 ER_{j,t-1} + \beta_9 IR_{j,t-1} + \beta_{10} GDP_{j,t-1} + \varepsilon_{i,t}^{FO}$ and report results in Panel B. All variables are defined in Table 1. Lastly, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	ROA	*ROE*	*PER*	*Tobin's Q*	*EPS*
Panel A: Stock performance and FO					
Model 1	0.14**	-0.03	0.31**	-0.01	0.14**
	(0.05)	(0.17)	(0.15)	(0.01)	(0.07)
Obs.	16,920	16,867	11,255	17,238	16,252
Panel B: FO					
Model 2	1.76***	0.62***	-1.10***	1.61*	1.41**
	(0.40)	(0.11)	(0.40)	(0.95)	(0.70)
Obs.	16,876	16,857	13,512	17,193	16,603
	Z-score		***SDROA***	***SDROE***	
Panel C: Stock risk and FO					
Model 3	0.04*		0.02	0.15	
	(0.02)		(0.02)	(0.11)	
Obs.	16,920		12,155	12,038	
Panel D: FO					
Model 4	-0.29		-2.03	0.58***	
	(0.41)		(1.84)	(0.21)	
Obs.	16,876		12,679	12,567	

Second, using Equation (2), we examine the impact of stock performance on *FO*. We find strong evidence in support of the positive and statistically significant effect of stock performance (proxied using *ROA*, *ROE*, *Tobin's Q*, and *EPS*) on *FO*. The only exception is *PER*, which is found to have a negative and statistically

significant effect on *FO*. It should be noted that a higher *PER* value means an expensive price (overweight) for foreign investors to invest which explains the negative relationship between *PER* and *FO*. Thus, these findings support the argument provided by Liu and Hsu (2014), that better stock performance attracts foreign investors.

Third, we read results from Equation (3), which examines the impact of *FO* on stock risk. We use three measures, namely *Z-score*, *SDROA*, and *SDROE* for stock risk. We document that *FO* has a statistically significant and positive effect on one out of three stock risk measures, namely *Z-score*. For the remaining two risk measures, we find statistically insignificant results. According to Altman (1968), a higher *Z-score* value (>3.00) means a low probability for a firm to default, and therefore, our findings indicate that increase in *FO* will reduce the chances of firms to default.

Finally, we estimate Equation (4) to examine the impact of stock risk on *FO*. Our results indicate an increase in stock risk, proxied using *SDROE*, will significantly increase *FO*. Our findings corroborate the argument provided by Nguyen (2012) and Vo (2016), where they state that foreign investors are risk taking investors and, therefore, they would choose to invest in stocks with higher risk to obtain a higher return.

Additionally, we conduct a similar analysis using country-specific data and report these results in Table 5. We estimate Equations (1) to (4) for panel of firms in each of the six ASEAN countries. We begin by discussing results from Panel A. Our results suggest that *FO* has a negative association with *PER* (Indonesia), *Tobin's Q* (Thailand). The positive relationship between *FO* and stock performance is only evidenced in the case of Indonesia (*ROA* and *EPS*) and Malaysia (*PER*). There are also some cases where we find the unidirectional relationship between *FO* and stock performance variables. For instance, in the case of Malaysia *FO* has a statistically significant and negative effect on *PER* and *ROA* while *Tobins Q* and *EPS* have a positive and statistically significant effect on *FO* Similarly, *PER* is found to have a negative and statistically significant effect on *FO* in the case of the Philippines and Vietnam.

