

Nexus between ESG Practice and Firm Performance: Are there any Stylised Facts?

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Abstract: This study examines the relationship between firm performance and ESG (environmental, social and governance) practice for Malaysian public-listed companies. It evaluates whether the relationship varies with firms' market capitalisation, total liabilities, and free cash flow. Using firm-level data from 72 companies covered in the FTSE4Good Bursa Malaysia (F4GBM) index from 2014 to 2022, our results show the following. First, ESG practice is positively and significantly associated with firm performance. However, the positive impact is conditional on the firm-specific variables. In particular, the positive impact of ESG is significant for firms with high market capitalisation. Second, the positive impact of ESG diminishes as firms accumulate higher liabilities. Third, the positive impact of ESG prevails if firms attain a high level of free cash flow. Our results suggest that firms must increase their market capitalisation, reduce total liabilities, and improve their free cash flow to benefit from ESG practices.

Keywords: Environmental, social and governance (ESG), Tobin Q, corporate finance performance

JEL classification: G11, G18, G32, G38, H21

1. Introduction

ESG (environmental, social and governance) investing began with socially responsible investing (SRI) in the 1960s when investors excluded stocks or stocks of an entire industry from their portfolios based on business activities such as tobacco production or civil rights (Townsend, 2020). It is widely believed that the concept of SRI arose from earlier religious practices, such as the Methodist Church's refusal to invest in businesses related to tobacco, alcohol, gambling, or weapons (Sahut & Pasquini-Descomps, 2015; Townsend, 2020). This exclusive investment standard based on religious teachings became the original prototype of SRI.

With the development of social and environmental changes, environmental protection, human rights equality awareness, anti-war awareness, and awareness of ethnic minorities, some investors hope to reflect their society responsible and value-oriented investment activities. ESG investing has been widely recognised in Europe

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and America. The first ESG investment fund in the United States was launched in 1971 (Agarwal, 2020), and the first ESG index was established in 1990.¹ At the beginning of its establishment, more than 80% of the investment came from Europe and the United States. In 2006, the United Nations (UN) established the Principles for Responsible Investment (PRI) to encourage sustainable investment.

ESG is no longer unfamiliar to practitioners, policymakers, corporations, investors and researchers (Bofinger et al., 2022). The ESG-oriented policy is in line with the Paris Agreement adopted in 2015. This study observes that in recent years, policymakers in various countries have begun to incorporate ESG elements into their policies, such as tax exemptions or rebates for the purchase of electric vehicles and lower borrowing costs for commercial financing for green companies (Pástor et al., 2021; Zhang et al., 2021). The most obvious example is the passage of the European Union (EU) Sustainable Financial Disclosure Regulation (SFDR) and taxonomy regulations in Europe (Bioy & Jmili, 2021).

A study by Aydoğmuş et al. (2022) noted that the impact of ESG disclosures on firm performance has gained rising attention among researchers in recent years. The rising interest in climate change, circular economy and biodiversity issues has induced the academic literature to shift from examining the impact of corporate governance on firm performance to the discovery of the linkage between environmental factors and firm performance.

Motivated by the growing importance of ESG practices to the individual company performance and the economy, this study examines the relationship between firm performance and ESG practice for Malaysian public-listed companies. Malaysia is an interesting case for ESG research for two reasons. First, the launch of the FTSE4Good Bursa Malaysia Index in 2014 and the adoption of the Sustainable Development Goals (SDGs), which came into effect in January 2016, have resulted in an apparent increase in ESG disclosures, highlighting efforts to reduce information asymmetry, improve transparency and provide non-financial voluntary disclosures that benefit investor decision-making. Second, the introduction of the Malaysian Code for Institutional Investors in 2014 urged the director to give attention to ESG to meet the long-term interests of various stakeholders. Given the fast-growing ESG disclosures, examining the impact of ESG practices on firm performance is interesting.

