

The relationship between environmental, social, governance,
and financial performance among listed companies in Thailand
between 2019-2022

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Saranpong Daengdej

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Abstract

This study examines the relationship between corporate ESG (Environmental, Social, and Governance) participation and financial performance among the top listed companies in Thailand between 2019 to 2022. The data used in this research is collected from S&P Global and SET (Stock Exchange Thailand). The estimation method is fixed effect panel-data regression. Main findings indicate that ESG participations were found to have a negative effect on ROA, ROE, and Tobin's Q which were used as indicators of financial performance. Furthermore, contrary to previous studies and expectation, the empirical result shows that ESG negatively affects CFP (Corporate Financial Performance) in Thailand. The unexpected results of this study may be attributed to the short-term view of the study and the emerging incentives to support high ESG rated companies as compared to existing incentives in previously studied developed markets. This research has implications on how Thai firms approach and strategize their ESG participation targets and create policies to adhere to Sustainable Development Goals or government regulations.

1.0 Introduction

In Thailand, there is a lack of metrics to measure the impact of participating in corporate social responsibility, this leaves a gap in formal ESG framework & best practices for organizations to follow. This research want to measure the relationship of ESG on CFP among listed companies in SET between 2019-2022. This study relates to my previous work in social enterprise and collaborative CSR through the production and distribution of PPE to at-risk communities. This background experience piqued my interest in CSR frameworks with environmental, social, and corporate governance has gained importance in recent years in Thailand as companies begin to recognize the value of investing in sustainable development. The results of this research may have implications for government policies on sustainable development as well as businesses that value early adoption and self-regulation in investing in sustainable development.

The objective of this research is to quantify the relationship between corporate social responsibility and corporate financial performance. To do this we will first identify the key dimensions of ESG amongst listed companies. Secondly, we will assess the relationships between variables in the data set. Thirdly, we will examine control variables that may impact ESG and CFP such as company age, and company size. Lastly, we will quantify the relationship through a panel regression and give recommendations for companies and policymakers to maximize the benefit of investing in ESG.

Giese (2017) from MSCI research identified three major channels from ESG to financial value: higher profitability, lower tail risk, and lower systematic risk. The study found that high ESG-rated companies were more competitive and generated

abnormal returns, leading to higher profitability compared to low ESG-rated counterparts Giese (2017). It also found that high ESG-rated companies were better at managing business and operational risks leading to less incidents that impact on their share prices Giese (2017). Lastly MSCI found that high ESG-rated companies tend to be less volatile, and experience less systematic risks compared to their low ESG-rated counterparts Giese (2017). All these claimed benefits of ESG warrants a further study to see whether it holds up in the context of a developing market such as Thailand.



Figure 1 – Benefit of high ESG ratings

Previous similar research results on data from companies listed in CAC40 find that CSR (using ESG scores as indicators for CSR) positively affects CFP, Jahmane Jahmane and Gaies (2020) therefore it is reasonable to hypothesize that our results should concur with previous research. The scope of this study will focus on companies listed in the SET (Stock Exchange of Thailand) picking from top companies within SET50 & SET100 indexes. The study will analyze data from 2019 to 2022 allowing for the assessment of short-term impacts of ESG on financial performance.



2.0 Literature review

Previous literature like this study had various approaches and scope, notably Jahmane Jahmane and Gaies (2020) and Nollet Nollet, Filis et al. (2016) approach to companies from CAC40 between 2002 to 2017 and S&P500 between 2007 to 2011, using linear and non-linear regression in their method to examine the relationship between CSR (ESG Score) and CFP. Findings from CAC40 concluded that “social performance decreases the negative impact of financial instability enhancing the financial performance” and there is a positive non-linear effect of CSR on CFP, noted by Jahmane Jahmane and Gaies (2020). On the other hand, Nollet Nollet, Filis et al. (2016) findings indicate that there is a significant negative relationship between CSP (corporate social performance) and return on capital. Furthermore, Nollet Nollet, Filis et al. (2016) concluded that the CSR impacts CFP after a certain amount of CSP has been invested by the firm.

A company’s business sector is another variable that is interesting to look at when talking about CSR and CFP relationship. In Kuzey Kuzey, Uyar et al. (2021) paper “CSR Performance and firm performance in the Tourism, healthcare, and financial sectors: Do metrics and CSR committees’ matter?” The author set out to test whether CSR matters in those sectors. Findings indicate that the healthcare and tourism sectors experience no benefit from CSR participation, generating no value, efficiency, or sales growth, Kuzey Kuzey, Uyar et al. (2021). While another study by Forgione Forgione and Migliardo (2020) looks at the relationship between CSR and a bank’s market power, using Lerner’s index to measure the banks’ market power. Findings indicate a negative correlation between the bank’s CSR engagement and market power.

Other studies conducted specifically looking at Asian companies are of interest to our research as well since different economic conditions and cultures might impact how markets react to CSR. This is the case for Kao Kao, Yeh et al. (2018) paper: “The Relationship between CSR and Performance: Evidence in China”. Findings found changes in market responses to CSR depending on the ownership type of that company, state-owned enterprises have strong government incentives “overinvesting in CSR to serve state interest.” While non-state-owned enterprises have less government intervention and findings indicate that CSR activities positively affect the firm’s performance, Kao Kao, Yeh et al. (2018). Looking at the broader Asian market Saeed Saeed, Alnori et al. (2023) investigated a firm's social and environmental performance impacts on financial performance. Sampling from eight emerging Asian markets findings indicates that social dimensions are more impactful to financial performance than environmental dimensions, furthermore socially oriented firms are more stable in competitive industries Saeed Saeed, Alnori et al. (2023).

When conducting this research, concerns over the use of recent data from 2019-2022 due to the impact of the covid-19 pandemic and economic downturn were acknowledged. However, in a previous study conducted in Japan by Lian Liu on the effect of ESG performance on the stock market of Japan during covid-19; the study concludes that there is a positive association between ESG performance and stock returns. Liu, Nemoto et al. (2023). This eased those concerns over the data period and it’s reasonable to expect a similar result from this research.

The gap in research has allowed an opportunity to take a more detailed look into the impact of SET-listed firm's CSR engagement as more firms' ESG numerical scores are starting to be published in recent years allowing us to quantify in more

detail the relationship between CSR and CFP amongst these firms. Utilizing similar models found in previous research we can replicate and evaluate our hypothesis.



3.0 Data Summary

The data sets used in this paper are the company ESG Score from S&P Global as an indicator of corporate social responsibility participation and financial data from SET as an indicator of financial performance for those companies.

