

PERFORMANCE OF CONVENTIONAL, ISLAMIC, AND SOCIAL RESPONSIBLE INVESTMENT (SRI) INDICES DURING COVID-19: A STUDY OF INDONESIAN STOCK MARKET

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ABSTRACT

This paper investigates (i) the volatility of Indonesian Islamic, SRI, and Conventional equities, (ii) their serial correlation, and (iii) their dynamic correlation and relationship during the COVID-19 pandemic. Using MGARCH-DCC, our findings suggest that the Islamic index is most volatile but performs more efficiently than the others and exhibits no co-movement with Conventional and SRI during the Pandemic crisis. The study empirically shows the resilience and efficiency of the Islamic stocks in Indonesia during the Pandemic. These findings provide valuable and practical recommendations on portfolio diversification for investors and offers policy implications for regulators interesting in and dealing with impact or responsible investing.

Keywords: Islamic stocks, Socially responsible investing, Capital market, Stock performance, MARCH.

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I. INTRODUCTION

The pandemic that erupted in early 2020 has stimulated discussion on whether an impact investing strategy performs better than a conventional one. The investor's expectation of Sustainable Responsible Investing (henceforth, SRI) is high, and to mainstream the SRI, it must excel in uncertain periods such as the Pandemic crisis (Lean & Nguyen, 2014). The explanation for SRI superiority is two folds. First, SRI has been promoted by authorities, such as United Nations Principles for Responsible Investment (PRI) and United Nations Environment Programme (UNEP), with initiatives of bringing global corporations to agree to comply with SRI rules. Secondly, large-cap companies can be asserted as SRI due to their commitment to the principles. It is built upon the aspiration to change the game's rules in the market. The development of SRI, which aligns well with trending interest in SDGs, suggests an impact investing strategy as an alternative. It is hoped that investors can participate in efforts to create a better world without compromising their economic interests through SRI. Nonetheless, the available empirical evidence remains limited as to whether SRI stocks are "good" and are "fairly played" despite all the odds, particularly during this Pandemic, which motivates the present study on the SRI performance.

There has been increasing interest in SRI funds worldwide. For instance, in Australia, this fund increased by 32% within one year in 2001. In the United States, SRI funds reached US\$ 3.07 trillion in 2010, an increase of more than 380 percent from US\$ 639 billion in 1995. In the U.K., by year 2001, SRI had reached 224.5 billion pounds, and in Europe, the SRI market grew from € 1 trillion in 2005 to € 1.6 trillion in 2007. Meanwhile, the SRI market for developing countries, such as the South African SRI market, had reached 1.55% of the entire investment market in the country as at 2001 (Dewi, 2012). Although the development of SRI in developing countries has not been high, it is hoped that public interest in SRI will develop in line with the increasing public awareness of the impact of economic activities on humans (people), the environment (planet) and profit (Erragragui & Revelli, 2016; Erragragui & Revelli, 2015).

As a matter of fact, Islamic and SRI stocks emerge to be at the center of ethical and impact investment (Abdelsalam, Duygun, Matallín-Sáez, & Tortosa-Alsina, 2014; Azmi, Ng, Dewandaru, & Nagayev, 2019; Erragragui, Hassan, Peillex, & Khan, 2018; Williams & Zinkin, 2010). Indeed, both are perceived to be alike. Studies have evidenced the promising growth of SRI and Islamic assets and emphasized their importance to impact investors (Qoyum, Al Hashfi, Zusryn, Kusuma, & Qizam, 2021). However, it has also been noted that all Islamic stocks are SRIs, but not all SRIs are Islamics. On the other hand, Islamic stocks are older than the SRIs and conceptually adhere to SRI principles (Erragragui & Revelli, 2015). In other words, Islamic stocks are a subset of SRI with added religious screening. Meanwhile, SRI covers all firms that fulfill environmental, social, and governance criteria (Alda, 2021).

In the literature, various studies have discussed the issues of risk and return profile for ethical assets. Some have noted lowered profit and thus lower stock price for Islamic, SRI, and other investments with similar ethical responsibilities (El-Masry, de Mingo-López, Matallín-Sáez, & Tortosa-Alsina, 2016; Gassner, 2009). In other words, "*do well by doing good*" is only an old quote irrelevant to

stock investors. Furthermore, few studies that compare Islamic stocks to SRIs find that Islamic stocks are less prone to systematic risks and thus more rewarding than the SRIs (Azmi et al., 2019; Erragragui et al., 2018; Erragragui & Revelli, 2016; Erragragui & Revelli, 2015). On the contrary, other studies (Abdelsalam, Duygun, et al. 2014; Abdelsalam, Fethi, Matallín, & Tortosa-Alsina, 2014; Nofsinger & Varma, 2014; Qoyum, Al Hashfi, et al., 2021; Urquhart & Zhang, 2019) provide empirical supports for the outperformance of SRI assets. In short, there is still a mixed conclusion about the performance of Islamic and SRI across regions.

