

Foreign and domestic ownership as the mediator Between investment strategy and company performance

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Abstract

The study aims to examine the moderating effect of the ownership structure on the relationship between investment strategy and the comprehensive firm performance in ASEAN. Using data from financial reports and sustainability reports, the samples are 34 nonfinancial companies in ASEAN 2007 until 2019. The sample testing method is unbalanced panel data regression to test hypothesis. The results show foreign and domestic ownership moderate the relationship between investment strategy and productivity and financial performance. This research also proves that foreign and domestic ownership cannot form the relationship between investment strategy and environmental performance. This study gives additional evidence as confirmation of the theory of Industrial Organization about the implementation of the corporate strategy is influenced by external factors, namely the role of foreign ownership in improving corporate performance. This study gives new insight to the company about the importance of considering the investment strategy based on R&D and the role of foreign and domestic ownership to increase productivity, financial performance and environmental performance.

Keywords: *ownership, investment strategy, comprehensive firm performance, industrial organization.*

Abstrak

Penelitian ini bertujuan untuk menguji pengaruh mediasi struktur kepemilikan perusahaan pada hubungan strategi investasi dan kinerja komprehensif perusahaan di ASEAN. Studi ini merupakan studi empiris yang menggunakan data laporan keuangan dan sustainability report. Sampel merupakan 34 perusahaan nonkeuangan di ASEAN tahun 2007 sampai dengan 2019. Metode pengujian sampel adalah unbalanced panel data regression untuk menguji pengaruh mediasi struktur kepemilikan pada hubungan strategi investasi dan kinerja komprehensif perusahaan yang terdiri dari kinerja keuangan, productivity, dan environmental performance. Hasil penelitian menunjukkan foreign ownership dan domestik memediasi hubungan antara strategi investasi dengan productivity dan kinerja keuangan. Secara khusus, pengaruh mediasi kepemilikan domestik lebih besar dibanding pengaruh mediasi foreign

ownership. Selain itu, foreign ownership dan domestik tidak dapat memediasi hubungan antara strategi investasi dan environmental performance. Penelitian ini memberikan konfirmasi terhadap teori Industrial Organization tentang penerapan strategi perusahaan yang dipengaruhi oleh faktor eksternal yaitu peran dari foreign ownership dalam meningkatkan firm performance. Studi ini memberikan wawasan baru kepada perusahaan tentang pentingnya mempertimbangkan strategi investasi berbasis R&D dan peran foreign ownership dan domestik untuk meningkatkan productivity, kinerja keuangan dan environmental performance.

Kata Kunci: *struktur kepemilikan, strategi investasi, kinerja komprehensif perusahaan, industrial organization*

Introduction

The investment strategy is one of the company's strategies that can increase competitive advantage, because it involves technological and innovation factors which support the progress and improvement of a company's performance in long term. Investment strategies are mostly used by companies from developed countries. Thus far, the investment strategy has been used by companies in developing countries. One way to implement this strategy is to open up opportunities for foreign investors who have more experience and knowledge. Studies on investment strategies and company performance have been carried out in many countries such as China, Korea, Turkey, America, Europe, Vietnam, Estonia, Hungary, Czech Republic, Slovakia, Lithuania, Poland, Latvia, Slovenia, India, England, Italy, and Taiwan (Hlavacek & Bal-domanska, 2016).

Investment strategies generally use measurements of R&D investment (David, Yoshikawa, Chari, & Rasheed, 2006), IT investment (Chae, Koh, & Park et al., 2018), and sustainability investment (Tseng, Tan, Jeng, Lin, Negash, Nur, & Cokro, 2019). Several studies that have tested the role of investment strategy as measured using R&D investment on performance including Kim (2015); Cincera, Ravet, & Veugelers (2015); Jaisinghani (2016); Ruiqi, Wang, Xu, & Yuan (2017); Yoo, Lee, & Sambock (2019); Park & Lee (2019); and Kancs & Siliverstovs (2016) found that R&D investment can improve company performance.

The use of interaction variables such as ownership structure on the relationship between investment strategy and company performance has been carried out in previous studies, for example Ulku & Teoman (2015) found that foreign ownership and licensed technology were able to improve financial performance, export levels and productivity in terms of technological capabilities of companies in Turkey. Ug & Park (2018) presented that R&D intensity is positively related to foreign ownership whose parent originates from developing countries. Vithessonthi & Racela (2015) noticed that internationalization was able to moderate the relationship between R&D intensity and company performance in America. Chen, Hua, & Boateng (2016) observed that foreign acquisitions were able to increase the productivity and R&D investment of companies in China. Bond & Guceri (2017) found that the existence of R&D can increase company productivity in the UK. Schiffbauer, Siedschlag, & Ruane

(2017) discovered that there was a positive effect of foreign investment on labor productivity in UK firms.

In contrast to Vithessonthi & Racela (2015) who found that R&D investment actually had a negative effect on company performance, Lindemanis, Loze, & Pajuste (2019) observed that in the short term a change in ownership of a private company in the UK has a positive effect on sales growth but lower return on assets, while in the long term a change in ownership is positively related to productivity (sales per employee and asset turnover). Likewise, Wang & Wang (2015) showed that there is no difference in productivity gains in foreign and domestic companies acquired in China, even Likitwongkajon & Vithessonthi (2020) who studied that foreign investment is negatively related to company performance in Japan both in the short and long term. Foreign investment seems to reduce revenue growth and has no effect on companies. In addition, Curtis, McVay, & Toynbee (2020) discovered that R&D investment has reduced the future profitability of American companies although in the short term it can increase profitability steadily but at a low level. The discrepancy in the results of this study raises important questions regarding the role of R&D investment and ownership structure for the company's prospects which need to be analyzed further.

