Can Social Responsible Investment and Gold be a Good Diversifier for Indonesia Sharia Investors?

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Abstract

The COVID-19 Pandemic persists after the global financial crisis resumption of financial turbulence. This vulnerabilities phenomenon compelled investors to restructure their portfolio by implementing a well-diversification strategy. The Sharia Investment and Environment Social Governance (ESG) Investment are two types of investment that enormously attract investors' interest, partly due to their resilience in times of crisis. This study examines the market integration between Sharia stocks, ESG stocks, and Gold and empirically compares its integration in the period before and during the covid-19 Pandemic. The data used were daily closing prices on two Indonesia Sharia indices, ESG index and Gold price from January 2, 2015, to August 31, 2021. Through Johansen Cointegration, the results ascertain the cointegration among variables, implying limited diversification opportunities among assets in the long run. Vector Error Correction Model found the significant short-term relationship between the Sharia stock index and ESG investment in the pre-pandemic period but turned out to be insignificant during the Pandemic. Further, the finding confirms the Gold's ability as a good diversifier for both assets in the pre-pandemic period. However, during the Pandemic, it suggests that gold can indeed provide diversification gains only for the ESG index. Our results have imperative implications about the asset allocation under portfolio optimization.

Keyword   : Covid19; ESG Investment; Portfolio Diversification; Sharia Stock; Market integration
JEL Classification : C58, F3, G15

1.   INTRODUCTION

The resilience of Sharia stocks in the face of crises has been proven through various empirical evidence for decades. The more frequent financial crisis, such as the Asian financial crisis in 1997, The Global Financial Crisis (GFC) in 2007-2008, had attracted the attention of researchers to scrutinize its performance. Several studies revealed that Sharia stocks performed better than the so-called conventional investment during the GFC period. This was partly due to the Sharia stock screening process being divided into two aspects,

namely qualitative and quantitative. Qualitatively, Sharia stocks exclude businesses that are against Sharia principles. Quantitatively, the ethical equity controls financial ratios, where the debt ratio should not be more than 45%. El-Alaoui et al.(2018) enunciated that high debt levels will worsen the portfolio return, volatility, and value at risk in the condition of shocks. In Indonesia, it was noted that sharia compliance stocks showed positive performance during the Pandemic. Since the covid-19 Pandemic was initially announced in March 2020, Indonesia Sharia Stock Index and Jakarta Islamic Index have risen up to 13.9% and 7.8%, respectively.

Some consecutive financial downturn generates the need for more resilient investment, which, among others, is socially responsible. In this sense, Environment Social Governance Stock (ESG) investment could be a good alternative for investors. This type of asset excludes companies that produce or distribute products that are not environmentally friendly such as alcohol, tobacco, weapons, or gambling, which will have implications for the company's financial indicators and reputation in the capital market. Under this essential fundamental, investors and investment managers consider these factors in selecting their assets. In addition, It was proven that the ESG index showed its resilience during the Pandemic and outperformed the Indonesia Composite Index *investasi.kontan.co.id.*

However, the performance of individual assets will be worthless if those assets have high co-movement. To produce an optimal portfolio, investors and fund managers need to combine assets with low or even negative correlations. This strategy is part of portfolio diversification or known as portfolio optimization. The application of this strategy has become more complex due to globalization, where all information in the capital market is borderless. Stock markets are becoming more integrated, leading to fewer opportunities for diversification (Ben et al., 2020; Jian & Li, 2021).

The wake of the recent Covid-19 Pandemic by the end of 2019 has had a massive impact on global markets. This Pandemic is persisted in the resumption of another financial turmoil during the global financial crisis recovery. Through their studies, scholars have noticed that the Pandemic has a significant impact on stock market movements (Thomas et al., 2020; Trisnowati & Muditomo, 2021; Waheed et al., 2020). Government policies such as lockdowns and stern quarantine regulations have substantially impacted economic activity throughout the world, affecting the capital markets, including in Indonesia. Agustin (2021) shed light on social restriction in Indonesia, which negatively affects the Indonesia Sharia Stock Indices. Indonesia Stock Exchange reported that starting at the 6300 level, Indonesia Composite Index experienced a decline to its lowest point of 3937 level on March 24, 2020.