Variable	Description	Unit
ESG	The S&P Global ESG index	0-100
ROA	Return on asset used as an indicator of financial performance	%
ROE	Return on equity used as an indicator of financial performance	%
TobinQ	Tobin's Q used as an indicator of company valuation	Numerical
MarketCap	Indicator of the size of the company	Baht Millions
Year	Year of data	Years
Age	Age of company	Years

Table 1 - Variables descriptions

	Mean	Std. Dev.	Min	Max
ESG	51.820175	30.524319	1	93
ROA	8.638640	9.703652	-24.27000	64.170000
ROE	13.731886	15.475479	-35.82000	102.780000
TobinQ	3.327510	3.101664	0.43692	18.934369
MarketCap	2.091616e+05	2.271104e+05	1.185062e+04	1.256772e+06
Age	40.552632	22.143541	5	132

Table 2 - Summary Statistics Table

Upon examining the data, the overall ESG growth sticks out as a key factor.

Year	Mean	Std. Dev.	Min	Max
2019	47.456522	32.425440	1	89
2020	46.109091	33.041317	6	90
2021	52.322581	29.589971	5	92
2022	59.261538	26.675877	8	93

Table 3 - ESG statistical summary Table

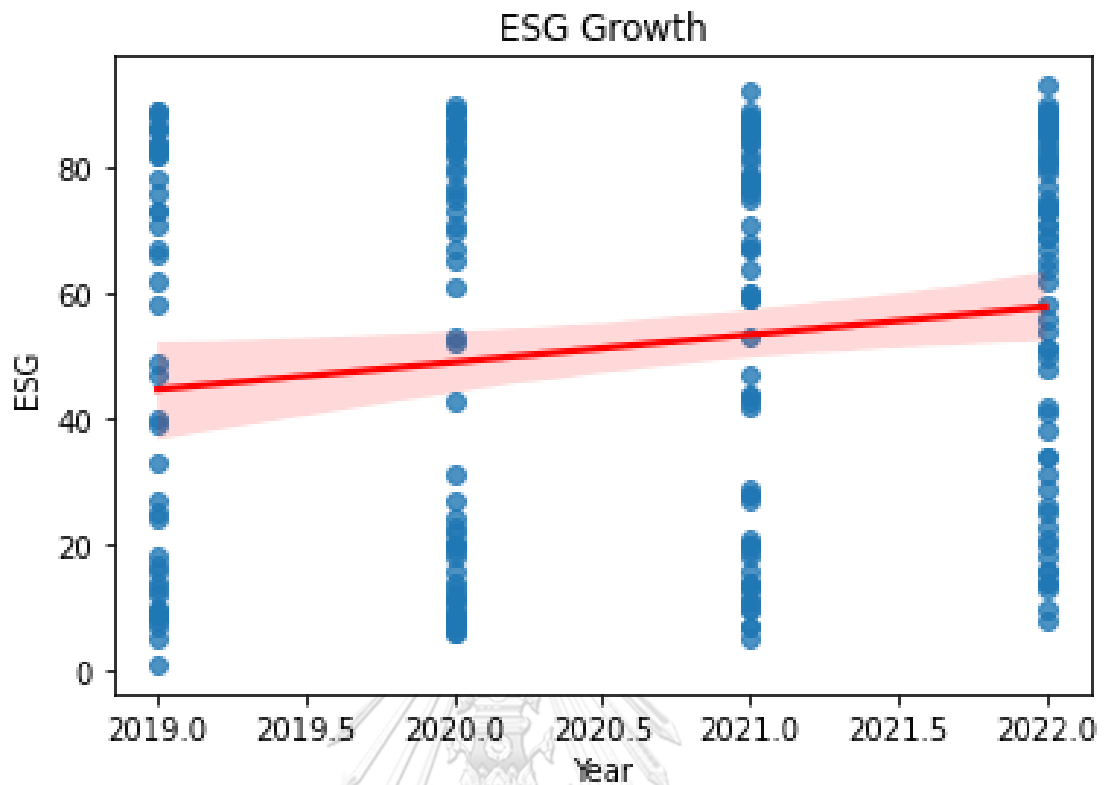


Figure 2 – ESG Growth graph with trend line

The ESG statistical summary and this ESG growth trendline scatter plot depict a trend of overall ESG score improvements amongst Thai companies over the past 4 years. Notice in Table 3 the ESG growth data showed higher Mean and Lower Std. Dev as the time series data progresses. This showed a clear trend that companies ESG are in an uptrend as shown in Figure 2. To confirm this, we should look at the growth line for each company as well.