The current corporate paradigm is not only implementing a business strategy to increase economic benefits (productivity and financial performance), but also needing to prioritize sustainability activities such as environmental performance as a form of accountability to both shareholders and the general public (Alipour, Ghanbari, Jamshidinavid, & Taherabadi, 2019; Burhanudin & Ferguson, 2018; Chariri, Nasir, Januarti, & Daljono, 2019; Das, Rangarajan, & Dutta, 2020; Gaur, Ghosh, & Zheng, 2019; Warriors, 2018; Luo, Qian, & Ren, 2015). Environmental performance is important to consider because the impact is not only for investors but also for the general public (El-Kassar & Singh, 2019; Singh, Giudice, Del, Chierici, & Graziano, 2020). Until now, there are few studies on the role of investment strategy on environmental performance, so it needs attention for further study. Several studies that have been conducted including Luan, Tien, & Chen (2016); Liu & Lin (2019); Alam, Atif, Chien-Chi, & Soytaş (2019) they found that companies which implement investment strategies are able to improve environmental performance and will be greater if the company has international scale activities.

The results that are still inconsistent between research with each other and the lack of studies involving environmental performance in the research model motivate researchers to carry out further testing of investment strategies on performance by offering a new model, namely a mediation model that involves the company's ownership structure. In contrast to previous studies, this study tries to compare the mediating effect of foreign and domestic ownership on the relationship between investment strategy and productivity, financial performance, and environmental performance.

This study was conducted on companies in ASEAN where ASEAN countries have emerged as areas of high economic growth compared to other countries in the world and are currently considered the most successful organizations in developing countries. For this reason, it is necessary to carry out further analysis on how the role of investment strategy and ownership has

on company performance in the ASEAN context (Do, Patel, Budhwar, Katou, Arora, & Dao, 2019). Previous studies have used a lot of performance variables with proxies of profitability, innovation, sustainability and growth. In contrast to previous studies, this study uses productivity variables with more specific input and output factors, financial performance, and overall environmental performance in the test. The use of foreign ownership and domestic ownership variables has been used in previous studies but separately, by that this study tries to use the two ownership structures to compare simultaneously the resulting effect on the relationship between investment strategy and company performance.

Viewed from the perspective of the Industrial Organization /IO (Porter, 1981), Industrial Organization Theory (IO) paradigm is a company which is able to place a position in a marketplace that has certain industrial characteristics in which the company competes. IO is a theory that explains how a company's performance is not only influenced by internal factors, but external factors are also important to consider. IO focuses more on competition-based economic conditions which means that all companies have similarities in the industry except in terms of the strategies applied where the strategy can be determined by external factors, one of which is through foreign ownership.

Collis & Montgomery (1995) explained that understanding how the strategy can be a source of company advantage and success can be very difficult in practice, because the success of a company cannot be measured only by internal factors, therefore in implementing the relationship between investment strategies and the company's performance still needs to be tested broader. This is also based on the inconsistency of results found in several studies such as Vithessonthi & Racela (2015), Wang & Wang (2015), and Likitwongkajon & Vithessonthi (2020). The success of a company does not only rely on internal factors but it is very substantial to study external factors such as opening up foreign investment opportunities as supporters which are expected to improve the company's ability facing competition.

The concept from the IO perspective tends to explore how the relationship between each company and other companies produces industry outcomes, this can be signified that a company will have a competitive advantage in the industry if it has an extensive business network with other companies or opens the door for investment from abroad which has its own uniqueness and special advantages to support each other. Schiffbauer et al. (2017) stated that IO offers a more complex insight into the role of foreign ownership on firm performance. Foreign ownership is expected to have a greater economic impact. Besides, foreign ownership can have an impact on long-term productivity because it has a wider scope of knowledge and the effects of competition.

H1: Foreign ownership mediates the effect of investment strategy on productivity.

The equation model for the first hypothesis is:

$$\widehat{FOREIGN}_{it} = \hat{\alpha}_1 + \hat{\beta}_1 INVEST_{it} + \varepsilon_{1it} \quad (1)$$

$$PROD_{it} = \alpha_2 + \beta_2 INVEST_{it} + \beta_3 \widehat{FOREIGN}_{it} + \sum_{j=4}^9 \beta_j Control_{it} + \varepsilon_{2it} \quad (2)$$

Studies that have examined the relationship between investment strategy and firm performance, such as, Morbey & Reithner (1990) explained that there

is a strong direct relationship between R&D intensity and future sales growth and productivity, but R&D intensity has no effect on future profit margins. Dowling, Mcgee, Mcgee (1994) and Jaisinghani (2016) stated that innovation investment through R&D investment is associated with higher financial performance besides that there is a significant interaction effect between R&D investment and cost leadership strategy on operating performance. Kim (2015) found that R&D investment was able to reduce fluctuations in future economic benefits such as financial performance and sales. Cincera et al. (2015) R&D said that investment from innovative companies has an effect on increasing cash flow.