Prior literature stated that the connection and interdependence between several financial assets increased (Jawad et al., 2017; Mensi et al., 2017; Naeem et al., 2021). Akhtaruzzaman et al. (2020) examine how financial contagion occurs through financial and nonfinancial firms between China and G7 countries during the COVID–19 period. Their study noticed that the correlation among financial firms became higher during the covid-19 Pandemic, which led to more limited diversification opportunities for investors. In this regard, investors need to diversify their investments by considering the degree of market integration. Since the Covid-19 Pandemic is a source of systematic risk, investors need to understand how this shock will impact the relationship or level of integration between financial assets. This understanding can help investors have flight-to-quality episodes, where they need to transfer their investment, from high-risk assets to safe strategies (Troster et al., 2019). Hence, the pattern of relationships or integration between assets can be used to maintain financial stability.

The emergence of various global crises has attracted the attention of academics to examine ESG and Sharia stocks as two types of assets that have been empirically proven to be resilient to crises. Enormous literature analyzes the performance's distinction between Sharia stocks and conventional counterparts (Al-Yahyaee et al., 2020; El-Alaoui et al., 2018; Ur Rehman et al., 2016; Aarif et al., 2021). Other studies compared the performance of ESG stocks and the conventional market (Mohti et al., 2019; Lins et al., 2017; Singh, 2020). In addition to earlier studies which concern the integration of ESG stocks or Sharia stocks with its conventional stocks, according to the author's best knowledge, there is no research conducted analyzing the relationship between ESG and Sharia stocks in Indonesia in the context of market integration, particularly during the COVID-19 pandemic crisis.

Against this backdrop, our study aims to fill this gap by analyzing the integration between the Indonesia Sharia Stock Index, ESG index, and Gold as an asset which is often referred to as a safe haven asset in times of crisis. In addition, we also derive the distinction of market integration among assets in the periods before and during the COVID-19 Pandemic. Our study will provide useful guidance for investors and fund managers for the implementation of diversification strategy in the pursuit of optimum portfolios. The remainder of this paper is organized as follows – the second section briefly explores the existing Literature Review, the third section outlines the data and empirical methodology, the fourth section provides the empirical results, and the fifth section concludes the overall study.

2. HYPOTHESIS DEVELOPMENT

Modern Portfolio Theory (MPT), introduced by Harry Markowitz (1952), states that an Efficient portfolio allows maximum return to be achieved within a certain level of risk or the reaching a certain level of return at minimum risk. Moreover, this theory enunciated that risky assets can reduce overall portfolio risk if there is low covariance between risky assets and the whole portfolio. Succinctly, combining assets from different categories with low correlation will reduce overall volatility, triggering portfolio managers to invest more aggressively. Ahmed et al. (2017) suggest that cointegration analysis is necessary to detect long-term equilibrium. Integrated variables might have the same stochastic trend, indicating that they will bond together in the long run.

Numerous prior studies that primarily concern capital market performances argue that Islamic stock, well known as sharia stock, is better positioned than its conventional counterparts. Their unique features, such as ethical and financial ratios screening, may postulate lower investment risks (Foglie & Panetta, 2020; Hassan et al., 2020). Islamic Market also show remarkable growth during this last decade as it provides a massive range of investment opportunities for investors.

Al-Yahyaee et al. (2020) compare the performance of 22 Islamic stocks and Dow Jones conventional stocks in 22 countries during the two subsequence crisis period, namely Global Financial Crisis and European Debt Crisis. Their study revealed that although conventional equity dominated Islamic equity during the pre-crisis period, it was predictably that it outperformed its counterparts during and post-crisis.

Meanwhile, sustainability or impactful investment becomes a prominent aspect for companies to implement the business strategy. This drives the companies to act in a responsible way in order to meet the stakeholder's expectations. Unlike their conventional counterparts, Stocks under the ESG criteria stocks have gone through the screening process, which only includes stocks with environmental, social, and corporate governance concerns.

These efforts generally involve local communities and active stakeholders who drive the company's strategies. This is part of embedding ESG strategies to contribute to sustainable investment (Yesuf & Aassouli, 2020). On the other hand, investors who focus more on value have begun to realize that investing in social-responsible companies may result in better risk-adjusted returns (Jain et al., 2019).

