The performance of Islamic versus conventional stocks during the COVID-19 shock: evidence from firm-level data

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Abstract

In this study, we extend the recently heated debate that compares the performance of Shariah compliant equities with their non-Shariah compliant counterparts especially during the Covid-19 shock. Unlike the existing literature, which uses stock market index level data to reach controversial conclusions, we use firm-level stock returns data to find robust evidence that Shariah compliant stocks outperformed their conventional counterparts during the Covid-19 market meltdown. More specifically, we find that the prices of Shariah compliant stocks reacted to the increase in Coronavirus confirmed cases and government social distancing measures with lower negative returns than the prices of non-Shariah compliant stocks. Overall, our findings imply that Shariah compliant stocks fared better during the Covid-19 crisis episode.

Keywords: Shariah-compliant; Islamic; Covid-19; social distancing measures; financial markets; Pakistan

Introduction

The question whether the Shariah compliant stocks outperform their conventional counterparts especially during the crisis episodes has attracted substantial academic attention in recent years. The extant literature in this regard is largely inconclusive with some finding the Shariah compliant stocks outperform, others arguing their performance is not any different from conventional stocks and some even reporting their underperformance (see, for example, the recent literature survey by Delle Foglie and Panetta (2020)). Exploiting the Covid-19 health and economic crisis as an exogenous shock, recent papers use stock market index-level data and, consistent with pre-Covid-19 literature, largely report mixed evidence. For instance, one stream of papers finds the Shariah compliant stock indexes experienced lower drop in valuation, lower volatility and faster recovery in response to the Covid-19 outbreak (Chowdhury *et al.* 2021; Hassan *et al.* 2021; Dharani *et al.* 2022). Another stream, however, reaches the conclusion that the outbreak resulted in identical drop in stock market valuations (Hassan et al. 2021) and similar increase in volatility (Hasan *et al.* 2021b) in both Shariah compliant and conventional stock markets. Extending this debate, we use stock-level data of individual Shariah compliant and non-compliant firms from the Pakistan stock exchange to answer the above question.

The comparison using global stock indexes data is problematic because of the substantial overlap between the global conventional and Shariah compliant stock indexes. In general, global Shariah compliant stock index consists of a sub-group of companies, meeting the Shariah compliance screening criteria, from the global conventional stock market index. For instance, the top ten constituents of Shariah compliant global index of Dow Jones are also included in their global conventional index. Such an overlap in comparison groups might be a potential reason behind noisy findings by the previous studies. To account for this problem, we use firm-level data from

Pakistan and compare the performance of Shariah compliant firms with their non-compliant counterparts. Such approach is likely to provide more clean results.

To qualify for Shariah-compliance, a stock has to fulfill Shariah based screening criteria which, first, excludes the interest-based and non-permissible businesses and, second, limits, for the underlying business, the level of leverage, the interest payments, the investments in non-Shariah compliant interest-based financial instruments and the income received from interest-based and speculative sources. The exclusion of interest-based businesses and limits on leverage, interest payments and speculative income suggests that Shariah compliant stocks would be relatively safer (Azad *et al.* 2018; Cheong 2021).

Our empirical approach builds on the recent literature which shows that the stock markets responded negatively to the Covid-19 confirmed cases and related government social distancing policies (Al-Awadhi *et al.* 2020; Ashraf 2020b, a; Zhang *et al.* 2020; Ashraf 2021; Ashraf & Goodell 2021) and this negative stock market reaction varied depending on the risk of underlying assets (Albuquerque *et al.* 2020; Ramelli & Wagner 2020; Ding *et al.* 2021). We hypothesize that if investors assessed the Shariah compliant stocks as less risky assets class as compared to the conventional stocks then the comparative decline in the prices of former assets class would be the milder.

Using the daily stock return data over the period January 1-June 30, 2020 for the Shariah compliant and non-compliant companies included in the KSE-100 index of the Pakistan Stock Exchange, we find the Shariah compliant stocks exhibited relatively milder negative reaction to the increase in Covid-19 confirmed cases, government social distancing interventions and feverish stock market situation. Overall, our results suggest the Shariah compliant stocks were more resilient to the crisis.

We make multiple contributions to the extant literature. First, our study is particularly related to the literature that compares the performance of Shariah compliant stocks with their conventional counterparts during the crises periods. The findings of this literature are largely mixed. For instance, on the one hand, authors such as Ashraf and Mohammad (2014), Alexakis *et al.* (2017), Al-Yahyaee *et al.* (2020) and Tahir and Ibrahim (2020) find that Shariah compliant stocks outperformed conventional ones not only during the worse shocks of the GFC and the European Sovereign Debt Crisis but also during the pre- and post-crises periods. Other studies, however, conclude that Shariah compliant indexes either exhibited similar market risk as the conventional ones during the GFC (Al-Khazali *et al.* 2014; Sensoy 2016; Paltrinieri *et al.* 2019) or even in some cases demonstrated higher volatility (Ben Rejeb & Arfaoui 2019). Building on this literature, Delle Foglie and Panetta (2020) note that "Literature has not yet actually proven differences in performance and diversification benefits of Islamic Finance instruments".

Second, our paper can also interest those interested in the general issues surrounding Shariah compliant assets during the Covid-19 outbreak, such as the hedging benefits or the performance of equity funds. In this regard, recent studies have found Islamic stock indexes acted as attractive hedging instrument against the US, Global and European stock market (Ashraf *et al.* 2020; Hasan *et al.* 2021a; Umar & Gubareva 2021). Likewise, Shariah compliant equity funds outperformed the conventional ones during the Covid-19 (Mirza *et al.* 2022).