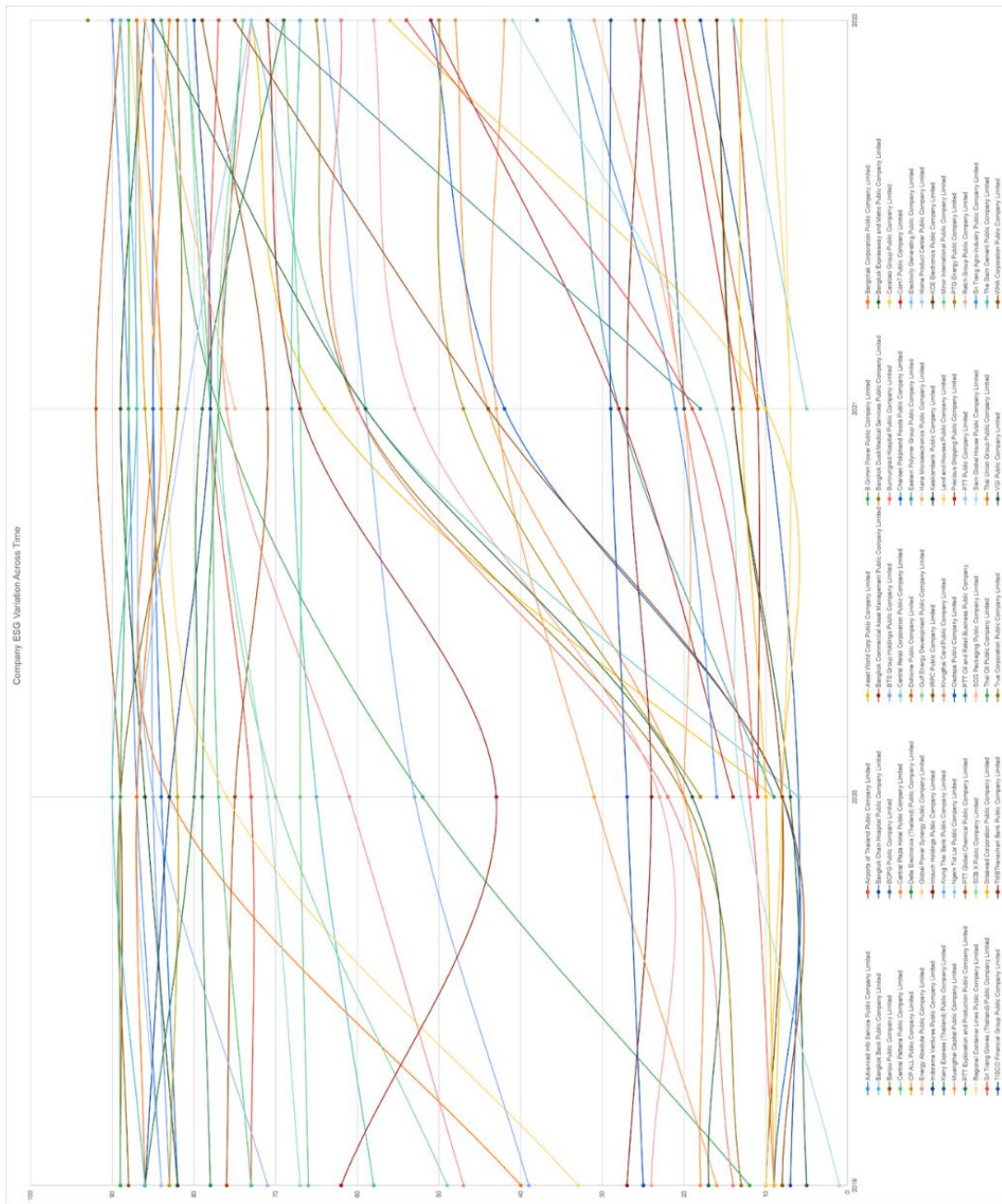


Figure 3 – ESG Growth graph individual companies

From this growth individual graph, 3 major groups of companies are identified: High ESG companies, Low ESG companies, and ESG Growth companies.

	ESG	ROE	ROA	MarketCap	TobinQ	Age
ESG	1					
ROE	-0.276425	1				
ROA	-0.339178	0.919908	1			
MarketCap	0.444989	-0.030751	-0.074494	1		
TobinQ	-0.199277	0.342976	0.253705	0.240800	1	
Age	0.155975	-0.061447	-0.049581	0.074027	-0.198315	1

Table 4 - Correlation Table

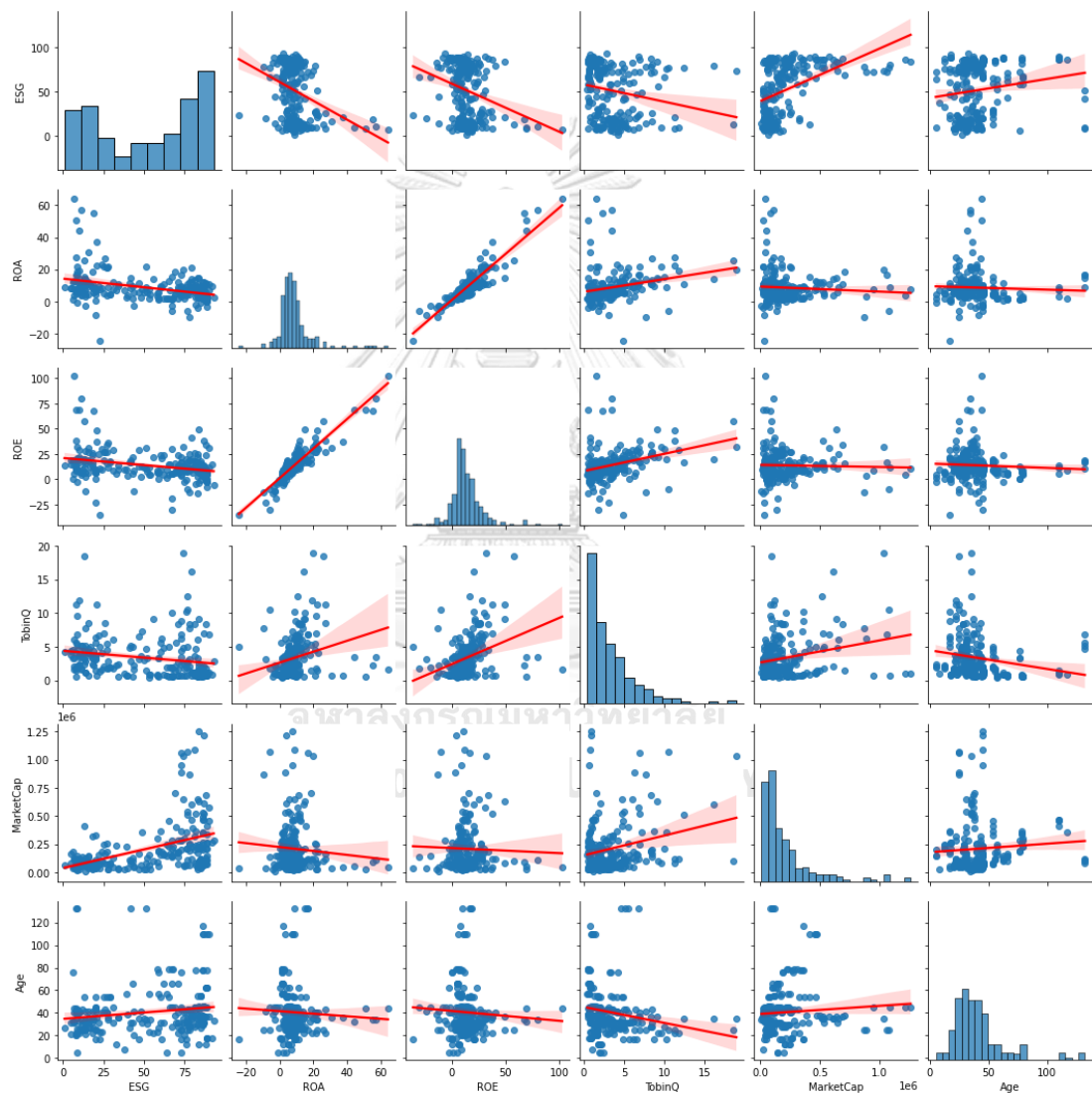


Figure 4 - Correlation Scatter Plot with trendline

4.0 Empirical Methodology & Results

In this study, ROA and ROE are chosen as an indicator of financial performance and Tobin's Q as an indicator of market valuation, a similar logic to Jahmane Jahmane and Gaies (2020). Firstly, ROA measures a company's profitability relative to its total assets, a good indicator of how effectively a company can create profit from its investments in assets. Similarly, ROE measures a company's profitability relative to its shareholder's equity, a good indicator of how effectively a company can utilize shareholder capital to generate returns. Both were chosen to be CFP indicators due to their common use as a benchmark for effective use of company resources. Lastly, Tobin's Q ratio compares the market value of a company to its replacement cost, a good indicator for a company's growth opportunities, investment efficiency, and long-term value creation. We use fixed effect panel OLS to estimate the relationship between ESG and CFP. The key advantage to using fixed effect is it allows us to address endogeneity and selection bias as well as allow the control over time-variant omitted variables. By accounting for unobserved heterogeneity, fixed effect models provide a more robust estimate of the causal relationship between variables. The variables used refer to (Table-1).