Ruiqi et al. (2017) told that R&D expenditures have a positive effect on the future financial performance of companies in China. Future performance related to R&D for state-owned companies is better than non-state-owned enterprises. Yoo et al. (2019) R&D expenditures at the mature stage have a positive effect on future performance but produce an insignificant effect on sustainable growth. Park & Lee (2019) companies with consistent R&D investment show higher growth. Studies that examine the relationship between investment strategy and environmental performance have been carried out by Luan et al. (2016); Liu & Lin (2019); Alam et al. (2019) they discovered that companies which implement investment strategies are able to improve environmental performance and will be larger if the company has international scale activities. The investment strategy which is oriented towards knowledge and innovation that continues to develop and the support can be obtained from company colleagues or investors from other countries.

H2: Foreign ownership mediates the effect of investment strategy on financial performance.

The equation model for the second hypothesis is:

$$FIN_{it} = \alpha_3 + \beta_{10}INVEST_{it} + \beta_{11}FOREIGN_{it} + \sum_{j=12}^{17} \beta_j Control_{it} + \epsilon_{3it} \quad (3)$$

Based on IO where the relationship between investment strategy and company performance can be influenced by external factors, this study focuses on the use of the ownership variable as an external variable that can affect the relationship between R&D investment and company performance. Several studies that have discussed the relationship between these variables include David et al. (2006) which stated that foreign ownership increases strategic investment (in R&D and capital intensity) to a greater extent when the company has growth opportunities, aside from that foreign ownership is able to encourage investment strategy in accordance with the competitive conditions faced.

H3: Foreign ownership mediates the effect of investment strategy on environmental performance.

The equation model for the third hypothesis is:

$$ENV_{it} = \alpha_4 + \beta_{18}INVEST_{it} + \beta_{19}FOREIGN_{it} + \sum_{j=20}^{25} \beta_j Control_{it} + \epsilon_{4it} \quad (4)$$

Phung & Mishra (2015), Girma, Gong, Görg, & Lancheros (2015), Foreign ownership has a positive effect on export market opportunities. Foreign acquisitions also have a positive effect on R&D investment and those are greater than non-foreign ownership. Lindemanis et al. (2019) in their research

stated that for the short term foreign ownership-dominated companies have an effect on higher sales growth but lower profitability, while for the long term foreign ownership is positively related to productivity (sales per employee and asset turnover). Bentivogli & Mirenda (2017) and Setiawan, Bandi, Kee Phua, & Trinugroho (2016) found that there was an increase in size, profitability, financial soundness, and dividend-paying ability for companies with higher levels of foreign ownership. Ulku & Teoman (2015) and Bond & Gucer (2017) exposed that foreign ownership and licensed technology can improve financial performance, export levels and company productivity. Ug & Park (2018), Chen et al. (2016), and Schiffbauer et al. (2017) discovered that foreign ownership has a positive relationship to R&D intensity.

H4: Domestic ownership mediates the effect of investment strategy on productivity.

The equation model for the fourth hypothesis is:

$$\widehat{DOMESTIC}_{it} = \hat{\alpha}_5 + \hat{\beta}_{26} INVEST_{it} + \epsilon_{5it} \quad (5)$$

$$PROD_{it} = \alpha_6 + \beta_{27} INVEST_{it} + \beta_{28} \widehat{DOMESTIC}_{it} + \sum_{j=29}^{33} \beta_j Control_{it} + \epsilon_{6it} \quad (6)$$

Vithessonthi & Racela (2015) found that internationalization was able to moderate the relationship between R&D intensity and firm performance. Foreign ownership is able to strengthen the relationship between investment strategy and company performance because foreign ownership is considered as one of the external factors that support in increasing capabilities and knowledge, especially research and development companies. Vithessonthi & Racela (2015) explained that R&D intensity has a negative effect on operating performance but has a positive effect when interacted with internationalization. Wang & Wang (2015) confirmed that there was no significant difference in productivity gains between foreign and domestic acquired companies. Foreign ownership significantly improves the financial condition and exports of Chinese companies compared to domestically acquired companies. Previous studies that have been described show that the relationship between investment strategy, foreign ownership, and firm performance looks like a puzzle whose tests are still separate in each study and it has not been seen explicitly what the role of ownership structure is in influencing the relationship of investment strategy to productivity, financial performance and environmental performance. environmental performance, so that this study develops a hypothesis to test the relationship between these variables as a whole.

H5: Domestic ownership mediates the effect of investment strategy on financial performance.

The equation model for the fifth hypothesis is:

$$FIN_{it} = \alpha_7 + \beta_{34} INVEST_{it} + \beta_{35} \widehat{DOMESTIC}_{it} + \sum_{j=36}^{41} \beta_j Control_{it} + \epsilon_{7it} \quad (7)$$

In addition to foreign ownership, there are also studies which found that both foreign and domestic ownership structures have no difference in influencing the relationship of R&D investment to company performance, for example, Vithessonthi & Racela (2015), Lindemanis et al. (2019) who stated that in short term changes of ownership in private companies in the UK have a positive effect on sales growth, but lower profit margins on assets; while for the long term change of ownership is positively related to (sales per employee and

asset turnover) as well as Wang & Wang (2015) showed that there is no difference in productivity increase in companies foreign and domestic acquisitions, even Likitwongkajon & Vithessonthi (2020) and Roy & Narayanan (2019) studied that foreign investment is negatively related to the performance of companies in Japan in both the short and long term, besides that foreign investment has an impact on the decline in the company's revenue growth. Based on the findings from previous studies which found that foreign and domestic ownership had no difference in influencing company performance, there was even a study that found that foreign ownership actually had a negative effect on company performance.

H6: Domestic ownership mediates the effect of investment strategy on environmental performance.