This paper aims to unfold the performance of Islamic vis-a-vis Socially Responsible Investment (SRI) and Conventional indices in the Indonesian stock market during a pandemic. The conventional index is included in the the analysis to serve as the benchmark for both impact indices. While there have been some similar studies on indices performance (Budiarso, Hasyim, Soleman, Zam, & Pontoh, 2020; Qoyum, Al Hashfi, et al., 2021), there is a scant empirical investigation of the performance of these asset classes, particularly during COVID-19 crisis in Indonesia stock market. As Indonesia is the potential largest hub for Islamic Finance, the study will not only enrich the literature on the topic but also provide valuable information for investors, particularly for impact investors interested in mainstreaming the “*doing well and good*” strategy. In the paper, we address three key questions: (1) How is the volatility of Indonesian Islamic, SRI, and Conventional equities during COVID-19 pandemic crisis? (2) Which among the three indices exhibit random walk behavior, thus arguably more efficient? And (3) are there dynamic correlations and relationships amongst the three indexes during the crisis?

The rest of the paper is structured as follows. Section two is the review of existing and related studies. Section three presents the methodology and data, followed by the results in section four. Finally, section five provides concluding remarks and some policy recommendations.

II. LITERATURE REVIEW

While studies on the performance of assets during this pandemic crisis are novel, the pandemic has raised the issue of the efficiency of capital markets. Conceptually, if the market is a “fully fair game,” market volatility pattern, which is a proxy for risk, will follow the bad news but would restore its confidence in the market. There is evidence from existing studies that volatility is increasing as the pandemic crisis is unfolded; for example, Zhang, Hu, & Ji (2020) show heightened systematic risks in 12 developed and emerging markets during such a health crisis; Bai, Wei, Wei, Li, & Zhang (2020) show that the pandemic crisis increases the volatility of equity market. A study by Baig, Butt, Haroon, & Rizvi (2021) discovers that confirmed cases and deaths due to COVID-19 and government controls on mobility are positively linked with market illiquidity and volatility at a global level. Ali, Alam, & Rizvi (2020) find that the Chinese market experienced a surge in volatility but recovered earlier than the global market. A study by Baker et al. (2020) shows that the U.S. stock market experienced shocks at an unprecedented scale, reflected by plummeting equities and rocketing volatility. These studies focus on stocks and no distinction is made whether they are socially responsible stocks or not.

Many studies document that stock markets react negatively in various health crises. A study by Pandell & Cho (2013) shows that the Foot-and-Mouth Disease (FMD) outbreak caused the capital market to perform negatively. In addition to the FMD outbreak, the SARS epidemic at that time also shook the economies of several countries. For instance, Devaraj et al. (2007) note that the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 weakened the Taiwan economy. The tourism industry experienced the highest share price decline (approximately 29 percent) within a month after the SARS outbreak. It is noted that seven publicly traded hotel companies experienced sharp decline in revenue and share prices during the SARS outbreak period. The hospitality sector was affected, and other sectors, such as aviation, were also hit hard by the crisis (Loh, 2006). As per the recent case of COVID, the Bucharest Exchange Trading (BET) Index experienced a significant negative impact from the Pandemic (Hatmanu & Cautisanu, 2021). Another study by Orhun (2021) demonstrates that the stock market of countries with more significant FDI to China would likely be more severely hit than those with higher health expenditures (higher GDP per capita nations). In short, based on these past studies, it seems fair to say that a health crisis causes wealth shocks in the global market.

Efforts to reduce risk are to diversify. Investors are taught not to “put their eggs into one basket.” Jones (2004) defines “diversification is the key to the management of portfolio risk because it allows investors significantly to lower portfolio risk without adversely affecting return.” Titman, Keown, & Martin (2014) state that “The effect of reducing risks by including a large number of investments in a portfolio is called diversification.” According to Auruma & Sudana (2013), forming a portfolio through diversification of various industries produces less risk than preparing a portfolio through diversification of one industry shares. By diversifying, there will be many profit opportunities. However, when market conditions are weak or unfavorable, diversification may not be adequate and lead to optimal results if it is not carried out effectively (Hunan, 2001).

Islamic stocks, which are identified via screening methodologies developed by Islamic scholars, are conceptually more stable and resilient during the bearish time (Al-Khazali & Mirzaei, 2017; Anwer, Azmi, & Mohamad, 2021; Erragragui et al., 2018). While resilience is attractive to some investors, they still doubt whether the religious screening of stocks produces a commendable return (Erragragui & Revelli, 2016). Gassner (2009) argue that (a) religious filtering reduces the universe of asset diversification, thus potentially lowering risk-return benefit and (b) it imposes costs, thence reducing profitability and stock prices. Similar arguments are also found in the research on impact investing assets (Agrawal & Hockerts, 2021).