Model (1): ROA

$$ROA = \beta_0 + \beta_1 * ESG + \beta_2 * MarketCap + \beta_3 * Age + \varepsilon$$

Model (2): ROE

$$ROE = \beta_0 + \beta_1 * ESG + \beta_2 * MarketCap + \beta_3 * Age + \varepsilon$$

Model (3): TobinQ

$$TobinQ = \beta_0 + \beta_1 * ESG + \beta_2 * MarketCap + \beta_3 * Age + \varepsilon$$

Full Data	Dependent Variable:		
	ROA	ROE	TobinQ
ESG	-0.0707 (0.0465) 2.258e-05***	-0.1041 (0.0686) 3.63e-05***	-0.0120* (0.0064) 1.376e-05***
MarketCap	(6.751e-06)	(9.595e-06)	(3.042e-06)
Age	-0.0322 (0.4080)	-0.1505 (0.7262)	-0.0856 (0.1042)
Const	8.8422 (14.996)	17.430 (26.859)	4.4233 (3.8523)
Observations	228	228	228
R-squared	0.0961	0.0879	0.4993
F Statistic	5.6682	5.14	53.193

Note *p<0.1, **p<0.05, ***p<0.01

Table 5 – Full data regression results

Table 5 shows the regression results against ROA, ROE, and Tobin's Q, respectively. Current results indicate a statistically significant relationship for only TobinQ. Initial findings indicate that the level of ESG participation among firms in SET negatively affects the firm's Tobin's Q, however only slightly. It is important to mention that a negative correlation to Tobin's Q means firms with higher ESG scores become more undervalued by the market. This might relate to a similar phenomenon explained by Kao Kao, Yeh et al. (2018) in their study in China where firm ownership type where managerial opportunism hypothesis & good management hypothesis might play a role. To investigate this further a different approach is needed to understand this relationship. Identifying that of the 65 companies 15 maintained an ESG score of over 40 in the past 4 years, 18 companies maintained an ESG score of under 40, and 22 companies ESG scores improved from under 40 to over 40. Separating the companies into High ESG participation, Low ESG participation, and recently improved to high ESG participation, we can run the regression again to look

at these relationships. Figures 8 – 16 will show the regression results of these separation of data into categories and Table 6-8 will summarize the coefficient and significance of the results.

High ESG	Dependent Variable:		
	ROA	ROE	TobinQ
ESG	-0.1977** (0.0903)	-0.3176* (0.1667)	-0.0092 (0.0391)
MarketCap	1.666e-05*** (3.69e-06)	2.795e-05*** (5.413e-06)	1.39e-05*** (3.235e-06)
Age	0.0175 (0.4842)	0.1569 (0.9244)	-0.0353 (0.1397)
Const	15.330 (24.209)	19.130 (44.800)	0.4022 (5.3024)
Observations	92	92	92
R-squared	0.2062	0.1384	0.6674
F Statistic	5.5402	3.4275	42.801
Note	*p<0.1, **p<0.05, ***p<0.01		

Table 6 – High ESG Companies regression results

Low ESG	Dependent Variable:		
	ROA	ROE	TobinQ
ESG	-0.1591 (0.2769)	-0.1444 (0.3313)	-0.0100 (0.0312)
MarketCap	0.0001** (6.748e-05)	0.0002** (8.957e-05)	4.735e-05*** (9.65e-06)
Age	-0.1980 (1.0824)	-1.0964 (1.7568)	-0.1685 (0.1248)
Const	10.128 (34.836)	43.046 (57.336)	5.6825 (4.1055)
Observations	55	55	55
R-squared	0.1728	0.1402	0.4928
F Statistic	2.3667	1.8478	11.011
Note	*p<0.1, **p<0.05, ***p<0.01		

Table 7 - Low ESG Companies regression results

ESG Growth	Dependent Variable:		
	ROA	ROE	TobinQ
ESG	-0.0423 (0.0536)	-0.0622 (0.0906)	0.0002 (0.0109)
MarketCap	3.99e-05 (2.863e-05)	6.123e-05 (4.287e-05)	1.009e-05 (6.925e-06)
Age	-0.6251 (1.0914)	-0.9907 (2.0635)	-0.3466 (0.2689)
Const	26.734 (36.104)	42.215 (67.987)	14.447 (8.9047)
Observations	81	81	81
R-squared	0.1018	0.0942	0.293
F Statistic	2.1153	1.9405	7.7375
Note	*p<0.1, **p<0.05, ***p<0.01		

Table 8 – ESG Growth Companies regression results

Explaining these results is complicated. As suggested in the initial regression, separating the data into groups based on the ESG participation and growth of their ESG participations could shed light on why the results aren't as expected. Within companies that maintain High ESG over the past 4 years regression results are significant and negative for ESG on ROA and ROE, while MarketCap continues to be the dominant explainer of CFP. Age continues to be insignificant.

Within companies that maintained a Low ESG over the past 4 years regression results indicate that ESG is not a significant determinant explainer of CFP while MarketCap continues to be the dominant explainer of CFP. Age continues to be insignificant.

Lastly within the group of companies that experience ESG Growth within the past 4 years, the regression results indicate that none of the independent variables are significant explainers of CFP. The results continue to perform differently from expectations and there are several factors that could explain why this is the case.

After thorough examination of the regression results there is still a huge gap between the expected results and the findings from this research. While previous studies conducted in developed markets, this study conducted in Thailand could have one big difference in government policies and financial incentives for corporations to adhere to ESG standards. Studies conducted in those developed markets like ones conducted by Jahmane 2020 in CAC40 may have yielded more significantly positive relationship between CSR(ESG) and CFP because of their government's more mature environmental policies and tax incentives than that of Thailand's. Coşkun mentioned in their theoretical approach to the roles of ESG in corporate financial performance and competitiveness that theory and empirical evidence of ESG on a firm's competitiveness are still emerging as the recent emergence and focus on ESG is a response to the sustainability crisis we are experiencing Coşkun (2023).

A good example of what Coşkun is talking about is found in another research on ESG disclosure and firms performance in Malaysia, they found that in firms with no competitive advantage, an increase in ESG disclosure decreases firm's performance Mohammad and Wasiuzzaman (2021).

Another explanation to why the results of this study didn't match previous findings and expectations could be attributed to Thailand's emerging adoption and focus on ESG ratings. Many companies in SET 50 and SET 100 had just recently focused on investing in projects that contribute positively to their ESG scores and saw their score rise in the past 4 years. Even though this study looks at various industries and companies, it is still only looking at the short-term impact of those efforts. It is possible that in the medium-term and long-term of 5 – 10 years from now the results of this study could better reflect the existing consensus on the benefits of ESG. In the

meantime, even though most research and academics supports ESG participation and herald it as an asset class to invest in; Thai companies should practice caution in budgeting and decision making focusing on ESG as the research behind it is still emerging and the short-term benefits of these endeavors might not be present.