The equation model for the sixth hypothesis is:

$$ENV_{it} = \alpha_8 + \beta_{42} INVEST_{it} + \beta_{43} DOMESTIC_{it} + \sum_{j=44}^{49} \beta_j Control_{it} + \varepsilon_{8it} \quad (8)$$

Research Methods

The sample of this research was non-financial companies in ASEAN for the period 2007 – 2019. All data were obtained from the Osiris database. The research sample was a company with certain criteria as needed in the test. The company data available in the osiris database were 4892 companies, but there were only 34 companies that meet the criteria, especially companies that had R&D data and Sustainability Reports. After collecting data from 34 companies included in the criteria, varied data were obtained, namely in each company having data with different years so that unbalanced panel data was obtained and the final sample obtained for testing was 141 observations. Productivity, financial performance, and environmental performance are the dependent variables in this study. As shown in Table 1, Productivity (PROD) is calculated using output divided by input. Output consists of net sales, net profit margin, R&D asset, and Input consists of Fixed asset, Cost of sales, Payroll & labor related expenses, R&D expense. Financial performance (FIN) uses Return on Assets (ROA) measurement, and environmental performance uses a ratio of comparison of the number of disclosures on environmental performance divided by the number of disclosures according to GRI Standards.

As shown in table 1, the main independent variable used in this study is investment strategy (INVEST) which is measured using R&D expense plus R&D asset it then divided by total asset. The next independent variable is foreign ownership (FOREIGN) and domestic ownership (DOMESTIC) measured using the percentage of each ownership. For the control variable using AGE, namely the natural logarithm of the number of ages since the company was founded until the end of the research period, SIZE is the natural logarithm of market value of equity, CFO to total assets_{t-1}, Leverage is debt to total assets, Sales growth, namely Sales minus Sales_{t-1} then divided by Sales_{t-1}, and Industry dummy using the two leading digits of the US SIC Code.

This study used a mediation model that examined the mediating effect of ownership structure on the relationship between investment strategy and the company's comprehensive performance. The regression model used the 2SLS regression model, namely in the first stage (first stage) the effect of exogenous variables on endogenous variables (in the form of mediating variables) is tested,

that was the effect of investment strategy on ownership structure consisting of foreign ownership (equation 1) and domestic ownership (equation 5). Then, the next test (second stage) was used to examine the mediating effect of foreign and domestic ownership structures on the relationship between investment strategy and the company's comprehensive performance. After testing, further analysis could be carried out to draw conclusions about the influence of the mediating variables that have been tested. Detailed analysis could be seen in the explanation of tables 5 and 8.

Table 1. Variable Measurement

Variable	Measurement	Source
Productivity (PROD _{it})	PROD _{it} : $\frac{\text{Output}}{\text{Input}}$ Input: Fixed asset _{it} , Cost of sales _{it} , Payroll & labor related expenses _{it} , R&D expense _{it} . Output: net sales _{it} , net profit margin _{it} , R&D asset _{it} .	Osiris
Financial performance (FIN _{it})	Return On Asset (ROA): $\frac{\text{EBIT}_{it}}{\text{Total Assets}_{it}}$	Osiris
Environmental performance (ENV _{it})	Each of 34 items related to environmental indicators takes a value of "1" if information on an item is disclosed, otherwise zero. The total scores range between 0 and 34 and are calculated in percentages : $\frac{\text{Total Disclose}}{\text{Standar Disclose}}$	Sustainability report
Investment strategy (INVEST _{it})	$\frac{\text{R\&D Expense}_{it} + \text{R\&D Assets}_{it}}{\text{Total Assets}_{it}}$	Osiris
Foreign ownership (FOREIGN _{it})	Percentage of foreign ownership	Osiris
Domestic ownership (DOMESTIC _{it})	Percentage of domestic ownership	Osiris
Age (AGE _{it})	Natural logarithm of number of years since firms established	Osiris
Size (SIZE _{it})	Natural logarithm of market value of equity (stock price x number of shares outstanding)	Osiris
CFO (CFO _{it})	$\frac{\text{CFO}_{it}}{\text{Total Assets}_{t-1}}$	Osiris
Leverage (LEV _{it})	$\frac{\text{Debt}_{it}}{\text{Total Assets}_{it}}$	Osiris
Sales growth (SALE _{it})	$\frac{\text{Sales}_{it} - \text{Sales}_{t-1}}{\text{Total Assets}_{t-1}}$	Osiris
Industry dummy (INDUSTRY _{it})	Two digit of US SIC CODE	Osiris

Result and Discussions

The descriptive statistics shown in table 2 present the characteristics of the data distribution of each variable. The average productivity value (PROD) of 59% indicates that the company is quite productive, although there are several

companies that have low productivity (0.00). The average financial performance (FIN) is 6.6% with a maximum value of 60%, this explains that there are companies that have a fairly high financial performance, but on average for all companies still have a fairly low financial performance. The average environmental performance of 39% indicates that the disclosure of environmental performance is still low even though there are several companies that have quite a lot of environmental disclosure. The average investment strategy (INVEST) of 17% of total assets with a minimum value of 0.00% and a maximum of 29% means that the investment made by the company is still quite low in terms of research and development. The average foreign ownership is 20% and domestic ownership is 80%, meaning that the companies that are the sample of the research as a whole are still dominated by domestic ownership.