There is also a short study on the market efficiency of Islamic stocks, particularly during the pandemic. The COVID-19 pandemic crisis is a recent phenomenon, and the findings are contradictory and polarized into at least two streams. The first stream argues that Islamic and SRI stocks underperform their conventional counterparts. Comparing Islamic and conventional stocks from 2008 to 2013 in Pakistan, Rana & Akhter (2015) argue that the Islamic stock index of Pakistan underperforms its conventional counterparts due to a smaller investment universe, increased monitoring costs, and limited diversification.

Ajmi, Hammoudeh, Nguyen, & Sarafrazi (2014) find that the Islamic market may outperform its conventional counterparts during bull markets but underperform in bear markets because of a lack of hedging.

The second stream argues that Islamic stocks and SRI have relatively outperformed the conventional stocks. Arouri, ben Ameer, Jawadi, Jawadi, & Louhichi (2013) pinpoint several findings: first, the impact of the financial crisis on the Islamic finance industry is less marked than that on conventional finance; second, the Islamic stocks generate high returns; and third, the Islamic portfolio reduces systemic risk and provides significant diversification benefits. Comparing the financial performance of Islamic and conventional indexes in Europe, the USA, and the World from 2000-to 2011, Jawadi, Jawadi, & Louhichi (2014) argue that while conventional investments seemed promising before the crisis and during periods of calmness, Islamic investment funds have relatively outperformed them since the subprime crisis and in turbulent times. Furthermore, they also find that the impact of the 2007-2009 recession is less significant on Islamic assets than on conventional markets. Similarly, Ho, Rahman, Yusuf, & Zamzamin (2014) find that Islamic indices outperform their conventional counterparts during crisis periods due to the conservative nature of Islamic-compliant investments offering investors superior investment alternatives during a crisis.

Some studies compare impact investing assets, such as Islamic and SRI, to conventional stocks in Indonesia. Beik & Wardhana (2011) and Sukmana & Kholid (2012) argue that Islamic stocks are more resilient to the crisis than the conventional stock index. Alfira, Fasa, & Suharto (2021) and Ganar et al. (2020) show that Islamic stocks underperformed during the pandemic. They employ descriptive statistics and static panel data of selected Islamic stocks in the Indonesian market. There is also mixed empirical result on the performance of ESG stocks (Pavlova & de Boyrie, 2021). Thus, there is still inconclusive finding on the performance of impact assets vis-a-vis conventional assets. Therefore, this study contributes to this line of research by re-assessing the performance of Islamic stocks, Social Responsible Investment (SRI), and conventional stocks in Indonesia during the COVID-19 pandemic.

While many studies examine the impact of the pandemic on Stock markets, there is scant literature comparing the performance of Islamic stocks vis-à-vis SRI during the pandemic, particularly for the Indonesia Stock Exchange. Recent studies by Qoyum et al. (2021) and Qoyum, Sakti, Thaker, & AlHashfi (2021) have not considered the pandemic period. They find that Islamic stocks empirically perform better in social and environmental criteria. They suggest that portfolios consisting of Islamic Stocks-Social Responsible Investing Stocks (henceforth, ISRI portfolio) outperform the conventional stocks.

III. METHODOLOGY

A significant issue facing investors is how to minimize risk while investing in a portfolio of assets in a pandemic situation. The primary purpose of this research is to examine the performance of three asset classes, i.e., conventional, SRI, and Islamic stocks, during the COVID-19 Pandemic. This study employs the MGARCH DCC modelling to generate conditional variances (or volatility of asset returns),

which in the context of crisis are proxies for resilience, and conditional correlations, which are proxies for asset co-movement. An understanding of how volatilities of and correlations between asset returns change over time, including their directions (positive or negative) and size (stronger or weaker), is of crucial importance for both domestic and international investors to diversify their portfolios for hedging against unforeseen risks as well as for dynamic option pricing.

In a multivariate GARCH (p, q) model (henceforth, MGARCH), the conditional variance and covariance of each asset depend upon its past conditional variance and past conditional variances of the other assets (Bollerslev, Engle & Nelson, 1994; Rusmita, Rani, Swastika, & Zulaikha, 2020). Dynamic conditional correlations (henceforth, DCC) are the most relevant in volatility modeling since they allow for time-varying means and variances. In other words, MGARCH DCC captures (when and how) changes in the interdependence between variables. The volatility of asset returns, r_t , is generally measured by its conditional variance and is denoted by:

$$h_t^2 = \text{Var}(r_t | F_{t-1}) \quad (1)$$

When returns move in the same direction, the correlations should be increased, and when they are moving in the opposite direction, correlations should be decreased. This process may mean revert to typical values of the correlations in the sense that high correlations will tend to fall and low correlations will rise. Economic events, such as down markets or macroeconomic variables, may augment the correlations.

