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EVALUATING ISLAMIC STOCK PORTFOLIO WEIGHTING METHOD: APPLICATION OF GLOBAL MINIMUM VARIANCE IN INDONESIA ISLAMIC STOCK MARKET

EVALUASI METODE WEIGHTING PORTOFOLIO SAHAM SYARIAH: PENERAPAN GLOBAL MINIMUM VARIANCE DI PASAR SYARIAH INDONESIA

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ABSTRACT

Investing in stocks can be a smart alternative to saving money in a bank or keeping cash on hand due to the negative impact of inflation. It offers various advantages, such as generating income and safeguarding wealth against inflation. Investing in stocks comes with risks, which can be mitigated through strategic portfolio construction. Multiple methods exist for portfolio weighting, one of the popular portfolio weighting methods is Global Minimum Variance (GMV) by Markowitz (1952). This research aims to provide evidence about the performance of the GMV Method for Islamic retail investors using the Jakarta Islamic Index as the investment universe. The study analyzes the out-of-sample performance of GMV compared to Benchmark Indexes, which are IHSG, LQ45, ISSI, and JII. The finding of this study provides that constructing an Islamic stock portfolio using GMV help historically able to help the investor to gain a better return compared to ISSI, LQ45, and JII in the overall observation period and earned better returns compared to all benchmark indexes after the Covid-19 Period. Global Minimum Variance also helps the investor to gain better risk-adjusted return compared to ISSI and JII in the overall observation period and after the Covid-19 Period. Therefore, the retail investor could use GMV to construct their Islamic Portfolio to gain better returns than the market.

Keywords: Global Minimum Variance, Islamic Stock, Markowitz Portfolio, Portfolio Weighting Methods.

ABSTRAK

Investasi di saham dapat menjadi alternatif cerdas dibandingkan menyimpan uang di bank atau menyimpan uang tunai karena dampak negatif inflasi. Ini menawarkan berbagai keuntungan seperti menghasilkan pendapatan tambahan dan melindungi kekayaan dari inflasi. Investasi di saham memiliki risiko, namun dapat dikurangi melalui konstruksi portofolio strategis. Ada berbagai metode untuk pembobotan portofolio, salah satunya adalah Metode Global Minimum Variance (GMV) oleh Markowitz (1952). Penelitian ini bertujuan untuk memberikan bukti tentang kinerja Metode GMV bagi investor ritel Islam dengan menggunakan Jakarta Islamic Index sebagai alam semesta investasi. Studi ini menganalisis kinerja out-of-sample Metode GMV dibandingkan dengan Indeks Benchmark seperti IHSG, LQ45, ISSI, dan JII. Temuan dari penelitian ini menyatakan bahwa konstruksi portofolio saham Islam menggunakan Metode GMV secara historis membantu investor untuk mencapai return yang lebih baik dibandingkan dengan ISSI, LQ45, dan JII dalam periode observasi keseluruhan, serta return yang lebih baik dibandingkan dengan semua indeks benchmark pada periode setelah pandemi Covid-19. Global Minimum Variance juga membantu investor untuk mendapatkan risk-adjusted return yang lebih baik dibandingkan dengan ISSI dan JII dalam periode observasi keseluruhan dan setelah periode Covid-19. Oleh karena itu, investor ritel

dapat menggunakan Metode GMV untuk mengkonstruksi Portofolio Syariah mereka guna mencapai return yang lebih baik dibandingkan dengan pasar.
Kata Kunci: Global Minimum Variance, Saham Syariah, Portofolio Markowitz, Metode Pembobotan Portofolio

INTRODUCTION

Keeping money in a bank savings account or holding cash might be a safe alternative to saving someone's wealth. However, it might not be very beneficial and will degrade the value as there is inflation. Investing provides opportunities to grow their wealth in the long term, achieve their financial goals, create new sources of passive income, and beat inflation so the value of the wealth does not erode. The stock exchange can allow investors to invest their wealth and generate returns by increasing the stock price and the dividend. In Indonesia, the stock exchange that facilitates investors to perform trading stock is Indonesia Stock Exchange (IDX). The price movement of Indeks Harga Saham Gabungan (IHSG), which is an index that consists of all stocks actively traded in IDX for the last 22 years, which shows a good performance with the average monthly return of IHSG during 2000-2022 is about 3,47% per month. This exciting performance is well received as the number of investors keeps increasing. By early March 2023, There will be more than 4,5 million Single Investor Identification.