Table 2. Descriptive statistic

Variable	Obs.	Minimum	Mean	Max	Std. Dev
PROD	141	0.00	0.59	2.00	0.29
FIN	141	-0.39	0.06	0.60	124.00
ENV	141	0.03	0.39	1.00	0.26
INVEST	141	-0.06	0.01	0.29	0.04
FOREIGN	141	0.01	0.20	0.99	0.26
DOMESTIC	141	0.01	0.79	0.99	0.26
AGE	141	7.00	3.48	190.00	0.74
SIZE	141	8.00	14.48	24.00	3.00
CFO	141	-0.42	0.08	0.50	0.11
LEV	141	0.09	0.45	0.78	0.17
SALE	141	-0.01	0.00	0.02	0.00
INDUSTRY	141	1.00	26.19	65.00	18.85

The correlation test results show that the correlation coefficient between the main variables (PROD, FIN, ENV, INVEST, FOREIGN, DOMESTIC) is less than 50% (< 0.5). Variance inflation factors (VIFs) were calculated to test for the presence of significant multicollinearity between independent variables. The data in table 3 indicates that all tested variables have an average VIF of 2.59 and are above the tolerance value of 0.01, meaning that there is no multicollinearity problem for the interpretation of the test results.

Table 3. Variance inflation factor

Variable	VIF	1/VIF
INVEST	1.11	0.90
FOREIGN	1.17	0.85
DOMESTIC	14.15	0.07
AGE	1.04	0.96
SIZE	1.08	0.93
CFO	1.20	0.83
LEV	1.12	0.89
SALE	1.29	0.77
INDUSTRY	1.12	0.89
MEAN VIF	2.59	0.79

Initial testing using equation 1 is the first step of mediation testing, that is

the relationship between investment strategy (INVEST) and foreign ownership (FOREIGN). The test results shown in table 4 indicates that there is a significant relationship ($p < 0.01$) with a positive coefficient of 2.499 between investment strategy and foreign ownership, this means that the initial test supports the mediation testing process at the next stage, namely to see the mediating effect of foreign ownership on relationship between investment strategy and productivity.

Table 4. Relationship between investment strategy and foreign ownership

FOREIGN	Coef.	t	P>t	Prob > F
Cons	0.16	7.34	0.00	R-squared = 0.18
INVEST	2.49	5.69	0.00	Adj R-squared = 0.18

Notes: Using equation 1; Number of observations = 141; Variable measurement refer to table 1; ***significant at 1%; **significant at 5%; *significant at 10%

The data in table 4 shows that foreign ownership has a significant relationship ($p < 0.1$) with a positive coefficient (0.41) on productivity, aside there is no relationship between investment strategy and productivity. This means that foreign ownership fully mediates the relationship between investment strategy and productivity, so it can be concluded that H1 is accepted.

Table 5. Regression results (mediating effect of foreign ownership)

Variables	Productivity	Financial performance	Environmental performance
Const	-0.10(0.17)	-0.200(0.00)	-0.03(0.23)
INVEST	-0.02 (0.96)	0.260(0.48)	-0.27(0.84)
FOREIGN	0.41 (0.08)*	.040(0.02)**	0.47(0.34)
AGE	0.02 (0.45)	0.00(0.24)	0.06(0.43)
SIZE	0.00 (0.93)	0.01(0.00)***	-0.00(0.76)
CFO	.22 (0.15)	.62 (0.00)***	.23 (0.37)
LEV	-.09 (0.75)	-.03 (0.32)	-.07 (0.80)
SALE	6.89 (0.00)***	-1.41 (0.33)	1.85 (0.68)
INDUSTRY	.00 (0.23)	-.00 (0.62)	.00 (0.50)
R ²	0.25	0.78	0.03
Adjusted R ²	0.19	0.77	-0.04
F -statistics	4.33	38.17	0.39
p- value (F)	0.00	0.00	0.92

Notes: Using equation 2 to 4; Number of observations = 141; Variables measurement refer to table 1; ***significant at 1%; **significant at 5%; *significant at 10%

The data in table 5 determines that foreign ownership has a significant relationship (5%) with a positive coefficient (0.04) on financial performance, besides there is no relationship between investment strategy and financial performance. This signifies that foreign ownership fully mediates the relationship between investment strategy and financial performance, so it can be concluded that H2 is accepted.

The test results point out that neither foreign ownership nor investment strategy has a significant relationship to environmental performance, this

indicates that foreign ownership cannot mediate the relationship between investment strategy and environmental performance. It can be concluded that H3 is rejected.

The test results shown in table 6 present that there is a significant relationship (1%) between investment strategy and domestic ownership with a negative coefficient (- 2.499). this means supporting mediation testing at a later stage.

Table 6. Relationship between investment strategy and domestic ownership

DOMESTIC	Coef.	Std. Err.	t	P>t	F(1, 139)	= 32.33
INVEST	-2.49	0.43	-5.69	0.00	Prob > F	= 0.00
_cons	0.84	0.02	38.47	0.00	R-squared	= 0.18
					Adj R-squared	= 0.18

Notes: Using equation 5; Number of observations = 141; Variables measurement refer to table 1; ***significant at 1%; **significant at 5%; *significant at 10%

Table 6 shows that there is a significant relationship (5%) between domestic ownership and productivity with a negative coefficient (-0.42). In addition, there is no significant relationship between investment strategy and productivity. If the coefficient of the relationship between investment strategy and domestic ownership is integrated with the coefficient of the relationship between domestic ownership and productivity (-2.49 X -0.42), it will produce a positive mediating coefficient (1.07), this implies that domestic ownership fully mediates the relationship between investment strategy and productivity, thus it can be concluded that H4 is accepted.

