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SUSTAINABLE DEVELOPMENT GOALS, HERDING, AND RISK-AVERSE BEHAVIOR IN MUSLIM COUNTRIES

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ABSTRACT

This study examines the impact of Sustainable Development Goals (SDGs) on behavioral biases, namely herding and risk-averse behaviors, in Sharia-compliant stocks. It also explores the mediating effect of investors' sentiments on the relationship between SDGs and behavioral biases. Adopting panel data and quantile regressions, we find that SDGs 4, 8, 10, 11, and 13 significantly and positively correlate with stock returns in Indonesia, Kuwait, Oman, and Qatar. However, SDG 7 is the only SDG goal that is significant to Saudi and UAE stock returns. The results imply a complete mediation as the SDGs have caused changes in investors' sentiment and subsequently triggered the investors to herd and become risk-averse. The impact of SDGs is more pronounced in the upper and lower quantiles of Indonesia, Saudi, and UAE stock returns, as well as the median quantile of Bahrain, Kuwait, Oman, and Qatar stock returns. The results of this study can benefit policymakers, regulators, and practitioners in identifying the best SDG practices to assist Sharia-compliant stocks in Indonesia and Gulf Cooperation Council (GCC) countries to attain better stock returns and improve investors' sentiments and behaviors. The results can also assist governments in weighing the impact and benefits of adopting SDGs in different Muslim countries.

Keywords: Sustainable development goals (SDG), Herding, Risk-averse, Islamic finance, GCC countries.
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I. INTRODUCTION

Indonesia and Gulf Cooperation Council (GCC) countries are in the early stage of implementing Sustainable Development Goals (SDGs). In 2015, the Indonesian Financial Services Authority introduced sustainability reporting along with the SDGs developed by the United Nations. Similarly, the regulators of GCC countries emphasized the disclosure of environmental, social, and governance (ESG) in their annual sustainability reporting. These transformative regulations improved the transparency and corporate impact of ESG. Nonetheless, what is the impact of complying with the 17 SDGs? Are investors' sentiments and behaviors affected by SDG compliance? It is worth finding answers to these questions, as the cost of achieving SDGs can be a burden for any listed companies, especially in developing Muslim countries. In this context, Muslim countries are countries with the most populous Islamic citizens.

Herding is a behavior where investors mimic the decisions of a bigger group of investors they perceive as well-informed (Loang & Ahmad, 2022). The existence of herding is widely documented in developed markets, such as the United States, the United Kingdom, Canada, and Hong Kong. Nonetheless, previous studies often overlook emerging markets, especially the Middle East. The Middle East regional market consists of GCC members, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). One of the distinctive features of GCC markets is they trade in Sharia-compliant stocks, which prohibits *riba* (exploitative gains made in trade or business under Islamic law), *gharar* (uncertainty, hazard, chance, or risk) or doubtful transactions, gambling, etc. Although other markets such as Indonesia, Singapore, and Egypt also trade in Sharia-compliant stocks, Indonesia and GCC markets have a higher number of Sharia-compliant companies due to their Muslim population. Moreover, Indonesian and GCC markets are dominated by Muslim investors, who may have different investment motives, especially in risk-taking (Barom, 2019).

Risk-averse behaviors are often shown in many developed markets, such as the US, the UK, Hong Kong, Japan, and Canada. Nonetheless, contradictory findings explain investors' behaviors in emerging markets. Momin and Masih (2015) show that investors in emerging markets are less likely to be risk-averse in increasing the appearance of their portfolios compared to developed countries. In contrast, Ali and Asri (2019) argue that investors are risk-averse to prioritizing their principal's safety invested in emerging markets. Regardless, studies that observe the impact of SDGs on risk-averse behaviors, especially on Sharia-compliant stocks in Islamic indices, are still limited. It is necessary to conduct a comparative study that examines risk-averse behaviors in several emerging countries.

Sharia-compliant stocks are the key growth of Indonesia and GCC markets, which benefit Muslims and socially conscious investors (Muhmad & Muhamad, 2021). Nevertheless, herding and risk-averse behaviors show that investors are irrational when following the investment decision of others to make similar decisions. Previous studies (Baharudin, 2019) that focused on sustainability reporting show that the board's effectiveness has improved along with the quality of sustainability reporting. Nonetheless, GCC countries are still lagging in sustainability reporting. Some authors (see Shamsudin et al., 2018) argue that the adoption of SDGs can cause the listed companies to perform poorly due to

higher compliance costs. In Indonesia and GCC markets, the impact of SDGs on investors' sentiments and behaviors has not been studied thoroughly.

The listed companies are crucial in shaping economic development in a nation. However, most listed companies cannot effectively nor efficiently realize the budget without effective governance and SDG practices (Mauro et al., 2021). The lack of compliance with sustainable goals can also lead to a negative impact on the nation's development in the long term (Boros & Fogarassy, 2019). As developing markets with a limited history of regulating SDGs, Indonesia and GCC countries may not provide uniform normative regulations that could regulate the control of conformity in a broader sense (Loang, 2022). The government must understand that implementing governance and the SDGs of listed companies is essential to serve the nation, as in developed markets.

Hence, examining the impact of corporate governance and SDGs on the financial market and company performance of Indonesian Islamic stocks and GCC countries is crucial. This study intends to select the Islamic stocks listed in Islamic indices. The indices allow this study to identify gaps in the practices of Islamic companies between Indonesia and GCC countries, provide practical suggestions, and enhance the current practices with empirical evidence. Islamic companies are supposed to be the benchmark for best practices of corporate governance and SDGs in a country. However, many companies argue that it may seem impossible to maintain the best SDG practices because these practices are too costly for them (Martens, 2020).

For practical implications, this study can assist policymakers, regulators, and practitioners in enhancing and establishing a comparative analysis of SDG practices of Indonesia and GCC Sharia-compliant stocks. This study encourages the adoption of Islamic stocks to implement the best practices and produce a positive impact of SDG in affecting investors' sentiments and behaviors. The results of this study can assist governments in improving the sustainability reporting framework by adopting SDG practices that can benefit the listed companies and society. This study contributes to the literature on finance, specifically on Islamic Finance, by examining the impact of SDGs on Islamic stocks.

The remaining sections of this paper are structured as follows: The second section examines the related literature. The methodology and estimated models are described in Section 3. Section 4 discusses the findings and analysis, and Section 5 concludes with the summary, implications, limits, and suggestions for further research.

II. LITERATURE REVIEW

2.1. Sustainable Development Goals

Studies on SDGs are common in academic research, but the bipolar view on their contribution to investors' sentiments and behaviors is controversial. Zeidan (2022) examines the impact of SDGs and argues that finance professionals are more sensitive in trading ESG stocks with a high level of SDG compliance because ethical investing is increasingly common. Johari and Komathy (2019) examine the adoption of sustainability reporting of 100 listed companies and find that companies with higher compliance with SDGs result in a higher return on assets, return on

equity, earnings per share, dividend per share, and stock return. Similarly, Ifada et al. (2021) argue that environmental disclosure, especially the higher voluntary disclosure, positively correlates to profit margin. Similar evidence is documented in Ndubuisi et al. (2022) and Shen et al. (2021), showing that SDGs compliance correlates to investors' sentiments.

Lassala et al. (2021) examine the financial performance of listed companies in pursuit of SDGs and show that ethical investors are inclined to invest in stocks with a high level of SDG compliance. Kim et al. (2021) noted that risk-averse investors tend to invest in SDG-compliant stocks due to the perception that they are socially responsible to shareholders. Likewise, Spulbar et al. (2019) ascertain that investors' behavior can be affected by SDG compliance due to lower enterprise risks and more potential prospects to behave ethically in a competitive business environment. Many studies have observed the impact of SDGs on investors' sentiments (see Sibande et al., 2021; Ndubuisi et al., 2022) and the impact of investors' sentiments on behavioural biases (see Zahera & Bansal, 2018; Rupande et al., 2019). Nonetheless, no studies have examined the mediating role of investors' sentiments on the relationship between SDGs and behavioral biases, which can explain the investors' behavior towards SDG compliance.