This study closely follows the research on Malaysia by Mohammad and Wasiuzzaman (2021), which looks at the impact of ESG practices on firm performance and explores potential firm-specific variables that influence the relationship between firm performance and ESG practices. This study differs from Mohammad and Wasiuzzaman (2021) in three aspects. First, in terms of the sample, Mohammad and Wasiuzzaman (2021) employed 661 listed companies in the main market of Bursa Malaysia. In contrast, this study employs firm-level data from the public-listed companies covered under the FTSE4Good Bursa Malaysia (F4GBM) index. The F4GBM index launched in 2014 is used to monitor the ESG development of the country. Hence, the sample firm covered in the F4GBM index is expected to capture the ESG practices in the Malaysian

¹ <https://www.msci.com/our-solutions/esg-investing#:~:text=MSCI's%20ESG%20origins%20date%20back,%2C%20advisers%2C%20banks%20and%20insurers>

capital market. Second, Mohammad and Wasiuzzaman (2021) explored the role of a firm's competitive advantage in influencing the relationship between firm performance and ESG practice. Meanwhile, this study takes the lead and explores the potential role of firms' market capitalisation, total liabilities and free cash flow in affecting the relationship between firm performance and ESG practices. Third, from the analytical perspective, this study provides a more innovative approach to interpreting the moderating effect of the firm-specific variables. In particular, this study computes the marginal effect of ESG at various levels of firms' market capitalisation, total liabilities and free cash flow. This study provides a comprehensive assessment of the impact of ESG practices on firm performance.

The empirical analysis of this study relies on unbalanced panel data from 72 public-listed companies covered in the FTSE4Good Bursa Malaysia (F4GBM) index from 2014 to 2022. The F4GBM index was launched in December 2014 with 24 constituents. It has four main objectives, namely, supporting investors in making ESG investments in Malaysian listed companies, increasing the profile and exposure of companies with leading ESG practices, encouraging best practice disclosure, and supporting the transition to a lower carbon and more sustainable economy. The F4GBM index measures the performance of companies publicly listed in Bursa Malaysia that demonstrate strong ESG practices. The composition of the F4GBM Index is reviewed semi-annually, and the constituents are drawn from the FTSE Bursa Malaysia EMAS Index, comprising public-listed companies from across the small, medium and large market capitalisation segments. An ESG score is created for the constituents in the FTSE Bursa Malaysia EMAS Index based on the FTSE Russell's ESG Data Model. The methodology analyses companies' exposure across a full spectrum of material ESG risks, classified into 14 ESG themes and underpinned by more than 300 detailed quantitative and qualitative indicators from the company financial report. Companies in the Bursa Malaysia EMAS universe with an ESG score exceeding a defined threshold are eligible for inclusion in the F4GBM Index. As of 2019, the threshold score for eligibility is 2.9 for companies in emerging markets and 3.3 for companies in developed markets.

The empirical results of this study are as follows. First, the estimated coefficient of ESG is positive and significant, implying that ESG practices enhance firm performance in the capital market of Malaysia. Second, the relationship between firm performance and ESG practices is conditional on the firm's market capitalisation. ESG practice is found to have an insignificant impact on firm performance for low market capitalisation companies. However, the positive impact of ESG becomes significant with increasing market capitalisation. Third, firms' total liabilities influence the relationship between firm performance and ESG practice. ESG practice is positively and significantly associated with firm performance for companies with low total liabilities. However, the positive impact diminishes with increasing levels of total liabilities. Fourth, free cash flow affects the relationship between firm performance and ESG practice. ESG practice is found to have an insignificant impact on firm performance for companies with low free cash flow. However, the positive impact of ESG becomes significant if free cash flow is sufficiently high.

This study contributes to the ESG literature in two aspects. First, this study adds to the ESG literature by providing a country-specific analysis of the impact of ESG practice

on Malaysian firm performance. In a broader context, this study also contributes to the growing ESG literature on emerging capital markets. Second, this study adds to the strand of research on the relationship between firm performance and ESG practice by bringing to the fore the potential role of firm-specific variables. Specifically, this study extends the literature on firm performance and ESG practice by exploring new moderating variables: market capitalisation, total liabilities and free cash flow. This complements the study by Mohammad and Wasiuzzaman (2021), in which the relationship between firm performance and ESG practice depends not only on firms' competitive advantage but also on the level of market capitalisation, total liabilities and free cash flow.

This paper is structured as follows. Section 2 develops the hypotheses of this study. Section 3 describes the data and empirical model. Section 4 presents the baseline estimation results, followed by the robustness checks in Section 5. The last section concludes the paper.

2. Hypotheses Development

This section develops the hypotheses for this study. ESG investing has drawn increased attention among international and domestic investors. As Henisz et al. (2019) suggested, a strong ESG practice would create value by improving growth potential, reducing cost, earning government support, improving productivity, and enhancing investment returns by optimizing capital allocation. Moreover, a study by Friede et al. (2015) surveyed more than 2,000 empirical studies on ESG disclosure and firm performance and found that ESG practices generally led to better firm performance. Thus, the first hypothesis is as follows:

H1: Firm performance is positively associated with ESG practices.