Table 7. The Regression Results (Mediating effect of domestic ownership)

Variable	Productivity	Financial performance	Environmental performance
Const	-0.03 (0.13)	-0.15 (0.01)	-0.03 (0.23)
INVEST	-0.10 (0.84)	0.26 (0.48)	-0.26 (0.84)
DOMESTIC	-0.42 (0.04)**	-0.046 (0.02)**	-0.49 (0.33)
AGE	0.03 (0.30)	0.00 (0.24)	0.06 (0.43)
SIZE	0.01 (0.38)	0.01 (0.00)***	-0.00 (0.76)
CFO	0.38 (0.08)*	0.62 (0.00)***	0.23 (0.38)
LEV	0.39 (0.48)	-0.03 (0.32)	-0.08 (0.79)
SALE	7.04 (0.00)***	-1.41 (0.33)	1.88 (0.68)
INDUSTRY	0.00 (0.25)	-0.00 (0.62)	0.00 (0.50)
R ²	0.25	0.78	0.03
Adjusted R ²	0.19	0.77	-0.04
F-statistics	3.30	38.13	0.40
p-value (F)	0.00	0.00	0.91

Notes: Using equation 6 to 8; Number of observations = 141; Variables measurement refer to table 1; ***significant at 1%; **significant at 5%; *significant at 10%

Table 7 shows that there is a significant relationship (5%) between domestic ownership and financial performance with a negative coefficient (-0.46). Besides, there is no significant relationship between investment strategy and financial performance. If the coefficient of the relationship between investment strategy and domestic ownership is integrated with the coefficient of

the relationship between domestic ownership and financial performance (-2.49 X -0.04), it will produce a positive mediation coefficient (0.11), this means that domestic ownership fully mediates the relationship between investment strategy and financial performance, it can be concluded that H5 is accepted.

Table 8. Compare the mediating effect of foreign ownership and domestic ownership

Hypothesis	<i>t</i>	Sig.	Results
H1	-0.02	0.41*	<i>Accepted</i>
H2	0.26	0.04**	<i>Accepted</i>
H3	-0.27	0.47	<i>Not Accepted</i>
H4	-0.10	-0.42**	<i>Accepted</i>
H5	0.26	-0.04**	<i>Accepted</i>
H6	-0.26	-0.49	<i>Not Accepted</i>

*Notes: Using equation 5 to 8; Number of observations = 141; Variables measurement refer to table 1; ***significant at 1%; **significant at 5%; *significant at 10%*

The test results for the sixth hypothesis shown in table 7 define that investment strategy does not have a significant relationship to environmental performance, besides that domestic ownership also does not have a significant relationship to environmental performance, then it can be said that domestic ownership cannot mediate the relationship between investment strategy and environmental performance. It can be concluded that H6 is rejected.

The data in table 8 explains that the mediation coefficient of foreign ownership on the relationship between investment strategy and productivity (2.49 X 0.41) is (1.03) while the mediation coefficient of domestic ownership on the relationship between investment strategy and productivity (-2.49 X -0.42) is (1.07). This shows that the mediating effect of domestic ownership is more dominant than foreign ownership. The mediation coefficient for foreign ownership on the relationship between investment strategy and financial performance (2.49 X 0.04) is (0.11) while the mediation coefficient for domestic ownership on the relationship between investment strategy and financial performance (-2.49 X -0.04) is (1.07). This shows that the mediating effect of domestic ownership is more dominant than foreign ownership.

Conclusion

The results of this study prove that both foreign ownership and domestic ownership have a mediating effect on the relationship between investment strategy and financial performance and productivity. When viewed from the magnitude of the influence of the two mediating variables, domestic ownership has a greater mediating effect, this is a proof that the dominance of domestic ownership of companies in ASEAN has a better performance impact than foreign ownership. Additional insights generated are companies in ASEAN are quite confident with their resources and domestic ownership to improve company performance. However, both foreign ownership and domestic ownership are not able to mediate the relationship between investment strategy and environmental performance, this could be due to several reasons: first, because foreign ownership of companies in ASEAN is very small, so foreign investors do not have control over companies to improve environmental

performance in ASEAN in order to support the sustainability development goals; second, the possibility that foreign investors tend to be oriented towards financial benefits to increase the utility of their investments from an economic point of view; third, it is possible that domestic investors are still not aware of real sustainability activities even though the company has disclosed environmental performance as a manifestation of the sustainability development goals, but it could only be limited to fulfill the obligations of the rules set by the regulator.

The limitation of this study lies in the relatively small sample, since the availability of data, especially R&D and sustainability reports, is still very small for non-financial companies in ASEAN. For this reason, further research is expected to expand the scope of research areas in ASIA. This study provides several implications: first, theoretically confirms the IO theory about the implementation of corporate strategy which is influenced by external factors. Foreign ownership as an external context of IO theory can be used as a reference to support performance improvement, both productivity and financial performance; Second, practical contributions provide new insights to companies about the importance of considering R&D-based investment strategies and the role of foreign and domestic ownership in improving productivity, financial performance, and environmental performance. From a regulatory perspective, this research provides new insights for regulators regarding policies that emphasize companies to pay more attention to environmental performance.