5.0 Conclusion

We embarked on this study expected to find an overwhelming positive relationship between ESG participation and corporate financial performance but turns out the answer is more complicated than what is on the surface. This study found a significant but negative relationship between ESG participation and Thai listed companies Tobin's Q, indicating an inverse relationship in the company's growth opportunities, investment efficiency, and long-term value creation. Further inquiries also showed a significant but negative relationship between ESG participation by highly-ESG-rated SET listed companies and their return on assets and returns on equity. Thailand's ESG landscape is still emerging, and the results from this study showing ESG to negatively affect corporate financial performance, don't reflect the global trends. To see medium or long-term benefits of ESG participations, the Thai government should improve government policies and tax incentives for companies to adopt these standards and support the companies in their sustainability efforts. The result of this research only raises caution on how Thai firms create policies to adhere to sustainable development goals or government regulations. As Thailand adapts to global sustainability standards and stakeholders are aware of the potential benefits that aren't being captured by current methods, the landscape of ESG participation is surely to shift in the years to come.

6.0 Appendix

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=====
PanelOLS Estimation Summary
=====
Dep. Variable:                ROA      R-squared:      0.0961
Estimator:                PanelOLS  R-squared (Between): -0.1744
No. Observations:        228      R-squared (Within):  0.0961
Date:                    Sun, Jul 09 2023  R-squared (Overall): -0.1498
Time:                    20:20:40      Log-likelihood      -685.94
Cov. Estimator:          Clustered
Entities:                65      F-statistic:       5.6682
Avg Obs:                3.5077      P-value           0.0010
Min Obs:                1.0000      Distribution:      F(3,160)
Max Obs:                4.0000      F-statistic (robust): 3.8721
Time periods:          4      P-value           0.0105
Avg Obs:                57.000      Distribution:      F(3,160)
Min Obs:                46.000
Max Obs:                65.000

=====
Parameter Estimates
=====
Parameter      Std. Err.      T-stat      P-value      Lower CI      Upper CI
-----
const          8.8422         14.996      0.5897      0.5563      -20.772      38.457
ESG            -0.0707         0.0465     -1.5215     0.1301     -0.1624      0.0211
MarketCap     2.258e-05      6.751e-06  3.3443     0.0010     9.245e-06    3.591e-05
Age           -0.0322         0.4080     -0.0790     0.9371     -0.8381      0.7736

=====
F-test for Poolability: 6.0608
P-value: 0.0000
Distribution: F(64,160)
Included effects: Entity
=====

```

Figure 5 - Fixed Effect Regression with ROA as dependent variable, data includes 65 SET listed companies from 2019-2022

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: ROE R-squared: 0.0879
Estimator: PanelOLS R-squared (Between): -0.2001
No. Observations: 228 R-squared (Within): 0.0879
Date: Sun, Jul 09 2023 R-squared (Overall): -0.1654
Time: 20:20:40 Log-likelihood -801.77
Cov. Estimator: Clustered
F-statistic: 5.1400
P-value: 0.0020
Distribution: F(3,160)

Entities: 65
Avg Obs: 3.5077
Min Obs: 1.0000
Max Obs: 4.0000
F-statistic (robust): 5.0055
P-value: 0.0024
Distribution: F(3,160)

Time periods: 4
Avg Obs: 57.000
Min Obs: 46.000
Max Obs: 65.000

=====
Parameter Estimates
=====
Parameter Std. Err. T-stat P-value Lower CI Upper CI
-----
const 17.430 26.859 0.6489 0.5173 -35.614 70.473
ESG -0.1041 0.0686 -1.5180 0.1310 -0.2395 0.0313
MarketCap 3.63e-05 9.595e-06 3.7836 0.0002 1.735e-05 5.525e-05
Age -0.1505 0.7262 -0.2072 0.8361 -1.5846 1.2837
=====
F-test for Poolability: 5.6978
P-value: 0.0000
Distribution: F(64,160)

Included effects: Entity

```

Figure 6 - Fixed Effect Regression with ROE as dependent variable, data includes 65 SET listed companies from 2019-2022

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: TobinQ      R-squared:      0.4993
Estimator:      PanelOLS   R-squared (Between): -0.5409
No. Observations: 228      R-squared (Within):  0.4993
Date:           Sun, Jul 09 2023  R-squared (Overall): -0.4543
Time:           20:20:40      Log-likelihood:      -282.66
Cov. Estimator: Clustered

Entities:      65            F-statistic:        53.193
Avg Obs:      3.5077        P-value:            0.0000
Min Obs:      1.0000        Distribution:        F(3,160)
Max Obs:      4.0000

Time periods: 4
Avg Obs:      57.000
Min Obs:      46.000
Max Obs:      65.000

=====
Parameter Estimates
=====
Parameter      Std. Err.      T-stat      P-value      Lower CI      Upper CI
-----
const          4.4233          3.8523      1.1482      0.2526      -3.1845      12.031
ESG            -0.0120          0.0064     -1.8688      0.0635      -0.0246      0.0007
MarketCap     1.376e-05       3.042e-06  4.5244      0.0000      7.755e-06    1.977e-05
Age           -0.0856          0.1042     -0.8213      0.4127      -0.2914      0.1202
=====
F-test for Poolability: 24.787
P-value: 0.0000
Distribution: F(64,160)

Included effects: Entity

```

Figure 7 - Fixed Effect Regression with TobinQ as dependent variable, data includes 65 SET listed companies from 2019-2022

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable:          ROA      R-squared:          0.2062
Estimator:            PanelOLS  R-squared (Between): -1.2418
No. Observations:      92      R-squared (Within):  0.2062
Date:                  Sun, Jul 09 2023  R-squared (Overall): -0.5680
Time:                  20:42:37      Log-likelihood       -240.93
Cov. Estimator:       Clustered
                        F-statistic:          5.5402
                        P-value:            0.0019
                        Distribution:       F(3,64)

Entities:              25
Avg Obs:               3.6800
Min Obs:               1.0000
Max Obs:               4.0000

Time periods:         4
Avg Obs:               23.000
Min Obs:               22.000
Max Obs:               25.000

F-statistic (robust): 11.386
P-value:               0.0000
Distribution:          F(3,64)

=====
Parameter Estimates
=====
Parameter  Std. Err.  T-stat  P-value  Lower CI  Upper CI
-----
const      15.330    24.209  0.6332  0.5288   -33.033   63.693
ESG        -0.1977   0.0903  -2.1898  0.0322  -0.3781   -0.0173
MarketCap  1.666e-05  3.69e-06  4.5137  0.0000  9.284e-06  2.403e-05
Age        0.0175    0.4842  0.0362  0.9713  -0.9498    0.9849

=====
F-test for Poolability: 3.6184
P-value: 0.0000
Distribution: F(24,64)

Included effects: Entity