As Mohammad and Wasiuzzaman (2021) argued, ESG disclosure activities rely heavily on firm resources. The study found that a firm's competitive advantage positively moderates the relationship between firm performance and ESG disclosures. The results highlight the important role of firm-specific conditions in influencing the relationship between firm performance and ESG practices. Accordingly, this study takes the lead from Mohammad and Wasiuzzaman's (2021) lead to explore potential firm-specific variables that affect the relationship between firm performance and ESG practices. The selected firm-specific variables are market capitalisation, total liabilities and free cash flow. The variable selection is motivated by the close-knit relationship between firm performance and the three firm-specific variables.

A study by Al-Hiyari et al. (2023) found that firms with stronger ESG performance have a higher investment efficiency, thereby contributing to higher firm performance. This study conjectures that market capitalisation, total liabilities and free cash flow moderate the relationship between firm performance and ESG practices through the investment channel. In particular, firms with higher market capitalisation, lower total liabilities or higher free cash flow exhibit a greater capacity in terms of financial resources and human capital to invest in productive investment, thereby contributing to higher investment efficiency. The additional investment strengthens the positive

impact of ESG practices on firm performance. Conversely, firms with lower market capitalisation, higher total liabilities or lower free cash flow are likely to divert the financial resources for other expenses, thereby reducing the allocation for productive investment and achieving lower investment efficiency. The reduction in the investment weakens the positive impact of ESG practices on firm performance. Thus, hypotheses 2, 3 and 4 are set to test these conjectures.

H2: *The firm's market capitalisation positively moderates the relationship between its performance and ESG practices.*

H3: *The firm's total liabilities negatively moderate the relationship between its performance and ESG practices.*

H4: *The positive relationship between ESG practices and firm performance is conditional on the firms' free cash flow.*

3. Empirical Model and Data

3.1 Empirical Model

This study formulates the following empirical model to examine the relationship between firm performance and ESG practices:

$$TOBINQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 LnMKTCAP_{it} + \beta_3 LnTL_{it} + \beta_4 FCF_{it} + \beta_5 DY_{it} + INDUSTRY_i + YEAR_t + \varepsilon_{it} \quad (1)$$

where i is the firm index, t is the year index, and Ln represents natural logarithm. $TOBINQ$ represents Tobin's Q ratio, a proxy for firm performance (Chia et al., 2020; Fang et al., 2009; Mohammad & Wasiuzzaman, 2021). ESG indicates the ESG score, $MKTCAP$ represents market capitalisation, TL refers to total liabilities, DY indicates dividend yield, and FCF denotes free cash flow.² Meanwhile, $INDUSTRY$ is a set of industry-specific dummy variables constructed based on the sector classification of Bursa Malaysia to control for time-invariant industry effects. Year dummies ($YEAR$) are included to control for the common shocks and ε_{it} is the error term. The coefficient of interest in Eq. (1) is β_1 , which captures the association between firm performance and ESG practices.

To examine the moderating effect of market capitalisation, total liabilities and free cash flow on the relationship between firm performance and ESG practices, Eq. (1) is extended by including the interaction term between ESG and the firm-specific variables as follows:

$$TOBINQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 LnMKTCAP_{it} + \beta_3 ESG_{it} \times LnMKTCAP_{it} + \beta_4 LnTL_{it} + \beta_5 FCF_{it} + \beta_6 DY_{it} + INDUSTRY_i + YEAR_t + \varepsilon_{it} \quad (2)$$

$$TOBINQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 LnMKTCAP_{it} + \beta_3 LnTL_{it} + \beta_4 ESG_{it} \times LnTL_{it} + \beta_5 FCF_{it} + \beta_6 DY_{it} + INDUSTRY_i + YEAR_t + \varepsilon_{it} \quad (3)$$

² Due to the presence of negative cash flow, this variable is not transformed into natural logarithm.

$$TOBINQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 LnMKTCAP_{it} + \beta_3 LnTL_{it} + \beta_4 FCF_{it} + \beta_5 ESG_{it} \times FCF_{it} + \beta_6 DY_{it} + INDUSTRY_i + YEAR_t + \varepsilon_{it} \quad (4)$$