Table 5.
Country-Spesific Results

In this table, we report results for a panel of firms in each country. Our approach is the same as explained in Table 4. We report results for the relationship between stock performance and *FO* in Panels A B, we report results for the relationship between *FO* and stock risk. Lastly, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	ROA	*ROE*	*PER*	*Tobin's Q*	*EPS*		*Z-score*	*SDROA*	*SDROE*
Panel A: FO and stock performance						**Panel B: FO and risk**			
Indonesia									
Model 1	0.16**	0.04	-0.45**	0.01	0.40**	Model 3	-0.03	0.05**	0.47***
	(0.07)	(0.21)	(0.19)	(0.04)	(0.19)		(0.02)	(0.02)	(0.14)
Model 2	0.54*	-0.06	-0.21***	0.34	0.25*	Model 4	-1.82	4.75**	0.73***
	(0.33)	(0.08)	(0.08)	(0.99)	(0.14)		(1.13)	(2.30)	(0.22)

Table 5.
Country-Spesific Results (Continued)

	ROA	*ROE*	*PER*	*Tobin's Q*	*EPS*		*Z-score*	*SDROA*	*SDROE*
	Panel A: FO and stock performance						**Panel B: FO and risk**		
					Malaysia				
Model 1	0.06	-0.12	0.59*	-0.01	0.00	Model 3	-0.01	0.01	0.14
	(0.06)	(0.13)	(0.33)	(0.00)	(0.00)		(0.01)	(0.02)	(0.10)
Model 2	0.79***	0.04	0.24	1.94***	8.11**	Model 4	0.21	-3.58**	-0.97
	(0.29)	(0.07)	(0.16)	(0.49)	(7.24)		(0.22)	(1.71)	(0.64)
					Philippines				
Model 1	0.22	0.12	0.63	-0.01	0.00	Model 3	0.04	-0.11*	-0.46***
	(0.15)	(0.32)	(0.76)	(0.02)	(0.00)		(0.05)	(0.07)	(0.12)
Model 2	0.98	0.51**	-0.29**	-0.50	7.18	Model 4	-2.10*	-2.08*	-1.29*
	(0.79)	(0.24)	(0.12)	(2.17)	(6.80)		(1.26)	(1.17)	(0.73)
					Thailand				
Model 1	-0.01	-0.17**	-0.36	-0.03***	-0.01	Model 3	-0.01	-0.03***	-0.04
	(0.03)	(0.08)	(0.25)	(0.01)	(0.01)		(0.01)	(0.01)	(0.03)
Model 2	0.47	0.27*	-0.07	-3.28***	-6.83	Model 4	-0.43	-17.94***	-2.95***
	(0.47)	(0.16)	(0.07)	(1.23)	7.08)		(0.33)	(4.54)	(0.74)
					Vietnam				
Model 1	0.00	-0.20	-0.16	-0.00	0.00	Model 3	0.04**	-0.02	-0.06
	(0.04)	(0.14)	(0.21)	(0.00)	(0.00)		(0.02)	(0.02)	(0.06)
Model 2	-1.00	0.08	-0.15***	-1.26	-46.39	Model 4	0.82	-0.09	-0.32**
	(1.06)	(0.12)	(0.06)	(1.74)	(47.46)		(0.65)	(0.51)	(0.15)

Furthermore, we report results for the relationship between *FO* and stock risk in Panel B for six ASEAN countries. In the case of Indonesia, *FO* and stock risk (measured using *SDROA* and *SDROE*) are statistically significant and have a positive relationship, whereas in the case of the Philippines, the relationship is found to be negative and statistically significant. With respect to the *Z-score*, we find weak significant evidence in the case of all countries, except in Vietnam and the Philippines. In the case of Malaysia, we find a statistically significant and negative unidirectional relationship from *SDROA* to *FO*. Overall, we conclude that the relationship between *FO* and stock performance and *FO* and stock risk is country dependent, and also the direction of the causality is dependent on the choice of proxies used for stock performance and stock risk in specific countries.

Next, we read results from Table 6. Here, we examine the impact of *FO* on three macroeconomic variables (namely *ER*, *IR*, and *GDP*), and vice versa. More specifically, we estimate Equation (5) to examine the impact of *FO* on *ER*, *IR*, and *GDP*, while Equation (6) is estimated to examine the impact of *ER*, *IR*, and *GDP* on *FO*. Also, it is worth noting that we have now conducted these analyses using data at the country level. We report results for panels of stocks in six ASEAN countries, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. We begin by reading results from Panel A, where we report the relationship between *FO* and *ER* of six ASEAN countries. We find that the relationship between *FO* and *ER* is statistically significant and negative in the case of Malaysia and Thailand. In other words, we find a bi-directional negative relationship between *FO* and

ER, Additionally, the relationship between *FO* and *ER* is found to be statistically significant and positive in the case of Vietnam while it is found to be statistically insignificant in the case of Indonesia, the Philippines, and Singapore. Our findings are not surprising as the prior literature also finds mixed evidence with respect to the relationship between *FO* and *ER* (see, inter alia Kim and Singal, 2000; Lee and Ryu, 2019; Xie *et al*., 2019).

