Financial Market Risks during the COVID-19 Pandemic

Omair Haroon, Mohsin Ali, Abdullah Khan, Mudeer A. Khattak & Syed Aun R. Rizvi


To link to this article: https://doi.org/10.1080/1540496X.2021.1873765

Published online: 26 Apr 2021.
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ABSTRACT
This article examines the nature of time-varying systematic risk for both Islamic and non-Islamic sectoral indices during COVID-19. The novelty lies in the analysis of behavioral changes in beta as the global health crisis moved from an epidemic to a pandemic. Using daily stock market return data on 10 different industry sectors, we show that both Islamic and conventional indices depict a similar pattern, but Islamic equities exhibit lower risk, indicating a subdued reaction to market movements. However, as the COVID-19 evolves from an epidemic to a pandemic, the trend changes, with Consumer Services, Financials, Healthcare, and Oil & Gas sector betas depicting an overreaction in Islamic equities. These results remain robust to multiple additional tests. On this basis, we argue that a lower systematic risk of Islamic equities can offer portfolio diversification opportunities.

1. Introduction

The COVID-19 outbreak has infected over 60 million worldwide by November 27, 2020. With the first cases detected in December 2019, the worldwide death toll by July first week had risen to half a million people. This rapid scale and exponential trajectory of COVID-19 cases have led the World Health Organization (WHO) to reclassify COVID-19 firstly as a global emergency on Feb. 20, 2020, and then a pandemic on 11th March 2020. With the world moving into an uncertain phase with lockdowns and economic shutoffs, the financial markets have been reeling under the pressure with higher volatility and nearly a third of market capitalization being wiped out during these times (see: Ali, Alam, and Rizvi 2020; Haroon and Rizvi 2020a, 2020b).


When it comes to systematic risk, whether Islamic equities are different from their conventional counterparts is not a foregone conclusion [Balli, de Bruin, and Chowdhury (2020)]. Some researchers
have suggested that there is no conclusive evidence of Islamic stocks providing diversification benefits [Delle Foglie and Panetta (2020)]. As pointed out by Albuquerque et al. (2020), COVID-19 provides a unique opportunity for researchers to use this crisis as an event study to test the unique value propositions of socially responsible investing. Unlike the world financial crisis of 2007, which had its origins in the financial sector of the economy and spilled over to the ‘real economy,’ the COVID-19 crisis is exogenous in nature and has its origins in the ‘real economy’ and is translating into a financial crisis. The effect of Islamic finance on the real economy is gaining traction in the literature [Juhro et al. (2020)]. Therefore, it is pertinent to hold a sectoral analysis to fully understand the implications of COVID-19 on the economy in general and financial markets in particular.

The objectives of this study are twofold: (1) Analyze and investigate whether the systematic risk behaves differently for Islamic and conventional sectoral indices during the ongoing COVID-19 crisis; (2) Analyze whether Islamic sectors have been relatively less risky throughout the COVID-19 crisis or has the nature of risk in Islamic sectors evolved with the progression of COVID-19 crisis. Earlier studies like Rizvi and Arshad (2018) and Dewandaru et al. (2015) have found Islamic sectors to be less risky during endogenous crises owing to their lower systematic risks. It is pertinent to ask whether systematic risk behaves differently in an exogenous crisis like the COVID pandemic that has its roots from outside the financial system. More importantly, from the investors’ perspective are Islamic stocks still providing an alternate safer investment?

By segregating the COVID-19 period between WHO declared Epidemic (Dec 2019 to March 10, 2020) and Pandemic (post March 10, 2020) we explore the behavior of systematic risk of conventional and Islamic sectoral indices across, the full-time period available (Jan 1, 2020 till August 15, 2020) and then during the Epidemic phase (Jan 1, 2020–March 10, 2020) and Pandemic Phase (March 11, 2020–August 15, 2020). We explore this behavior by inquiring about changes in systematic risk during these phases and exploring their volatility during the similar times.