For Eq. (2) to Eq. (4), according to Kingsley et al. (2017), it is inappropriate to draw inferences based on the estimated coefficients of the interaction term. The reason is that the insignificance of the interaction term does not indicate the insignificance of the marginal effects of ESG at all levels of market capitalisation, total liabilities and free cash flow. Similarly, a significant interaction term does not necessarily mean the significance of the marginal effects of ESG at all levels of market capitalisation, total liabilities and free cash flow. Thus, the marginal effect estimates are needed to explain the relationship between firm performance and ESG practice for the model with an interaction term. The marginal effect of ESG on firm performance for the above three models can be computed as follows:

$$\frac{\partial TOBINQ_{it}}{\partial ESG_{it}} = \beta_1 + \beta_3 LnMKTCAP_{it} \quad (5)$$

$$\frac{\partial TOBINQ_{it}}{\partial ESG_{it}} = \beta_1 + \beta_4 LnTL_{it} \quad (6)$$

$$\frac{\partial TOBINQ_{it}}{\partial ESG_{it}} = \beta_1 + \beta_5 FCF_{it} \quad (7)$$

Following common practice in firm-level studies, all the variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. Moreover, the pooled ordinary least squares (OLS) with double-clustered standard errors suggested by Peterson (2009) are used to estimate Eq. (1) to Eq. (4) to account for within-cluster correlations.

3.2 Data

This study collects firm-level data from the public-listed companies covered in the F4GBM index. Given that Bursa Malaysia launched F4GBM in 2014 to monitor the country's ESG development, the sample period of this study spans from 2014 to 2022.

Based on the latest review period of June 2022, there are a total of 87 companies that meet FTSE4Good criteria and are included in the construction of the F4GBM index.³ However, due to data availability of the ESG score and Tobin's Q ratio from the Bloomberg database and the exclusion of financial firms, this study arrives at a final sample of 72 companies. The panel data are unbalanced due to missing data in some companies. Table 1 shows the list of variables.

³ https://www.bursamalaysia.com/sites/5d809dcf39fba22790cad230/assets/62b2c52e5b711a17932395db/June9_2022_FTSE4GOOD_BURSA_MALAYSIA_JUNE_2022_SEMI-ANNUAL_REVIEW.pdf

Table 1. List of variables

Variables	Description	Unit of measurement
<i>TOBINQ</i>	Tobin's Q ratio. Market capitalisation over firm asset	Ratio
<i>ESG</i>	Environmental, Social, and Government disclosure	Score
<i>MKTCAP</i>	Market capitalisation	Million MYR
<i>TL</i>	Total liabilities	Million MYR
<i>FCF</i>	Free cash flow	Million MYR
<i>DY</i>	Dividend yield	%

Note: All the data are retrieved from the Bloomberg database.

4. Empirical Results

Table 2 shows the descriptive statistics for all variables used in this study. The average value of *TOBINQ* in the sample is about 2.2% over the period. Meanwhile, the average score of *ESG* is about 43, placing Malaysia's ESG performance in the second quartile of the ESG benchmark set by Refinitiv.⁴ The second quartile indicates satisfactory relative ESG performance and a moderate degree of transparency in reporting material ESG data publicly. This number is reasonable because ESG is a relatively new phenomenon among companies in Malaysia. Its development is in the infant stage.

Table 2. Descriptive statistics

Variables	Mean	Std dev	Skewness	Kurtosis	Obs.
<i>TOBINQ</i>	2.1702	2.1636	2.9326	12.5102	619
<i>ESG</i>	42.8669	11.0307	0.2558	2.5211	447
<i>LnMKTCAP</i>	8.3327	1.4326	0.0113	2.3761	619
<i>LnTL</i>	7.4456	1.8219	-0.0603	2.3391	632
<i>FCF</i>	294.5624	896.3495	1.0914	7.4641	631
<i>DY</i>	3.3529	4.8896	4.3996	27.4689	620

Notes: *Ln* denotes natural logarithm. Obs. refers to the number of observations.

Table 3 shows the pairwise correlation coefficients for all the variables. Notably, *TOBINQ* and *ESG* are positively and significantly correlated, suggesting a positive relationship between firm performance and ESG practice. Furthermore, each pairwise correlation has a coefficient value lower than 0.8 (threshold value suggested by Gujarati (2003)), indicating absence of multicollinearity issues in the model.

