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FINANCIAL PERFORMANCE: SUSTAINABILITY, SIZE, SHARIA, AND SECTOR EFFECTS IN MUSLIM-MINORITY STOCK EXCHANGES

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ABSTRACT

Sustainability and halal stocks have become increasingly popular in the digital and globalized world after the COVID-19 pandemic, even in Muslim-minority developed countries. This study examines whether sustainability, size, and Sharia compliance status affects financial performance and whether the effects are different across sectors and stock exchanges. We collect the cross-section data for 2022–2023 covering 270 public-listed companies. These include earning-per-share (EPS) representing performance, market capitalization representing firm size, and business sectors from Compustat, halal status and level from Musaffa, and Environmental, Social, and Governance (ESG) rating and risk representing sustainability from Sustainalytics. Using the partial least square structural equation model (PLS-SEM), we discover the significance of sustainability and size but the debatably significant moderating effect of Sharia, sector, and stock exchange on performance. We explain these findings by the Stakeholder Theory and Resource-Based View. These results should prove beneficial to managers in backing their green and Sharia compliance strategies for financial performance.

Keywords: Sustainability, Sharia, Firm size, Financial performance, Muslim-minority.
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I. INTRODUCTION

The COVID-19 pandemic has been a catalyst for changes, presenting unprecedented challenges to businesses across the globe. Companies have been forced to adapt their operations rapidly to survive and perform in the face of economic uncertainties, sustainability disruptions, and changing consumer behavior. However, the impact of the pandemic and the subsequent recovery process may vary across different regions and contexts (He et al., 2020; Tekin & Güçlü, 2023).

Muslim-minority countries, characterized by a significant Muslim population within predominantly non-Muslim countries, represent a distinct economic environment where Muslims face unique challenges and opportunities due to their cultural, religious, and regulatory contexts. Muslim individuals, as members of a minority group, encounter difficulties when engaging in investment activities, generating profits, and experiencing growth within a financial system not aligned with Islamic principles. The Islamic principles encompass the concept of sustainability, wherein the adherence to halal practices necessitates that they benefit both the environment and individuals. However, it is essential to note that while certain practices may be environmentally friendly, they may not necessarily meet the criteria for being halal. Muslims anticipate a harmonious coexistence between sustainability and Sharia (Menne et al., 2022). Muslim investors expect the high performance and profitability of their Sharia-compliant and sustainable stocks. Thus, understanding the interplay between financial performance, sustainability, and Sharia laws (Jan et al., 2019; Khattak et al., 2020; Lee & Isa, 2023; Ramli et al., 2022) in these countries can provide valuable insights for managers, Muslim investors, and businesses aiming to navigate the post-pandemic recovery phase effectively, especially in Muslim-minority countries where these three factors might not be aligned.

Sustainability has emerged as a critical business imperative in recent years, with organizations recognizing the need to adopt environmentally and socially responsible practices. Sustainable business practices not only contribute to the well-being of the planet and society but also offer potential financial benefits. Research, as early as the 1970s, has documented a positive connection between sustainability and financial performance in various contexts, but findings are difficult to generalize and remain disjointed and a puzzle (Friede et al., 2015). Further, Sharia compliance, which refers to adherence to Islamic principles and ethical guidelines, is another key dimension influencing Muslim investors, even in Muslim-minority countries. The interaction between sustainability, Sharia, and financial performance in Muslim-minority countries after the COVID-19 pandemic remains underexplored and a puzzle as most studies are in emerging and Muslim countries (Khattak et al., 2020; Lee & Isa, 2023; Ramli et al., 2022; Tekin & Güçlü, 2023) not in developed countries where Muslims are a minority. This study fills in a gap in this context.

Furthermore, the sector classification and stock exchange listing of a company might interact with determinants of financial performance. More specifically, sector-specific characteristics and the governance framework of different stock exchanges might influence the association between sustainability, firm size, and enterprise financial performance. Understanding the interplay between these factors is essential for identifying sector-specific opportunities and challenges,

enhancing corporate governance practices, and fostering sustainable growth in Muslim-minority countries. This paper aims to explore the complex interaction effect of sustainability, firm size, Sharia compliance, sector classification, and stock exchange listing on the financial performance of companies operating in Muslim-minority countries after the COVID-19 pandemic. By utilizing a comprehensive latest dataset and employing robust statistical methods, this research seeks to provide empirical evidence and offer practical recommendations for business managers to navigate the evolving business landscape in these unique contexts.

The paper is structured as follows. Section 2 reviews related literature and presents hypothesis development. Section 3 describes the data and methodology. The results are discussed in Section 4, and the conclusion and recommendations are in Section 5.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Sustainability and Financial Performance

Numerous studies reveal a positive relationship between performance and sustainability, with financial performance more often become the outcome. Few studies deviate from this typical pattern and fall short of supporting this finding. Notwithstanding the results of these few studies, the positive impact of environmental, social, and governance (ESG) on performance appears to have a long history. When regions are taken into account (such as the US vs. non-US, developed vs. emerging), encouraging results are obtained (Friede et al., 2015).

The stakeholder theory, which contends that a business will succeed better in the long run if it manages its interactions with its stakeholders well, explains the connection between sustainability and performance. Individuals or groups who gain something from or suffer harm from the decisions made by a company are considered stakeholders. Based on the stakeholders' viewpoint, well-run companies with value maximization goals also consider the stakeholders, in addition to the shareholders. Consequently, reputable companies tend to commit to ESG and sustainability agenda. In summary, sustainable business conducts can achieve both sustainability objectives and profits. By contrast, the agency theory posits a negative relation between sustainability and performance, in which businesses' adoption of sustainable development strategies may be at the expense stockholders. The devotion of resources by executive management to sustainable endeavors may only boost their own image and in the process neglect their primary duties as managers (Lee & Isa, 2023). As most empirical evidence corroborates positive impact of sustainability on performance (Lee & Isa, 2020, 2023; Ramli et al., 2022, Barauskaite & Streimikiene, 2021, Friede et al., 2015, and Khattak et al., 2020), we propose the following hypothesis:

H1: Sustainability factor impacts positively company's financial performance

2.2. Size and Firm Performance

Existing studies confirm that firm size is a significant factor in the connection between sustainability and financial performance, which is in line with the resource-based view theory (Orlitzky, 2001). Fund size may have a significant

impact, dependent on measures of financial performance (Muñoz, 2020). Some studies find that small companies perform substantially worse than large companies, either directly (Gregory et al., 1997; Mion & Adaui, 2019) or indirectly via corporate governance and sustainability (Drempetic et al., 2020). Theoretically, the reason for putting sustainability as the mediating effect is that big companies have more resources for better corporate governance and being more sustainable and, consequently, better financial performance (Barney, 1991). Based on this, we state the following hypotheses:
H2: Firm size directly affects company's financial performance
H3: Firm size indirectly affects company's financial performance through sustainability factor

2.3. Moderating Effects of Sharia

Islamic rules and standards, known as Sharia, govern the conduct of Muslims and Islamic institutions in their economic, political, and social affairs. Most literature discusses only Sharia-compliant stocks (Lee & Isa, 2020, 2023) or compares Sharia vs non-Sharia stocks (Amalia & Kartikasari, 2016; Khattak et al., 2020). Some studies however evaluate Sharia as a moderating factor in the relationship between sustainability and performance, where some find insignificant relation using the number of Sharia experts on board as an indicator for Sharia governance (Jan et al., 2019) while others document significant relation (Khattak et al., 2020).