During the past 20 years, Environment Social and Governance (ESG) stocks have massively attracted the interest of investors, fund managers, and scholars. An immense study has been conducted to assess ESG indices' performance and compare them to the matched conventional indices. In the period of market crises, some studies find that ESG stocks outperformed their conventional counterparts, partly due to the financial stability of the constituents. The fundamental aspect is expected to dampen the downside risk in crises(Lins et al., 2017).

Anderson et al. (2021) examined the interaction between ESG stock, conventional stock, ethical equity, currency, and crude oil price using the sample period from October 1, 2007, to December 18, 2018. This period has accommodated several changes in market conditions, including the GFC between 2007 and 2008, followed by the Great Recession between 2008 and 2012, the Eurozone crisis in 2009 and 2012, and a period of high volatility in oil prices between 2014 and 2016. This study reports two imperative findings. First, there is a significant bi-directional relationship between ESG equity and conventional and Islamic stocks. Second, there is also a significant relationship between ESG equity, currency, and commodity markets. Overall, the results of this study indicate that ESG equity is not a potential diversifier with major asset classes.

Another study conducted by Rehman et al. (2021) examined the relationship between conventional stocks in Brazil, India, Russia, China, and South Africa (BRICS) with the ESG index in the sample period July 13, 2013 to February 28, 2018. Overall, the results of this study also show that there is a significant relationship between the ESG index and the conventional index of all BRICS countries. However, the long-term and short-term solid and significant relationship only occurs between the ESG Index with China and South Africa. Meanwhile, Brazil and Russia only recorded a short-term relationship with the ESG index. At the same time, India only had a long-term relationship with the ESG index. Another vital point revealed in this study is that the BRICS stock market has been integrated, supporting several previous studies' results.

Previous studies clearly posit the directional relationship between the ESG portfolio and Islamic stock. This relationship may arise as both Islamic and ESG investing belong under the broader umbrella of Social Responsible investing. Following are the hypotheses pertaining to this relationship:

Hypothesis 1: The dynamic relationship exists among the Indonesia Sharia Stock Market and ESG Stock market in the period of pre-Covid-19 Pandemic.

Hypothesis 2: The dynamic relationship exists among Indonesia Sharia Stock Market and ESG Stock market in the period of Covid-19 Pandemic

In addition to shariah compliance stock, one of the significant safe-haven assets is gold. Gold is an asset that is a healthy investment opportunity that can compensate for losses caused by the decline in the value of other assets in the market (Maghyereh & Abdoh, 2021; Mensi et al., 2017; Chkili, 2017; Naeem et al., 2021). Extending previous study, Raza et al. (2016) conducted a study to scrutinize a theoretical explanation of the relationship between gold and other financial assets, namely the hedge, diversification, and

safe-haven hypothesis. Investors or investment managers expand their portfolios and add diversifiers or hedge assets with no positive or negative correlation with other assets under normal conditions. Under the hedge hypothesis, the assets in the portfolio should be negatively correlated or even uncorrelated with other assets under normal market conditions.

Meanwhile, the diversification hypothesis states that assets positively correlate with other assets under normal conditions. On the other hand, the safe-haven hypothesis states that assets are negatively correlated or uncorrelated in extreme conditions or financial crises. Furthermore, Robiyanto (2018) stated that Gold tends to have the opposite movement to stocks. Hence, Gold is a good hedge for Sharia Investors in Indonesia.

Various studies have analyzed the relationship between gold and conventional stocks and show a strong correlation among assets (e.g., Raza et al., 2016; Tuna, 2018). Some other studies highlighted that gold and stocks have weak and even negative correlations (e.g., Nguyen & Elisabeta, 2016; Iqbal et al., 2020). Trabelsi (2019) investigates the relationship between the Islamic stock market and some types of assets classes, namely bonds, crude oil, and gold. This paper covers Islamic Stock Markets in five regional financial systems. This paper exhibit that the nature of connectedness over the past decade is time-frequency dynamics, mostly dominated by the long-run relationship across variables. Furthermore, the results also suggest that the equity and crude oil markets are, on average, mostly net transmitters of return volatility shocks to other markets, while gold and bond market are, on average, net receivers.