Table 4 shows the baseline estimation results for this study. Column 1 shows the estimation results for the model without interaction term (Eq. (1)). Focusing on the key variable, the estimated coefficient of *ESG* is positive and significant at the 5% level. The finding implies that ESG practices enhance firm performance in the capital market of

⁴ <https://www.refinitiv.com/en/sustainable-finance/esg-scores>

Table 3. Pairwise correlations

	<i>TOBINQ</i>	<i>ESG</i>	<i>LnMKTCAP</i>	<i>LnTL</i>	<i>FCF</i>	<i>DY</i>
<i>TOBINQ</i>	1.0000					
<i>ESG</i>	0.1915***	1.0000				
<i>LnMKTCAP</i>	0.2308***	0.3530***	1.0000			
<i>LnTL</i>	-0.3144***	0.2500***	0.6610***	1.0000		
<i>FCF</i>	0.0617	0.2430***	0.4573***	0.2666***	1.0000	
<i>DY</i>	0.0131	0.0372	0.1264**	0.0369	0.1084***	1.0000

Notes: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively. *Ln* denotes natural logarithm.

Table 4. Baseline estimation results

	Without interaction term		With interaction term	
	1	2	3	4
<i>ESG</i>	0.0586** (0.0274)	-0.0935 (0.1186)	0.1667** (0.0687)	0.0555** (0.0258)
<i>LnMKTCAP</i>	0.9942*** (0.1959)	0.2580 (0.6813)	0.9945*** (0.1988)	0.9961*** (0.1952)
<i>LnTL</i>	-0.9455*** (0.1803)	-0.9378*** (0.1783)	-0.3314 (0.3600)	-0.9523*** (0.1799)
<i>FCF</i>	-0.0002** (0.0000)	-0.0002** (0.0000)	-0.0002* (0.0000)	-0.0007 (0.0004)
<i>DY</i>	-0.0168 (0.0247)	-0.0132 (0.0241)	-0.0208 (0.0232)	-0.0162 (0.0244)
<i>ESGxLnMKTCAP</i>		0.0173 (0.0153)		
<i>ESGxLnTL</i>			-0.0144* (0.0073)	
<i>ESGxFCF</i>				0.0001 (0.0001)
Constant	-0.1277 (0.9182)	6.1489 (5.3569)	-4.8297** (2.1448)	0.0192 (0.9261)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
No. of firms	72	72	72	72
No. of observations	447	447	447	447

Notes: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively. Values in parentheses are double-clustered standard errors. *Ln* denotes natural logarithm.

Malaysia. The result validates hypothesis 1 and concurs with the finding by Mohammad and Wasiuzzaman (2021) on Malaysia. In a broader context, the results align with the findings by Alareeni and Hamdan (2020), Deng and Cheng (2019), Friede et al. (2015) and Yoon et al. (2018), in which ESG practice is important in improving company performance.

Column 2 shows the estimation results for Eq. (2) that takes into account the interaction between *ESG* and market capitalisation. The estimated coefficient of the interaction term ($ESG \times LnMKTCAP$) is insignificant. However, the insignificance of the interaction term does not indicate the insignificance of the marginal effects of ESG at all market capitalisation levels. Hence, the corresponding marginal effect graph is plotted as shown in Figure 1. Interestingly, for firms with low levels of market capitalisation, ESG practices have an insignificant impact on their firm performance. However, the positive impact of ESG becomes significant with increasing market capitalisation. The result validates hypothesis 2 and highlights the important role of market capitalisation in influencing the relationship between firm performance and ESG practices. Specifically, firms with a higher market capitalisation exhibit a greater capacity in terms of financial resources and human capital to invest in productive investment, thereby contributing to higher investment efficiency. The additional investment strengthens the positive impact of ESG practices on firm performance. Conversely, firms with low market capitalisation are vulnerable to economic shocks and they are likely to set aside financial resources as a buffer to withstand adverse economic impacts. As a result, this reduces investment activities and erodes the positive impact of ESG on firm performance.