The remainder of the paper is organized as follows: Next section reviews the relevant literature. Third section discusses the Shariah compliant industry and the Covid-19 situation of the Pakistan. Fourth section presents the model. Fifth section reports empirical findings. Final section concludes the study.

Literature review

Our study largely builds on the two strands of recent literature: One that examines the response of Shariah compliant stock indexes, vis-à-vis conventional counterparts, to the outbreak of Covid-19 pandemic. Second that finds the drop in stock markets in response to the Covid-19 was largely depended on the risk of underlying assets.

The findings of first strand of studies are largely mixed. For instance, on the one hand, Hasan *et al.* (2021b) consider the two comparable pairs of conventional and Islamic stock indexes – Dow Jones Index and FTSE Index – and found that the pandemic creates identical volatility in both stock markets. Likewise, Hassan *et al.* (2021) use the data of MCSI equity indexes of 50 countries over the period Jan. 01-Sep. 30, 2020 and conclude that both Islamic and conventional stock indexes experienced largely similar drop in valuations, except some Asian countries where Islamic stock indexes outperformed. On the other hand, Sherif (2020) shows that though the outbreak affected negatively both the UK Dow Jones faith-based ethical index and its conventional counterpart, the effect was statistically insignificant on the former. Similarly, Chowdhury *et al.* (2021) examine the Dow Jones world conventional and Islamic sectoral indexes and find that Islamic sectoral indexes experienced relatively lower drawdown and faster recovery than their non-Islamic counterparts. Dharani *et al.* (2022) analyze the performance of S&P 1200 Shariah and non-Shariah sectoral indexes over the period Oct. 01, 2010 to Oct. 29, 2020, and report that the Shariah compliant indexes on average have had lower volatility and higher returns during the Covid-19 shock.

In the second strand, initial studies showed that stock markets' return declined and volatility increased in the first Quarter of 2020 in response to the Covid-19 outbreak (Al-Awadhi *et al.* 2020; Ashraf 2020b, a; Goodell 2020; Onali 2020; Seven & Yilmaz 2020; Zhang *et al.* 2020; Matos *et al.*

2021). A parallel literature however also showed that the stock market drop was not uniform and largely depended on the risks of underlying assets. For instance, Ramelli and Wagner (2020) explore that stock prices of US companies with higher exposure to China dropped more initially with the Covid-19 outbreak in China, however later investors favored those stocks when epicenters of the outbreak shifted to Europe and the US. They also observe stocks of firms with lower leverage and higher liquid assets were less severely affected by the outbreak. Albuquerque *et al.* (2020) show that stocks with higher environmental and social ratings observed significantly higher returns and lower return volatility during the first quarter. Ding *et al.* (2021) employ data of 6700 companies from 61 countries and find that the negative stock prices reaction to the Covid-19 confirmed cases was milder for firms with less leverage, higher profits, and more liquid assets. Likewise, Heyden and Heyden (2020) also find that stock price reaction to the Covid-19 depended on firm-specific characteristics such as the assets tangibility, liquidity, and institutional holdings. Building on these studies, we expect, if Shariah compliant companies were considered safer by investors, then the decline in stock prices of such companies in response to Covid-19 confirmed cases and government social distancing measures would be milder.

Shariah compliant industry and the Covid-19 outbreak in Pakistan

Pakistan is a Muslim majority country with significant demand of Shariah compliant financial assets. Pakistan Stock Exchange (PSX from hereafter), which is the only stock market in Pakistan, classifies listed companies into either Shariah compliant or non-compliant.

To be Shariah compliant, a stock has to fulfill two types of screening criteria: the qualitative and the quantitative. The qualitative criterion assesses whether the business of the applicant company is permissible in Islam. Businesses involving interest based transactions, such as conventional

banks and leasing and insurance companies, making or selling liquor, pork or haram meat, and gambling activities such as derivatives, are not permissible.

The quantitative criterion sets the requirements for company financials such as the level of interest bearing debt, interest bearing investments, interest income, liquid assets and market price. For example, a company has to fulfil following quantitative criteria to be designated as Shariah compliant. The interest bearing debt that includes debt raised through conventional bank loans, bonds, commercial papers, hire purchase, finance lease, or by issuing preference shares should be less than 37% of total assets. The non-Shariah compliant investments, which include investments in conventional bank deposits, money market instruments, mutual funds, bonds, treasury bills, commercial paper, Bonds, or derivatives etc., should be less than 33% of total assets of the business. The non-Shariah compliant income that includes the income from interest based transactions, gambling, derivatives, casinos, addictive drugs, alcohol, penalty charged on late payment in credit sale and insurance claim reimbursement from a conventional insurance company) should be less than 5% of total revenue. Illiquid assets, which include all fixed assets such as property, plant & equipment, and inventories of raw materials, work-in-process and finished goods, should be at least 25% of total assets. Finally, the market price per share should be at least equal to or greater than net liquid assets per share.

The listed companies are reviewed semiannually, on the first day of January and July each year, for Shariah compliance criteria. Usually, the composition of companies changes after each review; some existing companies that fail to comply the Shariah screening criteria are excluded while others that start complying are included.

In response to the Covid-19 outbreak in the first quarter of 2020, stock markets around the world reacted with substantial negative returns. The Pakistan Stock Exchange (PSX) was no exception

to this global phenomenon. For instance, over the period January-March 2020, KSE-100, which is the representative index of Pakistan Stock Exchange tracking the share price movements of top 100 listed companies, declined from its highest value of 43,167 on January 17, 2020 to the lowest value of 27,228 on March 25, 2020, observing a decrease of around 36 percent.