The impact of SDGs is widely examined in developed countries but limited in Muslim countries. Muhmad & Muhamad (2021) discuss SDG practices in Singapore and argue that companies with higher cash flow and valuations exhibit better governance and SDGs. Sarkodie et al. (2020) compare the SDG practices of UK and US firms and show that investors value companies' social and environmental behavior as materials for investment decisions. The reason is that the investors have long-term considerations to trust the companies to behave morally to reduce their investment risk. Ghouma et al. (2018) argue that Canadian firms with better SDG practices seem to reduce the cost of debt financing due to higher protection of investors' rights to reduce agency problems within firms. In addition, Izhar and Munkin (2021) examine the impact of SDGs on Islamic finance from the Organization of Islamic Cooperation (OIC) countries and show that Islamic banks have a positive role in reducing income inequality. Similar evidence is documented in Ibrahim and Shirazi (2020), where Islamic Finance advocates a circular economy to achieve sustainable economic growth, not at the expense of the environment. These studies show the benefits of adopting SDGs in developed countries. However, comparative studies about the impact of SDGs on Muslim countries, especially on Sharia-compliant stocks in Indonesia and GCC countries, are still limited.

In 2014, Indonesia published the second edition of the CG handbook and a roadmap to tighten corporate governance rules in Indonesia for listed firms. It also participated in the High-Level Political Forum (HLPF) Voluntary National Review on Sustainable Development Goals in 2017 and 2019. Indonesia is intended to serve as the foundation for the HLPF meeting's regular evaluations. The country has the largest Muslim population in the world. Nonetheless, GCC countries have a longer track record of implementing the CG code: Oman (2002), Saudi Arabia (2006), UAE (2007), Qatar (2009), Bahrain (2010), and Kuwait (2013). GCC stock market capitalisations are usually greater than Indonesia's. Therefore, it would be interesting to compare Indonesia's experiences with GCC nations to shed more

light on the role of CG and SDGs in Muslim countries. Although most businesses are familiar with ESG, SDGs by the United Nations provide standard indicators to measure compliance, as the ESG indicators are dissimilar for each country.

Hence, this study aims to examine the impact of SDG compliance on herding and risk-averse behavior of Indonesia and GCC countries, as no study has looked at it from this perspective. Although the United Nations has consistently published the governance and SDG experience of OECD countries, the information on the comparative analysis of Muslim countries remains limited. In this context, this study proposes to examine the mediating effect of investors' sentiments on the relationship between SDGs and herding and risk-averse behaviors. This study also aims to identify the impact and benefits of SDG compliance on investors' sentiments and behaviors. Based on the above discussion, this study proposes the following research framework:

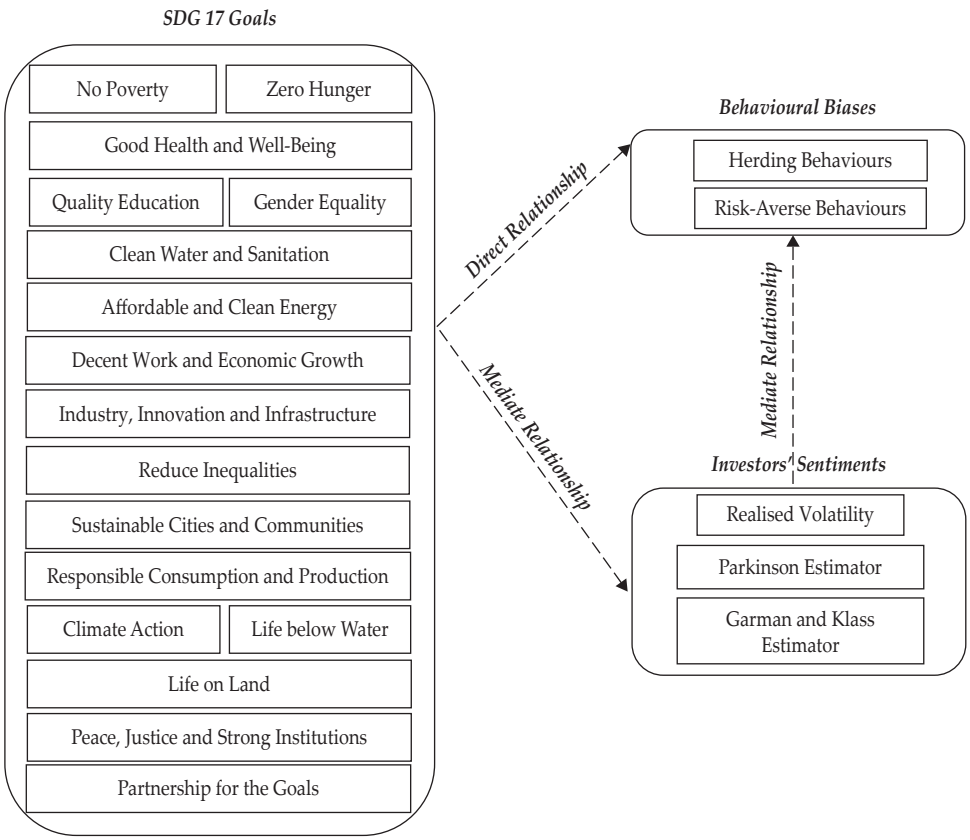

Figure 1.
Research Framework

The research framework outlines the impact of 17 SDGs on behavioral biases, namely herding and risk-averse behavior. Investors' sentiments are added to the framework to explain the mediator that triggers the investors' behavior. With higher/lower SDG compliance, investors are triggered to be proxied by volatility, further causing them to herd and become risk-averse.

III. ESTIMATED MODEL

3.1. Data and Sampling

A total number of 487 Islamic stocks in the Indonesia Stock Exchange were selected. As for the corresponding GCC countries, the following countries were selected: Bahrain (42), Kuwait (165), Oman (107), Qatar (55), Saudi Arabia (203), and the United Arab Emirates (UAE) – Abu Dhabi Securities Exchange (75). Indonesia and GCC markets were selected due to their large population of Islamic stocks, which can be used as benchmarking between different countries. The research timeframe was from 1 January 2017 to 31 December 2021. Only Sharia-compliant stocks that remain listed as of 31 December 2021 were chosen. Sharia-compliant stocks safeguard stakeholders' interests and prohibit riba, gharar, suspicious transactions, and gambling. Other securities such as derivatives, mutual funds, exchange-traded funds, and warrants were excluded as the disclosure of SDGs is not compulsory. Although businesses have a long history of complying with ESG, SDGs provide a standardized standard for different countries to benchmark. Thus, this study opts to examine SDGs instead of ESG. This study adopts the S&P Capital IQ to collect information, such as SDG compliance, stock prices, volatility, investors' sentiments, and behavioral biases.

3.2. Sustainable Development Goals

Seventeen SDGs were chosen based on the United Nations' 2030 Agenda for Sustainable Development. Based on the annual report and sustainability reporting disclosure, a dummy variable was constructed as a proxy for SDG compliance, with 1 representing compliance and 0 representing non-compliance for each Sharia-compliant stocks. Data were collected based on the disclosure in the Annual Report for each company. This study selects SDGs instead of ESG because SDGs are developed and standardized by the United Nations and widely recognized by many countries. SDGs also provide more details on environmental and social compliances compared to ESG.

3.3. Investor Sentiment

Investor sentiment reflects the emotions of individual investors, while market sentiment reflects the aggregate decision of all market investors. In this study, investor sentiment was proxied by the volatility of stock returns. Realized volatility (Wen et al., 2019), Parkinson estimator (Parkinson, 1980), and Garman and Klass measures of volatility were used (Garman & Klass, 1980). Realized volatility was used to capture overnight data that is error-free and near to actual volatility. Realized volatility was determined using the variance of discrete returns observed at different periods, where it is expressed in Equation (1):

$$RV_{i,t} = \sqrt{\frac{\sum_{i=1}^{N} R_{i,t}^2}{N}} \quad (1)$$

where $R_{i,t}$ indicates the return of stock *i* at time *t*, which was computed using the closing stock prices from the previous trading day. Realised volatility reflects the overnight-adjusted stock values.