Following the works of Rizvi and Arshad (2018) we focus on ten major sectors globally (see table 1) for exploring the behavior of systematic risk during the COVID-19 crisis. This study relies on a 30-day rolling window regression of sectoral returns to global market return for acquiring a time series of systematic risk. Further to this, we rely on the exponential generalized autoregressive conditional heteroscedastic (EGARCH) model for exploring the volatility of the sectoral returns.

Our findings lead to new three new findings, firstly, across all sectors (except Technology) and over the first half of 2020, the Islamic sectoral beta tends to be smaller than their conventional counterparts implying a subdued reaction to stock market changes. This trend remains in the epidemic phase, but in the pandemic phase, the trend changes, with Consumer Services, Financials, Healthcare, and Oil & Gas sector betas show an overreaction of the Islamic sector. This adds to the general volatility of stock return literature in the Islamic finance stream. Secondly, we observe during the epidemic and pandemic phase the beta of Islamic equities had relatively similar volatility compared to their

<table>
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<th>Sector</th>
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<th>Islamic</th>
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<tr>
<td>Utilities</td>
<td>UTL</td>
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<td>375</td>
</tr>
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</table>
conventional counterparts with slight differences. Third, in our analysis, we observe that the systematic risk of almost all sectors increased as the COVID-19 moved from an epidemic stage to a pandemic stage, highlighting increased perceived risk. This is in contrast with Baek, Mohanty, and Gliboskesy (2020) who found the market risk to have increased due to the COVID-19 crisis for companies associated with utilities, hospitality industry, tobacco, oil and gas, consumer goods, food production, and telecom sector; but found the systematic risk for companies associated with business equipment, personal and business services, steel, fabricated products and machinery, electrical equipment, automobile, and healthcare industry to have actually decreased in the COVID-19 crisis period.

The current study extends the existing literature on COVID-19 and financial markets with four major contributions. Firstly, it extends the limited literature on COVID-19 and systematic risk in Islamic and conventional stocks. Secondly, it extends the work of Rizvi and Arshad (2018) by documenting systematic risk in conventional stocks and Islamic stocks at a time of exogenous crisis as opposed to the endogenous crisis. Thirdly, by pursuing a sectoral level inquiry we add to the literature on the heterogeneity of markets earlier studied by Baek, Mohanty, and Gliboskesy (2020), Kong et al. (2011), Narayan et al. (2014a, 2014b), Narayan and Bannigidadmath (2015), Arshad, Rizvi, and Haroon (2020). They all suggest that the predictability of market components is heterogeneous, and not homogenous as mainly explored in market-level analysis. We also extend the work of Ashraf, Rizwan, and Ahmad (2020) by pin pointing exactly in which sectors are the systematic risk of Islamic stocks greater than the systematic risk of conventional stocks and how systematic risk changes across different sectors in different stages of the COVID-19 crisis. Fourthly, while Balli, de Bruin, and Chowdhury (2020) have asserted that improvements in market information contribute to decrease in the risk of Islamic equities over the long run. We provide evidence that improved market information also contributes to a decrease in the risk of Islamic equities in the short run.

Our findings are generally in line with the earlier literature that argues that firms with higher debt to equity ratio have a significantly negative relation between return and stock volatility as compared to those with lower debt/equity ratios (Black 1976; Christie 1982) and that Islamic stocks are often low-leverage stocks with high asset backing allowing a lower beta (see Dewandaru et al. 2015; Sensoy 2016). Our findings are also in line with the stream of literature documented by Delle Foglie and Panetta (2020) which favors the view that for investors a lower systematic risk of Islamic equities can offer portfolio diversification opportunities.

To reaffirm our results, our analysis is subjected to three robustness tests. Firstly, we recalculate time-varying beta at a weekly frequency, and our results are broadly consistent with those obtained using daily data. This suggests that our results are insensitive to the data frequency. Second, we proxy the volatility of beta with traditional standard deviation as well, and find trivial changes in our main results. Thirdly, we also tested our sample of both daily and weekly data using the Multivariate GARCH model, and our results conform to our earlier findings. Following the introduction, Section 2 explores the data and methodologies used and then an empirical analysis in Section 3. Lastly, the conclusion is presented in Section 4.