In this study, the sharia moderating effect is explored between size and performance. The idea is that Islamic governance will increase the positive relationship between size and performance because halal stocks are usually more capitalized, have less debt, and have healthier asset quality (Beck et al., 2013). The positive relation between size and performance can be stronger for Sharia-compliant firms or weaker due to the deviation of management focus from core financial responsibilities. Hence, the hypothesis to be tested is:
H4: The positive relationship between size and performance depends on Sharia compliance status of the company

2.4. Moderating Effects of the Industry Sector

Industry sectors potentially affect the link between sustainability and firm performance. During Covid-19, certain sectors, like energy, consumer staple, and health firms tend to have higher ESG and higher financial performance (Tekin & Güçlü, 2023). To comprehend the complex relationship between sector, Sharia, sustainability, and performance, we include all sectors including the financial sector which has distinct financial reports and company operations (Ramli et al., 2022). Ağan et al. (2016) find that the sustainability – performance relation is significant for chemicals, textile, and consumer products. Further, He at al. (2020) note that Covid-19 impacts different industries differently (He et al., 2020). Since this study covers the period after Covid-19 pandemic, we view the importance of industry sectors to prevail. Hence, we state the following hypothesis:
H5: The relationship between size and performance depends on sectors

2.5. Moderating Effects of Stock Exchange

Numerous studies document significant anomalies in firm size and earnings-price ratio in different stock exchanges, namely NASDAQ, NYSE, and Amex. Small firms in different stock exchanges tend to be different. For example, small firms in the NYSE are due to their underperformance while firms in NASDAQ are small because they are small at the time of listing. The differences between firms traded in different stock exchanges are due to the stock exchange characteristics and requirements. Goff (1994) notes that findings based on one stock exchange (say the NYSE) may not be extended to firms in another stock exchange such as NASDAQ. However, Mion & Adaui (2019) note that different stock exchanges in different developed countries, like Italy and Germany, do not affect their sustainability reporting quality (Mion & Adaui, 2019). Because our samples are mostly firms traded in NYSE (48%) and NASDAQ (49%), we expect that the microstructure behind these stock exchanges will affect the way small and large firms interact with sustainability, hence our hypothesis in this regard is:

H6: The relationship between size and performance depends on the stock exchanges

III. METHODOLOGY

3.1. Data Collection

Data are from various sources. Financial performance and firms' specific characteristics (size, sector, and stock exchange) are from Compustat, which is a database service provided by Standard and Poor's (S&P). The sustainability scores, namely the environmental, social, and corporate governance (ESG) scores are from Sustainalytics. Its rating is adopted by Yahoo Finance and stock exchanges around the world, including Indonesia. We collect all available cross-sectional data of 270 firms from May 30th to June 1st, 2023.

Sharia values are from Musaffa. Stocks traded in Muslim countries like Indonesia and Malaysia have a Sharia council to determine which stocks are halal and which are not. But stock exchanges in developed countries do not have Sharia councils. However, Musaffa offers a comprehensive halal stock screener certified by the Accounting and Auditing Organization for Islamic Finance Institutions (AAOIFI), an independent global not-for-profit organization whose standards are adopted by its members from 45 countries, including Indonesia. The screening methodology prohibits the sale of goods containing pork, tobacco, alcohol, and marijuana, as well as practices of excess debt, adult entertainment, gambling, cloning, firearms and defense, interests, and certain financial aspects, such as impermissible revenue ratio less than 5%, interest and debt ratio less than 30%. Our study is among the pioneer in terms of using Musaffa for research on stocks in developed countries.

3.2. Variables

A company's financial performance is proxied by earning per share (EPS) (Khattak et al., 2020; Ramli et al., 2022; Yang et al., 2019). EPS is the holy grail, the single most popular financial benchmark, among pundits and investors for a very long time. Scholars and shareholders value its simplicity in representing the earnings

generated for shareholders, although its application is limited by the inability of the EPS to reflect shareholder value (Wet, 2013). We will discuss this limitation in the next subsection on limitations. The EPS is computed as (net income − preferred dividends) / weighted average shares outstanding. Compustat calculates four variations of EPS. EPS1 is the standard EPS excluding extraordinary items and discontinued operations (EI & DO). EPS2 is the primary EPS but includes EI & DO. EPS3 is diluted excluding EI & DO, while EPS4 is diluted including EI & DO. We run confirmatory Tetrad analysis where we validate the EPS to be best specified as a reflective measurement model because all p-values are above 5% as presented in Table 1.

Table 1.
Confirmatory Tetrad Analysis

Financial Performance Indicators	P-values
1: EPS1,EPS2,EPS3,EPS4	0.658
2: EPS1,EPS2,EPS4,EPS3	0.322

Sustainability is proxied by ESG rating and ESG risk (Drempetic et al., 2020; Muñoz, 2020). Note that the five risk categories, which are negligible (0–10), low (10–20), medium (20–30), high (30–40), and severe (40+), are used to classify the ESG scores. According to this classification, the lower the ESG rating the better, since it means less risk of sustainability. For ease of interpretation, we reverse the rating such that the higher values reflect better ESG scores, while keeping the range of data constant. The ESG score and ESG Risk score are reflective indicators of our low-order construct of sustainability quality. All our indicators are reflective because they are interchangeable with high outer loading (See Table 6). Another reason for not introducing any dimensions or subgroups of indicators in our lower-order constructs is that we aim for a parsimonious but effective model for our study. Other studies might use higher-order formative constructs for sustainability (Mion & Adaui, 2019) and we open this possibility for future studies.

The Sharia or halal status is proxied by Halal, Not Halal, and Doubtful as the three classes for the covered stocks' Sharia compliance. Stocks are designated as "Not Covered" when Musaffa analysts have not yet reviewed them. The Halal stocks are divided into five groups and ranked from 1 to 5 once it has been determined that they are Sharia compliant. The more stars a stock gets, the more Sharia-compliant it is, and the higher the ranking. Assume, for instance, that a certain stock is given a ranking of 5 stars. In this scenario, the stock is a member of the stock category with the highest Sharia compliance. For our analysis, we denote not-covered stocks as missing values, nonhalal as -1, doubtful as 0, and Sharia-compliant stocks according to their stars from 1 to 5.

Size is proxied by market capitalization (Beck et al., 2013; Drempetic et al., 2020; Muñoz, 2020). We denote mega-cap as 6, large as 5, mid as 4, small as 3, micro as 2, and nano as 1. Sharia, size, and the last two variables are single indicator constructs: industry sector and stock exchange. Industry sectors are coded according to the Global Industry Classification Standard (GICS) where eleven business sectors are implemented.

The scope of this study covers stocks where their data are available. These stocks are from Muslim-minority countries including the USA (NAS & NYSE), Netherlands (AMS), Canada (TSE), Swiss (SWX), and Belgium (BRU). We should note that our samples are dominated by USA stocks. Thus, the findings are not generalizable for other developed countries although their samples are included.