Parkinson's estimator is another measure of volatility. Parkinson (1980) proposes that volatility may be calculated using the highest and lowest stock prices rather than the starting and closing stock prices. It is a metric that measures severe volatility. Parkinson estimator is more reliable than starting and closing prices for analyzing investors' extreme behaviors (Blasco et al., 2012). The formula for the Parkinson's estimator is written as in Equation (2):

$$\sigma_P = \frac{1}{2\sqrt{In2}} \sqrt{\frac{1}{n} \sum_{t=1}^{n} {P_{i,t}}^2} \quad (2)$$

where $P_{i,t} = In\frac{H_{i,t}}{L_{i,t}}$ and $H_{i,t}$ are the maximum and minimum prices of stock *i* at time *t*, respectively. Parkinson estimator is appropriate for analysing the effect of market disturbance that moves stock prices away from the fundamentals.

The Garman-Klass estimate is derived from Parkinson's estimator to correct the underestimation of the starting leaps caused by the Parkinson estimator's disregard for the opening stock prices. As markets are more active during opening and closing hours, the Garman-Klass estimator is expanded to incorporate opening and closing stock values. The estimator of Garman-Klass is given as in Equation (3):

$$\sigma_{GK} = \sqrt{\frac{1}{n} \sum_{t=1}^{n} \left[\frac{1}{2} {P_{i,t}}^2 - (2In2 - 1){Q_{i,t}}^2\right]} \quad (3)$$

where $Q_{i,t} = In\frac{C_{i,t}}{O_{i,t}}$ and $C_{i,t}$ is the closing price of stock I at time t and $O_{i,t}$ is the opening price of stock I at time t. As it incorporates the opening, closing, maximum, and lowest stock prices, the Garman-Klass estimator is the most comprehensive measure of volatility.

Various volatility metrics may be used to describe investor mood. Realized volatility captures the stock values from the previous day using overnight data. Parkinson estimator measures the severe volatility of intraday trading. The Garman-Klass estimator is improved from the Parkinson estimator using the opening and closing stock prices as a complete metric to proxy volatility.

3.4. Herding Behavior

This study used the Cross-Sectional Absolute Deviation (CSAD) instead of the ordinary least square (OLS) regression of CSAD, as in Chiang and Zheng (2010), to examine herding in the Indonesian and GCC markets. A panel data regression

was used because it is more effective than OLS regression in capturing cross-sectional and time-series analyses (Loang & Ahmad, 2023). OLS regression tends to disregard unobserved factors that affect the dependent variable, which might result in subjective conclusions. Hence, the panel data regression was adopted to enhance the explanatory strength of the CSAD regression when detecting the presence of herding. The Equation for the CSAD is as follows:

$$\mathrm{CSAD}_{i,t} = \frac{1}{N}\sum_{i=1}^{N}\left|R_{i,t} - R_{m,t}\right| \tag{4}$$

$$\mathrm{CSAD}_{i,t} = \beta_0 + \beta_1 R_{m,t} + \beta_2\left|R_{m,t}\right| + \beta_3 R^2{}_{m,t} + \varepsilon_t \tag{5}$$

where CSAD is the cross-sectional absolute deviation of stock *i* at time *t*, N is the number of stocks, Ri,t is the observed stock return of stock *i* at time *t*, Rm,t is the market return at time *t* (linear), |Rm,t| is the absolute term of the cross-sectional market return at time *t*, and $R^2_{m,t}$ is the squared term of the cross-sectional market return at time *t* (non-linear). The decreasing dispersion between stock returns and market returns, as shown by the negative coefficient value of $R^2_{m,t}$, is indicative of herding. It demonstrates that a small group of investors (stock return) follows and herds with a larger group of investors (market return) to make the same investment decisions.

3.4. Investors' Risk-Averse Behavior

Tversky and Kahneman (1992) established prospect theory to argue that investors evaluate profits and losses differently. They demonstrate that investors are risk-averse and more emotionally affected by investment loss. Prospect theory explains why investors often depart from the predicted security returns (Barberis et al., 2021). In this context, risk aversion is assessed by the following value function based on the historical returns of stocks:

$$RB = \sum_{i=-n}^{m} E(r_i)\ .\pi_i \tag{6}$$

where:

$$E(r_i) = \begin{cases} r_i^c & r_i \geq 0 \\ -\lambda(-r_i)^c & r_i < 0 \end{cases} \tag{7}$$

is the value function for each stock return, and:

$$\pi_i = \begin{cases} f\left(\frac{m-i+1}{30}\right) - f\left(\frac{m-i}{30}\right) & r_i \geq 0 \\ f\left(\frac{i+n+1}{30}\right) - f\left(\frac{i+n}{30}\right) & r_i < 0 \end{cases} \tag{8}$$

with:

$$f(\mathrm{p}) = \frac{p^{\delta}}{\left[p^{\delta}+(1-p)^{\delta}\right]^{1/\delta}} \tag{9}$$

is referred to as the probability weighting function. In the above equations, RB represents risk-averse behavior, r represents stock return, λ represents loss aversion, δ represents probability weighting, and c represents the concave/convex function. λ is larger than 1 when investors are more sensitive to investment losses than gains. In contrast, λ is less than 1 when investors place a greater importance on gains than losses. When λ equals to 0, there are no indications of risk-averse behavior.

The probability weighting δ is used to study investor behavior while choosing between an exceptionally huge gain (loss) with a low likelihood and a definite modest gain (loss). The loss aversion parameter λ is predicted to be 2.25, the concave/convexity ratio c is 0.88, and it is expected to be 0.61 for gains and 0.69 for losses. In Tversky and Kahneman (1992) and Barberis et al. (2021), these computed parameters have been shown to support investors' risk-averse behaviors.

3.6. Robustness: Quantile Regression

For robustness, quantile regression examines the occurrence of herding and risk-averse behaviors in various τth quantiles of CSAD by calculating the conditional median. Unlike panel data and OSL regressions, which measure the conditional mean and are sensitive to outliers, this method measures the conditional median to reveal specific information about the distribution's tails. This study adopts the quantile regression of Chiang et al. (2010) and Chaffai and Medhioub (2018) to examine risk-averse behaviours in various quantiles. The quantile regression is given as in Equation (10):

$$CSAD_{\tau}(\tau|V_{\tau}) = \beta_{0,\tau} + \beta_{1,\tau}.\mathrm{R_{m,t}} + \beta_{2,\tau}.\left|\mathrm{R_{m,t}}\right| + \beta_{3,\tau}.\mathrm{R^2_{m,t}} + \varepsilon_{\mathrm{t},\tau} \tag{10}$$

where V_{τ} represents the explicative variables. Based on the above equation, this study established two quantile regression models: the herding behaviour model and the risk-averse behaviour model.

Herding Behaviour:

$$\begin{aligned} CSAD_{\tau}(\tau|V_{\tau}) = {} & \beta_{0,\tau} + \beta_{1,\tau}.\mathrm{R_{m,t}} + \beta_{2,\tau}.\left|\mathrm{R_{m,t}}\right| + \beta_{3,\tau}.\mathrm{R^2_{m,t}} + \beta_{4,\tau}.NP_{i,t} + \\ & \beta_{5,\tau}.ZH_{i,t} + \beta_{6,\tau}.GH_{i,t} + \beta_{7,\tau}.QE_{i,t} + \beta_{8,\tau}.GE_{i,t} + \\ & \beta_{9,\tau}.CW_{i,t} + \beta_{10,\tau}.ACW_{i,t} + \beta_{11,\tau}.DW_{i,t} + \beta_{12,\tau}.III_{i,t} + \\ & \beta_{13,\tau}.RI_{i,t} + \beta_{14,\tau}.SC_{i,t} + \beta_{15,\tau}.RC_{i,t} + \beta_{16,\tau}.CA_{i,t} + \\ & \beta_{17,\tau}.LW_{i,t} + \beta_{18,\tau}.LL_{i,t} + \beta_{19,\tau}.PJ_{i,t} + \beta_{20,\tau}.PG_{i,t} + \\ & \beta_{21,\tau}.RV_{i,t} + \beta_{22,\tau}.PARK_{i,t} + \beta_{23,\tau}.GK_{i,t} + \varepsilon_{\mathrm{t},\tau} \end{aligned} \tag{11}$$