```

Figure 8 - Fixed Effect Regression with ROA as dependent variable, data includes 15 SET listed companies from 2019-2022 that maintained an ESG score over 40.


```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: ROE R-squared: 0.1384
Estimator: PanelOLS R-squared (Between): -0.7129
No. Observations: 92 R-squared (Within): 0.1384
Date: Sun, Jul 09 2023 R-squared (Overall): -0.4139
Time: 20:42:37 Log-likelihood: -309.86
Cov. Estimator: Clustered
Entities: F-statistic: 3.4275
Avg Obs: 25 P-value: 0.0222
Min Obs: 3.6800 Distribution: F(3,64)
Max Obs: 1.0000
Time periods: 4
Avg Obs: 23.000
Min Obs: 22.000
Max Obs: 25.000
F-statistic (robust): 12.142
P-value: 0.0000
Distribution: F(3,64)

=====
Parameter Estimates
=====
Parameter Std. Err. T-stat P-value Lower CI Upper CI
-----
const 19.130 44.800 0.4270 0.6708 -70.368 108.63
ESG -0.3176 0.1667 -1.9049 0.0613 -0.6506 0.0155
MarketCap 2.795e-05 5.413e-06 5.1635 0.0000 1.714e-05 3.877e-05
Age 0.1569 0.9244 0.1698 0.8657 -1.6898 2.0037
=====
F-test for Poolability: 4.5123
P-value: 0.0000
Distribution: F(24,64)
Included effects: Entity

```

Figure 9 - Fixed Effect Regression with ROE as dependent variable, data includes 15 SET listed companies from 2019-2022 that maintained an ESG score over 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: TobinQ      R-squared: 0.6674
Estimator: PanelOLS      R-squared (Between): -0.4389
No. Observations: 92     R-squared (Within): 0.6674
Date: Sun, Jul 09 2023   R-squared (Overall): -0.2577
Time: 20:42:37          Log-likelihood: -114.99
Cov. Estimator: Clustered
                        F-statistic: 42.801
                        P-value: 0.0000
                        Distribution: F(3,64)

Entities: 25
Avg Obs: 3.6800
Min Obs: 1.0000
Max Obs: 4.0000

Time periods: 4
Avg Obs: 23.000
Min Obs: 22.000
Max Obs: 25.000

F-statistic (robust): 7.1369
P-value: 0.0003
Distribution: F(3,64)

=====
Parameter Estimates
=====
Parameter  Std. Err.  T-stat  P-value  Lower CI  Upper CI
-----
const      0.4022   5.3024  0.0759   0.9398   -10.191  10.995
ESG        -0.0092   0.0391  -0.2356  0.8145   -0.0873   0.0689
MarketCap  1.39e-05  3.235e-06  4.2962  0.0001   7.435e-06  2.036e-05
Age        -0.0353   0.1397  -0.2527  0.8013   -0.3143   0.2437
=====

F-test for Poolability: 29.527
P-value: 0.0000
Distribution: F(24,64)

Included effects: Entity

```

Figure 10 - Fixed Effect Regression with TobinQ as dependent variable, data includes 15 SET listed companies from 2019-2022 that maintained an ESG score over 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable:                ROA      R-squared:                0.1728
Estimator:                   PanelOLS  R-squared (Between):    -0.3326
No. Observations:            55      R-squared (Within):     0.1728
Date:                         Sun, Jul 09 2023  R-squared (Overall):    -0.3050
Time:                         20:40:40  Log-likelihood          -170.37
Cov. Estimator:              Clustered
                               F-statistic:            2.3667
                               P-value:                   0.0881
                               Distribution:             F(3,34)
Entities:                     18
Avg Obs:                     3.0556
Min Obs:                     1.0000
Max Obs:                     4.0000
                               F-statistic (robust):    1.7233
                               P-value:                   0.1807
                               Distribution:             F(3,34)
Time periods:                 4
Avg Obs:                     13.750
Min Obs:                     8.0000
Max Obs:                     18.000

=====
Parameter Estimates
=====
Parameter  Std. Err.   T-stat   P-value   Lower CI   Upper CI
-----
const      10.128   34.836   0.2907   0.7730   -60.668   80.924
ESG        -0.1591  0.2769  -0.5747  0.5693   -0.7218   0.4036
MarketCap  0.0001  6.748e-05  2.1752  0.0367   9.644e-06  0.0003
Age        -0.1980  1.0824  -0.1830  0.8559   -2.3976   2.0016

=====
F-test for Poolability: 9.2386
P-value: 0.0000
Distribution: F(17,34)
Included effects: Entity
=====

```

Figure 11 - Fixed Effect Regression with ROA as dependent variable, data includes 18 SET listed companies from 2019-2022 that maintained an ESG score under 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable:                ROE      R-squared:                0.1402
Estimator:                  PanelOLS  R-squared (Between):    -0.7160
No. Observations:          55        R-squared (Within):     0.1402
Date:                       Sun, Jul 09 2023  R-squared (Overall):    -0.6219
Time:                       20:40:40      Log-likelihood          -192.45
Cov. Estimator:            Clustered
                             F-statistic:           1.8478
                             P-value:                   0.1571
                             Distribution:          F(3,34)
Entities:                   18
Avg Obs:                   3.0556
Min Obs:                   1.0000
Max Obs:                   4.0000
F-statistic (robust):      2.0679
P-value:                   0.1228
                             Distribution:          F(3,34)
Time periods:              4
Avg Obs:                   13.750
Min Obs:                   8.0000
Max Obs:                   18.000

=====
Parameter Estimates
=====
Parameter  Std. Err.  T-stat  P-value  Lower CI  Upper CI
-----
const      43.046   57.336   0.7508   0.4580   -73.474   159.57
ESG       -0.1444   0.3313  -0.4359   0.6657   -0.8176   0.5288
MarketCap  0.0002   8.957e-05  2.1466   0.0390   1.025e-05  0.0004
Age       -1.0964   1.7568  -0.6241   0.5367   -4.6667   2.4738
=====
F-test for Poolability: 9.0914
P-value: 0.0000
Distribution: F(17,34)
Included effects: Entity

```

Figure 12 - Fixed Effect Regression with ROE as dependent variable, data includes 18 SET listed companies from 2019-2022 that maintained an ESG score under 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: TobinQ      R-squared:      0.4928
Estimator:      PanelOLS   R-squared (Between): -0.0434
No. Observations: 55      R-squared (Within):  0.4928
Date:           Sun, Jul 09 2023  R-squared (Overall): -0.1030
Time:           20:40:40      Log-likelihood       -64.070
Cov. Estimator: Clustered

Entities:      18          F-statistic:      11.011
Avg Obs:      3.0556      P-value          0.0000
Min Obs:      1.0000      Distribution:     F(3,34)
Max Obs:      4.0000      F-statistic (robust): 9.0384
Time periods: 4          P-value          0.0002
Avg Obs:      13.750     Distribution:     F(3,34)
Min Obs:      8.0000
Max Obs:      18.000

Parameter Estimates
=====
Parameter      Std. Err.      T-stat      P-value      Lower CI      Upper CI
-----
const          5.6825         1.3841     0.1753     -2.6609     14.026
ESG            -0.0100         -0.3209     0.7502     -0.0733     0.0533
MarketCap     4.735e-05      9.65e-06   4.9067     0.0000     2.774e-05   6.696e-05
Age           -0.1685         0.1248     -1.3503     0.1858     -0.4221     0.0851
=====
F-test for Poolability: 21.008
P-value: 0.0000
Distribution: F(17,34)

Included effects: Entity