Indonesia is a dominantly Muslim country. The investment instrument must comply with Sharia (Islamic Law) in investing, especially in stock. For the stock to be called Islamic Stock, it must pass the screening process. In Indonesia, Islamic stock is screened by Otoritas Jasa Keuangan twice a year using several screening criteria, including business and financial screening. The stock is eligible to be categorized as Islamic Stock is included in Daftar Efek Syariah (DES). The Development of Islamic stock itself is massive, as 64,1% of companies listed in IDX will be classified as Islamic Stock in 2022. To gain more benefits from Islamic stock and reduce the potential risk of a decrease in the wealth invested in Islamic stock, Islamic investors could construct portfolios. Therefore this study assesses how the application of Global Minimum Variance developed by Markowitz (1952) can help the Islamic investor in Indonesia Stock Market to beat the performance of the market. Several authors have done similar research. Faturohman & Christian (2023) found that using the monthly stock price of LQ45 to construct a portfolio from 2004 to 2015, GMV could not beat the two benchmark indexes, IHSG and LQ45. Similar research was also done by Pysarenko et al. (2019). That study found that GMV could be used to construct a portfolio that can beat the US Stock Market and has historically proven to be able to beat the Risk-Adjusted Return of the US Stock Market using the S&P 500 as the benchmark index.

Because of the screening process, Islamic Stock possesses different characteristics than its conventional counterparts. According to Moskowitz & Grinblatt (1999) and Zaremba & Umutlu (2018), the conventional banking sector usually those industries causes a pattern in a cross-sectional return. The financial screening process makes the credit risk or default risk of the company that issued

Islamic stock lower since the financial screening process makes companies with excessive leverage excluded and classified as non-shariah compliant stock. Therefore, Islamic equities are often less vulnerable to activities that might result in significant idiosyncratic risk, which include interest-bearing loans and speculation. A study by Jawadi et al. (2014) shows that Islamic stocks have lower idiosyncratic risk than non-Islamic companies. The study also discovered that Islamic equities' idiosyncratic risk is inferior in nations with more developed Islamic financial markets. Ameer (2015) found that Islamic stocks in the United States possessed lower idiosyncratic risk than non-Islamic stocks. The study also discovered that the idiosyncratic risk of Islamic equities is lower in businesses that adhere to Shariah guidelines more strictly. According to the findings of this research, Islamic stock screening may serve as an effective strategy to decrease idiosyncratic risk. Therefore, Islamic stock might appeal more to investors in that way. Thus, applying the Global Minimum Variance portfolio weighting method to Construct an Islamic Portfolio may offer different results than Conventional ones. More than that, according to Ganie et al. (2022), Covid-19 caused an increase in volatility and the presence of significant abnormal returns. This might affect the applicability of this portfolio weighting method differently as the condition of the Stock market is affected by Covid-19. To the best author's knowledge, research currently needs to discuss the application of Global Minimum Variance in the Indonesia Islamic Stock Market that uses the Jakarta Islamic Index as an investment universe and includes the data from the Covid-19 outbreak to the observation period. Therefore, this paper is written to fill those research gaps and provide evidence to Islamic investors in the Indonesian Stock Market to choose the best portfolio weighting method to beat the market.

METHODOLOGY

The investment universe that is being used as the sample of this research is all the stocks in the Jakarta Islamic Index, consisting of 30 constituents with high liquidity and high market capitalization. This investment universe is used to reduce the exposure to liquidity risk and high trading costs. The data being used is historical data from June 2009 to December 2022. June 2009 is chosen to be the date of the earliest data in line with when the Global Financial Crisis ended, which ended in early 2009. On the other hand, the latest data used is from December 2022, aligning with the Indonesian Government's lifted restrictions related to covid- 19 (PPKM), which happened on December 30th, 2022. In conventional portfolios, exiting and entering stock from the universe is prohibited. However, following Ashraf et al. (2017), stocks are allowed to enter or exit from Shariah-Compliant Portfolio. This research follows those rules since usually there is every time there is a new Daftar Efek Syariah (DES) published by Otoritas Jasa Keuangan (every six months), and there are several stocks that are classified as non-shariah compliant in the previous JII's constituent list. Therefore, every time a new JII constituent list exists, a new portfolio is created to ensure an Islamic investor invests in Shariah-compliant stock and the return from the investment is halal. The data that is being used in this study is secondary data.