Risk-Averse Behaviour:

$$RB_{\tau}(\tau|V_{\tau}) = \beta_{0,\tau} + \beta_{1,\tau}.NP_{i,t} + \beta_{2,\tau}.ZH_{i,t} + \beta_{3,\tau}.GH_{i,t} + \beta_{4,\tau}.QE_{i,t} + \beta_{5,\tau}.GE_{i,t} + \beta_{6,\tau}.CW_{i,t} + \beta_{7,\tau}.ACW_{i,t} + \beta_{8,\tau}.DW_{i,t} + \beta_{9,\tau}.III_{i,t} + \beta_{10,\tau}.RI_{i,t} + \beta_{11,\tau}.SC_{i,t} + \beta_{12,\tau}.RC_{i,t} + \beta_{13,\tau}.CA_{i,t} + \beta_{14,\tau}.LW_{i,t} + \beta_{15,\tau}.LL_{i,t} + \beta_{16,\tau}.PJ_{i,t} + \beta_{17,\tau}.PG_{i,t} + \beta_{18,\tau}.RV_{i,t} + \beta_{19,\tau}.PARK_{i,t} + \beta_{20,\tau}.GK_{i,t} + \varepsilon_{t\,\tau} \quad (12)$$

where $RV_{i,t}$ is the realised volatility of stock i at time t, $PARK_{i,t}$ is the Parkinson estimator of stock i at time t, and $GK_{i,t}$ is the Garman and Klass estimator of stock i at time t, while the 17 SDGs (*NP, ZH, GH, QE, GE, CW, ACW, DW, III, RI, SC, RC, CA, LW, LL, PJ, and PG*). The comparison between various models can provide comprehensive empirical evidence to indicate the impact of SDG on herding and risk-averse behavior. The quantile regression can also examine the mediating effect of investors' sentiments for the robustness test. This study examines the quantiles 0.05, 0.25, 0.50, 0.75, and 0.90.

IV. RESULTS AND DISCUSSION

4.1. Estimate Impact of SDGs on Herding and Risk-Averse Behavior

This study has designed two panel data regression models, namely the herding behavior model and the risk-averse behavior model, to examine the effect of SDGs. The models were used to analyze extensive data for assessing SDG compliance outcomes. The Hausman test was used to choose between fixed-effect and random-effect models for the panel data regression. White test, Breusch-Pagan test, Pesaran Scaled test, and Pesaran CD test were used to identify the presence of heteroscedasticity. These tests determine if the values of the independent variable in the regression influence the variance of the regression errors. When the p-value of heteroscedasticity is less than 0.05, heteroscedasticity is present. This study applies a panel-corrected standard error (PCSE) to adjust for heteroscedasticity. Table 1 summarizes the impact of SDGs on herding and risk-averse behaviors. Indonesia, Bahrain, Kuwait, Oman, and Qatar apply the random-effect model, while Saudi and UAE adopt the fixed-effect (PCSE) model to rectify heteroscedasticity in the herding regression. Indonesia and GCC countries use the fixed-effect (PCSE) model for the risk-averse behavior model.

Table 1.
Impact of SDGs on Herding and Risk-Averse Behavior

	Herding Behavior							Risk-Averse Behavior						
Variables	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**
Model	**Random-Effect**					**Fixed-Effect (PCSE)**		**Fixed-Effect (PCSE)**						
Constant	0.05	0.08	0.07	0.01	0.00	0.02	0.00	0.86	0.08	0.62	0.01	0.51	0.02	0.12
Herding (Dispersion of returns)														
$R_{m,t}$	0.23	0.10*	0.00*	-0.32*	0.40**	0.02**	-0.64*	-	-	-	-	-	-	-
$\|R_{m,t}\|$	0.55	-0.59*	-0.07**	-0.24*	0.22*	0.05*	1.34*	-	-	-	-	-	-	-
$R^2_{m,t}$	-1.39	1.72*	-0.52**	-2.98*	-1.42*	-2.17*	-2.18*	-	-	-	-	-	-	-
Sustainable Development Goals														
SDG 1: No Poverty	0.05	0.17	0.00**	0.05	0.47	0.02	0.41	0.00	0.05	0.16	0.01	0.04	0.01	0.07
SDG 2: Zero Hunger	0.03	0.02	0.01	0.02	0.05	0.01	0.01	0.01	0.02	0.02	0.00	0.14	0.27	0.68
SDG 3: Good Health and Well-Being	0.04	0.12	0.00	0.05	0.41	0.83	0.03	0.00	0.05	0.12	0.00	0.01	0.13	0.18
SDG 4: Quality Education	0.10***	0.05	0.02**	0.01**	0.09	0.60	0.13	0.00	0.40	0.05	0.02	0.10	0.01	0.00
SDG 5: Gender Equality	0.03	0.02	0.00	0.04	0.05	0.84	0.52	0.00	0.04	0.01	0.02	0.01	0.00	0.84
SDG 6: Clean Water and Sanitation	0.03	0.16	0.00	0.02	0.46	0.58	0.42	0.00	0.02	0.15	0.02	0.02	0.31	0.71
SDG 7: Affordable and Clean Energy	0.00	0.08	0.00	0.00*	0.10	0.00**	0.64**	0.01**	0.00**	0.10*	0.21**	0.00**	0.14*	0.58*
SDG 8: Decent Work and Economic Growth	0.005*	0.06	0.00***	0.01*	0.037*	0.14	0.12	0.01	0.01	0.25	0.00	0.01	0.08	0.26
SDG 9: Industry, Innovation and Infrastructure	0.03	0.09	0.00	0.07	0.08	0.38	0.84	0.01	0.07	0.04	0.02	0.01	0.06	0.57
SDG 10: Reduce Inequalities	0.08**	0.002	0.004*	0.08**	0.00*	0.74	0.54	0.01	0.10	0.00	0.02	0.09	0.01	0.26
SDG 11: Sustainable Cities and Communities	0.05**	0.05	0.00*	0.01**	0.057*	0.02	0.73	0.01***	0.03**	0.05*	0.10*	0.05*	0.05*	0.56*

Table 1.
Impact of SDGs on Herding and Risk-Averse Behavior (Continued)

	Herding Behavior							Risk-Averse Behavior						
Variables	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**
Model	**Random-Effect**					**Fixed-Effect (PCSE)**		**Fixed-Effect (PCSE)**						
SDG 12: Responsible Consumption and Production	0.09	0.02	0.01	0.02	0.01	0.53	0.93	0.01	0.02	0.10	0.04	0.04	0.01	0.27
SDG 13: Climate Action	0.030***	0.16	0.00**	0.01*	0.73**	0.00	0.05	0.01*	0.07**	0.16*	0.01*	0.01**	0.08*	0.78*
SDG 14: Life below Water	0.01	0.20	0.00	0.08	0.10	0.05	0.06	0.01	0.01	0.10	0.01	0.01	0.12	0.68
SDG 15: Life on Land	0.00	0.11	0.00	0.00	0.70	0.82	0.01	0.00	0.00	0.11	0.03	0.00	0.44	0.62
SDG 16: Peace, Justice and Strong Institutions	-0.02	-0.01	0.00	-0.05	-0.04	0.81	0.66	0.00	-0.05	-0.01	0.00	-0.02	0.10	0.87
SDG 17: Partnership for goals	0.04	-0.05	-0.01	0.05	-0.05	0.13	0.76	-0.01	0.05	-0.01	-0.01	0.02	0.58	0.01
Specification														
R-squared	0.60	0.57	0.48	0.57	0.62	0.54	0.62	0.03	0.36	0.48	0.47	0.44	0.51	0.69
Hausman Test	0.79	0.28	0.67	0.28	0.84	0.02	0.00	0.01	0.01	0.05	0.02	0.01	0.03	0.07
White Test	0.86	0.58	0.19	0.37	0.21	0.04	0.08	0.86	0.38	0.19	0.36	0.40	0.01	0.05
Breush-Pagan	0.48	0.92	0.74	0.28	0,38	0.00	0.12	0.13	0.53	0.54	0.24	0.52	0.00	0.04
Pesaran Scaled	0.58	0.44	0.85	0.57	0.27	0.02	0.00	0.09	0.23	0.38	0.72	0.47	0.01	0.03
Pesaran CD	0.69	0.28	0.22	0.59	0.62	0.06	0.02	0.13	0.32	0.64	0.38	0.43	0.01	0.02

Note: ***, **, and * represents 1, 5, and 10 per cent significant level.