2. Data and Methodologies

Following the works of Kong et al. (2011), Narayan et al. (2014a, 2014b, 2014c, 2014d), Phan, Sharma, and Narayan (2015), Arshad and Rizvi (2015) and Alam, Arshad, and Rizvi (2016), we focus on sectors of the market. Specifically, we focus on 10 sectoral global indices for both conventional and Islamic counterpart from January 1, 2020 to August 15, 2020. The indices have been extracted from the Dow Jones Index for both Islamic and conventional. The indices are value-weighted indices; for details and motivation, see Narayan et al. (2017) and Narayan et al. (2017). Daily returns are calculated using the equation, \( r_t = \ln(P_t) - \ln(P_{t-1}) \). Here, \( r_t \) and \( P_t \) denote daily return and price at the business day \( t \), respectively. \( \ln \) represents natural log. For robustness checks, we use other data frequencies, as recommended by Narayan and Sharma (2015), namely, weekly and monthly returns.
Following the work of Rizvi and Arshad (2018) we have restricted our sample based on two major filters. Firstly, the sectoral index should at least span across 10 markets and have a minimum of 30 stocks in its composition to ensure a global spread of data. Secondly, matching the Islamic index of the sector should be available, to address the objective of undertaking comparisons between Islamic and conventional sectoral indices. Based on these two filters ten sectors are identified, which are listed in Table 1.

Following traditional works in finance, the beta is the measure of the systematic risk. We estimate the beta value by running the regression of each sector’s daily returns on the respective global index returns for Islamic and conventional markets over a rolling window of 30 days owing to lack of longer duration of data, since COVID-19 is still novel.

To understand the volatility of the Stock market, we rely on Exponential GARCH models which have been extensively used in studying the volatility of stock markets in finance literature. Yu and Hassan (2008), Rizvi, Arshad, and Alam (2018), etc. have relied on the asymmetric GARCH model developed by Nelson (1991) suggesting a better fit of the EGARCH model for volatilities. The EGARCH model presides over other models with its ability to allow for a more stable optimization of routines, and no parameter constraints.

\[
\ln \sigma^2_{j,t} = \omega_t + \beta_j \ln(\sigma^2_{j,t-1}) + \gamma \frac{\varepsilon_{t-1}}{\sqrt{\sigma^2_{j,t-1}}} + \alpha \left[ \frac{|\varepsilon_{t-1}|}{\sqrt{\sigma^2_{j,t-1}}} - \sqrt{\frac{2}{\pi}} \right]
\] (1)

Where \(\sigma^2_{j,t}\) denotes the conditional variance since it is a one-period ahead estimate for the variance calculated on any past relevant information. \(\ln\) represents natural logarithm, \(\omega_t\) symbolizes a conditional density function. The \(\alpha\) consideration represents the symmetric effect of the model, i.e. the GARCH effect. \(\beta\) calculates the perseverance in conditional volatility irrespective of market movements. Furthermore, the parameter \(\gamma\) measures the leveraging effect.

### 3. Empirical Analysis

Table 2 provides the average betas for the full-time period of COVID –19 (available as of now), and also the sample split into Epidemic and Pandemic phase. Interestingly, when we look at the full-time period, we notice that the betas of Islamic and conventional sectors, are different from Islamic sectors being lower except the technology sector. Following the work of Rizvi and Arshad (2018) we conducted an f-test and t-test to test whether the mean and variance of the Islamic and sectoral indices are statistically different and our findings concur with this. The lower average beta for Islamic