Table 6.
Relationship between Foreign Ownership and Macroeconomic Variables

In this table, we report results for the relationship between macroeconomic variables (namely, *ER*, *IR*, and *GDP*) and *FO* in each of the six ASEAN countries considered in this study. More specifically, we estimate following two equations: $Macro_{j,t} = \alpha_{i,t} + \beta_1 Macro_{i,t-1} + \beta_2 FO_{i,t} + \sigma_{i,t}^{Macro}$ and $FO_{i,t} = \alpha_{i,t} + \beta_1 FO_{i,t-1} + \beta_2 Macro_{j,t} + \sigma_{i,t}^{FO}$. *FO* or foreign ownership (%) is the percentage for each stock in each country owned by foreign investors based on their country classification as in the Osiris Database. Ex Rate or exchange rate is the macroeconomic variable in USD vis-à-vis the local currency. Interest Rate is the rate of interest from central banks. Ln. GDP is the natural logarithm of gross domestic product. Exchange rate, interest rate, and GDP are obtained from the World Bank Open access database. Observations are the number of observations. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Dependent Variable	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Panel A: Causality between FO and ER						
ER	-0.00	-0.00***	0.00	-0.00	-0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FO	-0.84	-61.14***	1.47	-3.50	-6.88***	17.71***
	(2.66)	(3.85)	(4.55)	(2.32)	(4.68)	(1.52)
Obs.	5,928	7,998	2,508	7,543	7,707	6,549
R-squared	0.00	0.03	0.00	0.00	0.01	0.02
Number of ID Firms	501	708	216	636	654	581
Panel B: Causality between FO and IR						
IR	-0.01***	0.00***	-0.00	-0.00***	-0.01***	-0.11***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FO	-5.59***	3.72***	-0.30	-21.32***	-6.71***	-0.99***
	(0.26)	(0.39)	(0.30)	(1.77)	(0.25)	(0.04)
Obs.	5,928	8,873	2,520	7,564	7,707	6,549
R-squared	0.08	0.01	0.00	0.02	0.09	0.11
Number of ID Firms	501	869	217	640	654	581
Panel C: Causality between FO and GDP						
GDP	0.00***	0.00***	0.00***	0.00***	0.01***	0.01***
	(0.000)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FO	26.54***	10.54***	5.97***	22.39***	29.41***	10.87***
	(0.99)	(0.63)	(1.15)	(0.91)	(0.82)	(0.33)
Obs.	5,928	8,873	2,520	7,564	7,71	6,55
R-squared	0.12	0.03	0.01	0.08	0.16	0.16
Number of ID Firms	501	869	217	640	654	581

Now we turn to results reported in Panel B. Here, we report results for the relationship examined between *FO* and *IR*. We find negative and statistically significant bi-directional causality between *FO* and *IR* in the case of Indonesia, Singapore, Thailand, and Vietnam. In the case of Malaysia, the relationship between *FO* and *IR* is found to be positive and statistically significant while for the Philippines we find statistically insignificant results. Our findings suggest that foreign ownership mostly leads to a lower interest rate in the ASEAN countries because foreign investors may demand a lower interest rate to improve the stock price. This condition generates a higher profit for the foreign investor. Our findings are consistent with Peranginangin *et al*. (2016), who find that a lower interest rate increases market liquidity and ultimately the stock price.

Finally, we examine the relationship between *FO* and GDP and report results in Panel C. We document the positive and statistically significant bi-directional relationship between *FO* and *GDP* in the case of all six ASEAN countries. In other words, an increase in *FO* leads to an increase *GDP*, and vice versa, for all six ASEAN countries. Our findings are consistent with Hsiao & Hsiao (2006) and Alquist *et al*. (2019).