The results presented in Table 1 imply that herding exists with negative values of squared market return ($R^2_{m,t}$) for Sharia stocks in Indonesia, Kuwait, Oman, Qatar, Saudi, and the UAE. No evidence of herding was detected in Bahrain. The negative coefficient indicates that investors herd towards the market return, and the dispersion between stock return and market return is either decreasing or increasing at a decreasing rate. Similar investment decisions are made to avoid a potential loss against the market return. Furthermore, SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduce Inequalities), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action) significantly and positively correlate to the CSAD in Indonesia, Kuwait, Oman, and Qatar. SDG1 (No Poverty) is found to be significant in the Kuwait market, and SDG 7 (Affordable and Clean Energy) is the only variable significant to the stock return in Saudi and the UAE. The SDGs are found to be insignificant in Bahrain. The empirical evidence shows that SDGs affect the stock return in a positive correlation. Compliance with SDGs can result in higher values of stock return.

Apart from that, the risk-averse behavior model measures investors' tendency to avoid risk in investment. The results show that SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action) significantly and positively correlate to risk-averse behaviors. It implies that SDGs can affect the tendency of risk-averse behaviors in Sharia stocks in Indonesia and GCC. It also indicates that investors are conservative in trading Sharia-compliant stocks.

The results are supported by El-Bassiouny and El-Bassiouny (2019), in which less-developed countries have less advanced SDG practices than developed countries. SDG practices have a more significant impact in developed markets. Bahrain has a smaller market size than Indonesia and other GCC countries. One possible explanation is that developed markets are more efficient than developing markets (Mertzanis et al., 2019). According to the Efficient Market Hypothesis, efficient markets should reflect all available information. In this perspective, less-developed countries are less efficient in reflecting SDGs' influence on herding and risk-averse behaviour (Lamouchi, 2020). In addition, evidence suggests that adopting SDG practices may result in higher stock returns for Sharia-compliant firms. This result is reinforced by Khaled et al. (2021), which claim that larger companies have better social responsibility and internal controls. The reason is that SDG practices may result in enhanced risk management and internal controls that reduce company risks, leading to greater stock values (Hamonangan & Danarsari, 2022).

4.2. Estimate Mediating Effect of Investors' Sentiments

The second objective of this study is to examine the mediating effect of investors' sentiments on the relationship between SDGs and herding and risk-averse behaviors. According to Baron and Kenny's statistical mediation model, examining the mediation effect in a regression involves three steps. The independent variable (SDGs) must correlate to the dependent variable (herding and risk-averse behavior). The relationship shows that investors herd and are risk-averse due to SDG compliance in the market, which triggers them to react to it.

The independent variable must also affect the mediator variable significantly. The final step of the model involves the examination of the full mediation effect of the mediator variable. The process is valid when the independent variable (SDGs) no longer affects the dependent variable (herding and risk-averse behavior) once the mediator (investor's sentiments) controls the relationship.

Table 2 illustrates the impact of investors' sentiments on herding and risk-averse behavior. The results show that herding exists in Sharia stocks of Indonesia, Kuwait, Oman, Qatar, Saudi, and the UAE, with a negative and significant coefficient of the squared market return. Bahrain is the only market without herding evidence. In terms of the impact of investors' sentiments, Parkinson and Garman-Klass estimators are significant to herding and risk-averse behavior in Indonesia and GCC countries. However, realized volatility is insignificant. The results imply that the investors rely on stock prices of the previous day as the benchmark to trade, as Parkinson and Garman-Klass estimators capture historical volatility.

Table 3 summarizes the mediating effect of investors' sentiments on the relationship between SDGs and herding and risk-averse behaviors. Herding is persistent in the Indonesia, Kuwait, Oman, Qatar, Saudi, and UAE markets. The negative and significant coefficient of the squared market return implies that investors trade on the stock herd towards the market return. Surprisingly, the results imply that SDGs are insignificant by adding investors' sentiments to the regression. This is because their sentiments have changed the direction of the relationship between SDGs and herding and risk-averse behavior. In the context of investors' sentiments, Parkinson and Garman-Klass estimators are significant to herding and risk-averse behavior. The relationship shows that SDGs affect investors' sentiments, which subsequently influence the existence of herding and risk-averse behavior. Based on Baron and Kenny's mediation model, the results indicate a full mediation, as the empirical evidence suggests that investors' sentiments mediate the relationship between SDGs and behavioral biases.

Table 2.
Impact of Investors' Sentiments on Herding and Risk-Averse Behavior

	Herding Behaviour							Risk-Averse Behaviour						
Variables	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**
Model	**Random-Effect**					**Fixed-Effect (PCSE)**		**Fixed-Effect**						
Constant	0.01	0.02*	0.00	0.12*	0.00	0.00*	0.18	0.02	0.01	0.00*	0.01	0.20	0.18	0.03
Herding (Dispersion of returns)														
$R_{m,t}$	0.02	0.00	0.02	0.06	0.13	0.94	0.091	-	-	-	-	-	-	-
$\|R_{m,t}\|$	0.83	0.01	0.42	0.38	0.42	0.01	0.02	-	-	-	-	-	-	-
$R^2_{m,t}$	-1.02***	0.34*	-0.58**	-1.28**	-2.59*	-1.48*	-2.84**	-	-	-	-	-	-	-
Investors' Sentiment														
Realised Volatility	-0.39	-0.27	-0.12	-0.10	-0.73	-0.18	-0.72	0.37	0.28	0.00	0.01	0.23	0.48	0.17
Parkinson	0.82*	0.45**	0.04**	0.05**	0.23*	0.43*	0.83*	0.27*	0.27**	0.17***	0.01*	0.47*	0.02*	0.38*
Garman and Klass	0.71***	0.28*	0.18*	0.23**	0.13**	0.13**	0.72*	0.71*	0.47	0.84**	0.04**	0.01*	0.01*	0.00*
Specification														
R-squared	0.72	0.61	0.59	0.57	0.67	0.58	0.47	0.56	0.66	0.69	0.67	0.68	0.52	0.61
Hausman Test	0.71	0.59	0.24	0.58	0.28	0.07	0.00	0.00	0.03	0.05	0.07	0.01	0.06	0.00
White Test	0.96	0.59	0.11	0.67	0.71	0.08	0.09	0.62	0.69	0.11	0.52	0.80	0.64	0.56
Breush-Pagan	0.85	0.54	0.68	0.73	0,69	0.00	0.17	0.16	0.56	0.58	0.54	0.57	0.85	0.36
Pesaran Scaled	0.52	0.64	0.55	0.64	0.77	0.07	0.00	0.63	0.76	0.69	0.35	0.87	0.95	0.82
Pesaran CD	0.51	0.72	0.70	0.24	0.67	0.00	0.07	0.16	0.67	0.68	0.69	0.86	0.76	0.25