We run measurement invariance assessment (Micom) and multi-group analysis (MGA) analysis for this construct: NYSE against NAS. The reason we conduct only on this construct is that the categorization meets the minimum subsample size for a model that has two arrows pointing at a construct, like our study, at a significance level of 5% and minimum R2 0.1 is 110 samples (Cohen, 1992). It suggests an equal sample but we cannot meet the requirement given our secondary data. However, multi-group analysis, either full or partial, finds that the difference between these subgroups is not meaningful in our dataset, as shown by all 1-tailed and 2-tailed (NAS vs NYS) p-value higher than 5% as presented in Table 2.

Table 2.
Multi Group Analysis and Measurement Invariance Assessment

Relationship	Difference (NAS - NYS)	1-tailed (NAS vs NYS) p-value	2-tailed (NAS vs NYS) p-value
QE (Sustainability) -> Performance	-0.218	0.914	0.172
Size -> Performance	-0.011	0.512	0.977
Sharia x Size -> Performance	0.183	0.051	0.102
Sector x Size -> Performance	0.097	0.220	0.439
Sustainability -> Performance	-0.127	0.768	0.464
Sector -> Performance	0.084	0.232	0.463
Sharia -> Performance	-0.002	0.511	0.978

Note: QE = Quadratic Effect

Thus, the effect of our categorical variables is not for the whole model like MGA nor all of the independent variables like control variables, but rather for specific variables via moderation effects.

3.3. Data Analysis

We first conduct preliminary checks (Hair et al., 2018) to justify our analytical method and find that the dataset is not normal and not linear as indicated in Table 3.

Table 3.
Normality Test

Constructs	Excess kurtosis	Skewness	CM	K-S	S-W	CM, K-S, S-W p-value
Performance	42.124	5.443	4.268	.201	.568	0.000
Stock Exchange	9.594	1.938	5.401	.274	.616	0.000
Sector	-0.537	0.004	0.886	.174	.955	0.000
Shariah	0.782	1.447	7.879	.390	.687	0.000
Size	-0.661	-0.016	2.196	.213	.899	0.000
Sustainability	0.236	-0.467	0.749	.138	.953	0.000

Note: Kurtosis, skewness, and Cramér-von Mises (CM) are collected from Smartpls, while Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) are collected from SPSS outputs.

Table 4.
Linearity Test

Relationship	Linearity	Deviation from Linearity	Quadratic Effects (QE)	Original Sample
Size → Sustainability	0.000	0.199	0.100	-0.066
Size → Performance	0.000	0.405	0.155	-0.045
Sustainability Performance	0.065	0.000	0.000	0.254

Table 3 shows that none of the constructs has Cramér-von Mises (CM), Kolmogorov-Smirnov (K-S), and Shapiro-Wilk (S-W) p-value more than 5% meaning that data is not normal. This finding is confirmed by skewness and kurtosis of performance that has a value beyond −2 and +2. Hence, performance variable exhibits substantial non-normality.

Table 4 presents that the link between sustainability and performance is not linear as indicated by a significant deviation from linearity as well as quadratic effect at 5% significance level. We will discuss more about linearity in the next subsection on the robustness check.

As such, we exclude regression and covariance-based structural equation model (CB-SEM) in our analysis since they require normality and linearity. We decide that variance-based (VB) partial least square (PLS) structural equation model (SEM) is the most appropriate approach for our case because of not only the aforementioned anomalies on our dataset but also our goal to find effects, identify key "driver" constructs (exploratory), explain variance (explanatory research), and predict key target constructs (predictive research). Further, the PLS-SEM is better than CB-SEM because achieving model fit with secondary data, like data in this study, is unlikely when using CB-SEM (Hair et al., 2018). We use SmartPLS 4 software as it allows attractive visual graphs with straightforward features and its latest version allows us to explore other aforementioned data analyses like regressions and CB-SEM.

IV. RESULTS AND ANALYSIS

4.1. Data Description

Our sample stocks comprises mostly healthcare industries, followed by information technologies, financials, and industries. Most of our stocks are not halal, traded in the USA, mid-cap, and have middle ESG risks as shown in Table 5.

Table 5.
Sample Descriptions

Code	#	%	Sector
Sample by Industry sectors			
10	9	0.96	Energy
15	15	2.41	Materials
20	38	8.12	Industrials
25	23	6.15	Consumer Discretionary
30	6	1.92	Consumer Staples
35	68	25.44	Health Care
40	39	16.68	Financials
45	41	19.72	Information Technology
50	7	3.74	Telecommunication Services
55	10	5.88	Utilities
60	14	8.98	Others
Sample by Sharia status			
-1	174	64.44	Not halal
0	5	1.85	Doubtful
1	18	6.67	Halal with 1 star
2	25	9.26	Halal with 2 star
3	18	6.67	Halal with 3 star
4	16	5.93	Halal with 4 star
5	12	4.44	Halal with 5 star
Blank	2	0.74	Not Covered
Sample by the stock exchange			
NAS	131	48.52	NASDAQ, USA
NYS	130	48.15	New York, USA
TSE	5	1.85	Toronto, Canada
BRU	1	0.37	Brussels, Belgium
SWX	1	0.37	Swiss
AMS	1	0.37	Amsterdam, Netherlands
PAR	1	0.37	Paris, France
Sample by size (market capitalization)			
1	1	0.10	Nano-cap
2	28	5.68	Micro-cap
3	96	29.21	Small-cap
4	87	35.29	Mid-cap
5	55	27.89	Large-cap
6	3	1.83	Mega-cap

Table 5.
Sample Descriptions (Continued)

Code	#	%	Sector
Sample by sustainability quality & ESG Risk (Pre-reverse score)			
1	4	0.49	Negligible ESG Risk
2	67	16.30	Low ESG Risk
3	127	46.35	Medium ESG Risk
4	57	27.74	High ESG Risk
5	15	9.12	Severe ESG Risk

4.2. Outer Model Quality

Based on the assessment of the measurement model criteria, the construct quality is determined. First, we assess the quality of our outer model by factor loadings, construct reliability, and construct validity. Table 6 shows that none of the items in this study has factor loadings less than the recommended value of 0.709 (Chin & Todd, 1995; Hair et al., 2014), hence no items are further removed. Second, we also check whether our measuring instrument is repeatable, consistent, and stable yielding the same results using Cronbach's alpha > 0.7, composite reliability (CR) using rho_a > 0.7, and average variance extracted (AVE) value greater than 0.5 (Chin & Todd, 1995; Garson, 2016). Because our indicators of reliability have values above the threshold, construct reliability is established. Third, convergent validity signals the high covariance between multiple measurements of similar aspects because the measurement is an accurate measure of the concept. It is manifested by an average variance extracted (AVE) value greater than 0.5 (Hair et al., 2018), as presented in Table 6. Hence, convergent validity is validated.

Table 6.
Validity and Reliability Analysis

Construct	Items	Factor Loadings	Alpha	CR	AVE
Financial Performance	EPS1	0.999	0.999	0.999	0.998
	EPS2	0.999			
	EPS3	0.999			
	EPS4	0.999			
Sustainability	ESG1	0.987	0.968	0.995	0.969
	ESG2	0.982			

Discriminant validity is validated using the Fornell and Larcker standard in which a construct's correlation with all other constructs is less than its square root of AVE for that construct (Chin & Todd, 1995; Garson, 2016; Hair et al., 2018). Table 7 demonstrates that the values of cells from the same column and row are higher than all cells below, meaning that discriminant validity is strongly supported. The discriminant validity of our measurement is verified by Heterotrait Monotrait (HTMT) ratios as all values are below 0.9.