References

- Alam, M. S., Atif, M., Chien-Chi, C., & Soytaş, U. (2019). Does corporate R&D investment affect firm environmental performance? Evidence from G-6 countries. *Energy Economics*, 78, 401–411. <https://doi.org/10.1016/j.eneco.2018.11.031>
- Alipour, M., Ghanbari, M., Jamshidinaid, B., & Taherabadi, A. (2019). The relationship between environmental disclosure quality and earnings quality: a panel study of an emerging market. *Journal of Asia Business Studies*, 13(2), 326–347. <https://doi.org/10.1108/JABS-03-2018-0084>
- Bentivogli, C., & Mirenda, L. (2017). Foreign Ownership and Performance: Evidence from Italian Firms. *International Journal of the Economics of Business*, 24(3), 251–273. <https://doi.org/10.1080/13571516.2017.1343542>
- Bond, S. R., & Guceri, I. (2017). R&D and productivity: evidence from large UK establishments with substantial R&D activities. *Economics of Innovation and New Technology*, 26(October), 108–120. <https://doi.org/10.1080/10438599.2016.1203525>
- Burhanudin, B., & Ferguson, D. (2018). Environmental issues: managing product switching intentions among Indonesian consumers. *Journal of Asia Business Studies*, 12(1), 99–116. <https://doi.org/10.1108/JABS-06-2015-0066>
- Chae, H., Koh, C. E., & Park, K. O. (2018). Information & Management Information technology capability and firm performance: Role of industry. *Information & Management*, 55(October 2017), 525–546. <https://doi.org/10.1016/j.im.2017.10.001>
- Chariri, A., Nasir, M., Januarti, I., & Daljono, D. (2019). Determinants and consequences of environmental investment: an empirical study of Indonesian firms. *Journal of Asia Business Studies*, 13(3), 433–449. <https://doi.org/10.1108/JABS-05-2017-0061>
- Chen, Y., Hua, X., & Boateng, A. (2016). Effects of foreign acquisitions on financial constraints, productivity, and investment in R&D of target firms in China.

- International Business Review*, 26(4), 640–651.
<https://doi.org/10.1016/j.ibusrev.2016.12.005>
- Cincera, M., Ravet, J., & Veugelers, R. (2015). The sensitivity of R & D investments to cash flows: Comparing young and old EU and US leading innovators. *Journal Economics of Innovation and New Technology*, 25(3), 304–320.
- Collis, D. J., & Montgomery, C. A. (1995). *Corporate Strategy*. In McGraw-Hill (Vol. 16). New York: McGraw-Hill.
- Curtis, A., McVay, S., & Toynbee, S. (2020). The changing implications of research and development expenditures for future profitability. *Review of Accounting Studies*.
<https://doi.org/10.1007/s11142-019-09528-6>
- Das, M., Rangarajan, K., & Dutta, G. (2020). Corporate sustainability in SMEs: an Asian perspective. *Journal of Asia Business Studies*, 14(1), 109–138.
<https://doi.org/10.1108/JABS-10-2017-0176>
- David, P., Yoshikawa, T., & Chari, M. D. R. (2006). Research Notes and Commentaries Strategic Investment in Japanese Corporations: Do Foreign Portfolio Owners Foster Underinvestment or Appropriate Investment? *Strategic Management Journal*, 27 (6), 591–600. <https://doi.org/10.1002/smj.523>
- David, P., Yoshikawa, T., Chari, M. D. R., & Rasheed, A. A. (2006). Strategic investments in Japanese corporations: Do foreign portfolio owners foster underinvestment or appropriate investment? *Strategic Management Journal*, 27(6), 591–600.
- Do, H., Patel, C., Budhwar, P., Katou, A. A., Arora, B., & Dao, M. (2019). Institutionalism and its effect on HRM in the ASEAN context: Challenges and opportunities for future research. *Human Resource Management Review*, 30(4), 100729. <https://doi.org/10.1016/j.hrmr.2019.100729>
- Dowling, M. J., McGee, J. E., Dowling, M. J., & McGee, J. E. (1994). Business and Technology Strategies and New Venture Performance: A Study of the Telecommunications Equipment Industry. *Management Science*, 40(12), 1663–1677.
- El-Kassar, A. N., & Singh, S. K. (2019). Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices. *Technological forecasting and social change*, 144, 483-498. <https://doi.org/10.1016/j.techfore.2017.12.016>
- Gaur, A., Ghosh, K., & Zheng, Q. (2019). Corporate social responsibility (CSR) in Asian firms: a strategic choice perspective of ethics and compliance management. *Journal of Asia Business Studies*, 13(4), 633–655. <https://doi.org/10.1108/JABS-03-2019-0094>
- Girma, S., Gong, Y., Görg, H., & Lancheros, S. (2015). Investment liberalisation, technology take-off and export markets entry: Does foreign ownership structure matter? *Journal of Economic Behavior and Organization*, 116, 254–269.
<https://doi.org/10.1016/j.jebo.2015.04.008>
- Hlavacek, P., & Bal-domanska, B. (2016). Impact of Foreign Direct Investment on Economic Growth in Central and Eastern European Countries. *Engineering Economics*, 27(3), 294–303.
- Jaisinghani, D. (2016). Impact of R&D on profitability in the pharma sector: an empirical study from India. *Journal of Asia Business Studies*, 10(2), 194–210.
<https://doi.org/10.1108/JABS-03-2015-0031>
- Kancs, d'Artis, & Siliverstovs, B. (2016). R&D, innovation and employment: Firm level evidence. *Research Policy*, 45(3), 634–646.
<https://doi.org/10.1016/j.respol.2015.12.001>
- Kim, Y. C. (2015). Capitalizing R&D expenditures or expensing them all?: Evidence from the accounting environment of South Korea. *International Journal of Disclosure and Governance*, 13(2), 117–134. <https://doi.org/10.1057/jdg.2015.14>