Note: ***, **, and * represents 1, 5, and 10 per cent significant level

Table 3.
Mediating Effect of Investors' Sentiments

	Herding Behaviour							Risk-Averse Behaviour						
Variables	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**
Model	**Random-Effect**					**Fixed-Effect (PCSE)**		**Fixed-Effect (PCSE)**						
Constant	0.03	0.00	0.00	0.03	0.10	0.07	0.02	0.04	0.01	0.00	0.04	0.02	0.04	0.14
Herding (Dispersion of returns)														
$R_{m,t}$	0.24	0.59	0.69	0.13	0.02	0.04	0.14	-	-	-	-	-	-	-
$\lvert R_{m,t} \rvert$	0.01	0.24	0.53	0.04	0.13	0.03	0.62	-	-	-	-	-	-	-
$R^2_{m,t}$	-1.30***	0.54	-1.49**	-1.30*	-1.05*	-2.59*	-1.28*	-	-	-	-	-	-	-
Sustainable Development Goals														
SDG 1: No Poverty	0.05	0.13	0.45	0.05	0.83	0.02	0.81	0.01	0.09	0.18	0.01	0.04	0.01	0.07
SDG 2: Zero Hunger	0.03	0.12	0.09	0.02	0.05	0.09	0.09	0.01	0.23	0.02	0.24	0.19	0.27	0.42
SDG 3: Good Health and Well-Being	0.04	0.92	0.00	0.05	0.59	0.58	0.03	0.02	0.09	0.12	0.00	0.01	0.17	0.12
SDG 4: Quality Education	0.10	0.02	0.02	0.99	0.09	0.50	0.93	0.18	0.90	0.09	0.08	0.19	0.01	0.00
SDG 5: Gender Equality	0.15	0.02	0.00	0.09	0.09	0.85	0.52	0.04	0.09	0.01	0.08	0.09	0.00	0.24
SDG 6: Clean Water and Sanitation	0.03	0.98	0.00	0.08	0.88	0.58	0.82	0.05	0.08	0.15	0.08	0.08	0.71	0.71
SDG 7: Affordable and Clean Energy	0.11	0.98	0.29	0.98	0.90	0.05	0.88	0.62	0.50	0.10	0.81	0.04	0.74	0.52
SDG 8: Decent Work and Economic Growth	0.05	0.02	0.01	0.09	0.03	0.98	0.92	0.24	0.11	0.85	0.00	0.08	0.12	0.54
SDG 9: Industry, Innovation and Infrastructure	0.03	0.95	0.05	0.07	0.08	0.38	0.28	0.21	0.03	0.08	0.08	0.01	0.04	0.97
SDG 10: Reduce Inequalities	0.02	0.12	0.01	0.98	0.00	0.34	0.54	0.02	0.15	0.00	0.02	0.05	0.01	0.24
SDG 11: Sustainable Cities and Communities	0.05	0.05	0.05	0.09	0.06	0.08	0.33	0.20	0.13	0.09	0.10	0.09	0.09	0.94

Table 3.
Mediating Effect of Investors' Sentiments (Continued)

	Herding Behaviour							Risk-Averse Behaviour						
Variables	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**	**Indonesia**	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi**	**UAE**
Model	**Random-Effect**					**Fixed-Effect (PCSE)**		**Fixed-Effect (PCSE)**						
SDG 12: Responsible Consumption and Production	0.01	0.02	0.09	0.02	0.09	0.57	0.93	0.13	0.02	0.10	0.04	0.08	0.01	0.27
SDG 13: Climate Action	0.03	0.14	0.00	0.01	0.77	0.00	0.05	0.01	0.03	0.14	0.01	0.01	0.08	0.78
SDG 14: Life below Water	0.01	0.20	0.00	0.08	0.10	0.05	0.04	0.01	0.01	0.10	0.01	0.01	0.18	0.48
SDG 15: Life on Land	0.00	0.11	0.00	0.00	0.70	0.88	0.01	0.00	0.00	0.11	0.03	0.00	0.88	0.48
SDG 16: Peace, Justice and Strong Institutions	-0.02	-0.01	0.00	-0.05	-0.04	0.54	0.44	0.00	-0.09	-0.01	0.00	-0.08	0.10	0.87
SDG 17: Partnership for goals	0.15	-0.52	-0.01	0.05	-0.05	0.13	0.34	-0.01	0.09	-0.01	-0.01	0.02	0.92	0.01
Investors' Sentiment														
Realised Volatility	0.29	0.38	0.89	0.01	0.14	0.58	0.28	0.52	0.05	0.14	0.51	0.25	0.33	0.05
Parkinson	1.05***	0.04*	0.49*	0.58*	0.24**	0.68*	0.27*	0.53**	0.52**	0.03*	1.02**	0.58*	0.13**	1.03*
Garman and Klass	0.93*	0.85*	0.28**	0.68**	0.98**	0.28**	0.68*	0.82***	0.94***	0.69*	0.90**	0.05*	0.79*	0.02*
Specification														
R-squared	0.58	0.42	0.51	0.62	0.62	0.64	0.72	0.63	0.76	0.62	0.49	0.51	0.66	0.52
Hausman Test	0.20	0.21	0.92	0.21	0.14	0.02	0.00	0.02	0.09	0.05	0.08	0.09	0.02	0.07
White Test	0.19	0.63	0.68	0.92	0.21	0.04	0.01	0.04	0.03	0.09	0.03	0.02	0.03	0.16
Breush-Pagan	0.47	0.63	0.24	0.28	0,91	0.00	0.12	0.02	0.02	0.06	0.02	0.05	0.06	0.22
Pesaran Scaled	0.92	0.44	0.14	0.84	0.22	0.02	0.00	0.00	0.25	0.08	0.00	0.02	0.06	0.02
Pesaran CD	0.90	0.21	0.42	0.47	0.92	0.09	0.02	0.05	0.05	0.06	0.02	0.69	0.25	0.06

Note: ***, **, and * represents 1, 5, and 10 per cent significant level

The findings of this study are consistent with Zeidan (2022), where SDG variables influence the mood of finance professionals. Most investors consider SDG compliance a part of their investment criteria to demonstrate better corporate governance and social responsibility. As a result, compliance with SDGs may result in a stronger inclination of investors' sentiments, causing them to herd and become risk-averse. Similar evidence is shown by Adira and Halida (2021), which indicates that the perceived threats of SDGs can influence sentiment levels. Investors are aware of the benefits of SDG compliance in shaping the economy and society.

4.3. Estimation of Quantile Regression of Herding and Risk-Averse Behavior

For robustness purposes, this study employed a quantile regression to examine the impact of SDGs on herding and risk-averse behavior. Figure 2 illustrates the effect of SDGs on the tendency of herding and risk-averse behavior. Quantile regression measures the conditional median to calculate the conditional mean differently from panel data regression. The results show that the impact of SDGs on herding is more pronounced in the lower and upper quantiles in Indonesia, Saudi, and the UAE, with a significant level of 5% and 1%, respectively. Bahrain, Kuwait, Oman, and Qatar show that herding tends to exist in the median (quantile = 0.5). The herding tendency of Bahrain is lower than in other GCC markets. For risk-averse behavior, similar evidence is spotted. The impact of SDGs on investors' risk-averse behavior in Indonesia, Saudi, and the UAE is higher in the lower and upper quantiles. It implies that investors tend to be risk-averse to Sharia stocks that comply with the most or least 17 SDGs to safeguard their investment.

This result is compatible with Martínez et al. (2022). They demonstrate that the effect of SDG is more significant in established markets than in developing nations, particularly in times of market stress. One possible explanation is that SDG adoption in underdeveloped countries is less widespread than in developed ones (Jabbari et al., 2020). The reason is that the cost of complying with SDGs is high for Islamic companies. The comparison between the expenses and the benefits of SDG adoption cannot be measured in financial statements, which is detrimental to shareholders. As a result, the influence of SDGs on herding and risk-aversion behavior in Bahrain, Kuwait, Oman, and Qatar is not as evident as in Indonesia, Saudi Arabia, and the UAE on the distribution's tails.