Data collection

For empirical analysis, we collected the daily stock prices data of Shariah compliant and non-compliant companies included in the KSE-100 index from the DataStream database. The KSE-100 index is the most representative of the Pakistan Stock Exchange (PSX), capturing the 85 percent of total market capitalization. We choose the sample period from January 01, 2020 to June 30, 2020. Two factors motivate us to choose this sample period: First, numerous recent studies which examine that firm-level factors moderate the adverse impact of Covid-19 on stock prices, such as Bae *et al.* (2021), Espinosa-Méndez and Arias (2021) and Matos *et al.* (2021), have used similar first two quarters of 2020 data for empirical analysis. Second, as the composition of Shariah compliant companies usually changes after each semiannual review, we choose a period, January 01-June 30, 20\20, over which the composition remains same. Over the period of our sample, 63 constituents companies of KSE-100 index were Shariah compliant while the 37 non-compliant.

Methodology

Motivating from the recent studies of Ashraf (2020b), Ashraf (2020a) and Ashraf (2021), we use following pooled panel data regression model:

$$Return_{i,t} = \alpha_0 + \beta_1 Cases_t + \beta_2 Govt.response_t + \beta_3 Shariah\ Compliant_i + \beta_4 Feverish_t + \beta_x Market\ capitalization_{i,t} + \in_{it} \quad (1)$$

Where $Return_{it}$ is daily return of company i at time t. Cases stands for the extent of Covid-19 outbreak, measured as the natural log of daily change in Covid-19 confirmed cases. Govt. response is measured with the stringency index from the Oxford Covid-19 Government Response Tracker (OxCGRT). Stringency index represents the government response to the outbreak regarding school closures, workplace closures, public transport closure, cancelation of public events, restrictions on public gatherings, stay at home policy, ban on international travels, and ban on internal movements. The index ranges 0 to 100, where higher values stand for more strict government response. Since investors react quickly to the new information, we take daily change of Stringency Index to capture the impact of announcements of government response measures on stock prices. We expect stock prices reacted negatively to the announcements of government lockdown policies.

Shariah compliant equals 1 for Shariah compliant companies and 0 for non-compliant conventional companies. Fever period is a dummy variable, equals 1 over the period January 17-March 25, 2020 and 0 otherwise, representing Covid-19 led bearish market trend in Pakistan Stock Exchange. Daily market capitalization is added as a control variable. $\in_{it}$ are heteroscedastic robust standard errors cluster at company-level. Appendix A briefly summarizes the variables definitions.

To assess whether Shariah compliant stocks reacted differently to the outbreak of Covid-19 and related government measures, we include following interaction terms.

$$\begin{aligned} Return_{i,t} = {} & \alpha_0 + \beta_1 Cases_t + \beta_2 Govt.response_t + \beta_3 Shariah\ Compliant_i + \beta_4 Feverish_t \\ & + \beta_1 Cases \times Shariah\ Compliant_{i,t} \\ & + \beta_2 Govt.response \times Shariah\ Compliant_{i,t} + \beta_3 Shariah\ Compliant_i \\ & + \beta_4 Feverish \times Shariah\ Compliant_{i,t} + \beta_x Market\ capitalization_{i,t} \\ & + \in_{it} \qquad (2) \end{aligned}$$

We expect significant interaction terms if Shariah compliant companies reacted differently to the Covid-19 cases, government response measures and feverish stock market trend.

Results and discussion

Summary statistics

Table 1 presents the full sample summary statistics of all main variables used in the analysis. Mean value of the Returns equals -0.020 showing the average realized stock returns over the sample period were negative 2 percent. Returns has a standard deviation of 3.2 suggesting a wide variation in stock returns over the sample period. Table 2 presents the summary statistics of stock returns for the full sample as well as the two sub-samples where the sample companies are divided as Shariah compliant and non-compliant. As evident from the mean values, non-compliant stocks have generated returns that are more negative during the Covid-19 shock. However, both types of stocks observed similar volatility, as the difference between standard deviations of two sub-groups is not substantial. This summary statistics suggests that Shariah compliant stocks performed better in terms of returns.

(Insert Table 1 & 2 here)

Correlation analysis

Table 3 presents the pairwise Pearson correlations between main variables. As shown, all three pandemic related variables, including cases, govt. response and fever period, have strong negative correlation with stock returns. These correlations suggest that the pandemic has adverse effect on stock returns. None of the correlation coefficients is too strong (i.e., 0.8 or higher) minimizing the chances of multicollinearity in our multivariate regression models.

(Insert Table 3 here)

Main panel regression results

Table 4 presents main regression results. Model 1 reports the results of baseline model. Covid-19 cases has significant negative association with stock returns, suggesting the stock prices of Pakistani companies declined in response to an increase in Covid-19 confirmed cases. Similarly, govt. response also enters negative and significant, implying that the stocks responded negatively to government response measures aimed to contain the outbreak. These results are in line with recent studies which report that, in general, stock markets reacted negatively to the Covid-19 cases and government response measures (Ashraf 2020b, a).

The Shariah compliant dummy variable enters positive and significant, suggesting on average Shariah compliant companies have had higher returns as compared to the non-compliant counterparts.

In Model 2, we add fever period dummy variable, which also enters negatively significant capturing the effect of contagious stock market declines during the months of February and March of 2020. Results of cases and government response variables still hold, showing that stock prices' reaction to these variables was over and above the contagious market fall of first quarter of 2020.