The DCC-MGARCH enable modelling of many time-series without losing the over-parameterization problem while still preserving the flexibility of univariate GARCH (Khalid & Ahmad, 2021). There are two steps in the model; the first is that univariate GARCH models are estimated, and a standardized residual is attained. The second is to calculate the correlation matrix and coefficient, where R_t is the time-varying of the conditional correlation matrix.

$$R_t = \text{diag}(q_{11,t}^{-1/2}, q_{22,t}^{-1/2}, \dots, q_{mm,t}^{-1/2}) Q_t \text{diag}(q_{11,t}^{-1/2}, q_{22,t}^{-1/2}, \dots, q_{mm,t}^{-1/2}) \quad (2)$$

Where matrix Q_t of GARCH (1,1) model is:

$$Q_t = V_{ij} + \lambda_1 \frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \left(\frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \right)' + \lambda_2 Q_{t-1} \quad (3)$$

V_{ij} is a matrix of long-run or unconditional correlations;
 λ_1 and λ_2 are time-invariant parameters, where $\lambda_1 + \lambda_2 < 1$
If a variance targeting approach is applied;

$$V_{ij} = (1 - \lambda_1 - \lambda_2) \bar{Q} \quad (4)$$

thus

$$Q_t = (1 - \lambda_1 - \lambda_2)\bar{Q} + \lambda_1 \frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \left(\frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \right)' + \lambda_2 Q_{t-1} \quad (5)$$

Following this assumption, the log-likelihood function can be written as follows:

$$\text{Log } L1(\theta_1) = -\frac{1}{2} \sum_{t=1}^T [\log\{\text{diag}(D_t)\} + D_t^{-1} \varepsilon_t^2] \quad (6)$$

$$\text{Log } L2(\theta_2|\theta_1) = -\frac{1}{2} \sum_{t=1}^T \{\log|R_t| + (D_t^{-1} \varepsilon_t) R_t^{-1} (D_t^{-1} \varepsilon_t)\} \quad (7)$$

The data used in the study are daily from 02-Mar-2020 to 11-Jun-2021 and are sourced from Refinitiv Eikon of Thomson Reuters. The FTSE Indonesia represents the conventional Index and its constituents are large and mid-capitalized Indonesian companies. The Islamic index used is the Refinitiv Islamic Indonesia Index. It is a free float-adjusted market capitalization-weighted index where constituents are Islamic stocks that fulfilling Shariah-screening criteria. Finally, we use SRI KEHATI Index to represent the SRI stocks. It is a green index of sustainable and responsible investment stocks consisting of 25 listed stocks on the Indonesian stock exchange.

IV. RESULTS AND ANALYSIS

For capital market investors, volatility reflects future market risk and return information. This paper calculates the standard deviation of daily return changes on the index prices during a recent health crisis. As pandemic cases reached a new level, the second half of 2020 presented a real challenge where large-scale social restrictions were persistently being imposed. Stringent measures were first introduced by Jakarta's government starting September 14th, 2020, which paralyzed almost all sectors in the city. The imposed lockdowns include the closure of all schools and educational institutions, recreational parks and facilities, a significantly reduced capacity, and work-from-home transitions for industries, public transport, and offices, amongst others. It can be seen from the volatility coefficient shown in Figure 1 and Figure 2 that FTSE Indonesia and Refinitiv Islamic are both sensitive to the news on the pandemic. The volatility of stock returns surged to a new point on September 14th, 2020, particularly for conventional and Islamic indices as can be seen in Figures 1 and 2.

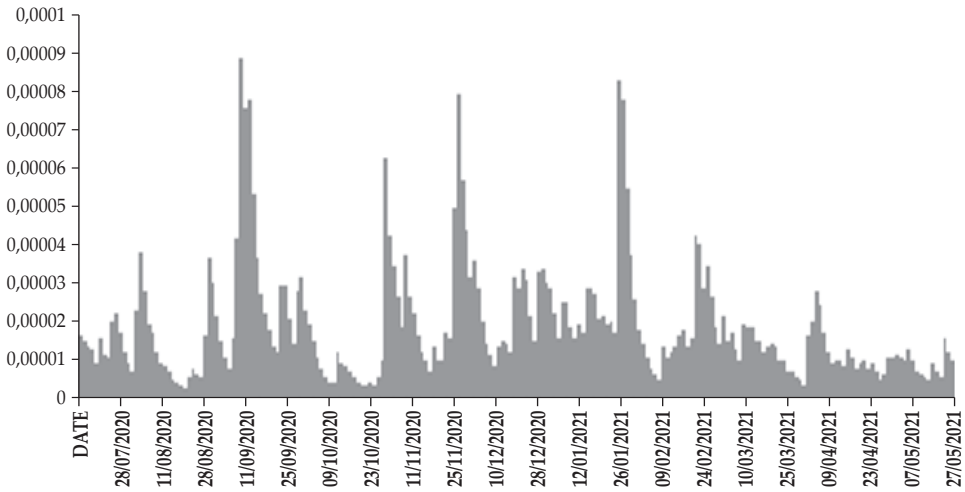


Figure 1. The Volatility of the Conventional Index

Figure 2 depicts the stock returns volatility of the Islamic index. In this case, the Islamic index volatility is higher and more volatile as compared to the conventional index. This pattern is expected because the business and financial screenings limit diversification benefits of the stock constituents. An earlier study by Azmi et al. (2019) indicate that the Islamic index tends to show more volatility than its counterparts due to the restricted diversified benefits of the index’s constituents. The increase in volatility is aggravated by controlled movement orders of September 14th, 2020, which were first introduced to curb the spread of the virus. This policy hit all sectors, while the finding demonstrates it was the most volatile time for the Islamic index.