C. Robustness Tests

To examine the robustness of our findings, we first stratify the sample into the Global Financial Crisis (GFC) period (2007-2010) and the post-GFC period (2011-2018). These results are reported in Panel A of Table 7. We note that during the crisis period, statistically significant and positive bidirectional causality is found between *FO* and *ROA*. On the other hand, the positive and statistically significant association between *FO* and *Tobin's Q* and *FO* and *PER* is found during the post-crisis period. Additionally, we also note that there exists a significant unidirectional relationship from *ROE* to *FO* irrespective of the crisis periods considered.

Next, when we consider the relationship between *FO* and stock, we find a statistically significant and positive bidirectional relationship between *FO* and *Z-score* during the crisis period, however, during the post-crisis period, the positive causality runs from *Z-score* to *FO*. In addition, we also note that there exists a statistically significant and positive unidirectional causality from *SDROA* and *SDROE* to *FO* during post-crisis period.

Overall, our robustness check findings imply that an increase in foreign investors enhances stock performance during both crisis and post-crisis periods. Furthermore, the higher performance also attracts foreign investors to invest in the ASEAN countries during both crisis and post-crisis periods. Additionally, we also note that an increase in foreign ownership will reduce equity risk during the crisis period. Our findings are consistent with Batten and Vo (2015), who show that foreign investment preferences help resolve problems due to asymmetric information during a crisis period. As a result, any risks associated with stocks decline. Thus, the risk during the crisis period had a positive impact on foreign ownership but had the opposite effect in the post-crisis period.

Table 7.
Robustness Check

In this table, we report robustness check results. Here, we divide our sample data into the global financial crisis and post-crisis periods. Our estimation models are explained in Table 4. Lastly, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	ROA		*ROE*		*PER*		*Tobin's Q*		*EPS*	
	Crisis	**Post-crisis**	**Crisis**	**Post-crisis**	**Crisis**	**Post-crisis**	**Crisis**	**Post-crisis**	**Crisis**	**Post-crisis**
					Panel A: Stock performance and FO					
Model 1	0.46***	0.04	0.43	0.09	0.10	0.27*	0.01	0.01***	-0.00	-0.00
	(0.17)	(0.03)	(0.55)	(0.12)	(0.37)	(0.14)	(0.01)	(0.00)	(0.00)	(0.01)
					Panel B: FO					
Model 2	0.96***	0.14	0.42***	0.40***	0.04	0.46***	2.64*	5.73***	7.25	0.20
	(0.26)	(0.15)	(0.12)	(0.10)	(0.07)	(0.14)	(1.48)	(1.76)	(6.80)	(0.15)
	Z-score			*SDROA*			*SDROE*			
	Crisis		**Post-crisis**	**Crisis**		**Post-crisis**	**Crisis**		**Post-crisis**	
					Panel C: Stock risk and FO					
Model 3	0.15*		0.01	-0.02		0.02	-0.14*		0.04	
	(0.09)		(0.01)	(0.02)		(0.01)	(0.08)		(0.04)	
					Panel D: FO					
Model 4	1.15*		-1.43***	0.22		6.06***	0.12		1.58***	
	(0.64)		(0.49)	(0.90)		(1.59)	(0.16)		(0.49)	

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IV. CONCLUSION

This study examines the relationship between foreign ownership and stock performance and between foreign ownership and stock risk. Our hypothesis is that foreign ownership influences both stock performance and stock risk. We use stock level data for a panel of six ASEAN countries (Indonesia, Vietnam, Thailand, Singapore, Malaysia, and Philippines) over the period 2007 to 2018.

Using a GMM estimation approach, we find that foreign ownership has a positive relation with both stock performance and stock risk. However, it is important to note that the direction of causality between foreign ownership and stock performance-risk is dependent on the choice of different proxies. Therefore, overall, we conclude that we find mixed evidence with respect to the direction of causality between the variables considered in the study.

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