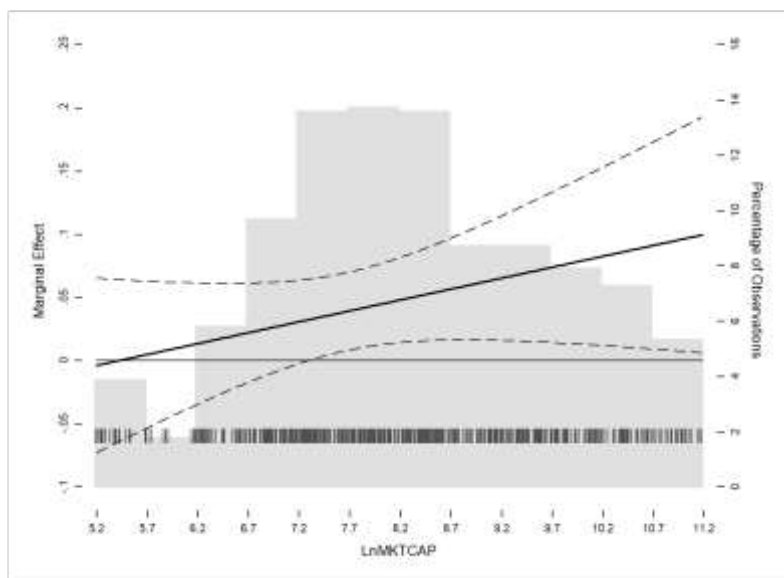


Figure 1. Marginal effect of *ESG* on *TOBINQ* at various levels of *LnMKTCAP*

Notes: The figure provides the marginal effect (solid line) and its 90% confidence interval (dotted lines), with the frequency distribution of *LnMKTCAP* (histogram). The above marginal effect diagram is plotted based on the estimation result in column 2 of Table 4.

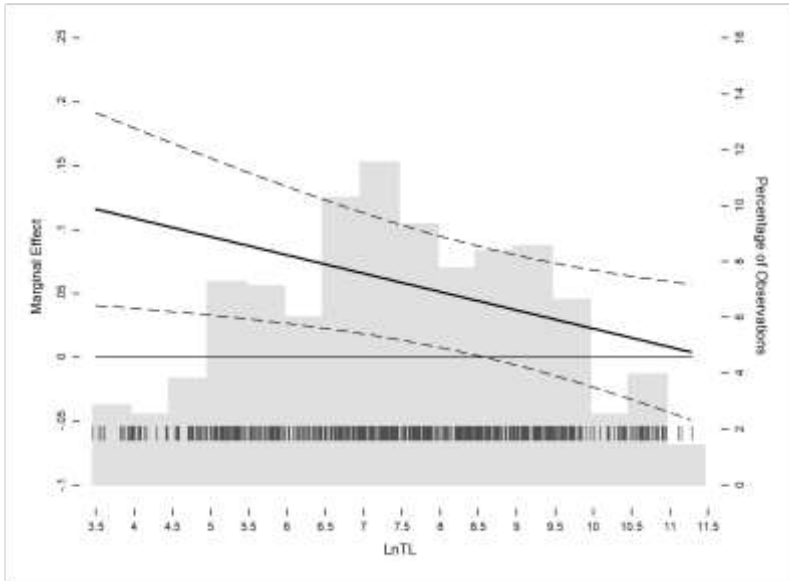


Figure 2. Marginal effect of *ESG* on *TOBINQ* at various levels of *LnTL*

Notes: The figure provides the marginal effect (solid line) and its 90% confidence interval (dotted lines), with the frequency distribution of *LnTL* (histogram). The above marginal effect diagram is plotted based on the estimation result in column 3 of Table 4.

Column 3 shows the estimation results for Eq. (3), where the interaction between *ESG* and total liabilities is included. The corresponding marginal effect graph is shown in Figure 2. The result shows that *ESG* practice is positively and significantly associated with firm performance for companies with low total liabilities. However, the positive impact diminishes with increasing levels of total liabilities. The results validate hypothesis 3, whereby higher total liabilities would offset the positive impact of *ESG* practices on firm performance. The result is justifiable. Intuitively, firms with high total liabilities must spend a significant portion of their financial resources to pay for the accrued debt. This debt payment reduces the allocation to productive investment and leads to lower investment efficiency. The reduction in investment offsets the positive impact of *ESG* practice on firm performance.

Column 4 shows the estimation results for Eq. (4) that includes the interaction between *ESG* and free cash flow. The corresponding marginal effect graph is shown in Figure 3. Interestingly, the impact of *ESG* practices on firm performance is insignificant for companies with low free cash flow. However, the positive impact of *ESG* becomes significant as the level of free cash flow increases.