We add interaction terms in Models 3 to 5. The interaction term between cases and Shariah compliant dummy variables is positive and significant suggesting the negative effect of cases on returns weakens for Shariah compliant companies. Interaction terms of Shariah compliant dummy with govt. response and fever period dummy are also positive, though insignificant, again implying that the adverse effect of government response measures and the fever period on stock prices was milder on Shariah compliant stocks.

Recent literature reports the impact of Covid-19 on firms varied depending on the industry. For instance, the industries such as Tourism and energy were hit hard adversely while pharmaceutical and IT gained substantially during the pandemic. To account for the concern that Shariah compliant companies of some specific industries do not drive our results, we include industry fixed-effect dummy variables in the regression. As shown in Model 6, after including industry fixed effects, the interaction term between Shariah compliant firms and coronavirus cases remains significant eliminating the concern that results are because of some specific industry.

Overall, our results suggest that Shariah compliant stocks have demonstrated higher resilience to the Covid-19 shock.

(Insert Table 4 here)

We draw Figure 1 to graphically display the moderating effect of Shariah-compliance on the adverse stock price reaction to Coronavirus cases. The green line represents the returns of Shariah compliant stocks while the red line non-Shariah compliant stocks. Both lines are downward slopped implying that the growth in Coronavirus cases has had negative impact on stock returns. However, the line representing Shariah compliant is less downward slopped implying that the adverse impact of Coronavirus cases on stock returns is weaker for Shariah compliant firms.

(Insert Figure 1 here)

Our findings that stock returns of Shariah compliant companies dropped less compared to the non-compliant firms are in line with previous studies such as Sherif (2020) who find that Islamic stocks have been least impacted by Covid-19 cases. Our results also corroborate Chowdhury *et al.* (2021) who find that during the Covid-19 period Islamic equities indexes outperformed their conventional counterparts. Our results are different from Hasan *et al.* (2021b) who find that Shariah Compliance

equities fail to provide resilience against the Covid-19 shock. One potential reason is that they use index level data. At firm level, our findings are similar to Cheong (2021) who conclude the Shariah compliant firms are more "stable and resilient" during the economic shocks.

Robustness checks

We confirm the main results with a number of robustness checks. First, we add daily time fixed-effect dummy variables in the main model to further control for global trends during the Coronavirus pandemic. As shown in Table 5, the results are like the ones in Table 4.

(Insert Table 5 here)

Second, we add VIX and MSCI world indexes one-by-one as additional controls for global uncertainty and financial markets trend during the pandemic. VIX is considered as a strong predictor of global stock market volatility especially during the pandemic (Berger *et al.* 2020). MSCI world index have been widely used as the international equity market benchmark (e.g. (Shear *et al.* 2020)). As Shown in Table 6, our main results still hold after controlling for VIX and MSCI world index. Further consistent with expectation, VIX has a negative impact on stock returns while MSCI has a positive impact.

(Insert Table 6 here)

Third, we estimate cross-sectional regression only for fever period. For doing so, we calculate stock returns for each company from February 25 to March 25, 2020. Using these returns as the dependent variable in Table 7, the Shariah compliant dummy variable enters positive, significant suggesting the decline in Shariah compliant stocks during the fever period was relatively milder.

(Insert Table 7 here)

Channel analysis

We consider the two firm-level characteristics[1], the leverage and tangibility, to further investigate the channels through which Shariah-compliance firms act to be more resilient. Shariah screening criteria requires firms to have lower leverage and higher tangible assets. We interact both the Coronavirus cases and Govt. response with these two firm-level variables. Significant interaction terms would show that the adverse effect of Pandemic related variables on stock returns depends on firm leverage and tangibility.

As shown in Table 8, the interactions terms of the leverage variable with cases and govt. response enter negative and significant suggesting that the negative effect of both cases and govt. response on stock returns strengthens for the firms with higher leverage. Likewise, the interaction terms between cases and tangibility enter positive and significant pointing out that the negative effect of cases weakens for the firms with higher amount of tangible assets. Figure 2 graphically displays the results of interaction terms. As shown in Panel A, stock price reduction in response to the increase in Coronavirus cases is milder if leverage is lower. Likewise, Panel 2 shows the stock price reduction is milder if the level of tangible assets held is higher. As Shariah-compliance screening criteria limits the maximum leverage and the minimum amount of tangible assets to be held, together above results imply that Shariah compliance criteria are helpful in ensuring the complying firms stand resilient to the crisis episodes.

(Insert Table 8 here)

(Insert Figure 2 here)

[1] We exclude financial firms in this analysis as their leverage and tangibility ratios are quite different from non-financial firms.

Conclusion

In this study, we contribute to the literature that debate the performance of Shariah compliant stocks vis-à-vis non-Shariah compliant stocks especially during the crises periods. Using the data of 100 large listed Shariah compliant and non-compliant companies on Pakistan Stock exchange during the Covid-19 economic and health shock, we find that Shariah compliant stocks outperformed non-Shariah compliant counterparts. Specifically, we observe that the negative stock price reaction to the Covid-19 confirmed cases and related government response measures was milder for Shariah compliant companies.

These findings have important implications for the academicians and investors. On the one hand, our evidence with firm-level stocks data is helpful in settling the controversial findings of recent studies. On the other hand, the better performance of Shariah compliant stocks during the Covid-19 shock further validate their use as a hedge and safe-haven asset during crises periods.

A potential limitation of our study is that the Pakistan is a Muslim majority country with substantial demand of Shariah compliant products. The better stock performance of Shariah compliant firms might be due to the belief-based investors' tendency to differentiate and invest in stocks aligned with their religious beliefs. A potential venue for future studies may be to extend the sample to more countries having investors with varying religious beliefs.