- Kwon, H. U., & Park, J. (2018). R&D, foreign ownership, and corporate groups: Evidence from Japanese firms. *Research Policy*, 47(2), 428-439. <https://doi.org/10.1016/j.respol.2017.11.010>
- Laskar, N. (2018). Impact of corporate sustainability reporting on firm performance: an empirical examination in Asia. *Journal of Asia Business Studies*, 12(4), 571-593. <https://doi.org/10.1108/JABS-11-2016-0157>
- Likitwongkajon, N., & Vithessonthi, C. (2020). Do foreign investments increase firm value and firm performance? Evidence from Japan. *Research in International Business and Finance*, 51, 101099. <https://doi.org/10.1016/j.ribaf.2019.101099>
- Lindemanis, M., Loze, A., & Pajuste, A. (2019). The effect of domestic to foreign ownership change on firm performance in Europe. *International Review of Financial Analysis*, 101341. <https://doi.org/10.1016/j.irfa.2019.04.004>
- Liu, K., & Lin, B. (2019). Research on influencing factors of environmental pollution in China: A spatial econometric analysis. *Journal of Cleaner Production*, 206, 356-364. <https://doi.org/10.1016/j.jclepro.2018.09.194>
- Luan, C. J., Tien, C., & Chen, W. L. (2016). Which "green" is better? An empirical study of the impact of green activities on firm performance. *Asia Pacific Management Review*, 21(2), 102-110. <https://doi.org/10.1016/j.apmr.2015.12.001>
- Luo, Y., Qian, X., & Ren, J. (2015). Initial public offerings and air pollution: Evidence from China. *Journal of Asia Business Studies*, 9(1), 99-114. <https://doi.org/10.1108/JABS-08-2014-0056>
- Morbey, G. K., & Reithner, R. M. (1990). How R & D Affects Sales Growth , Productivity and Profitability. *Research-Technology Management*, 33(3), 11-14.
- Park, H., & Lee, J. (2019). R&D Dynamics and Firm Growth : The Importance of R&D Persistency in the Economic Crisis. *International Journal of Innovation Management*, 23(5), 1-24. <https://doi.org/10.1142/S136391961950049X>
- Phung, D. N., & Mishra, A. V. (2015). Ownership Structure And Firm performance : Evidence From Vietnamese Listed Firms. *Australian Economic Papers*, 55(1), 63-98. <https://doi.org/10.1111/1467-8454.12056>
- Porter, M. E. (1981). The Contributions of Industrial Organization To Strategic Management. *Academy of Management Review*, 6(4), 609-620. <https://doi.org/10.5465/amr.1981.4285706>
- Roy, I., & Narayanan, K. (2019). Outward FDI from India and its impact on the performance of firms in the home country. *Journal of Asia Business Studies*, 13(1), 1-32. <https://doi.org/10.1108/JABS-05-2017-0063>
- Ruiqi, W., Wang, F., Xu, L., & Yuan, C. (2017). R&D expenditures , ultimate ownership and future performance : Evidence from China. *Journal of Business Research*, 71, 47-54. <https://doi.org/10.1016/j.jbusres.2016.10.018>
- Schiffbauer, M., Siedschlag, I., & Ruane, F. (2017). Do foreign mergers and acquisitions boost firm productivity? *International Business Review*, 26(6), 1124-1140. <https://doi.org/10.1016/j.ibusrev.2017.04.003>
- Setiawan, D., Bandi, B., Kee Phua, L., & Trinugroho, I. (2016). Ownership structure and dividend policy in Indonesia. *Journal of Asia Business Studies*, 10(3), 230-252. <https://doi.org/10.1108/JABS-05-2015-0053>
- Singh, S. K., Chen, J., Del Giudice, M., & El-Kassar, A. N. (2019). Environmental ethics, environmental performance, and competitive advantage: Role of environmental training. *Technological Forecasting and Social Change*, 146(May), 203-211. <https://doi.org/10.1016/j.techfore.2019.05.032>
- Singh, S. K., Giudice, M. Del, Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, 150, 119762. <https://doi.org/10.1016/j.techfore.2019.119762>
- Tseng, M., Tan, P. A., Jeng, S., Lin, C. R., Negash, Y. T., Nur, S., & Cokro, A. (2019).

- Sustainable Investment : Interrelated among Corporate Governance , Economic Performance and Market Risks Using Investor Preference Approach. *Sustainability*, (11), 1–15. <https://doi.org/10.3390/su11072108>
- Ulku, H., & Teoman, M. (2015). The impact of R & D and knowledge diffusion on the productivity of manufacturing firms in Turkey. *Journal of Productivity Analysis*, 44(1), 79–95. <https://doi.org/10.1007/s11123-015-0447-x>
- Vithessonthi, C., & Racela, O. C. (2015). Short- and long-run effects of internationalization and R&D intensity on firm performance. *Journal of Multinational Financial Management*, 34, 28–45. <https://doi.org/10.1016/j.mulfin.2015.12.001>
- Wang, X., & Wang, J. (2015). Benefits of foreign ownership : Evidence from foreign direct investment in China. *Journal of International Economics*, 97(2), 325–338.
- Yoo, J., Lee, S., & Sambock, P. (2019). The Effect of Firm Life Cycle on the Relationship between R&D Expenditures and Future Performance, Earnings Uncertainty, and Sustainable Growth. *Sustainability*, 11(2019), 1–19.