A recent study by Maghyereh and Abdoh (2021) found a strong relationship between gold and the Dow Jones Islamic stock market index from January 2, 2006, to April 30, 2019. The results of this study indicate that gold cannot act as a safe haven, hedge, or diversifier for Islamic stocks both in the medium and long term, especially in the bullish and bearish. This is because the correlation between these assets increases with market turbulence. However, gold can be an effective hedge, safe haven, or diversifier only during normal conditions in the short term.

Another study by Naeem et al. (2021) assesses the relationship between Gold and Islamic stock under the normal, bearish and bullish market conditions. This study uses Dow Jones Islamic Index and ten sectoral Islamic indices. Through Quantile Regression, their study revealed the relationship between Gold and Islamic Stock in some limited industries. These two assets tend to follow a similar pattern during the market downturn and otherwise during normal conditions. To conclude, This study confirms the Gold's ability to be a safe-haven asset for Islamic investors during normal conditions.

Despite the previous results certainly supporting the hypothesis that gold can be an efficient hedge and overcome investment risks, research that analyzes the relationship between gold and sharia index and ESG index is still relatively scarce, particularly in Indonesia. These studies generally give different results caused by differences in samples, methods, and periods chosen. Following are the relevant hypotheses related to this background:

Hypothesis 3: The dynamic relationship exists among Indonesia Sharia Stock Index and Gold prices in the period of pre-Covid-19 Pandemic

Hypothesis 4: The dynamic relationship exists among Indonesia Sharia Stock Index and Gold prices in the period of Covid-19 Pandemic

Hypothesis 5: The dynamic relationship exists among ESG Index and Gold prices in the period of pre-Covid-19 Pandemic

Hypothesis 6: The dynamic relationship exists among Indonesia Sharia Stock Index and Gold prices in the period of Covid-19 Pandemic

3.   METHODS

Data and Variables
This study will include four types of assets, namely:

1. The Jakarta Islamic Index (JII) is the first Islamic stock index launched on the Indonesian capital market, precisely on July 3, 2000, or almost 21 years ago. The JII constituents consist of only 30 Sharia stocks with the most liquid assets listed on the IDX.

2. Indonesia Sharia Stock Index (ISSI) contains all Sharia stock compliance in Indonesia. As of December 2020, the number of issuers at ISSI was 423 companies. ISSI is present as an indicator of the performance of the Indonesian Islamic capital market.

3. Social Responsible Investment Kehati (SRI Kehati) as the representatives of socially responsible investment in Indonesia

4. Gold Price

The data was taken from January 2, 2015, to August 30, 2021, which was divided into two sub-periods: January 2015-March 10th 2020 as the Pre Covid-19 Pandemic Period (1214 observations) and March 11, 2020 – August 30, 2021, Covid-19 Pandemic period (342 observations).

In accordance with the research objectives, our study derives to analyze the interdependence between variables in both the long and short run. Due to its dynamic nature, the conventional correlation method is not sufficient to measure diversification. It is unable to capture the existence of long-term stationarity between measured variables. Ahmed et al. (2017) suggest that cointegration analysis is necessary to detect long-term equilibrium among Integrated variables.

To check the long-run integration, we applied Johansen Cointegration, and Vector Error Correction Model (VECM) was applied according to the result. The strength point of the VECM model is that all variables are considered as both exogenous and endogenous variables. This is commonly appropriate for macroeconomic variables that tend to have uncertain interdependency. This model is divided into several following stages:

Stationarity test

Time series data was a set of values for a variable taken at different times. Each data was collected periodically at certain time intervals. Widarjono (2012) states that time series data is stationary if it meets three criteria: the mean value and constant variation over time. The covariance between two-time series data only depended on the lag between the two time periods. Stationarity test with the Augmented Dicker Fuller Unit Root Test (ADF) was carried out with the hypothesis:

$H_0 : \delta = 0$ (dY_t stationary)

$H_0 : \delta \neq 0$ (Y_t not stationary)

H_0 was rejected if t $<t_{McKinnon}$, and it was concluded that Y_t contained unit-roots or Y_t was not stationary. Whereas H_0 was accepted if t$>$ $_{McKinnon}$, and it was supposed that Y_t did not contain a unit root or Y_t was stationary. If the data was not stationary on average, it was necessary to differentiate and reduce specific data from the previous data.