```

Figure 13 - Fixed Effect Regression with TobinQ as dependent variable, data includes 18 SET listed companies from 2019-2022 that maintained an ESG score under 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable:                ROA      R-squared:                0.1018
Estimator:                  PanelOLS  R-squared (Between):    -4.7643
No. Observations:          81        R-squared (Within):     0.1018
Date:                      Sun, Jul 09 2023  R-squared (Overall):    -3.3224
Time:                      20:40:49      Log-likelihood:         -255.14
Cov. Estimator:           Clustered
                             F-statistic:            2.1153
                             P-value:              0.1085
                             Distribution:         F(3,56)

Entities:                   22
Avg Obs:                   3.6818
Min Obs:                   2.0000
Max Obs:                   4.0000

Time periods:              4
Avg Obs:                   20.250
Min Obs:                   16.000
Max Obs:                   22.000

F-statistic (robust):      0.8004
P-value:                   0.4989
Distribution:               F(3,56)

=====
Parameter Estimates
=====
Parameter  Std. Err.  T-stat  P-value  Lower CI  Upper CI
-----
const      26.734    36.104  0.7405  0.4621   -45.590   99.059
ESG       -0.0423   0.0536  -0.7892  0.4333   -0.1496   0.0650
MarketCap  3.99e-05  2.863e-05  1.3934  0.1690  -1.746e-05  9.725e-05
Age       -0.6251   1.0914  -0.5727  0.5691   -2.8114   1.5612

=====
F-test for Poolability: 4.1998
P-value: 0.0000
Distribution: F(21,56)

Included effects: Entity

```

Figure 14 - Fixed Effect Regression with ROA as dependent variable, data includes 22 SET listed companies from 2019-2022 that improved their ESG score from under 40 to over 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: ROE R-squared: 0.0942
Estimator: PanelOLS R-squared (Between): -5.1284
No. Observations: 81 R-squared (Within): 0.0942
Date: Sun, Jul 09 2023 R-squared (Overall): -3.2117
Time: 20:40:49 Log-likelihood -292.80
Cov. Estimator: Clustered
Entities: F-statistic: 1.9405
Avg Obs: 22 P-value 0.1335
Min Obs: 3.6818 Distribution: F(3,56)
Max Obs: 2.0000
4.0000 F-statistic (robust): 0.9652
Time periods: 4 P-value 0.4156
Avg Obs: 20.250 Distribution: F(3,56)
Min Obs: 16.000
Max Obs: 22.000

Parameter Estimates
=====
Parameter Std. Err. T-stat P-value Lower CI Upper CI
-----
const 42.215 67.987 0.6209 0.5372 -93.979 178.41
ESG -0.0622 0.0906 -0.6861 0.4955 -0.2436 0.1193
MarketCap 6.123e-05 4.287e-05 1.4281 0.1588 -2.466e-05 0.0001
Age -0.9907 2.0635 -0.4801 0.6330 -5.1244 3.1429
=====
F-test for Poolability: 3.7160
P-value: 0.0000
Distribution: F(21,56)

Included effects: Entity

```

Figure 15 - Fixed Effect Regression with ROE as dependent variable, data includes 22 SET listed companies from 2019-2022 that improved their ESG score from under 40 to over 40.

```

=====
PanelOLS Estimation Summary
=====
Dep. Variable: TobinQ      R-squared:      0.2930
Estimator:      PanelOLS   R-squared (Between): -14.464
No. Observations: 81      R-squared (Within):  0.2930
Date: Sun, Jul 09 2023    R-squared (Overall): -12.462
Time: 20:40:49           Log-likelihood:      -85.752
Cov. Estimator: Clustered
                               F-statistic:      7.7375
                               P-value:      0.0002
                               Distribution:      F(3,56)

Entities: 22
AVG Obs: 3.6818
Min Obs: 2.0000
Max Obs: 4.0000

Time periods: 4
AVG Obs: 20.250
Min Obs: 16.000
Max Obs: 22.000

=====
Parameter Estimates
=====
Parameter  Std. Err.  T-stat  P-value  Lower CI  Upper CI
-----
const      14.447    8.9047  1.6224  0.1103   -3.3912   32.285
ESG         0.0002    0.0109  0.0166  0.9868   -0.0217   0.0221
MarketCap   1.009e-05  6.925e-06  1.4562  0.1509  -3.788e-06  2.396e-05
Age        -0.3466    0.2689  -1.2891  0.2027  -0.8852   0.1920
=====

F-test for Poolability: 27.316
P-value: 0.0000
Distribution: F(21,56)

Included effects: Entity

```

Figure 16 - Fixed Effect Regression with TobinQ as dependent variable, data includes 22 SET listed companies from 2019-2022 that improved their ESG score from under 40 to over 40.

REFERENCES

Coşkun, Y. (2023). The role of ESG in corporate financial performance and competitiveness. Reference Module in Social Sciences, Elsevier.

Since the early 2000s ESG integration becomes a critical component of corporate management and is increasingly perceived as a significant tool for the growth in sustainability crisis era. Requiring a significant cost, sustainability innovations also raise concerns about its relations with shareholder value and competitiveness. The empirical literature reveals there may be a positive linkage between corporate social performance (CSP) and corporate financial performance (CFP). However, it does not necessarily mean that ESG integration positively supports firm competitiveness according to both theoretical/empirical literatures. Therefore, we suggest that companies should not overestimate the role of ESG adaptation for their financial performance and competitive power.

Forgione, A. F. and C. Migliardo (2020). "CSR engagement and market structure: Evidence from listed banks." Finance Research Letters **35**: 101592.

According to the established literature, banks undertake social investment to compensate for the benefits enjoyed by the society. At first glance, one could expect more involvement in corporate social responsibility (CSR) from banks that have greater monopolistic power. However, this perspective would differentiate between banks and non-financial firms, since the latter use CSR engagement as a competitive lever. Thus, it follows that greater market pressure boosts a firm's CSR investments. This conundrum has triggered the present analysis which, after estimating a Lerner index and then running a system-GMM regression, verified the impact of a firm's monopolistic competition based on three scores pertaining to the listed banks' CSR commitment. Our results support the view that the level of social responsibility of the banks' management is affected by their markup on price.

Giese, G. (2017). "Has ESG Affected Stock Performance?" Has ESG Affected Stock Performance? <https://www.msci.com/www/blog-posts/has-esg-affected-stock/0794561659> 2023.

Are ESG characteristics tied to stock performance? Many researchers have studied the relationship between companies with strong environmental, social and governance (ESG) characteristics and corporate financial performance. A major challenge has been to show that positive correlations — when produced — explain the behavior. As the classic phrase used by statisticians says, “correlation does not imply causation.”