Appendix A: Variable definitions

Variable	Definition
Return	Equals the natural logarithm of daily stock returns for each firm
Cases	Natural logarithm of daily change in confirmed Covid-19 cases in Pakistan
Govt. response	Daily change in stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT)
Shariah Compliant	Dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise.
Fever period	Dummy variable, equals 1 for the period January 17-March 15, 2020, and 0 otherwise.
Market capitalization	Daily total market value of all outstanding shares of a firm
Tangibility	Ratio of tangible assets to total assets for each firm
Leverage	Ratio of total asset to total equity for each firm
VIX	Natural logarithms change in daily price of Chicago Board Options Exchange's (CBOE) Volatility Index
MSCI	Natural logarithms change in daily price of MSCI world index

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Table 1: Summary statistics

This table presents the summary statistics of all variables for the full sample period.

	Returns	Cases	Shariah compliant	Govt. response	Market capitalization	Fever period
Observations	9,408	9408	9,408	9408	9408	9,408
Mean	-0.020	0.120	0.656	0.013	49471.060	0.214
Std. Dev.	3.200	0.238	0.475	0.091	67342.640	0.410
Min	-19.400	0.000	0	-0.171	210.000	0
Max	13.353	2.030	1	0.609	540884.600	1

Table 2: Summary statistics

This table presents the summary statistics of stock returns for full sample as well as the sub-samples of both Shariah compliant and non-compliant companies.

	Full sample	Shariah compliant	Non-Shariah compliant
Observations	9,408	6,174	3,234
Mean	-0.020	0.019	-0.094
Std. Dev.	3.200	3.217	3.166
Min	-19.400	-17.338	-19.400
Max	13.353	13.353	11.441

Table 3: Matrix of correlations

This table reports the pair-wise Pearson correlations between main variables. * represents the significance at 5% level.

	Returns	Cases	Shariah Compliant	Govt. Response	Market capitalization	Fever period
Returns	1					
Cases	-0.240*	1				
Shariah Compliant	0.004	-0.000	1			
Govt. Response	-0.222*	0.658*	-0.000	1		
Market capitalization	-0.003	0.000	-0.0292*	0.002	1	
Fever period	-0.207*	0.406*	-0.000	0.339*	0.041*	1

Table 4: Impact of the Pandemic variables on stock returns of Shariah compliant and non-compliant companies: main specification

Dependent variable is Return, measured as the daily returns of a stock, in all models. Cases represents the extent of Coronavirus outbreak, measured as the natural logarithm of daily change in confirmed cases. Govt. response is represented with daily change in stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT). Shariah compliant is a dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise. Fever period dummy equals 1 for the period January 17-March 15, 2020, and 0 otherwise. Market capitalization is daily total market value of all outstanding shares of a company. Shariah compliant × Cases, Shariah compliant × Govt. response, Shariah compliant × Fever period are interaction terms, capturing the joint effect of Shariah compliance and Pandemic on stock returns. Results are estimated with panel pooled ordinary least squares regression model, with robust standard errors clustered at company-level. *, ** and *** shows significance at 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Return	Return	Return	Return	Return	Return
Cases	-1.551***	-0.827***	-1.199***	-0.827***	-0.827***	-1.200***
	(0.153)	(0.147)	(0.227)	(0.147)	(0.147)	(0.227)
Shariah compliant	0.112**	0.113**	0.0451	0.111**	0.0584	-0.0825
	(0.0524)	(0.0528)	(0.0606)	(0.0545)	(0.0631)	(0.0832)
Govt. response	-6.687***	-5.689***	-5.689***	-5.767***	-5.689***	-5.687***
	(0.406)	(0.397)	(0.397)	(0.730)	(0.397)	(0.397)
Market capitalization	-3.00e-07	-1.31e-07	-1.23e-07	-1.30e-07	-1.18e-07	2.39e-07
	(2.26e-07)	(2.16e-07)	(2.16e-07)	(2.16e-07)	(2.16e-07)	(2.01e-07)
Fever period		-1.388***	-1.388***	-1.388***	-1.555***	-1.390***
		(0.0899)	(0.0899)	(0.0899)	(0.135)	(0.0900)
Shariah compliant × Cases			0.567*			0.568*
			(0.292)			(0.292)
Shariah compliant × Govt. response				0.118		
				(0.831)		
Shariah compliant × Fever period					0.254	
					(0.188)	
Constant	0.191***	0.380***	0.425***	0.381***	0.416***	0.472***
	(0.0518)	(0.0552)	(0.0579)	(0.0561)	(0.0592)	(0.0876)
Industry effects	No	NO	NO	NO	NO	YES
Observations	9,408	9,408	9,408	9,408	9,408	9,408
Companies	96	96	96	96	96	96

Table 5: Impact of the Pandemic variables on stock returns of Shariah compliant and non-compliant companies: adding time fixed-effects