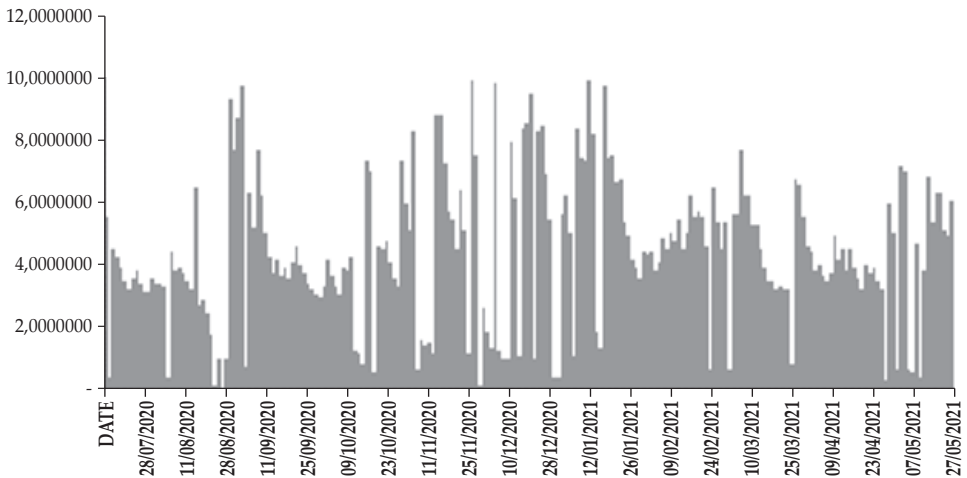


Figure 2. The Volatility of the Islamic Index

Figure 3 demonstrates the volatility of the SRI Index throughout the pandemic and suggests the following. First, the volatility of the SRI Index seems minimal. As volatility is measured by the standard deviation of daily return changes, low volatility could be the precursor for a prolonged steady increase in return trend. Arguably, the SRI-KEHATI index, which constitutes most blue-chip stocks with large capitalization, is (by default) expected to be less volatile than the more diversified Islamic or conventional stocks. Second, from August to December 2020, SRI KEHATI Index demonstrates almost an absence of volatility. During the first wave of the Covid-19 pandemic, regulators responded to the pandemic with stringent measures that prioritized life over livelihood. This may cause investors to be extra cautious in investing, including the constituent of SRI, since most of SRI KEHATI's constituents were banking and retail sectors predominantly. This period could be seen as a swift change in investors' strategy of holding onto cash instead of trading. The regime changed in early 2021.

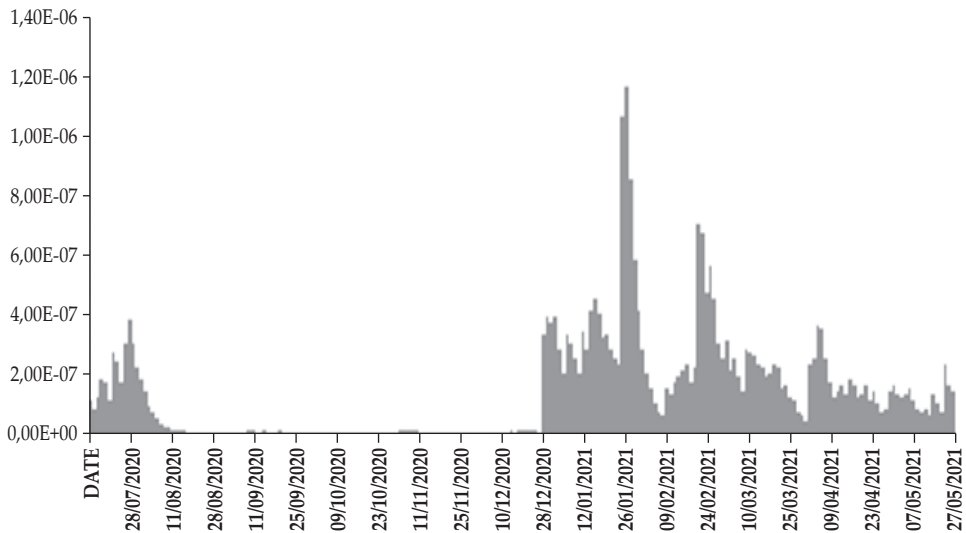


Figure 3.