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<tbody>
<tr>
<td></td>
<td>Full-time period</td>
<td>Epidemic</td>
<td>Pandemic</td>
</tr>
<tr>
<td><strong>Basic Material</strong></td>
<td>0.920</td>
<td>0.790</td>
<td>0.894</td>
</tr>
<tr>
<td><strong>Consumer Goods</strong></td>
<td>0.714</td>
<td>0.664</td>
<td>0.659</td>
</tr>
<tr>
<td><strong>Consumer Services</strong></td>
<td>0.909</td>
<td>0.894</td>
<td>0.915</td>
</tr>
<tr>
<td><strong>Financials</strong></td>
<td>1.076</td>
<td>1.071</td>
<td>0.905</td>
</tr>
<tr>
<td><strong>Healthcare</strong></td>
<td>0.712</td>
<td>0.718</td>
<td>0.835</td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
<td>1.059</td>
<td>0.956</td>
<td>0.997</td>
</tr>
<tr>
<td><strong>Oil &amp; Gas</strong></td>
<td>1.219</td>
<td>1.208</td>
<td>0.987</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>1.158</td>
<td>1.252</td>
<td>1.428</td>
</tr>
<tr>
<td><strong>Telecom</strong></td>
<td>0.542</td>
<td>0.281</td>
<td>0.493</td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>0.619</td>
<td>0.370</td>
<td>0.406</td>
</tr>
</tbody>
</table>

**Table 2. Average systematic risk (betas).** This table reports the mean for the betas of our 10 Islamic and conventional sectors. The betas are calculated by running the regression of each sector’s daily return on the respective global index for Islamic and conventional markets over a rolling window of 30 days. The 10 sectors are differentiated between Islamic and conventional indices, where they are further assorted into Epidemic (January 1, 2020–March 10, 2020) and Pandemic (March 11, 2020–August 15, 2022) Phase.
sectoral analysis is similar to the earlier findings of Dewandaru et al. (2015) who suggest that this may be attributable to the relatively smaller number of constituents, which may comprise of relatively less liquid stocks. This is highly possible as the screening criterion, which classifies the Shariah compliance of the stocks, depends heavily on the debt to equity ratios. Large equity firms in developing countries tend to be more illiquid and family owned, thus a lower average beta, may arise from that. While Dewandaru et al. (2015) had focused on static singular beta as a measure of systematic risk, our study focuses on time-varying beta, and findings concur.

This analysis may be limited in light of the difference in average betas we found earlier, we follow Ali, Alam, and Rizvi (2020) in studying this behavior in the epidemic and pandemic phase. Firstly, we notice, that average betas across all sectors reduced from epidemic to pandemic phase which may have occurred owing to the settlement of panic and media frenzy which was peaking in epidemic phase as highlighted by Haroon and Rizvi (2020b). Balli, de Bruin, and Chowdhury (2020) have asserted that improvements in market information contribute to decrease in the risk of Islamic equities over the long run. We have found that improved market information also contributes to a decrease in the risk of Islamic equities in the short run.

Secondly, in terms of comparative between Islamic and conventional sectoral indices, we find that a similar trend exists when we restrict our sample to the epidemic phase, but surprisingly in the pandemic phase, the systematic risk of Islamic sectoral stocks jumps higher than their conventional counterparts, for Consumer Services, Financial Companies, Health Care, and Oil&Gas sectors. This is surprising and in contradiction to the earlier works of Alam, Arshad, and Rizvi (2016), Rizvi and Arshad (2018) who find Islamic sectors to have sustained lower systematic risks through crises. This may be owing to the nature of the recent crises, which resulted in panic and lockdowns as highlighted by Butt et al. (2020). The higher equity businesses which comprise the Islamic sectoral constituents faced strain under continued lockdowns, while leveraged firms were able to benefit from government bailouts via the financial sector subsidies. The results in the pandemic period may also be due to the path dependence of not responding in the epidemic period.