Dependent variable is Return, measured as the daily returns of a stock, in all models. Cases represents the extent of Coronavirus outbreak, measured as the natural logarithm of daily change in confirmed cases. Govt. response is represented with daily change in stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT). Shariah compliant is a dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise. Fever period dummy equals 1 for the period January 17-March 15, 2020, and 0 otherwise. Market capitalization is daily total market value of all outstanding shares of a company. Shariah compliant × Cases, Shariah compliant × Govt. response, Shariah compliant × Fever period are interaction terms, capturing the joint effect of Shariah compliance and Pandemic on stock returns. Results are estimated with panel pooled ordinary least squares regression model, with robust standard errors clustered at company-level. *, ** and *** shows significance at 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Variables	Return	Return	Return	Return
Cases	-2.165***	-2.536***	-2.165***	-2.165***
	(0.712)	(0.735)	(0.712)	(0.712)
Shariah compliant	0.112**	0.0442	0.110**	0.0577
	(0.0525)	(0.0607)	(0.0543)	(0.0627)
Market capitalization	-4.40e-07*	-4.33e-07*	-4.40e-07*	-4.28e-07*
	(2.47e-07)	(2.45e-07)	(2.46e-07)	(2.43e-07)
Govt. response	-1.165	-1.165	-1.240	-1.165
	(2.270)	(2.270)	(2.335)	(2.270)
Fever period	-1.429***	-1.429***	-1.429***	-1.595***
	(0.202)	(0.202)	(0.202)	(0.257)
Shariah compliant × Cases		0.565*		
		(0.294)		
Shariah compliant × Govt. response			0.115	
			(0.835)	
Shariah compliant × Fever period				0.253
				(0.189)
Constant	0.203	0.247	0.203	0.237
	(0.160)	(0.163)	(0.161)	(0.162)
Time fixed-effects	Yes	Yes	Yes	Yes
Observations	9,408	9,408	9,408	9,408
Companies	96	96	96	96

Table 6: Impact of the Pandemic variables on stock returns of Shariah compliant and non-compliant companies: adding additional control variables

Dependent variable is Return, measured as the daily returns of a stock, in all models. Cases represents the extent of Coronavirus outbreak, measured as the natural logarithm of daily change in confirmed cases. Govt. response is represented with daily change in stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT). Shariah compliant is a dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise. Fever period dummy equals 1 for the period January 17-March 15, 2020, and 0 otherwise. Market capitalization is daily total market value of all outstanding shares of a company. Shariah compliant × Cases, Shariah compliant × Govt. response, Shariah compliant × Fever period are interaction terms, capturing the joint effect of Shariah compliance and Pandemic on stock returns. VIX and MSCI represtns logrithmic returns of VIX and MSCI indexes, respectively. Results are estimated with pooled ordinary least squares regression model, with robust standard errors clustered at company-level. *, ** and *** shows significance at 10%, 5% and 1% levels, respectively.

Variables	(1) Return	(2) Return	(3) Return	(4) Return	(5) Return	(6) Return	(7) Return	(8) Return
Cases	-0.565***	-0.933***	-0.565***	-0.565***	-0.605***	-0.977***	-0.605***	-0.605***
	(0.136)	(0.219)	(0.136)	(0.136)	(0.155)	(0.235)	(0.155)	(0.155)
Shariah compliant	0.120**	0.0526	0.119**	0.0661	0.113**	0.0451	0.111**	0.0584
	(0.0531)	(0.0610)	(0.0549)	(0.0635)	(0.0528)	(0.0607)	(0.0545)	(0.0632)
Govt. response	-5.677***	-5.677***	-5.748***	-5.677***	-5.987***	-5.987***	-6.065***	-5.987***
	(0.398)	(0.398)	(0.730)	(0.398)	(0.400)	(0.400)	(0.728)	(0.400)
Market capitalization	-1.25e-08	-5.32e-09	-1.21e-08	-4.55e-10	-1.20e-07	-1.13e-07	-1.19e-07	-1.08e-07
	(2.16e-07)	(2.15e-07)	(2.15e-07)	(2.15e-07)	(2.16e-07)	(2.16e-07)	(2.16e-07)	(2.16e-07)
Fever period	-1.361***	-1.361***	-1.361***	-1.524***	-1.373***	-1.373***	-1.373***	-1.540***
	(0.0901)	(0.0901)	(0.0901)	(0.135)	(0.0918)	(0.0918)	(0.0918)	(0.136)
Shariah compliant × Cases		0.562*				0.567*		
		(0.293)				(0.292)		
Shariah compliant × Govt. response			0.109				0.118	
			(0.831)				(0.831)	
Shariah compliant × Fever period				0.248				0.254
				(0.188)				(0.188)
VIX	-1.725***	-1.725***	-1.725***	-1.725***				
	(0.289)	(0.289)	(0.289)	(0.289)				
MSCI					3.029**	3.029**	3.029**	3.029**
					(1.286)	(1.286)	(1.286)	(1.286)
Constant	0.330***	0.374***	0.331***	0.365***	0.354***	0.398***	0.355***	0.389***
	(0.0556)	(0.0583)	(0.0566)	(0.0598)	(0.0569)	(0.0597)	(0.0578)	(0.0605)
Observations	9,216	9,216	9,216	9,216	9,408	9,408	9,408	9,408
Companies	96	96	96	96	96	96	96	96

Table 7: Impact of the Pandemic fever period on stock returns of Shariah compliant and non-compliant companies: cross-sectional regression

Dependent variable is Fever-period Return1 in model 1 and Fever-period Return2 in model 2. Fever-period Return1 are the aggregate stock returns between February 25 (i.e. reporting date of first COVID-19 case in Pakistan) and March 25, 2020 (the date on which KSE-100 index started a reversal). Fever-period Return2 are the aggregate stock returns between January 17 (when KSE-100 index started declining) and March 25, 2020. Shariah compliant is a dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise. Results are estimated with cross-sectional ordinary least squares regression model, with robust standard errors. *, ** and *** shows significance at 10%, 5% and 1% levels, respectively.