Johansen Cointegration Test

The Johansen procedure has limited opportunities to test cointegration vector shapes. Decision-making was rejected if the trace test statistics and maximum Eigenvalues > critical value at α, or p-value < significance value α, at the significance level (1- α) 100% (Johansen, 1988).

Vector Error Correction Model

Engle and Granger first popularized VECM in correcting short-term versus long-term disequilibrium. VECM is used to estimate data that is not stationary at the level but has a cointegration relationship. This model uses a restricted VAR form. If a time series data for the VAR model is proven to have a cointegration relationship, then VECM can be used to determine the short-term behavior towards its long-term value. VECM is a model for analyzing multivariate time series data that is not stationary. In general, the VAR model that is unrestricted and has up to -lags is as following equation 1.

$$Y_t = A_1 y_{t-1} + ... + A_p y_{tp} + \varepsilon_t \qquad (1)$$

Y_t : A vector with the k variables

A : Parameter matrix

ε_t : Error Vector

Because of the linear cointegration relationship, Equation 1 of the VAR model will change to a VECM model using the first Difference.

Granger Causality Test

Granger Causality Test is used to see the effect of each variable on the other variables in pairs. Based on the Granger causality hypothesis (Widarjono, 2012), a causality test determines whether an endogenous variable can be treated as an exogenous variable. This stems from ignorance of the interdependence between variables. If there are two variables, y, and z, then whether y causes z, or z causes y, or applies both, or there is no relationship between the two. The y variable causes the z variable, meaning how much z value in the current period can be explained by the z and y values in the previous period (Granger & Jji, 1988).

4. RESULTS

Table 1: Descriptive Statistics of the Indices

Variables	Mean	Median	Max	Min	Std. Deviation	Skewness	Kurtosis	CV
				Pre-Pandemic				
JII	686.3754	692.2900	798.7700	541.4000	48.2092	-0.5074	2.8898	0.0702
ISSI	174.0907	177.5250	199.6100	131.6100	14.8434	-0.9209	3.0428	0.0853
SRI	339.0239	343.7750	411.1100	230.8200	46.1840	-0.2484	1.8845	0.1362
Gold	1346.007	1333.7000	1697.1000	1070.8000	106.7291	0.5084	3.5330	0.0793
				During Pandemic				
JII	565.1937	554.0500	671.5900	393.8600	49.6778	-0.06331	3.3864	0.0879
ISSI	162.4983	170.0000	190.3900	115.9500	17.2123	-0.2969	1.8568	0.1059
SRI	330.5095	326.5400	398.7100	232.0000	32.4796	-0.1631	2.6353	0.0983
Gold	1816.627	1813.5500	2049.300	1487.100	93.9037	-0.4927	4.0614	0.0517

Table 1 documents the descriptive statistics of all variables. It shows a decrease in the average price of assets before the Pandemic and during the Pandemic. Conversely, the Gold price had a higher mean and median during the Pandemic as compared to the pre-pandemic period. These results initially indicate that Gold still has a remarkable performance during the Pandemic's upheaval. According to the CV value, both JII and ISSI as the representations of the Sharia stocks unearth increased volatility during the Pandemic.

Interestingly, SRI and Gold showed a decrease in volatility. During the Pandemic, ISSI, whose constituents are all sharia companies in Indonesia, showed the highest CV value compared to 3 other assets, indicating that this asset has the highest volatility. On another note, the Gold price series did not follow the risk-return relationship, where the higher prices commonly follow higher risk. Meanwhile, his data exhibit that Gold has a higher price and lower volatility during the Pandemic.

Table 2. Augmented Dicker Fuller (ADF) Test

Variable	Level		1st Difference	
	t-statistic	Probability	t-statistic	Probability
	Pre-pandemic			
JII	-2.199490	0.2067	-34.94456	0.0000
ISSI	-1.571591	0.4969	-33.90754	0.0000
SRI	-1.608835	0.4777	-33.69212	0.0000
Gold	-0.535966	0.8816	-33.56113	0.0000
	During Pandemic			
JII	-1.626921	0.4677	-14.79394	0.0000
ISSI	-1.191288	0.6793	-14.47300	0.0000
SRI	-1.672219	0.4445	-18.20944	0.0000
Gold	-2.577841	0.0986	-18.30434	0.0000

Notes: ***, **and * indicate significance at 1% level, 5% level and 10% level, respectively.