The Global Minimum Portfolio is constructed using the optimization of the formula below.

$$w^{GMV} = \arg\min_{w} w' \ \Omega w \quad s.t. \quad w'e = 1 \quad (1)$$

Where, Ω is $N \times N$ variance covariance matrix of equities' returns, N denotes the numebr of assets, e is the $N \times 1$ column vector of ones while w is the $N \times 1$ vector of weights, w^{GMV} s a vector of individual asset weights in the Global Minimum Variance portfolio. This calculation assumes that there are no short sales and that the maximum weight of each stock in the portfolio is 10% of the total portfolio. Therefore, there is an addition to the constraint to the formula, which is $0 \leq w_i \leq 0.1$ for $i = 1, ..., N$. To get the optimized weighting, the author uses Excel Solver Add-in. The portfolio is reconstructed every time there is a new JII's Constituent List to ensure compliance with the Sharia law.

Following Pysarenko et al. (2019) and Faturohman & Christian (2023), the portfolio performance is evaluated using out-of-sample data analysis. The out-of-sample performance analysis period is the Period after the portfolio is constructed and before the new portfolio is constructed, as there is a new JII list of constituents. The out-of-sample data analysis being evaluated is the portfolio's return, standard deviation, and risk-adjusted return using the Sharpe Ratio Formula.

$$\boldsymbol{S_p = \frac{E[r_p - r_f]}{\sigma_p}} \quad (2)$$

After calculating the portfolios' out-of-sample return, standard deviation, and risk-adjusted return, the result is compared to the return, standard deviation, and risk-adjusted return of the benchmark index, which in this paper is IHSG, LQ45, ISSI, and JII itself in order to get insight whether the Islamic portfolio constructed using Global Minimum Variance able to bet the market performance.