Jahmane, A. and B. Gaies (2020). "Corporate social responsibility, financial instability and corporate financial performance: Linear, non-linear and spillover effects – The case of the CAC 40 companies." Finance Research Letters **34**: 101483.

This article examines the influence of corporate social responsibility (CSR) on the financial performance (CFP) for CAC 40 companies from 2002 to 2017, considering the effect of financial instability at the macro level. We based our approach on a dynamic modeling of the CFP-CSR relationship, as well as on the

generalized method of moments (GMM) to overcome the problem of endogeneity. Our results show that CSR positively affects the CFP in two ways: directly, through an overall positive non-linear effect, and indirectly by mitigating the negative effect of banking crises on the CFP, which is a positive spillover effect.

Kao, E. H., et al. (2018). "The relationship between CSR and performance: Evidence in China." Pacific-Basin Finance Journal **51**: 155-170.

This study uses a system of simultaneous equations to investigate various hypotheses on the relationship between corporate social responsibility (CSR) and firm performance for state-owned enterprises (SOEs) and non-SOEs in China. The results show variations in market response to CSR engagement by firm ownership type. That is, the market responds favorably to CSR by market-oriented non-SOEs but neutrally to CSR by SOEs with substantial agency costs. The Chinese firms are able to link their CSR activities to firm performance over time, likely recognizing the long-term benefits of CSR. Our study demonstrates the important role of ownership in the dynamic CSR-performance relationship.

Kuzey, C., et al. (2021). "CSR performance and firm performance in the tourism, healthcare, and financial sectors: Do metrics and CSR committees matter?" Journal of Cleaner Production **319**: 128802.

The purpose of this study is twofold. First, it tests the association between corporate social responsibility (CSR) performance and firm performance in the tourism, healthcare, and financial sectors. Second, it investigates whether CSR committees moderate this association in those sectors. To achieve these objectives, two proxies for CSR performance namely CSR performance and change in CSR performance are utilized. Moreover, firm performance is measured by three dimensions: market-based, accounting-based, and sales-based performance. The data for the three sectors were retrieved from the Thomson Reuters Eikon database from 2011 to 2018. While the financial sector generates firm value out of CSR performance per se, the tourism and healthcare sectors cannot. It is imperative to establish CSR committees among tourism firms to enhance firm value from CSR practices, since CSR performance and change in CSR performance per se do not generate value unless CSR performance interacts with the CSR committee. Moreover, the interaction of CSR committees with change in CSR performance does not generate value in either sector, which may imply that stockholders are satisfied with the current level of CSR engagement. Unlike the tourism sector, CSR committees cannot currently contribute to achieving higher market value in the healthcare and financial sectors. The conclusions concerning other performance metrics (profitability and sales) for the three sectors are outlined in the conclusion section. The study provides an opportunity for the three sectors to leverage CSR for firm performance improvement and presents refined guidelines that employ different firm performance measurements and CSR metrics.

Liu, L., et al. (2023). "The Effect of ESG performance on the stock market during the COVID-19 Pandemic – Evidence from Japan." Economic Analysis and Policy.

Environmental, social, and governance (ESG) practices can play a crucial role in promoting green recovery by fostering sustainable and responsible economic growth. Based on a novel dataset of Japanese listed companies from January 2016 to December 2021, this study examines the effect of corporate (ESG) performance on the Japanese stock market during the COVID-19 pandemic. We contribute additional evidence to the literature by exploring the unique role of ESG factors that affect stock markets during economic downturns. The results of the study show a positive association between corporate ESG performance and stock returns during the COVID-19 period. Furthermore, we demonstrate that strong ESG performance contributed to enhanced stock market stability and increased market liquidity in Japan during the COVID-19 pandemic. These results provide a rationale for implementing supportive measures and regulations that encourage companies to adopt and disclose robust ESG practices. By doing so, they can contribute to the stability and liquidity of the stock market and fostering sustainable economic growth.

Mohammad, W. M. W. and S. Wasiuzzaman (2021). "Environmental, Social and Governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia." *Cleaner Environmental Systems* 2: 100015.

The objective of this research is to investigate the effects of firms' ESG (Environmental, Social and Governance) disclosures on firm performance, moderated by firm competitive advantage. The sample of the data is 3966 firm-year observations from year 2012–2017 of 661 firms listed in the Bursa Malaysia. To improve the robustness of our analysis we adopt clustering techniques in our regression analysis. The findings of this research indicate that ESG disclosure improves firm performance even after controlling for competitive advantage. We also find consistent evidence that an increase in ESG disclosure by one unit will increase firm performance by approximately 4 percent in Malaysia. The implication of this research is the need to re-examine the level of ESG disclosure and the financing incentive for firms with high ESG disclosure scores as high scores of ESG are associated with higher competitive advantage. Further, policymakers can enhance regulatory frameworks by incorporating ESG across various investment activities and value creation initiatives.

Nollet, J., et al. (2016). "Corporate social responsibility and financial performance: A non-linear and disaggregated approach." *Economic Modelling* 52: 400-407.

The present paper examines the relationship between Corporate Social Performance (CSP) and Corporate Financial Performance (CFP), using both accounting-based (Return on Assets and Return on Capital) and market-based (Excess Stock Returns) performance indicators. We use Bloomberg's Environmental Social Governance (ESG) Disclosure score covering the S&P500 firms in the period 2007–2011 which allows for the examination of both linear and nonlinear relationships to be considered. The results of the linear model suggest that there is a significant negative relationship between CSP and Return on Capital. However, the non linear models provide evidence of a U-shaped relationship between CSP and the accounting-based measures of CFP, suggesting

that in the longer run CSP effects are positive. Most prominent among our results is that fact that by disentangling the ESG Disclosure score into its environmental, social and governance sub-components, we find that a U-shaped relationship exists only between the governance sub-component and CFP. A straightforward implication of our findings suggests that in order for CSR to serve the interests of the shareholders, a long-run planning and considerable resources should be dedicated at this direction, given that CSR expenditure pays off only after a threshold of CSP has been reached. Furthermore, the fact that governance is the key driver affecting the CSP-CFP relationship suggests that CSR investments should be directed to this component.

Saeed, A., et al. (2023). "Corporate social responsibility, industry concentration, and firm performance: Evidence from emerging Asian economies." Research in International Business and Finance **64**: 101864.

Social and environmental performance are two pillars of corporate social responsibility that integrate the desires of firms to enhance their competitive advantages and demonstrate their commitment to society. Based on a sample of eight emerging Asian markets, this study investigates the role of firms' social and environmental performance in their financial performance, and how this may vary under different levels of industry competition. The results show that the social dimension is more effective in increasing firm performance relative to the environmental dimension. Further, the performance of socially oriented firms is more stable in highly competitive industries relative to environmentally oriented firms. Overall, this study supports the view that socially responsible firms have a competitive edge over their rivals that leads to higher profitability.





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