We further our analysis by exploring the volatilities of the betas presented in Table 3. The results are interesting as Islamic indices in Basic Materials, Consumer Good, Consumer Services, Financials, and Oil & Gas sectors tend to exhibit higher volatility. While only Technology and Healthcare have a markedly lower volatility than their conventional counterparts. This does not bode well from an investment strategy aspect. This may be attributed to the smaller size of the constituent list, which gives rise to less diversification opportunities. Similar to our exercise for average betas, we find no conclusive trend of whether Islamic or conventional sectors have a relatively higher volatility than the other. Only in financial sectoral indices, we find the Islamic index to have much higher volatility in the epidemic phase. As Sensoy (2016) highlighted this may be because the financial sector core business is

### Table 3. Average volatility of systematic risk (betas)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>Conventional</td>
<td>Islamic</td>
<td>Conventional</td>
</tr>
<tr>
<td>Basic Material</td>
<td>13.22%</td>
<td>15.23%</td>
<td>16.52%</td>
</tr>
<tr>
<td>Consumer Goods</td>
<td>7.35%</td>
<td>10.22%</td>
<td>6.77%</td>
</tr>
<tr>
<td>Consumer Services</td>
<td>9.57%</td>
<td>12.96%</td>
<td>11.00%</td>
</tr>
<tr>
<td>Financials</td>
<td>17.55%</td>
<td>21.81%</td>
<td>4.78%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>19.91%</td>
<td>10.39%</td>
<td>15.17%</td>
</tr>
<tr>
<td>Industrial</td>
<td>11.49%</td>
<td>10.63%</td>
<td>5.77%</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>36.12%</td>
<td>43.53%</td>
<td>33.00%</td>
</tr>
<tr>
<td>Technology</td>
<td>27.60%</td>
<td>17.26%</td>
<td>18.13%</td>
</tr>
<tr>
<td>Telecom</td>
<td>14.22%</td>
<td>7.56%</td>
<td>9.96%</td>
</tr>
<tr>
<td>Utilities</td>
<td>31.34%</td>
<td>16.42%</td>
<td>23.52%</td>
</tr>
</tbody>
</table>
considered un-Islamic, and its universe is limited and comprises of relatively illiquid stocks in the Islamic index. Islamic sectoral equities provide hedging opportunities to all types of investors including Islamic investors and socially responsible investors. Islamic investors may also build a portfolio of low-systematic risk-bearing Islamic equities along with other Shariah-compliant asset classes (like commodities).

For further robustness analysis, we pursue two more aspects. Firstly, we recalculate our betas for the sample period using weekly returns. The results concur with our earlier findings. For a further conformity check of our findings, we also calculate the betas for both daily returns and weekly returns using the alternative calculation of systematic risk using the covariance formula, and findings are similar to earlier conclusions drawn. We have also used the MGARCH model to factor in cross dependence and our results hold. (The results of volatility for the robustness checks are available with the author on request and not attached for brevity.)

4. Conclusion

The objective of this study is to explore the dynamics of systematic risks of conventional and Islamic equity markets during the global pandemic in 2020. The study focuses on ten sectoral indices spanning available data of 2020. The key contribution primarily stems from the comparative analysis of the betas, used as systematic risk proxy, in different stages of the intensity of COVID-19 crisis.

We conclude that while generally Islamic and their conventional counterpart sectoral indices follow a similar pattern but during the pandemic phase Consumer Services, Financials, Healthcare, and Oil & Gas sector Islamic indices present an over-reaction with inflated betas. However, in during the first half of 2020, as COVID-19 raged across the globe, Islamic sectors overall presented a relatively lower systematic risk, as compared to their conventional counterparts. While this supports the argument of lower risk of the investors, lower betas also tend to translate into lower returns as compared to their conventional counterparts in the bullish market. This study provides implications for the investors that a lower systematic risk of Islamic equities can offer portfolio diversification opportunities. This study is relevant to all types of investors including Islamic investors and socially responsible investors. Islamic investors may also build a portfolio of low-systemic risk-bearing Islamic equities along with other Shariah-compliant asset classes like commodities.

Our findings complement recent literature comparing Islamic and conventional financial markets as surveyed in, for example, Narayan et al. (2017). Our study adds a risk-oriented dimension toward understanding Islamic markets vis-à-vis conventional markets from the point of view of sectors. Since one of the reasons for low systematic risk could be the lower levels of debt, so as an extension of this study it would be interesting to see that if the same results can be obtained with similar conventional companies with lower debt levels.

Notes

1. Data from World Health Organization (WHO) website.
2. Limitation of data is owing to the timing of the pandemic, and this study.

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