The result validates hypothesis 4 and highlights the role of free cash flow in influencing the relationship between firm performance and *ESG* practice. The result is justifiable. Intuitively, firms with low free cash flow tend to have financial constraints for investment activities. The reduction in investment weakens the positive impact of *ESG* practices on firm performance. In contrast, firms with high free cash flow have greater

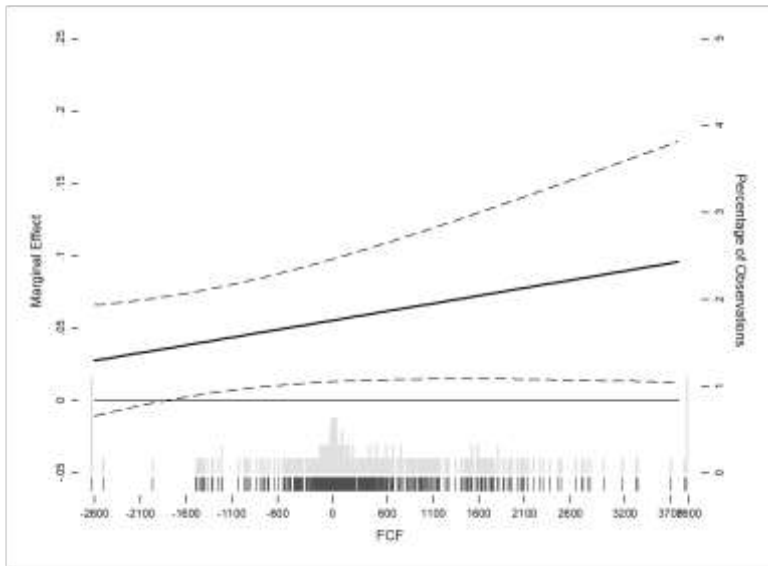


Figure 3. Marginal effect of *ESG* on *TOBINQ* at various levels of *FCF*

Notes: The figure provides the marginal effect (solid line) and its 90% confidence interval (dotted lines), with the frequency distribution of *FCF* (histogram). The above marginal effect diagram is plotted based on the estimation result in column 4 of Table 4.

financial capacity and capability to invest. The additional investment further enhances the positive impact of ESG practices on firm performance.

5. Endogeneity

To ensure the robustness of the baseline estimation results, this section addresses the issue of endogeneity in the model. Intuitively, firm performance is correlated with the firm-specific variables, indicating a possible reverse causality running from *TOBINQ* to the independent variables in the models of this study. To mitigate the endogeneity issue, this section re-estimates Eq. (1), Eq. (2), Eq. (3) and Eq. (4) by using the instrumental-variable estimator, namely the two-stage least squares (2SLS) estimator. It is worth noting that only the variable of interest in each model specification will be regarded as endogenous. This specification is to avoid instrument invalidity and over-identification problems. In Eq. (1), the *ESG* variable will be considered endogenous. Meanwhile, in Eq. (2) to Eq. (4), the interaction term and the associated constituent terms are assumed to be endogenous. Based on common practice in the literature (Baum et al., 2020; Boubaker et al., 2019), the 2SLS estimator is estimated using the two- and three-period lagged values of the endogenous variable as instruments. This study uses the second and third lags of the firm-specific variables.

As indicated earlier, inferences will be made based on the marginal effect estimate instead of the coefficient of the interaction term. The marginal effect diagrams for all the estimation results are not presented due to space constraints but are available upon