Table 7.
Discriminant Validity

	FP	SEC	SHA	SIZ	SXC	SUS
FP	0.999	0.159	0.065	0.251	0.139	0.067
SEC	-0.159	1	0.090	0.012	0.100	0.302
SHA	0.065	-0.090	1	0.308	0.017	0.237
SIZ	0.251	0.012	0.308	1	0.293	0.290
SXC	0.139	-0.100	-0.017	0.293	1	0.115
SUS	-0.068	0.298	0.234	0.288	0.114	0.984

Note: Fornell Larcker (Diagonally left) and HTMT (Diagonally right). FP = Financial Performance, SEC=Business Sector, SHA=Sharia Islamic Law Compliance, SIZ=Firm Size, SXC=Stock Exchange, SUS=Sustainability quality

The quality of our reflective measurement model is validated by Table 6 and Table 7 because it satisfies all non-parametric evaluation criteria of internal consistency reliability, convergent validity, and discriminant validity. We can only continue with the subsequent assessment of the structural inner model once we have established the acceptability of our measurement characteristics (Hair et al., 2017).

4.3. Inner Model Quality

Utilizing the Variance Inflation Factor (VIF), the multicollinearity of the inner model is evaluated. Because all VIFs are lower than 3.3 (Kock, 2015), our structural model is thought to be free of common method bias as indicated by Table 8, and can be evaluated further.

Table 8.
Inner Model Collinearity and Variance Inflation Factor (VIF)

Relationship	VIF
H1: QE (Sustainability) -> Financial Performance	1.151
H2: Size -> Financial Performance	1.263
H4: Sharia x Size -> Financial Performance	1.248
H5: Sector x Size -> Financial Performance	1.050
H6: Stock Exchange x Size -> Sustainability	1.178
Sector -> Financial Performance	1.183
Sharia -> Financial Performance	1.423
Size -> Sustainability	1.125
Stock Exchange -> Sustainability	1.287
Sustainability -> Financial Performance	1.340

4.3.1. Direct Effects

We evaluate the quality of our model by assessing the structural paths and their significance. Table 9 reveals that all hypotheses of direct positive relationships (H1: beta = 0.262, t = 3.639, $p < 0.000$ and H2: beta = 0.266, t = 4.838, $p < 0.000$) are supported. Hence, we support that the sustainability factor impacts positively

to company's financial performance as found by past studies (Barauskaite & Streimikiene, 2021; Friede et al., 2015; Khattak et al., 2020; Lee & Isa, 2020, 2023; Ramli et al., 2022). We also corroborate previous research that claims firm size directly and positively affects a company's financial performance (Gregory et al., 1997; Mion & Adaui, 2019; Muñoz, 2020; Orlitzky, 2001).

Table 9.
Hypotheses Testing

Relationships	B	SE	t	p-values	Results
QE (SUS) -> FP***	0.262	0.072	3.639	0.000	H1 supported
SIZ -> FP***	0.266	0.055	4.838	0.000	H2 supported
SHA x SIZ -> FP*	-0.076	0.042	1.835	0.067	H4 rejected
SEC x SIZ -> FP**	-0.124	0.055	2.235	0.025	H5 supported
SXC x SIZ -> SUS*	-0.116	0.061	1.897	0.058	H6 rejected
SIZ -> SUS***	0.258	0.065	4.004	0.000	
SXC -> SUS	0.084	0.066	1.285	0.199	
SUS -> FP	-0.004	0.099	0.044	0.965	
SEC -> FP	-0.062	0.048	1.286	0.198	
SHA -> FP	0.038	0.047	0.817	0.414	

Note: FP = Financial Performance, SEC=Business Sector, SHA=Sharia Islamic Law Compliance, SIZ=Firm Size, SXC=Stock Exchange, SUS=Sustainability quality, B = Beta coefficient, SE = Standard error, t = t statistics, p = probability, *** relationship are significant at $p<0.001$, ** $p<0.05$, * $p<0.1$. QE = quadratic effect

4.3.2. Moderating Effects

The significance of moderating effect is next analyzed. The result reveals a negative but nonsignificant moderating effect of Sharia and Stock Exchange on the relationship between Size and performance (H4: beta = -0.076, t = 1.835, p = 0.067 and H6: beta = -0.116, t = 1.897, p = 0.058), rejecting H4 and H6 at 5% significance. For those accepting a 90% confidence interval, H4 and H6 can be acceptable. This shows that with an increase in Sharia compliance, the relation between size and performance is debatably weakened as indicated by Table 9. There is a higher likelihood of superior performance among large enterprises with a lower level of adherence to Sharia principles compared to those with a higher level of adherence. The potential impact of Sharia compliance on the financial performance of large corporations in industrialized countries following the COVID-19 disaster is subject to debate, as whether this phenomenon happens only after the crisis or not because of the dearth of pre-Covid studies in a Muslim-minority context. As such, this finding calls for further investigations to confirm whether it leads to only a peculiarity or a common phenomenon.

Table 9 also reveals a negative but significant moderating effect of Sector on the relation between size and performance (H5: beta = -0.124, t = 2.235, p = 0.025), supporting H5 at 5% significance. This shows that in certain sectors (utilities and telecommunication), the relation between size and performance is undoubtedly weakened, especially when compared with energy sectors. Table 9 indicates that when compared with NAS, NYSE large stocks would (in)significantly underperform.

In order to comprehend the essence of the moderating effect better, slope analysis is provided. As illustrated by the top panel of Figure 1, the line is flatter for high compliance of Sharia (at +1SD), meaning that at a high level of Sharia compliance, the impact of size and performance is much weaker in comparison to a low level of Sharia compliance. At the low level of Islamic law compliance, the line tends to be steeper. In conclusion, a higher level of Islamic law compliance, adhering to prohibitions of alcohol, adult entertainment, interests, etc., debatably weakens the impact of size on a firm financial performance as represented by EPS.

In the middle graph of Figure 1, the line is much flatter for utility firms (at +1SD), meaning that the impact of size and performance is significantly much weaker in comparison to energy companies. For the bottom graph of Figure 1, the line is questionably flatter for NYSE firms (at +1SD), meaning that the impact of size and performance is weaker in comparison to NASDAQ companies. In conclusion, moderating effects seem to suggest the weakening of the impact of size on firm sustainability and financial performance as represented by EPS.