RESULTS AND DISCUSSIONS

Stock Weighting For Constructing Portfolio

Table 1. Stock Weighting For Constructing Portfolio

Ticker Code	Jun-14	Dec-14	Jun-15	Dec-15	Jun-16	Dec-16	Jun-17	Dec-17	Jun-18	Dec-18	Jun-19	Dec-19	Aug-20	Dec-20	Aug-21	Dec-21	Jul-22
AALI	0.10	0.10	0.10	0.04	0.03	0.07	0.10	-	-	-	-	-	-	-	-	-	-
ADRO	-	-	0.02	0.09	0.01	0.03	-	-	-	-	-	-	0.01	0.03	0.04	0.04	0.06
BSDE	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	-	-	-	-	-
BTPS	-	-	-	-	-	-	-	-	-	-	0.10	0.10	-	-	-	-	-
EXCL	0.07	-	-	-	-	-	0.10	0.05	0.00	0.09	0.05	0.10	0.08	0.05	0.03	0.02	0.01
INCO	-	-	-	-	-	-	-	-	0.04	0.02	0.01	-	-	-	-	-	-
JPFA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.00
JSMR	0.05	-	0.08	0.00	0.06	-	-	-	-	0.06	0.05	0.06	0.02	-	-	-	-
LPPF	-	-	0.00	0.00	-	-	-	-	0.05	0.01	-	0.01	-	-	-	-	-
LSIP	0.01	-	-	-	-	0.00	0.01	0.10	-	-	-	-	-	-	-	-	-
MPPA	-	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PTBA	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.01	0.01	0.01	0.00
PTPP	-	-	-	-	-	-	0.05	-	-	0.01	-	-	-	-	-	-	-
SMGR	0.00	-	-	0.04	-	-	-	-	0.00	0.01	0.03	-	0.04	-	-	0.00	0.00
UNTR	0.10	0.08	0.10	0.09	0.10	0.06	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.07	0.09	0.10
UNVR	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
ACES	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	0.10	-	-
AKRA	-	-	-	-	0.06	0.10	0.09	0.05	0.10	0.10	0.10	0.05	-	-	-	-	-
ANTM	-	-	-	-	-	0.00	0.06	0.07	0.02	0.03	0.01	-	-	-	-	-	-
ASII	0.02	-	0.04	0.10	0.04	0.01	0.00	-	0.02	0.02	0.03	-	0.00	-	-	-	-
BMTR	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRPT	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.00	-	-
BUKA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	-
CPIN	-	-	-	-	-	-	-	-	-	0.03	0.07	0.06	0.08	0.00	0.08	0.00	0.10
EMTK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	0.00
ERAA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01
HRUM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01
ICBP	-	0.01	0.00	0.08	0.10	0.04	0.04	-	0.10	0.10	0.00	0.00	0.02	0.10	0.10	0.10	0.10
INDF	0.10	0.10	0.10	0.04	0.08	0.10	0.05	-	0.10	0.00	0.02	0.06	0.10	0.10	0.10	0.10	0.10
INTP	0.03	0.08	0.04	0.06	0.03	0.05	-	-	0.00	-	0.03	0.00	0.01	0.09	0.02	0.03	0.05
KLBF	0.09	0.10	0.10	0.07	0.02	-	0.09	-	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.10	0.10
LPKR	-	-	-	0.04	-	-	-	0.05	0.03	-	-	-	-	-	-	-	-
MDKA	-	-	-	-	-	-	-	-	-	-	-	-	0.10	0.10	0.07	-	0.10
MIKA	-	-	-	0.10	0.10	0.10	-	-	-	-	-	-	-	0.10	0.10	0.10	0.06
MNCN	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	0.01	0.00
PGAS	0.10	0.10	0.10	0.00	-	0.07	0.01	-	-	-	-	-	-	-	-	-	-
PWON	-	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-
SCMA	-	-	0.00	-	0.10	-	-	0.10	0.10	0.08	0.10	0.10	0.04	0.02	-	-	0.00
SILO	0.07	0.07	0.10	0.06	0.06	0.10	-	-	-	-	-	-	-	-	-	-	-
SSMS	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TLKM	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
TPIA	-	-	-	-	-	-	0.06	0.08	0.03	0.04	-	0.06	-	-	-	-	-
WSBP	-	-	-	-	-	-	-	0.10	0.00	-	-	-	-	-	-	-	-
WSKT	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MYRX	-	-	-	-	-	0.07	0.05	0.10	-	-	-	-	-	-	-	-	-
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The portfolio is constructed seventeen times during the observation period. the weighting of the portfolio is presented in Table 1. Table 1. Stock Stock Weighting For Constructing Portfolio. From Table 1. We can see that not all stock available in the investment universe is included in the portfolio to achieve minimum variance. There are three stock that is constantly included in the portfolio in all observation period: TLKM, UNTR, and UNVR. Their contribution to the portfolio is always on the maximum value, which is 10% of the portfolio. These stocks could contribute to reducing the portfolio variance.

Performance of Portfolio

The following results: the return, standard deviation (volatility), and risk-adjusted return from Table 2. We can see that using the GMV method, the portfolio constructed is only sometimes gaining a positive return. At least in four out of 17 observation periods, GMV Portfolio offers a negative return. However, since most of each Period produces a positive return, the yearly average of return in the overall observation period and after the covid-19 Period shows a positive return. The standard deviation fluctuates in each Period ranging from 1% to 39%. The annual standard deviation is about 19% in the overall observation period.

In comparison, the standard deviation after the Covid-19 outbreak tends to increase to 21% as the stock market volatility tends to increase after the covid-19 outbreak. In terms of the risk-adjusted return that is calculated using the Sharpe ratio, nine out of seventeen observation periods showed a negative Sharpe ratio, which means that in that Period, the portfolio gain return is lower than the risk-free return which in this case is using the Monthly BI 7 Days Repo Rate on every end of the out-of-sample analysis portfolio. Therefore, the overall Sharpe ratio is negative since the portfolio has a negative Sharpe ratio in most of the observation period. However, in the last six observation period, which is the Period of observation after the Covid-19 outbreak, The portfolio showing positive risk-adjusted return as four out of the portfolios is showing positive risk-adjusted return.