Table 5. Robustness check with two-stage least square (2SLS) estimator

	Without interaction term		With interaction term	
	1	2	3	4
<i>ESG</i>	0.0920* (0.0512)	-0.2621 (0.2618)	0.2684** (0.1258)	0.0194 (0.0709)
<i>LnMKTCAP</i>	0.7612*** (0.2001)	-1.1285 (1.4543)	0.7850*** (0.1982)	0.6868* (0.3995)
<i>LnTL</i>	-0.7237*** (0.1883)	-0.6412*** (0.1772)	0.2995 (0.6003)	-0.7598*** (0.2132)
<i>FCF</i>	-0.0002* (0.0000)	-0.0002 (0.001)	-0.0001* (0.0000)	-0.0087 (0.0070)
<i>DY</i>	-0.0460 (0.0521)	-0.0289 (0.0512)	-0.0531 (0.0491)	-0.0396 (0.0934)
<i>ESGxLnMKTCAP</i>		0.0391 (0.0318)		
<i>ESGxLnTL</i>			-0.0229* (0.0132)	
<i>ESGxFCF</i>				0.0002 (0.0002)
<i>The marginal effect of ESG on TOBINQ at various levels of LnMKTCAP/LnTL/FCF</i>				
Minimum		-0.0593 (0.1005)	0.1892** (0.0857)	-0.4559 (0.4634)
0.25 quantile		0.0236 (0.0428)	0.1288** (0.0606)	0.0150 (0.0736)
Mean		0.0612* (0.0329)	0.0990* (0.0526)	0.0328 (0.0637)
0.75 quantile		0.1074** (0.0521)	0.0672 (0.0496)	0.0969* (0.0557)
Maximum		0.1751* (0.1010)	0.0099 (0.0600)	0.7180 (0.5606)
Stock-Wright LM S test	0.0682*	0.0244**	0.0012**	0.0235**
Hansen test	0.1871	0.1318	0.4385	0.2960
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
No. of firms	53	53	53	53
No. of observations	231	231	231	231

Notes: *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively. Values in parentheses are robust standard errors. The p-value is reported for the Stock-Wright LM S and Hansen tests. *Ln* denotes natural logarithm.

request. As an alternative, the marginal effects are computed at the minimum, 0.25 quantile, mean, 0.75 quantile, and maximum values of the market capitalisation, total liabilities and free cash flow.

Table 5 shows the estimation results using the 2SLS estimator. The diagnostic checks show that the Stock-Wright LM S tests are rejected, indicating the instruments' validity. The Hansen J-test is not rejected, implying that the results are free from overidentifying restriction. Column 1 presents the estimation results for Eq. (1). The estimated coefficient of *ESG* remains positive and significant, suggesting that the key finding of a positive association between firm performance and ESG practices is robust and not affected by the endogeneity issue. Column 2 shows the estimation results for Eq. (2). Consistent with the baseline estimation results in Table 4, the positive effect of ESG practice on firm performance becomes stronger and more significant with increasing levels of market capitalisation.

A similar finding is observed for the model that contains the interaction term between *ESG* and total liabilities (column 3). The result shows that the positive impact of ESG practice on firm performance diminishes with rising levels of total liabilities, suggesting that firms with relatively higher total liabilities are unlikely to reap the benefit from ESG investment. Column 4 shows the marginal effect of ESG practices on firm performance at various levels of free cash flow. Consistent with the baseline estimation results, the positive impact of ESG practice on firm performance prevails only if firms maintain a sufficiently high level of free cash flow. Taken together, the results from the 2SLS estimators are consistent with the baseline estimation results, suggesting that the key findings of this study are robust and not affected by the endogeneity concern.

6. Conclusion

This study examines the relationship between firm performance and ESG practice for companies listed in Bursa Malaysia. The analysis is extended by exploring for potential moderating variables. The empirical results prove that ESG practice is positively and significantly associated with firm performance. Further analysis using the model with interaction terms provides three important insights into the relationship between firm performance and ESG practice. First, the relationship between firm performance and ESG practices is conditional on the firm's market capitalisation. ESG practice is found to have an insignificant impact on firm performance for companies with low market capitalisation. However, the positive impact of ESG becomes significant with higher levels of market capitalisation.

Second, firms' total liabilities influence the relationship between firm performance and ESG practice. ESG practice is positively and significantly associated with firm performance for companies with low total liabilities. However, the positive impact diminishes as the level of total liabilities increases. Third, free cash flow affects the relationship between firm performance and ESG practice. ESG practice is found to have an insignificant impact on firm performance for companies with low levels of free cash flow. However, the positive impact of ESG becomes significant if firms accumulate a sufficiently high level of free cash flow.

The results have two important policy implications for companies. First, ESG practice is found to enhance firm performance. The result urges the public-listed companies in Malaysia to pursue ESG practices actively to attain higher firm performance. Second, to reap the benefit of ESG practice, a firm must increase its market capitalisation, reduce total liabilities and improve free cash flow.

The current study focuses on the constituent companies of the F4GBM index with good ESG disclosure practices. Future research can expand the scope of analysis by studying companies that are non-constituents of the F4GBM index. By considering these companies, the analysis will shed light on the moderating role of market capitalisation, total liabilities and free cash flow for firms with weak ESG disclosure practices.

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