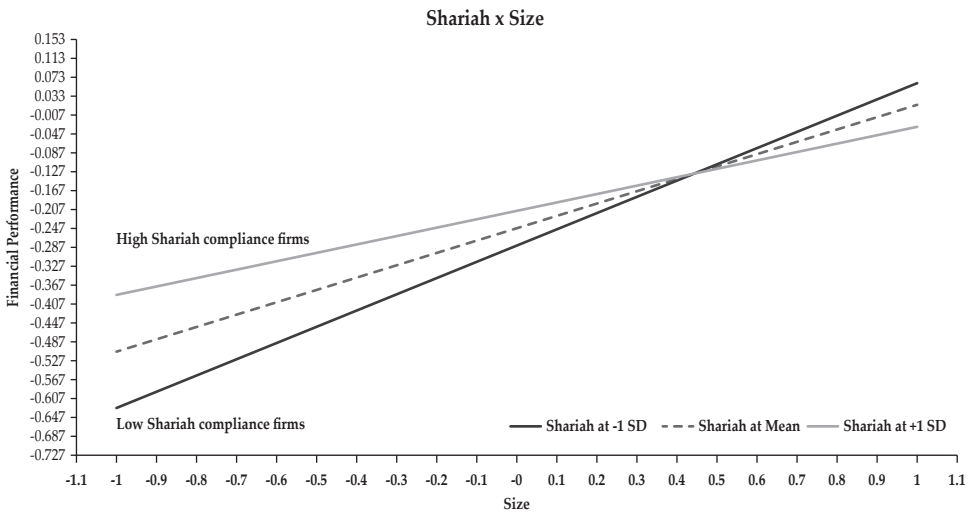

Figure 1.
Slope Analysis of Moderating Effects of (a) Sharia - top, (b) Sector - middle, and (c) Stock Exchange - bottom

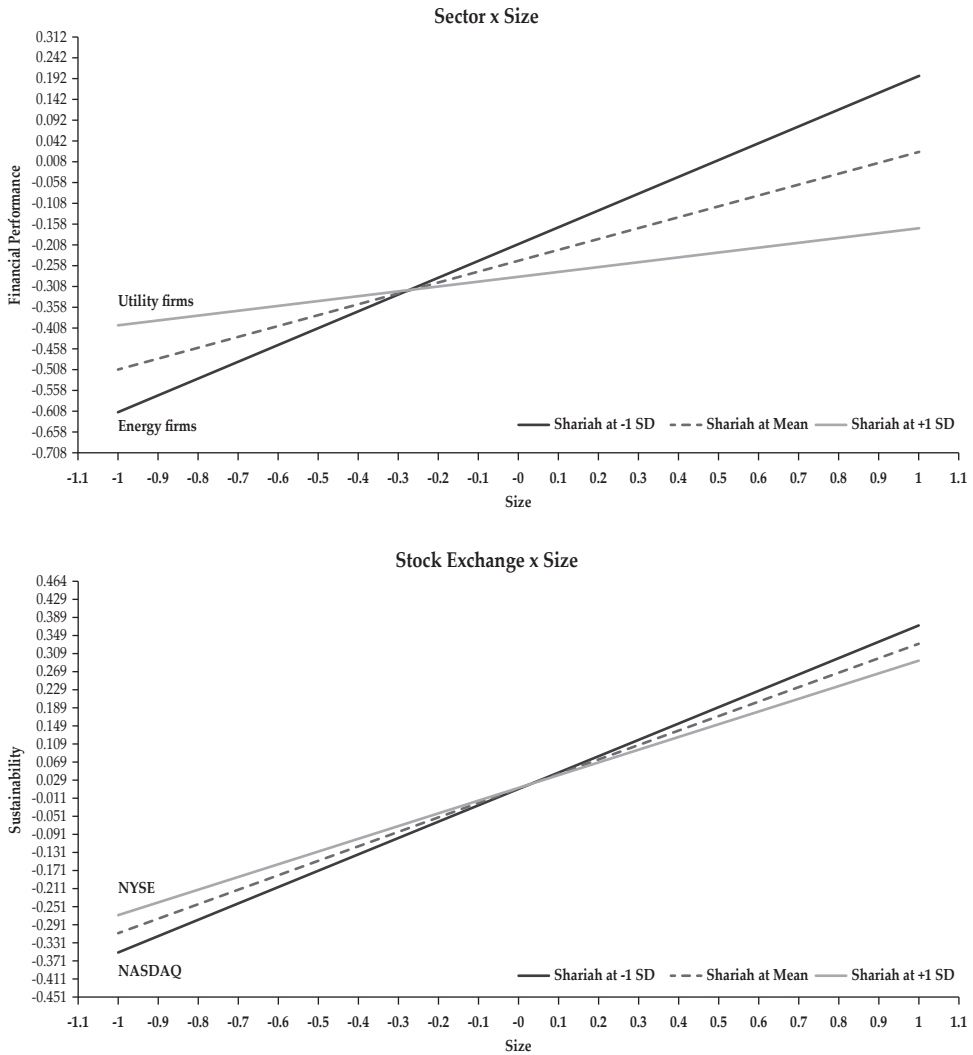

Figure 1.
Slope Analysis of Moderating Effects of (a) Sharia - top, (b) Sector - middle, and (c) Stock Exchange - bottom (Continued)

4.3.3. Mediating Effect

The indirect effect of size on financial performance through sustainability is not significant (H3: beta = -0.001, t = 0.027, p = 0.967). The total effect between size and performance is significant (beta = 0.265, t = 4.368, p < 0.001), and with the inclusion of the mediator the effect of size and performance is still significant (See Table 9, H2: beta = 0.266, t = 4.838, p < 0.001) thus H3 is not supported meaning the relationship between size and financial performance is direct only (no mediation). Table 10 details the direct, indirect, and total effects of this hypothesis.

Table 10.
Mediation Analysis Results

	Remark		Value
Total Effect	B		0.265
	T		4.368
	p-value		0.000
Direct Effect	B		0.266
	T		4.838
	p-value		0.000
Indirect Effect	B		-0.001
	SE		0.027
	t		0.042
	p-value		0.967
	Percentile bootstrap 95% confidence interval	Lower	-0.044
		Upper	0.067

4.4. Explanatory Power and Structural Model Quality

R square statistics reflect the proportion of the variance in the dependent variables explained by the model. Without the inclusion of the moderating effects, the R-Sq and R-Sq adjusted are 0.238 and 0.229 respectively. The adjusted R-sq indicates that 22.9% variation in performance (EPS) is accounted by model. Based on this, we conclude that the predictive accuracy of our model is moderate (Cohen, 1992).

With the inclusion of the interaction term of one factor of Sharia, the R-Sq and R-Sq adjusted values are 0.242 and 0.228 respectively. With the inclusion of the interaction term of the sector, the R-Sq and R-Sq adjusted values become 0.259 and 0.245, while with the inclusion of stock exchange the R-Sq and R-Sq adjusted values remain 0.238 and 0.229 respectively. Altogether, with the inclusion of the interaction terms of the three factors, the R-Sq and R-Sq adjusted values increase to 0.264 and 0.240 as illustrated by Figure 2. This shows an increase of only 1.1% in the proportion of performance variation explained by the model with the inclusion of moderating effects.