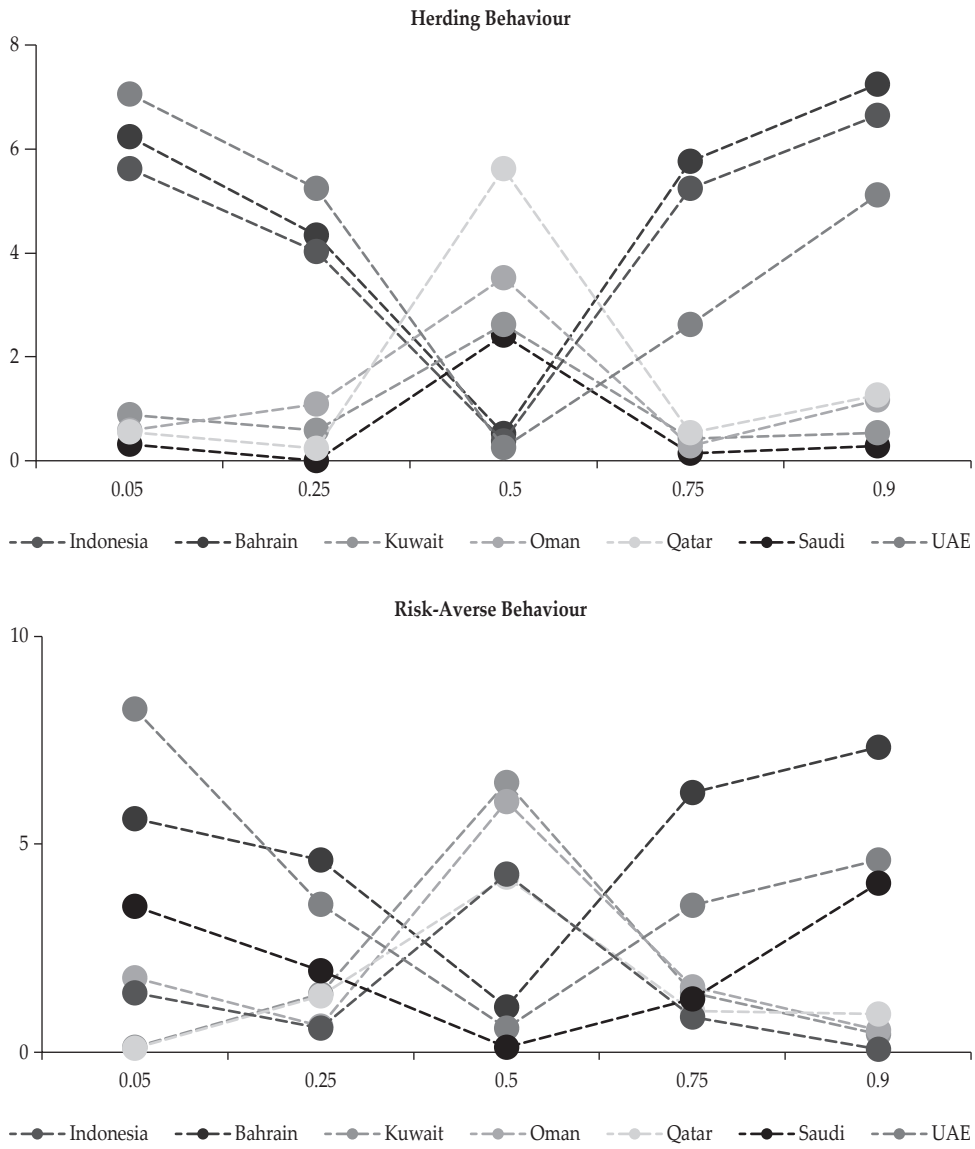

Figure 2.
Line Chart of Robustness Test

V. CONCLUSION

This study examines the impact of SDG practices on herding and risk-averse behavior of Sharia-compliant stocks in Muslim countries. It also examines the mediating effect of investors' sentiments on the relationship between herding and risk-averse behavior. The research timeframe is from 2017 to 2021. The seventeen SDG goals are chosen based on the United Nations guidelines. For the methodology, this study adopts panel data and quantile regression.

The results show that herding exists in Indonesia, Kuwait, Oman, Qatar, Saudi Arabia, and UAE Islamic stocks. Evidence of herding is not detected in Bahrain. In addition, SDG 1 (No Poverty), SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduce Inequalities), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action) are significant to stock return. It indicates that high compliance with SDGs can lead to a higher stock return in Islamic stocks. SDG 7 (Affordable and Clean Energy) is the only SDG variable significant to stock return in Saudi Arabia and the UAE. For risk-averse behavior, SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action) are positively and significantly correlated. The empirical evidence shows that SDGs affect stock return in a positive correlation. Compliance with SDGs can result in higher values of stock returns. The results of this study are consistent with El-Bassiouny and El-Bassiouny (2019), where developed markets have higher compliance with SDG practices than less-developed markets. Developed markets also have a higher level of market efficiency to reflect the impact of SDG practices in the financial market. Hence, the effect of SDGs is more pronounced in developed countries.

Based on Baron and Kenny's mediation model, the results imply a full mediation of investors' sentiments. The direction path has changed by adding investors' sentiments to the relationship between SDGs and herding and risk-averse behavior. As a result, SDGs are no longer significant to herding and risk-averse behavior because they have changed investors' sentiments and subsequently triggered them to herd and become risk-averse. The results also show that Parkinson and Garman-Klass estimators mediate the relationship between SDGs and herding and risk-averse behavior. Investors rely on the previous day's stock prices as the trade benchmark. The results of this study are consistent with Zeidan (2022), where ESG affect finance professionals' sentiments. Most investors consider SDG compliance as part of their investment considerations to indicate better corporate governance and social responsibility.

Quantile regression was employed to examine robustness. The results show that the impact of SDGs on herding and risk-averse behavior is more pronounced in the upper (τ>0.05) and lower (τ<0.05) quantiles in Indonesia, Saudi Arabia, and the UAE. The effect of SDGs is mostly in the median quantile in the Bahrain, Kuwait, Oman, and Qatar markets. The results imply that investors tend to be risk-averse to Sharia stocks that comply with the most or least 17 SDGs to safeguard their investment. Most developing countries cannot afford the cost to comply with most SDGs as developed countries.

In terms of theoretical implication, this study contributes to the literature on SDGs by examining the impact of SDGs on the tendency of herding and risk-averse behavior. Investors' sentiments act as the mediating variable and provide new insight into investigating the impact of SDGs on investors' behaviors. The findings also reveal that the Efficient Market Hypothesis is no longer valid in real life since herding and risk-averse behavior contradicts the EMH assumptions. EMH believes that investors are rational and stock prices represent all public and private information. The evidence of herding and risk-averse behavior in Indonesia and GCC markets shows that investors can be irrational in investment decision-making.

For practical implications, the findings enable policymakers, regulators, and practitioners to improve the current SDG practices of Sharia-compliant companies. This study highlights the role of SDGs in increasing stock returns, herding, and risk-averse behaviors. The results encourage investors to invest in Sharia-compliant stocks to avoid riba, gharar, suspicious transactions, and gambling activities. The results can also be used as additional information for the Corporate Governance Guide and Sustainability Reporting Guide to assist Islamic stocks in adhering to comprehensive SDG practices to benefit society.

For policy implication, the Central Bank of Muslim countries can formulate a robust policy to ensure herding and risk-averse activities are monitored, controlled, and regulated to avoid irrational stock trading in Sharia-compliant stocks. Conventional stocks should adopt the Islamic trading philosophy to reduce risks.

One of the limitations of this study is the lack of data to examine different behaviors of local and foreign investors in trading companies with and without compliance with SDG practices. Future studies are encouraged to observe the effect of SDGs in benefiting the financial market and company performances, such as return on assets. Future studies can also look at the impact of ESG on behavioral biases.

REFERENCES

Adira, N., & Halida, R. (2021, March). Perceived threats looming on SDG of peace and justice: Effects of investor's identity, symbolic and economic threats on attitudes towards FDI. In *IOP Conference Series: Earth and Environmental Science* (Vol. 716, No. 1, p. 012105). IOP Publishing.

Ali, M., & Asri, M. (2019, February). Prospect theory: Overcome risk disaster in emerging market. In *IOP Conference Series: Earth and Environmental Science* (Vol. 235, No. 1, p. 012010). IOP Publishing.

Baharudin, D. M. (2019). Pre and post MCCG 2017: Board audit committee effectiveness and independence issues. *Business Management and Strategy*, *10*(2), 199-216.

Barberis, N., Jin, L. J., & Wang, B. (2021). Prospect theory and stock market anomalies. *The Journal of Finance*, *76*(5), 2639-2687.

Barom, M. N. (2019). Understanding socially responsible investing and its implications for Islamic investment industry. *Journal of Emerging Economies and Islamic Research*, *7*(1), 1-13.

Blasco, N., Corredor, P., & Ferreruela, S. (2012). Does herding affect volatility? Implications for the Spanish stock market. *Quantitative Finance*, *12*(2), 311-327.

Boros, A., & Fogarassy, C. (2019). Relationship between corporate sustainability and compliance with state-owned enterprises in Central-Europe: A case study from Hungary. *Sustainability*, *11*(20), 5653.