The Volatility of the Sustainable, Responsible, and Impact Investing (SRI) Index

As volatility of returns is a proxy of asset risk, it is indicated in Figure 3 that the SRI index experienced a different pattern of risk and return in comparison to Islamic index. While SRI KEHATI stagnated, the Islamic index demonstrated the contrary. Figure 2 also tells that the most volatile Islamic index consists of large and middle-capitalized Indonesian companies. This result contradicts earlier studies (Azmi et al., 2019; Dharania, M.; Hassan, M. Kabir; Paltrinieric, 2019; Majdoub, Jihad; Mansour, 2014) as they find Islamic stocks are less volatile due to their being low-leveraged and asset-backed.

Table 1 shows that the first-lagged daily returns of conventional and SRI stocks are significant. The second lagged daily returns of conventional and SRI indices are also essential determinants of the recent return of the conventional Index.

Meanwhile, the coefficient of lagged return of Islamic stocks is not a significant determinant of both current conventional and SRI stocks. As for the Islamic market, the lagged daily returns of conventional, SRI, and Islamic stocks are insignificant to the recent Islamic stock returns. Such a result implies inefficient market theory for both Conventional and SRI indices but not for the Islamic index. The golden rule is that the absence of autocorrelation means an efficient market (Ielpo, Mercy, & Simon, 2017).

Based on the heteroscedasticity and autoregression tests, the best model specification for the study is shown in Table 1. The conventional index follows a model of AR 2, GARCH 1,1, while the SRI KEHATI and Islamic indices follow AR 1, GARCH 1,1. Table 1 indicates the VAR of Islamic stocks (AR 1, GARCH 1,1), where the lagged coefficients of Conventional, SRI, and Islamic are statistically insignificant determinants of the current Islamic returns. Such findings indicate that price changes in the Islamic market fully reflect the available information of the firms (Fama, 1991). In other words, the price changes of the Islamic index are independent of its conventional or SRI counterparts.

Table 1.
DCC-MGARCH Estimation of Conventional, Social Responsible Investing, and Islamic Stocks Co-movement

		Conventional		SRI		Islamic	
		Estimate	Std Error	Estimate	Std Error	Estimate	Std Error
<i>Mean equation</i>							
Constant		0.000185	0.0001186	0.000107	0.0000126	0.0257903	0.134135
Conventional	AR(1)/L.1	0.4919103*	0.0719082	0.1078528*	0.005814	0.2820996	55.92164
	AR(2)/L.2	-0.3239221*	0.0683634	-	-	-	-
SRI	AR(1)/L.1	3.034343*	0.6433973	-0.792288*	0.0335092	477.647	457.3222
	AR(2)/L.2	2.615563*	0.5951376	-	-	-	-
Islamic	AR(1)/L.1	0.0000442	0.0000519	0.00000138	0.00000549	-0.034085	0.082237
	AR(2)/L.2	0.0000346	0.000026				
<i>Variance equation</i>							
Constant		0.00000072*	0.000000247	0.000000003*	0.00000000139	1.070163**	0.577883
ARCH	L.1	0.3361632*	0.0980244	0.3765786*	0.1009645	0.249071*	0.099407
SEARCH	L.1	0.6791478*	0.059796	0.688396*	0.0588213	0.632917*	0.130944
Correlation		Conventional, SRI		Conventional, Islamic		SRI, Islamic	
		0.9877079*	.0070915	0.1309348	0.2097787	0.1080828	0.209842
Adjustment	Lambda 1	0.1746352*	0.0229487				
	Lambda 2	0.787711*	0.0252871				

Note(s): ** $p < 0.1$, * $p < 0.05$

Meanwhile, the first lagged SRI return is a factor of its current returns. There is a reverse relationship between lagged daily returns to current SRI stocks. There is also evidence of its mean-reverting behavior. Hence, SRI investors could predict price changes towards mean returns in the long run following shocks. However, when the coefficient of ARCH and GARCH is summed up, the total is more than

1. It means that SRI volatility does not have mean reversion properties. Another exciting result is that, while the past movement of conventional index influences the present return of itself and SRI, it does not affect the Islamic index. This finding highlights the fundamental difference between Islamic and SRI stocks with regards their relationship with the conventional asset class.

The mean reverting relationship is also found in AR 2 of conventional index return. While the first and second lags of SRI positively influence the current return of the traditional market, the finding statistically shows no relationship between conventional and Islamic markets. The second lagged return gives a negative relationship to the current changes. This is consistent with the study by Urquhart & Zhang (2019). However, when the coefficient of ARCH and GARCH is summed up, the total is more than 1. It means that conventional market returns do not have mean reversion properties.

Benchmarking the variance equations based on the ARCH and GARCH coefficients, the SRI index demonstrates the most sensitive and persistent volatility, followed by the conventional index and then Islamic index at the last position. The result indicates that there is a constant correlation between conventional index and SRI. Another result is on correlation, as indicated by $\lambda_{1,2}$. The magnitudes of the $\lambda_{1,2}$ suggest that the evolution of the conditional covariance depends more on their past values than on lagged residual innovations.