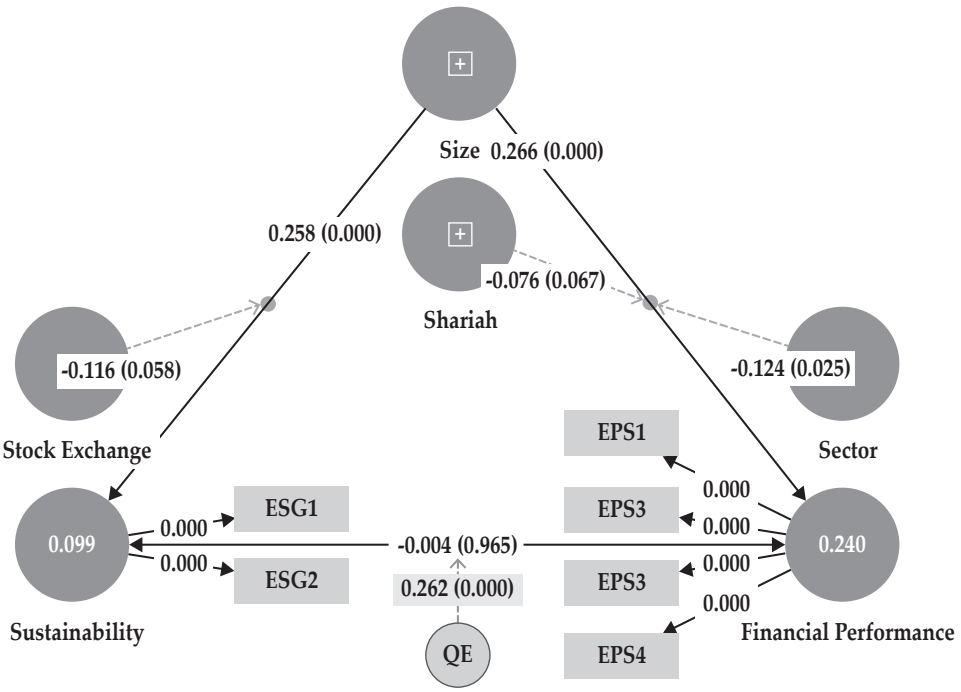

Figure 2.
Structural Model

Table 9 and Table 10 have established the significance and meaningfulness of three path estimates (H1, H2, and H5) but rebutted the other three paths (H3, H4, and H6). Figure 2 illustrates the strength and directions of all paths. Figure 1 elucidates the strength and directions of moderating effects suggesting how moderators interact with independent and dependent variables. The endogenous construct of financial performance has a moderate level of explained variance as expressed in a moderate R-square value of 0.240, as stated in Figure 2.

4.4.1. Effect Size

Effect size F-square refers to the change in R-Square when an independent variable is subtracted from the model. Implementing the general guidelines for assessing F-square 0.02, 0.15, and 0.35 representing small, medium, and large effect sizes (Cohen, 1992; Garson, 2016; Hair et al., 2017), we conclude that effect size of direct effects of sustainability (QE) and size to financial performance are medium and small effect respectively.

Acceptable explanatory powers depend on the research setting, and in some field of knowledge, values as low as 0.1 is satisfactory, for instance in estimating stock return (Raithel et al., 2012). f2 for Sharia is only 0.006, a very marginal effect when compared with those of size and sustainability. Regardless of its weak level, it is not negligible, as the effect size of moderation, is proposed to

realistically have different standards: 0.005, 0.01, and 0.025 for small, medium, and large considering that the average moderation effect size is only 0.009 (Hair et al., 2021). When analyzing the impact of the interaction term, standard cutoff values for the f2 effect size are not relevant. Hence, it is confirmed that there is a small negative moderation effect in the model stating that Sharia weakens the relationship between size and performance. Under similar criteria, we conclude that the industry sector and stock exchange have medium negative moderation effects on our model as presented in Figure 3 below.

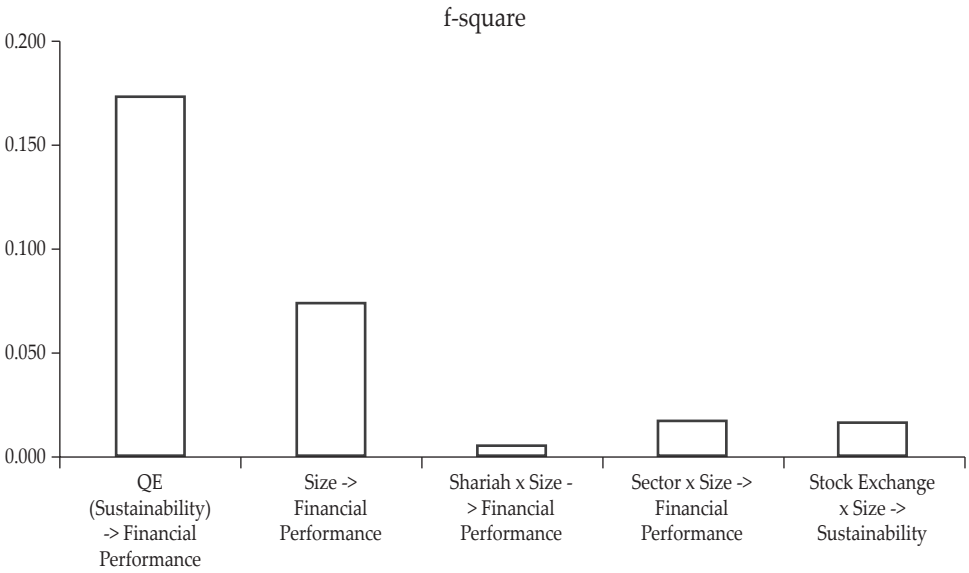

Figure 3.
Effect Sizes

The assessment of standard structural model results often involves the consideration of path estimation and R-square values as we have demonstrated in the above sections. In order to obtain a thorough and accurate understanding of the results, we expand and enhance the evaluation process by incorporating many elements such as effect sizes, predictive relevance, model fit, IPMA, NCA, and robustness checks (Hair et al., 2017). Figure 3 shows that the effect size of the direct effect of sustainability (QE) on financial performance is the highest effect size and thus should never be left out from explaining a corporate's performance.

4.4.2. Predictive Relevance

When determining whether a model has predictive relevance for endogenous constructs, Stone-Geisser's Q-square is used. Q-square values above zero indicate that the model has predictive relevance. Q-sq values of 0.02, 0.15, and 0.35 are considered weak, moderate, and strong respectively (Sarstedt et al., 2017). As our model has the Q2 value of latent variables of 0.051 (see Table 11), we conclude that the PLS path model has weak predictive relevance for this construct.

Table 11.
Explanatory Power

Relationships	f^2	Effect	R^2	R^2 adj	Q^2
H1: QE (SUS) -> FP***	0.174	Medium	26.4%	24.0%	0.051
H2: SIZ -> FP***	0.074	Small			
H4: SHA x SIZ -> FP*	0.005	Small			
H5: SEC x SIZ -> FP**	0.017	Medium			
H6: SXC x SIZ -> SUS*	0.016	Medium			
SIZ -> SUS***	0.066	Small			
SXC -> SUS	0.006	Negligible			
SUS -> FP	0.000	Negligible			
SEC -> FP	0.004	Negligible			
SHA -> FP	0.001	Negligible			

Note: FP = Financial Performance, SEC=Business Sector, SHA=Sharia Islamic Law Compliance, SIZ=Firm Size, SXC=Stock Exchange, SUS=Sustainability quality, B = Beta coefficient, SE = Standard error, t = t statistics, p = probability, *** relationship are significant at p<0.001, ** p<0.05, * p<0.1. QE = quadratic effect

4.4.3. Model Fit

We use indices of fit to measure the goodness of fit for PLS-SEM (Sarstedt et al., 2017), such as Standardized Root Mean Square Residual (SRMR), Normed Fit Index (NFI), or Bentler and Bonett Index. We use the estimated model as the most logical option and the saturated model as a comparison to determine the covariance matrix. As our SRMR value from the estimated model is less than 0.10 as presented in Table 12, we consider our model a good fit. One of the earliest fit measures to be suggested in the SEM literature is NFI. The fit is better the closer the NFI is to 1. NFI values over 0.9 typically indicate a good fit. This measure is not advised because the main drawback of NFI is that it fails to account for model complexity. Our estimated and saturated model is 0.407 and 0.648 respectively. Although the value is less than 0.9, if we add more parameters such as other financial indicators (Kartikasari & Merianti, 2016), we can get a higher NFI result. However, that is beyond the scope of our current paper.