The first step taken in analyzing time series data was the stationarity test. In particular, the data should not be stationary at the level but must be stationary at their first Difference. The results of the Augmented Dicker Fuller (ADF) test at a significance level of 5% indicated that all assets are not stationary at the level because the probability value is more than 5%, but all are stationary at the first difference level. This means that all variables are integrated into order one or I(1) and assert the cointegration test assumption.

Table 3 Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
		Pre-Pandemic		
None *	0.678180	3899.594	40.17493	0.0000
At most 1 *	0.557214	2525.474	24.27596	1.0000
At most 2 *	0.486567	1538.095	12.32090	1.0000
At most 3 *	0.452514	730.1321	4.129906	0.0001
Trace test indicates four cointegrating eqn(s) at the 0.05 level				
		During Pandemic		
None *	0.585361	931.3683	40.17493	0.0001
At most 1 *	0.500717	632.0500	24.27596	0.0001
At most 2 *	0.485203	395.8922	12.32090	0.0001
At most 3 *	0.393716	170.1382	4.129906	0.0001
Trace test indicates four cointegrating eqn(s) at the 0.05 level				

The results of the cointegration test for lag 2 in the pre-pandemic data, according to Table 3, indicate that the values of trace statistic and maximum eigenvalue are greater than their respective critical value with a significance level of 1%. This means that the null hypothesis, which states that there is no cointegrating equation, is rejected, and the alternative hypothesis, which states that it is cointegrated, cannot be rejected. So, it can be seen that among the four variables in this study, there are at least four cointegration equations at the 5% significance level. This result also applies to data during the Covid-19 Pandemic. It can be concluded that there is a long-term relationship among all assets. Because all variables are cointegrated, it is possible to estimate the VECM Equation.

Table 4 Granger Causality Test

Null Hypothesis	Pre-Pandemic			During Pandemic		
	Obs	F-Sta	Prob	Obs	F-Sta	Prob
ISSI does not Granger Cause Gold	1212	1.80493	0.1649	340	1.09977	0.3341
GOLD does not Granger Cause ISSI	1212	2.49721	0.0827	340	5.56954	0.0042***
JII does not Granger Cause GOLD	1212	1.16313	0.3129	340	0.68421	0.5052
GOLD does not Granger Cause JII	1212	1.82083	0.1623	340	5.90595	0.0030***
SRI does not Granger Cause GOLD	1212	5.08758	0.0063***	340	0.63139	0.5325
GOLD does not Granger Cause SRI	1212	1.94873	0.1429	340	4.93306	0.0077***

Null Hypothesis	Pre-Pandemic			During Pandemic		
	Obs	F-Sta	Prob	Obs	F-Sta	Prob
JII does not Granger Cause ISSI	1212	0.37219	0.6893	340	0.67750	0.5086
ISSI does not Granger Cause JII	1212	0.14491	0.8651	340	2.22999	0.1091
SRI does not Granger Cause ISSI	1212	1.98900	0.1373	340	0.38241	0.6825
ISSI does not Granger Cause SRI	1212	1.22929	0.2929	340	0.35601	0.7007
SRI does not Granger Cause JII	1212	4.11115	0.0166**	340	1.12516	0.3258
JII does not Granger Cause SRI	1212	1.60608	0.2011	340	2.90776	0.0560*

Note : ***, ** and * indicate rejection of null hypothesis at the 1%, 5% and 10% significance levels.

Granger Causality Test explains the possible relationship between two-paired assets, unidirectional or bidirectional. The result reveals that there is only a unidirectional relationship between variables. Almost all variables are independent in the pre-pandemic period unless SRI proved to have a unidirectional relationship with Gold JII. In this sense, SRI tended to act as drivers of the movement of gold and JII prices. Conversely, during the pandemic period, Gold acts as a driver for the movement of SRI and Sharia stock prices in both JII and ISSI. In addition, during the Pandemic, JII can become an independent variable for SRI at the significance level of 10%. This shows that the integration of Gold with other assets increases during the Pandemic.