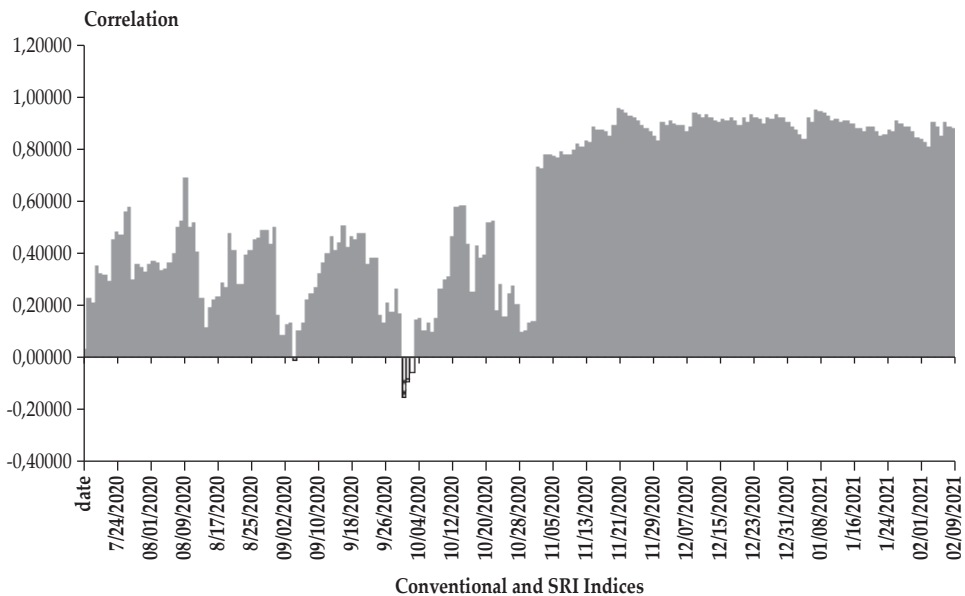


Figure 4.
Co-movement between Conventional and SRI Stocks

The observation of the correlation must consider how the conditional covariance of the stocks moves together. A positive correlation shows a linear or unidirectional relationship, whereas a negative correlation is the opposite. Figure 4 shows the plotted conditional correlations of stock market co-movements between

conventional and SRI indices. The result demonstrates that dynamic conditional covariance of conventional and SRI indices are positively and increasingly correlated over time, implying co-movement between these indices during the study period, particularly after the government's national-wide restricted/controlled movement order on November 23rd, 2020. After the date, it can be seen that the co-movement is close to positive 1, which implies that investors could expect a similar performance trend of conventional and SRI stocks.

A high correlation between different assets provides little diversification benefit (Yesuf & Aassouli, 2020). This result perhaps highlights the question and debates surrounding impact investing stocks under the Social Responsible Investing index, which allegedly includes socially irresponsible firms and thus are essentially conventional stocks but with different labeling (Aouadi & Marsat, 2018).

Figure 5 shows the correlations of stock market co-movements between Conventional and Islamic indices. Figure 6 shows conditional correlations between SRI and Islamic stock market co-movements. Figures 5 and 6 demonstrate a similar pattern; their dynamic conditional covariance could be seen as moderately low-to-modest. The findings contrast with studies by Rahman, Hedström, Uddin, & Kang (2021) and Yesuf & Aassouli (2020), who conclude that there is a high correlation between conventional and Islamic stocks and a moderate correlation between SRI and Islamic stocks.

Figures 5 and 6 also indicate a mixed co-movement trend amongst Islamic, conventional, and SRI stocks. First, there is a highly positive co-movement between the conventional and Islamic stocks and between SRI KEHATI and Islamic stocks from late September till the beginning of October 2020 and throughout November-December 2020. The second trend is the negative co-movement amongst the indices throughout August till the third week of September 2020. The first trend –the positive co-movement- happened during “a flattened COVID curve” in Indonesia. Apart from the flattening curve, there was also positive news about Vaccine production during the period. The second trend of negative co-movement demonstrates the reaction to bad news as COVID-19 cases rose. August and September marked the first wave of COVID-19 in Indonesia, where the virus spread was at its peak. Therefore, the positive co-movement between conventional and Islamic stocks and between SRI and Islamic stocks can be seen as investors' reaction and expectation towards good news on the controlled spread and successful Vaccine production. In contrast, the negative co-movement responds to negative information on the COVID-19 feed.

Another finding from the co-movement between Islamic and conventional stocks in Figure 5 and between Islamic and SRI stocks in Figure 6 is that the Islamic and conventional stocks have higher coefficient of co-movement than the Islamic and SRI stocks in Figure 6. It indicates that the Islamic market is more similar to the conventional than SRI. Although Islamic stocks follow industry and religious screenings, they are often considered the subset of traditional stocks.