Table 12.
The Goodness of Fit Measure

Criterion	Saturated model	Estimated model
SRMR	0.011	0.086
NFI	0.648	0.407

4.4.4. Importance-Performance Map Analysis

The importance-performance map analysis (IPMA), which considers both relative importance and each construct's performance, extends the PLS-SEM results. In order to prioritize managerial actions, it is crucial to be able to draw conclusions on two different criteria (i.e., performance and importance).

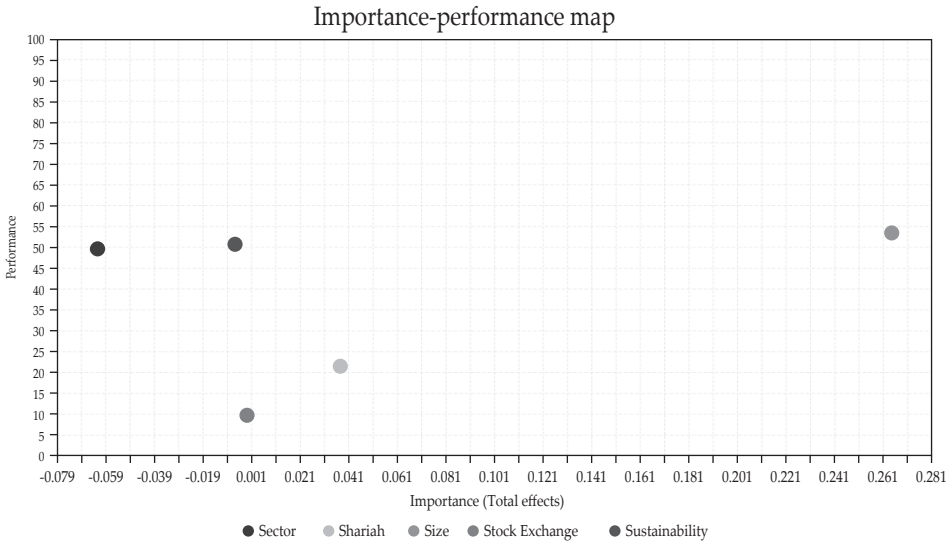

Figure 4.
Importance Performance Map

From Figure 4, Size has the most important effect on financial performance. It is more desirable to put the majority of attention on raising the performance of constructs that are highly significant in terms of how well they explain a particular target construct while also performing poorly, such as Sharia constructs for further research with high managerial implications.

4.5. Robustness Check

The robustness of the PLS-SEM results can be evaluated using complementary methods, according to the latest studies (Hair et al., 2018). Either the structural model or the measurement model is addressed by these techniques. We have performed the confirmatory tetrad analysis (CTA) as presented in Table 1, which allows for empirically supporting the specification of measurement models (i.e., formative vs. reflective).

We take into account the possibility of (1) nonlinear effects, (2) endogeneity, and (3) unobserved heterogeneity with regard to the structural model. First, we conduct tests to determine that, in contrast to the other relationships, the one between sustainability and performance is nonlinear. So, using bootstrapping, we establish a quadratic effect interaction term to map a nonlinear effect in the model and discover using bootstrapping that it is statistically significant (see Table 9).

Second, we check for endogeneity because our research approach is primarily explanatory in a PLS-SEM analysis. In a partial regression of the PLS path model, endogeneity tends to happen when we eliminate a construct that correlates with any of the exogenous and endogenous constructs. We use the Gaussian copula approach to evaluate and address endogeneity (Hair et al., 2018). We employ bootstrapping to determine the significance of the Gaussian copula terms and find

that critical endogeneity problems exist in the relationship between sustainability and financial performance as presented by Table 13 where p-values for this relation, across one, two, or three copulae, are below 5%.

Table 13.
Robustness Check on Endogeneity Using Gaussian Copula

Gaussian	Relationships	Original Sample	P-values
One Copula	Size → Sustainability	0.145	0.403
	Size → Performance	-0.576	0.127
	Sustainability → Performance	0.852	0.006
Two Copulae	Size → Performance	-0.583	0.119
	Sustainability → Performance	0.854	0.006
Two Copulae	Sustainability → Performance	0.852	0.006
	Size → Sustainability	0.145	0.403
Two Copulae	Size → Performance	-0.576	0.127
	Size → Sustainability	0.145	0.403
Three Copulae	Size → Performance	-0.583	0.119
	Size → Sustainability	0.145	0.403
	Sustainability → Performance	0.854	0.006

Because Table 13 indicates an endogeneity issue, we subsequently identify the causes of endogeneity. It is important to note, nonetheless, that endogeneity examination is only pertinent when our focus is solely on explanation and not when our focus is on the causal-predictive nature of the PLS-SEM. We believe the source of endogeneity bias in our study is simultaneity: there is a reverse, two-way, or reciprocal model. Although more studies support the impact of sustainability on performance like our study (Drempetic et al., 2020; Friede et al., 2015), the reverse impact can happen where performance impacts sustainability practices (Uthayakumar, 2021). The opposite effect is based on the slack resource theory, which contends that better financial performance means that firms have financial resources to invest in sustainability initiatives that reduce the negative effects of their operations on the economy, the environment, and society. This effect is corrected by our data collection where sustainability data are collected for the period before the financial performance data to ensure a causal effect.

Third and the last step to assess robustness is checking unobserved heterogeneity. The latter takes place when subgroups of data emerge beyond our observed constructs that produce noticeably dissimilar model estimates. Unobserved heterogeneity may lead to inaccurate results when the model is estimated using the entire dataset (Hair et al., 2018). In order to determine whether the analysis of the whole data set is appropriate or not, we, therefore, include a standard check for unobserved heterogeneity. We determine the number of segments to be extracted from the data as two segments, which results from the minimum value of AIC3 (modified AIC with Factor 3) and CAIC (consistent AIC), using a set of parameters derived from a finite mixture (Fimix) PLS as presented by Table 14.

Table 14.
Robustness Check on Unobserved Heterogeneity

Criteria	2 segments	1 segment
AIC3 (modified AIC with Factor 3)	466.232	760.869
CAIC (consistent AIC)	534.602	793.255
EN (normed entropy statistic)	0.909	0
Summed fit	1000.834	1554.124
%	94	6

Table 14 indicates that heterogeneity is present. In the next step, we run the PLS prediction-oriented segmentation process to reveal the segment structure of our data and find that the segments consist of 6% and 94% which makes a highly unbalanced heterogeneity where one segment constitutes only a little over 5%. Thus, we conclude that although heterogeneity is present, it is not critical.