	(1)	(2)
Variables	Fever-period Return1	Fever-period Return2
Shariah compliant	0.065*	0.029
	(0.034)	(0.042)
Constant	-0.383***	-0.454***
	(0.025)	(0.032)
Observations	96	96
R-squared	0.033	0.005

Table 8: Impact of the Pandemic variables on stock returns of Shariah compliant and non-compliant companies: adding additional control variables

Dependent variable is Return, measured as the daily returns of a stock, in all models. Cases represents the extent of Coronavirus outbreak, measured as the natural logarithm of daily change in confirmed cases. Govt. response is represented with daily change in stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT). Shariah compliant is a dummy variable, equals 1 if a company is Shariah compliant and 0 otherwise. Fever period dummy equals 1 for the period January 17-March 15, 2020, and 0 otherwise. Market capitalization is daily total market value of all outstanding shares of a company. Shariah compliant × Cases, Shariah compliant × Govt. response, Shariah compliant × Fever period are interaction terms, capturing the joint effect of Shariah compliance and Pandemic on stock returns. Two firm level characteristics include, Tangibility (the ratio of tangible assets to total assets) and Leverage (the ratio of total asset to total equity). Interaction terms of Tangibility and Leverage with Cases and Govt. response variables capture the joint effect of the Pandemic and firm-level characteristics. Results are estimated with pooled ordinary least squares regression model, with robust standard errors clustered at company-level. *, ** and *** shows significance at 10%, 5% and 1% levels, respectively.

Variables	(1) Return	(2) Return	(3) Return
Cases	-1.166***	-0.612***	-1.608***
	(0.340)	(0.163)	(0.314)
Shariah compliant	-0.0340	-0.00774	-0.0589
	(0.105)	(0.0886)	(0.0919)
Govt. response	-6.035***	-5.991***	-4.275***
	(0.480)	(1.163)	(1.223)
Market capitalization	-9.99e-08	-9.99e-08	-1.01e-07
	(2.15e-07)	(2.15e-07)	(2.15e-07)
Fever period	-1.378***	-1.378***	-1.378***
	(0.116)	(0.116)	(0.116)
Tangibility	0.275	0.415**	0.249
	(0.217)	(0.192)	(0.201)
Leverage	-0.00130	-0.00233*	-0.00160**
	(0.000931)	(0.00126)	(0.000810)
Cases × Shariah compliant	0.165		0.522*
	(0.378)		(0.294)
Cases × Leverage	-0.0117*		-0.00749
	(0.00632)		(0.00693)
Cases × Tangibility	1.325*		1.691**
	(0.699)		(0.718)
Govt. response × Shariah compliant		-0.521	-1.420
		(1.350)	(1.443)
Govt. response × Leverage		-0.0297**	-0.0168
		(0.0127)	(0.0114)
Govt. response × Tangibility		1.454	-1.457
		(2.106)	(2.334)
Constant	0.403***	0.336***	0.434***
	(0.0896)	(0.0801)	(0.0822)
Observations	6,664	6,664	6,664
Companies	68	68	68