Chaffai, M., & Medhioub, I. (2018). Herding behavior in Islamic GCC stock market: A daily analysis. *International Journal of Islamic and Middle Eastern Finance and Management*, *11*(2), 182-193.

Chiang, T. C., & Zheng, D. (2010). An empirical analysis of herd behavior in global stock markets. *Journal of Banking & Finance*, *34*(8), 1911-1921.

Chiang, T. C., Li, J., & Tan, L. (2010). Empirical investigation of herding behavior in Chinese stock markets: Evidence from quantile regression analysis. *Global Finance Journal*, *21*(1), 111-124.

El-Bassiouny, D., & El-Bassiouny, N. (2019). Diversity, corporate governance and CSR reporting: A comparative analysis between top-listed firms in Egypt, Germany and the USA. *Management of Environmental Quality: An International Journal*, *30*(1), 116-136.

Garman, M. B., & Klass, M. J. (1980). On the estimation of security price volatilities from historical data. *Journal of Business*, *53*(1), 67-78.

Ghouma, H., Ben-Nasr, H., & Yan, R. (2018). Corporate governance and cost of debt financing: Empirical evidence from Canada. *The Quarterly Review of Economics and Finance*, *67*(February), 138-148.

Hamonangan, R. A., & Danarsari, D. N. (2022). Merger as strategic partnership to support SDG: A positive signal for investors in stock market of APEC member countries. *KnE Social Sciences*, *7*(12), 412-423.

Ibrahim, A. J., & Shirazi, N. S. (2020). The role of Islamic finance in fostering circular business investments: The case of OIC countries. *Journal of Economic Cooperation & Development*, *41*(1), 89-120.

Ifada, L. M., Indriastuti, M., Ibrani, E. Y., & Setiawanta, Y. (2021). Environmental performance and environmental disclosure: The role of financial performance. *The Journal of Asian Finance, Economics and Business*, *8*(4), 349-362.

Izhar, H., & Munkin, M. (2021). Islamic finance and SDG 10: Evidence from selected OIC countries. In Hassan, M.K., Saraç, M., Khan, A. (Eds.), *Islamic finance and sustainable development* (pp. 127-149). Cham: Palgrave Macmillan.

Jabbari, M., Shafiepour Motlagh, M., Ashrafi, K., & Abdoli, G. (2020). Differentiating countries based on the sustainable development proximities using the SDG indicators. *Environment, Development and Sustainability*, *22*(7), 6405-6423.

Johari, J., & Komathy, M. (2019). Sustainability reporting and firm performance: Evidence in Indonesia. *International Journal of Accounting, Finance and Business*, *4*(17), 32-45.

Khaled, R., Ali, H., & Mohamed, E. K. (2021). The sustainable development goals and corporate sustainability performance: Mapping, extent and determinants. *Journal of Cleaner Production*, *311*, 127599.

Kim, M. J., Hall, C. M., & Han, H. (2021). Behavioral influences on crowdfunding SDG initiatives: The importance of personality and subjective well-being. *Sustainability*, *13*(7), 3796. https://doi.org/10.3390/su13073796

Lamouchi, R. A. (2020). Long memory and stock market efficiency: Case of Saudi Arabia. *International Journal of Economics and Financial Issues*, *10*(3), 29-34.

Lassala, C., Orero-Blat, M., & Ribeiro-Navarrete, S. (2021). The financial performance of listed companies in pursuit of the sustainable development goals (SDG). *Economic Research-Ekonomska Istraživanja*, *34*(1), 427-449.

Loang, O. K. (2022). Overreaction, investor sentiment and market sentiment of covid-19. *Vision, 0*(0). https://doi.org/10.1177/09722629221087386.

Loang, O. K., & Ahmad, Z. (2022). Does volatility cause herding in malaysian stock market? evidence from quantile regression analysis. *Millennial Asia, 0*(0). https://doi.org/10.1177/09763996221101217.

Loang, O. K., & Ahmad, Z. (2023). Economic and political factors on herding in Islamic GCC stock markets during covid-19 pandemic. *International Journal of Islamic and Middle Eastern Finance and Management*, *16*(4), 819-834.

Martens, J. (2020). The role of public and private actors and means in implementing the SDGs: reclaiming the public policy space for sustainable development and human rights. In M. Kaltenborn, M. Krajewski, & H. Kuhn (Eds.), *Sustainable Development Goals and Human Rights* (pp. 207-220). Cham: Springer.

Martínez, M. D. C. V., Martín-Cervantes, P. A., & del Mar Miralles-Quirós, M. (2022). Sustainable development and the limits of gender policies on corporate boards in Europe. A comparative analysis between developed and emerging markets. *European Research on Management and Business Economics*, *28*(1), 100168.

Mauro, S. G., Cinquini, L., & Pianezzi, D. (2021). New public management between reality and illusion: Analysing the validity of performance-based budgeting. *The British Accounting Review*, *53*(6), 100825.

Mertzanis, C., Basuony, M. A., & Mohamed, E. K. (2019). Social institutions, corporate governance and firm-performance in the MENA region. *Research in International Business and Finance*, *48*(1), 75-96.

Momin, E., & Masih, A. (2015). Do US policy uncertainty, leveraging costs and global risk aversion impact emerging market equities? An application of bounds testing approach to the BRICS. *MPRA Working Paper No*. 65834.

Muhmad, S. N., & Muhamad, R. (2021). Sustainable business practices and financial performance during pre-and post-SDG adoption periods: A systematic review. *Journal of Sustainable Finance & Investment*, *11*(4), 291-309.

Ndubuisi, G., Yuni, D., & Tingum, E. N. (2022). Economic sentiment and climate transition during the Covid-19 pandemic. In Goutte, S., Guesmi, K., & Urom, C. (Eds.), *Financial market dynamics after Covid 19* (pp. 101-121). Cham: Springer.

Parkinson, M. (1980). The extreme value method for estimating the variance of the rate of return. *Journal of Business*, *53*(1), 61-65.

Rupande, L., Muguto, H. T., & Muzindutsi, P. F. (2019). Investor sentiment and stock return volatility: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, *7*(1). 10.1080/23322039.2019.1600233.

Sarkodie, S. A., Adams, S., Owusu, P. A., Leirvik, T., & Ozturk, I. (2020). Mitigating degradation and emissions in China: The role of environmental sustainability, human capital and renewable energy. *Science of the Total Environment*, *719*, 137530.

Shamsudin, S. M., Abdullah, W. R. W., & Osman, A. H. (2018). Corporate governance practices and firm performance after revised code of corporate governance: Evidence from Indonesia. In Said, R., Mohd Sidek, N., Azhar, Z., & Anuar Kamarudin, K. (Eds.), *State-of-the-art theories and empirical evidence* (pp. 49-63). Singapore: Springer.

Shen, C. W., Luong, T. H., & Pham, T. (2021, April). Exploration of social media opinions on innovation for sustainable development goals by topic modeling and sentiment analysis. In Visvizi, A., Lytras, M.D., & Aljohani, N.R. (Eds.), T*he International Research & Innovation Forum* (pp. 459-471). Cham: Springer.

Sibande, X., Gupta, R., Demirer, R., & Bouri, E. (2021). Investor sentiment and (anti-) herding in the currency market: Evidence from twitter feed data. *Journal of Behavioral Finance*, 1-17.

Spulbar, C., Ejaz, A., Birau, R., & Trivedi, J. (2019). Sustainable investing based on momentum strategies in emerging stock markets: A case study for Bombay Stock Exchange (BSE) of India. *Scientific Annals of Economics and Business*, *66*(3), 351-361.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297-323.

Wen, F., Zhao, Y., Zhang, M., & Hu, C. (2019). Forecasting realized volatility of crude oil futures with equity market uncertainty. *Applied Economics*, *51*(59), 6411-6427.

Zahera, S. A., & Bansal, R. (2018). Do investors exhibit behavioral biases in investment decision making? A systematic review. *Qualitative Research in Financial Markets, 10*(2), 210-251.

Zeidan, R. (2022). Why don't asset managers accelerate ESG investing? A sentiment analysis based on 13,000 messages from finance professionals. *Business Strategy and the Environment, 31*(7), 3028-3039.