4.6. Necessary Condition Analysis (NCA)

As complementary views of causality and data analysis, NCA makes it possible for us to investigate and verify both hypotheses based on a sufficiency logic and those based on a necessity reason (Richter et al., 2020). We observe the significance level of both PLS-SEM and NCA results as presented in Table 15.

Table 15.
NCA Scenario and Conclusions

Scenario	PLS-SEM	NCA	Conclusion
H1: QE (Sustainability) -> Financial Performance	0.000	0.000	A specific condition and value (See Table 16) of the exogenous construct is necessary for the outcome to establish
H2: Size -> Financial Performance	0.000	0.033	
H4: Sharia x Size -> Financial Performance	0.033	0.599	No bare minimum of the exogenous structure is required to guarantee that the result will materialize
H5: Sector x Size -> Financial Performance	0.013	0.772	
H6: Stock Exchange x Size -> Sustainability	0.029	0.125	

Because PLS-SEM results are significant but NCA p-values are not for H4, H5, and H6, we conclude that, in general, the increases in the exogenous constructs of Sharia x size (H4), sector x size (H5), and stock exchange x size (H5) will increase the performance and sustainability; no bare minimum of the exogenous structure is required to guarantee that the result will materialize. In the meantime, because both PLS-SEM and NCA results are significant for H1 and H2, we conclude that generally speaking, an increment in the exogenous constructs of QE sustainability (H1) and size (H2) will compound the result of financial performance, yet, a specific condition and value as presented by Table 16 of the exogenous construct is mandatory for the outcome to materialize. For example, if we want 100% of the

ceiling line results as presented in the last line of Table 16, the requirements that must be met in order to achieve the result are 7.842 QE(SUS), 0.351 SIZ, -0.231 SHA x SIZ, -0.555 SEC x SIZ, and 0.233 SXC x SIZ. Figures in Table 16 refer to actual values, percentages of the range, and percentiles for both the outcome and the condition(s).

Table 16.
Bottleneck CE-FDH Values for Financial Performance

%	FP	QE (SUS)	SIZ	SHA x SIZ	SEC x SIZ	SXC x SIZ
0	-1.816	NN	NN	NN	NN	NN
10	-0.714	0.000	NN	NN	NN	NN
20	0.387	0.004	-0.694	-1.609	NN	-1.214
30	1.488	0.004	-0.694	-0.920	-2.208	0.233
40	2.590	0.074	0.351	-0.231	-0.696	0.233
50	3.691	1.657	0.351	-0.231	-0.696	0.233
60	4.793	1.657	0.351	-0.231	-0.696	0.233
70	5.894	7.842	0.351	-0.231	-0.696	0.233
80	6.996	7.842	0.351	-0.231	-0.696	0.233
90	8.097	7.842	0.351	-0.231	-0.555	0.233
100	9.199	7.842	0.351	-0.231	-0.555	0.233

Note: FP = Financial Performance, SEC=Business Sector, SHA=Sharia Islamic Law Compliance, SIZ=Firm Size, SXC=Stock Exchange, SUS=Sustainability quality, B = Beta coefficient, SE = Standard error, t = t statistics, p = probability, *** relationship are significant at p<0.001, ** p<0.05, * p<0.1. QE = quadratic effect

As we expand and enhance the evaluation process by incorporating elements such as effect sizes, predictive relevance, model fit, IPMA, NCA, and robustness checks, we find that effect sizes for the main variables of financial performance, size, and sustainability are small to medium. Q-square values indicate a well-reconstructed model, but the predictive relevance of our model is weak. SRMR value expresses that our model is *somewhat* of a good fit. IPMA shows that managers should focus on building firm size as this factor impacts corporate performance, as posited by the resource-based view. The robustness check detects some issues in our model. NCA confirms that specific conditions are necessary to establish the outcome.

4.7. Implications and Limitations

We provide empirical evidence to support the stakeholder theory in the link between sustainability and financial performance using post Covid-19 data (Table 9). Our findings confirm various past studies conducted prior to Covid-19 (Drempetic et al., 2020; Friede et al., 2015). According to the stakeholder theory, businesses that adopt sustainability practices add value not only for their shareholders but also for their clients, vendors, workers, communities, and other stakeholders. In return, their stakeholders appreciate these practices, and the firms enjoy better financial performance. However, we find that the relationship is not linear (Table 4) and possibly reciprocal (Table 13). Bur, to be concrete, we leave these for future research.

We also uncover that our moderating variables weaken the relationship between size, sustainability, and performance (See Figure 2). These moderators increase the explanatory power of our model by 1.1% with small and medium effect sizes according to interaction standards of moderating variables (Hair et al., 2021). This finding implies that certain industry sectors and particular stock exchanges where stocks are traded can explain the financial performance of firms.

Firm managers might find our findings interesting as we find a somewhat important moderating effect of Islamic law compliance on financial performance, even in Muslim-minority bourses. Our importance-performance map analysis shows that Sharia compliance exhibits considerable importance regarding its explanation of financial performance but also put on relatively poor performance, meaning that Sharia compliance in developed countries, mainly in the US, is still very limited. Our findings offer novelty in providing evidence of Sharia compliance for stocks in non-Muslim majority countries where Sharia weaken the relationship between size and financial performance. The generalizability of our findings to Muslim countries should be done with caution as stakeholders of companies in Muslim-majority countries and non-Muslim majority countries might behave differently.

Our findings are limited for generalizability as we employ only a cross-sectional dataset after Covid, i,e. 2022-2023. Future research should expand the analysis to different times. A comparative investigation before and after 2022-2023 is a chance to test the feedback effect between sustainability and performance.

We only use the EPS as a measure of financial performance while acknowledging that it has many limitations. Concerning drawbacks, accounting-based metrics like the EPS are retrospective and subject to bias if the sample includes businesses from various industries, as this study does. The main drawback of the EPS is that it is only available for publicly traded companies. Market instruments always involve systemic (non-firm) market risk, such as an economic downturn, whereas accounting instruments are more sensitive to non-systemic market risk (Barauskaite & Streimikiene, 2021). Thus, the relevance of our findings to private companies is limited. Further studies should expand beyond public companies and EPS as a financial performance indicator.

V. CONCLUSION AND RECOMMENDATION

We provide empirical evidence to support the stakeholder theory by pointing significant positive quadratic effects of sustainability on financial performance. Thus, we recommend managers to commit and implement sustainability practices to improve their financial performance. We also find a significant positive linear direct-only effect of size on performance as posited by the resource-based view theory. This path significance, corroborated by IPMA analysis, implies managers to concentrate on growing capitalization as the latter affects corporate performance. Sharia compliance, industry sector, and stock exchange interact with the main constructs to exert significant negative small to medium effects on the relationships and increase the explanatory power of our structural model. Large energy firms are more likely to outperform large utility firms. Large firms with low level of Sharia compliance are more likely to outperform large firms with higher levels of

compliance. That is, Sharia compliance tends to weaken the financial performance of large firms in developed countries after the Covid crisis. Islamic law adherence to business practices should be done cautiously in this regard. Future research should expand beyond the current scope of this study to include a longer data range, alternative financial indicators, and different methods that can capture the reciprocal relationship between sustainability and financial performance. The context of Sharia compliance in Muslim-minority countries, namely the USA, Netherlands, Canada, Swiss, and Belgium, still needs further evidence from other nations.

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