Table 5 VECM Estimation in Pre-Pandemic

Variables	GOLD	ISSI	JII	SRI
CointEq1	-1.604630	0.009962	0.034338	0.026233
	[-24.6547]***	[1.61353]	[1.13064]	[1.72884]*
D(GOLD (-1),2)	0.202628	-0.001592	-0.000120	-0.006012
	[4.08045]***	[-0.33800]	[-0.00519]	[-0.51929]
D(GOLD (-2),2)	0.026941	3.08E-06	0.003487	0.001353
	[0.93042]	[0.00112]	[0.25805]	[0.20039]
D(ISSI (-1),2)	-2.728480	-1.705276	-6.177717	-3.421412
	[-1.74632]*	[-11.5056]***	[-8.47350]***	[-9.39278]***
D(ISSI (-2),2)	-3.771396	-0.938526	-3.390241	-1.906933
	[-2.69152]**	[-7.06076]***	[-5.18510]***	[-5.83736]***
D(JII (-1),2)	0.035020	0.351747	1.269357	0.639856
	[0.09663]	[10.2319]***	[7.50635]***	[7.57324]***
D(JII (-2),2)	0.426898	0.189316	0.665905	0.373105
	[1.45259]	[6.79074]***	[4.85583]***	[5.44549]***
D(SRI (-1),2)	0.431232	-0.035584	-0.029987	0.082279
	[0.92027]	[-0.80051]	[-0.13714]	[0.75314]
D(SRI(-2),2)	0.330975	-0.006048	0.057698	0.013193
	[0.99950]	[-0.19254]	[0.37340]	[0.17089]

Note : ***, ** and * indicate rejection of null hypothesis at the 1%, 5% and 10% significance levels.

The VECM results show a short-term relationship between variables. Under this model, all variables are considered exogenous and endogenous variables. Table 5 shows

that during the pre-pandemic period, Sharia stocks, both ISSI and JII, had a significant effect on the movement of the SRI index. This means that, at this period, SRI and Sharia stock cannot be a good diversifier. The movement of the Sharia stock price will cause the movement of the SRI index price. The overlapping criteria of SRI and Sharia indices triggered investors and portfolio managers to include similar constituents under these two indices. This result supports the H1 and is consistent with Andersson et al.'s (2020) prior studies. Meanwhile, Gold is negatively influenced by the ISSI index at the levels of significance of 5% and 10%. This relationship implies that both assets have opposite co-movement. Sharia investors who want to use Gold as a diversifier are suggested to choose JII's constituents, which are the 30 most liquid companies on the sharia index in Indonesia. This result supports Hypothesis 3 and is consistent with the study by Naeem et al. (2021). It persists that Gold tends to follow a similar pattern to the sharia index under normal conditions. On the other hand, Gold is not affected by the SRI index or supports hypothesis 5. These results are consistent with Mensi et al.'s (2017) study, which asserts that gold can be used as a diversifier for the ESG stock index.

Table 6 VECM Estimation During Pandemic

Error Correction:	GOLD	ISSI	JII	SRI
CointEq1	-0.837624	-0.009754	-0.049350	0.026329
	[-10.6405]	[-1.20077]	[-1.36970]	[1.18146]
D(GOLD(-1),2)	-0.112350	0.017607	0.082967	-0.002351
	[-1.68684]*	[2.56171]***	[2.72161]***	[-0.12469]
D(GOLD(-2),2)	-0.048540	0.010098	0.043492	0.007029
	[-0.94165]	[1.89835]*	[1.84338]*	[0.48168]
D(ISSI(-1),2)	-5.678065	-1.079892	-2.675467	-1.328551
	[-2.36122]**	[-4.35174]***	[-2.43084]**	[-1.95156]
D(ISSI(-2),2)	-5.691036	-0.361631	-0.133312	-0.390371
	[-2.33982]**	[-1.44080]	[-0.11975]	[-0.56694]
D(JII(-1),2)	2.381325	0.095190	-0.057767	0.222824
	[4.19262]***	[1.62408]	[-0.22221]	[1.38579]
D(JII(-2),2)	1.847103	-0.006996	-0.344748	0.032698
	[3.35550]***	[-0.12316]	[-1.36832]	[0.20983]
D(SRI(-1),2)	-0.914131	0.000105	-0.038673	-0.568068
	[-2.40209]**	[0.00268]	[-0.22203]	[-5.27291]***
D(SRI(-2),2)	-0.442907	-0.024829	-0.166567	-0.393714
	[-1.24398]	[-0.67579]	[-1.02214]	[-3.90617]***

Note : ***, ** and * indicate rejection of null hypothesis at the 1%, 5% and 10% significance levels.