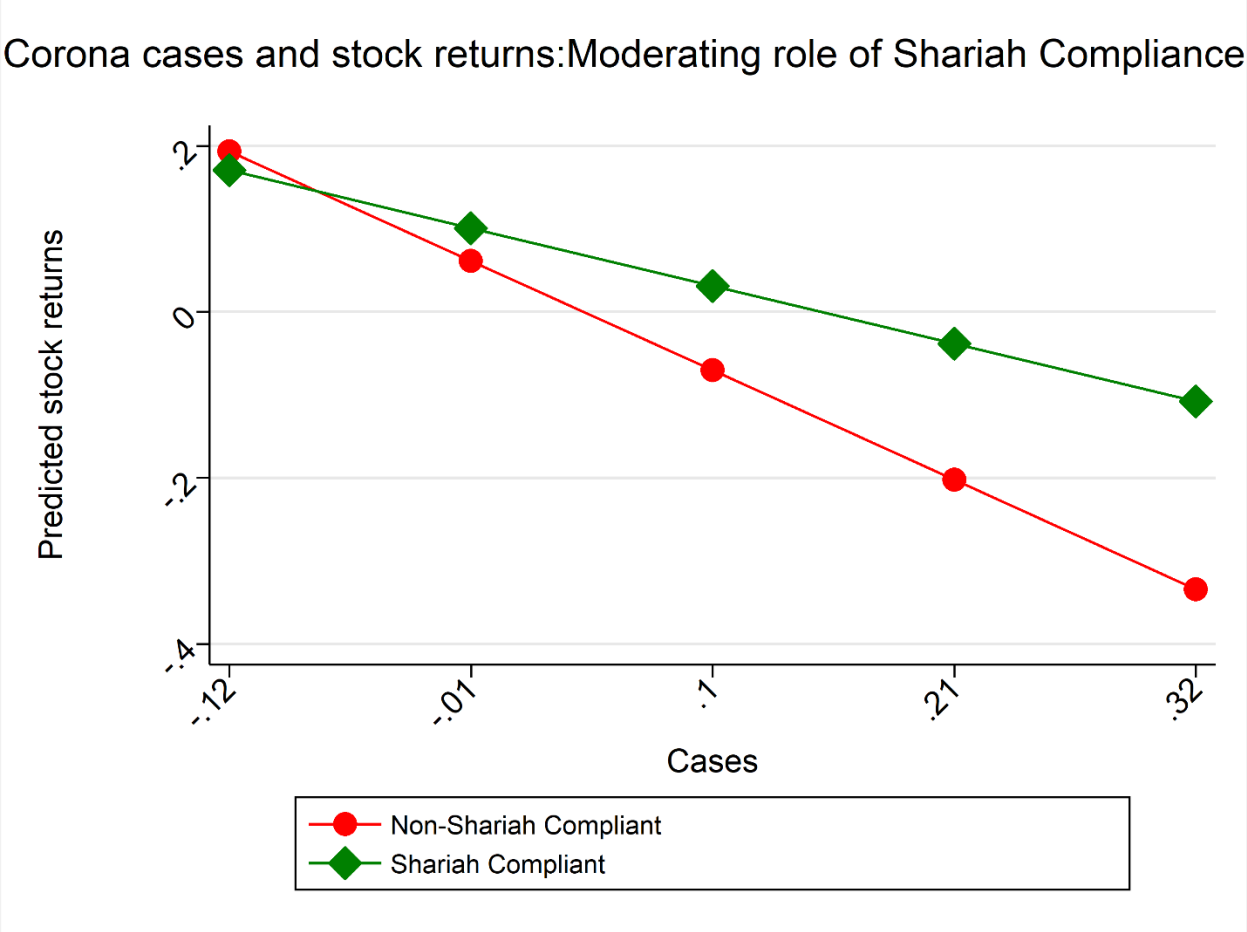

Figure 1:the graph presents impact of COVID cases on stock returns of Shariah Compliant and Non-Shariah Compliant firms. The green line represents Shariah compliant while red line represents Non-Shariah Compliant firms. The graph is formulated by using ± 1 Standard deviation of Corona cases.

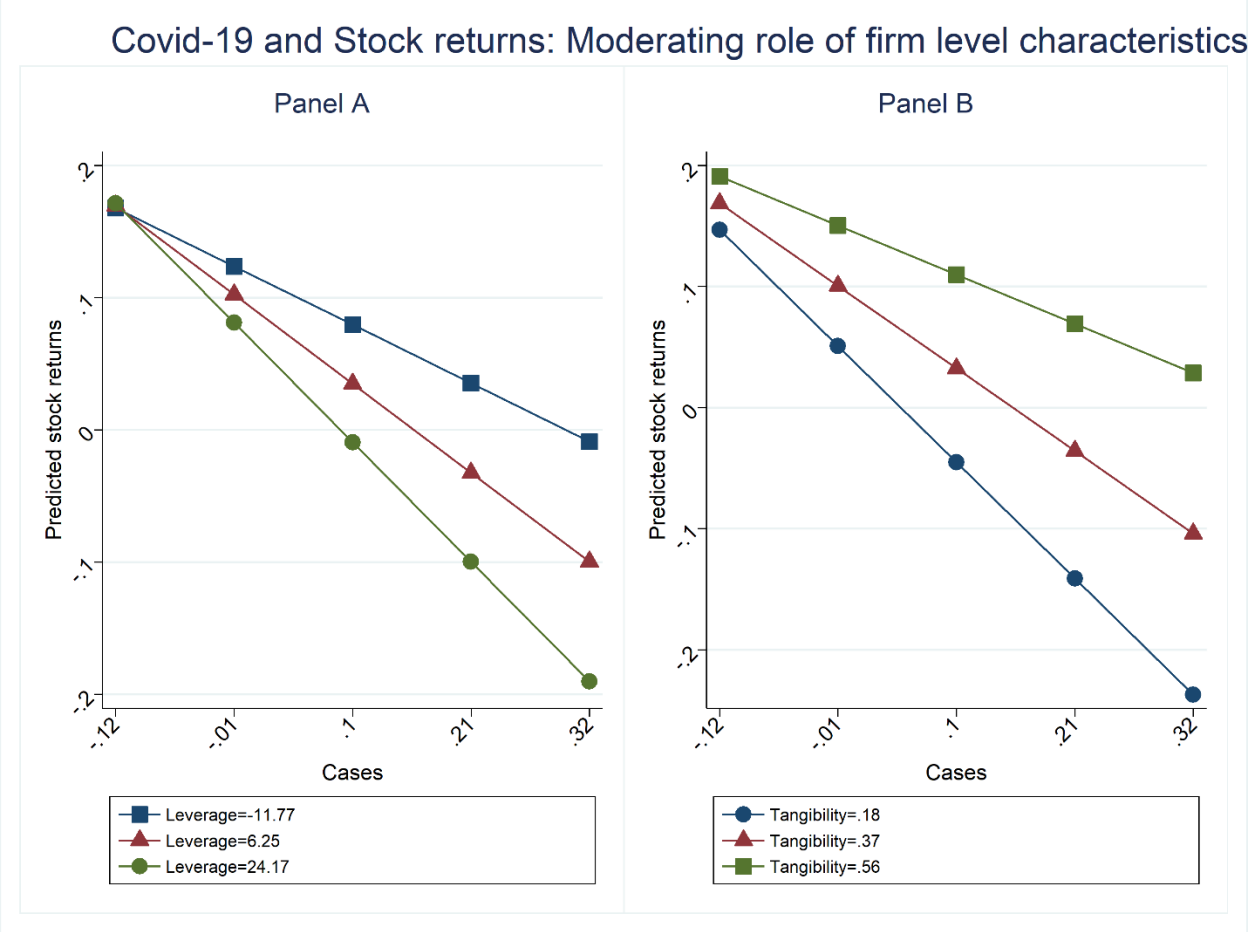

Figure 2 : The graph presents impact of cases on stock returns while considering moderating role of firm level characteristics. The graph is formulated by using ± 1 Standard Deviation of Corona cases, leverage, and tangibility. The panel A presents results for cases' impact on stock returns while considering moderating role of leverage. The panel B presents impact of cases on stock returns while considering moderating role of tangibility.