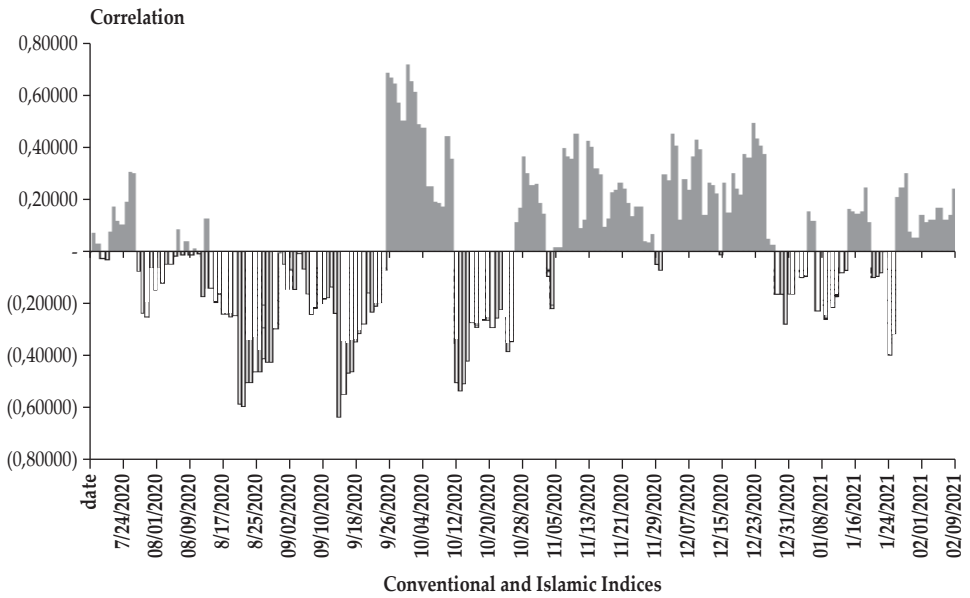


Figure 5.
Co-movement between Conventional and Islamic Stocks

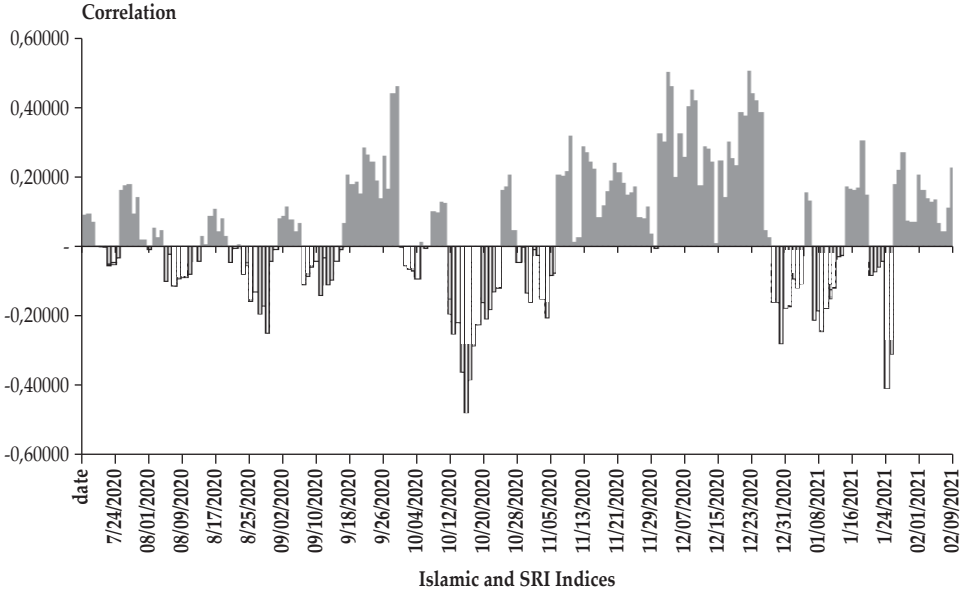


Figure 6.
Co-movement between Islamic and SRI Stocks

V. CONCLUSION

This study provides investors and regulators with empirical evidence of the performance of conventional, SRI, and Islamic indices during the COVID-19 pandemic crisis. The MGARCH DCC technique shows that Islamic stocks display the most volatility and are correlated more to the conventional stocks than to the SRI stocks. Islamic index experiences no serial correlation in its returns. Meanwhile, the conventional and SRI stock returns show lower volatility, experience serial correlation in returns, and have a near-perfect positive correlation. However, both conventional and SRI indexes display mean-reverting behavior during the COVID-19 pandemic. Investors could expect future price changes in conventional and SRI stocks to return to their mean in the long run ultimately.

It is essential to evaluate the performance of Islamic and SRI stocks during this crisis. As the index establishment aims to mainstream impact investing, only profit could draw rational investors into these asset classes. Thus, this paper suggests practical and policy implications: first, it is a practical recommendation for rational investors to diversify their portfolios using Islamic stocks and second, market regulators needs to improve the quality of screening or filtering for SRI stocks. As long as the SRI stocks are almost perfectly correlated and are less profitable than the conventional stocks, they could not draw much of investors' attention. Therefore, like Islamic stocks, which pose stringent and religious screens, SRI stocks must also be better filtered and supervised by the regulators.

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