During the Pandemic, there is a change in the integration between variables. Hypothesis 2 is rejected since ISSI and JII have no significant effect on the movement of the SRI price index and vice versa. This shows that diversification opportunities can still be done in these two types of investments, which contrasts with the pre-pandemic period results. This finding is in line with Andersson et al.'s (2020) studies, which stated that engaging the ESG index and sharia index would not impair the portfolio performance. Otherwise, it can enhance portfolio stability. Moreover, (Qoyum et al.(2021) consistently

reveal the complementary nature of Islamic and social responsible indices. It was also proven that sharia compliance companies have good environmental and social performance.

Examining the First column of table 6 where Gold acts as a dependent variable, revealed that Gold is significantly influenced by the Sharia Index (ISSI dan JII) movement. This is also supported by columns 2 and 3, which documents that ISSI and JII are significantly affected by the Gold's movement. This means that the opportunity for diversification between Gold and Sharia stocks is lower due to the bi-directional effect between these assets. Hypothesis 4 is supported as Gold has a significant effect on the stock prices of the ISSI and JII indices. On the contrary, ISSI and JII have a significant effect on the price of Gold. This result confirms the arguments Iqbal et al. (2020) stated that their study implies weak diversification opportunities between gold and Islamic stock. Further, Gold also does not significantly affect the SRI Price index, which means that hypothesis 6 is rejected, and these two assets can still be good diversifiers in constructing a portfolio.

In summary, during the pandemic period, Sharia Investors have limited diversification opportunities with the other two assets. Gold tends to be a weak diversifier, while the ESG index will be a good diversifier for sharia investors.

Discussions

The construction of a well-diversified portfolio is an essential element for investors to preserve an optimum portfolio. Integration between assets tends to change according to economic conditions. Several studies show that a financial downturn will increase integration between instruments in the capital market. Generally, this study observed the level of integration between the four assets to find out which assets can be good diversifiers to each other. The four assets were two Sharia indices, one ESG-based index, and Gold. Further, it was also scrutinized the comparative nature of market integration under two periods, namely pre-pandemic and during Pandemic. The Johansen Cointegration test results showed a long-term relationship between the assets. Thus, the cointegration test results indicate that variables have a stability or balance relationship and the similarity of movement in the long term. This implies that these four assets are not suggested as diversifiers in the long term.

However, investors can still benefit from diversification benefits in the short term. The Vector Error Correction Model test results exhibit good potential diversifiers for some specific assets. Gold could be a good diversifier for Sharia stocks and SRI indices in the pre-pandemic period. However, Sharia stock was not a good diversifier for the SRI Index, where it tended to act as a follower for the SRI Index. During the Pandemic, the increased level of integration between Gold and Sharia stocks led to the limited diversification opportunities among these assets. In addition, the opportunity for diversification between SRI and ISSI is considerably high during the Pandemic, whereas Gold possesses good ability as a diversifier for the SRI index.

5. CONCLUSIONS, LIMITATIONS, AND SUGGESTIONS

Co-movements among financial assets are of primary concern for investors, portfolio managers, and policymakers to construct a well-diversified portfolio. A clear understanding and accurate measurement of market integration would benefit portfolio managers and investors to construct a well-diversified portfolio. This study posits the ability of each asset as a diversifier among others and its comparative nature under two

conditions, namely normal and bearish conditions. Our findings demonstrate that the portfolio diversification opportunities among assets tend to be limited in the long term. However, investors may take benefit from diversifications strategy in the short term. The result further shows the distinctive relationship among assets pre and post Pandemic. In the pre-pandemic period, Gold was a good diversifier for both other assets, while the pandemic period provided wide opportunities for diversification between Social Responsible and Sharia Stocks. Investors, fund managers, and other stakeholders may use these findings as to the basis for the capital market's decision-making.

MPT describes two possible strategies to gain optimum portfolio, namely: 1. They are selecting uncorrelated asset combinations, i.e., diversification, 2 — determination of the optimum weight of each asset. The focus of this study is premised on the former. At the same time, the second step is too complex to be addressed in this study because it will involve the whole portfolio construction process. Future studies may posit finding the weight of each asset to accomplish portfolio optimization.

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