Table 2. Performance of Islamic Portfolio Constructed using GMV

Portfolio Construction Date	Return	Standard Deviation	Sharpe Ratio
Jun-14	0%	6%	(0.84)
Dec-14	0%	17%	(0.28)
Jun-15	-17%	19%	(1.57)
Dec-15	20%	13%	1.90
Jun-16	3%	13%	0.05
Dec-16	4%	8%	0.35
Jun-17	1%	8%	(0.19)
Dec-17	-10%	13%	(1.35)
Jun-18	2%	13%	(0.08)
Dec-18	5%	22%	0.13
Jun-19	2%	11%	(0.07)
Dec-19	-11%	39%	(0.42)
Aug-20	13%	20%	1.01
Dec-20	-11%	8%	(1.96)
Aug-21	11%	8%	2.27
Dec-21	7%	13%	0.49
Jul-22	5%	1%	3.41
Overall Observation Period	**5%**	**19%**	**(0.00)**
After Covid-19 Outbreak Period	**11%**	**21%**	**0.34**

Performance Comparison Between Portfolio and Benchmark Indexes

The performance of the portfolio construct compared to four famous indexes to see whether the portfolio constructed using GMV can generate better performance than the market. Similar to the previous subsection, the performance being assessed is the return, standard deviation (volatility), and risk-adjusted return.

Firstly, Table 3 compares the return generated by GMV in Out-of-Sample Analysis to four benchmark indexes. GMV portfolio has more than half of the seventeen observation periods, which is superior compared to IHSG, LQ45, and JII. While in the last six observation periods, it shows superiority even better. The GMV portfolio is superior in more than half covid-19 periods compared to IHSG, LQ45, JII, and risk-free return rate. The yearly average return of the GMV portfolio is showing more excellent performance compared to risk-free return and all benchmark indexes except the IHSG. In the last six observation periods, GMV has shown even more powerful return

performance, which beats all benchmark indexes and the risk-free rate. This finding is not aligned with the finding of Faturohman and Christian (2023), who found that using LQ45 as an investment universe and observation period before covid-19 outbreak, GMV could not benefit the investor that constructed their portfolio using that method as it produced lower returns compared to market. This might happen since the screening process could affect the risk and return of the portfolio itself (Moskowitz & Grinblatt (1999) and Zaremba & Umutlu (2018))

Table 3. Return Comparison between GMV and Indexes

Portfolio Construction Date	GMV	IHSG	LQ45	ISSI	JII	Risk Free Rate
Jun-14	0.26%	7.14%	9.23%	5.56%	5.50%	7.75%
Dec-14	0.43%	-6.05%	-6.61%	-6.36%	-4.93%	7.50%
Jun-15	-16.83%	-6.47%	-5.61%	-8.14%	-8.16%	7.50%
Dec-15	19.59%	9.22%	8.67%	14.39%	15.08%	5.50%
Jun-16	2.83%	5.58%	2.78%	3.70%	-0.03%	4.75%
Dec-16	4.28%	10.06%	10.51%	7.64%	7.99%	4.75%
Jun-17	0.99%	9.02%	10.41%	2.51%	1.26%	4.25%
Dec-17	-10.31%	-8.75%	-15.79%	-8.75%	-13.74%	4.75%
Jun-18	2.26%	6.82%	8.11%	6.20%	4.65%	6.00%
Dec-18	4.99%	2.65%	3.18%	1.09%	-0.38%	6.00%
Jun-19	1.90%	-0.93%	0.05%	0.92%	2.26%	5.00%
Dec-19	-10.67%	-14.50%	-8.82%	-4.83%	6.99%	4.00%
Aug-20	13.16%	11.01%	1.07%	-0.66%	-15.59%	3.75%
Dec-20	-10.64%	2.86%	-7.32%	-0.97%	-14.24%	3.50%
Aug-21	11.24%	7.01%	7.49%	7.55%	3.95%	3.50%
Dec-21	7.01%	5.62%	5.07%	8.90%	6.40%	3.50%
Jul-22	5.46%	-1.45%	-4.24%	5.78%	-1.66%	5.25%
Average Annual Return	**5.13%**	**5.84%**	**2.93%**	**4.63%**	**-1.16%**	**5.12%**
Average Annual Return After Covid	**11.06%**	**7.13%**	**0.00%**	**6.85%**	**-6.47%**	**3.88%**
No. Of GMV's Superior Periods	**N/A**	**9**	**10**	**6**	**10**	**5**
No. of GMV's Superior Periods After Covid	**N/A**	**5**	**4**	**2**	**5**	**4**

Secondly, Table 4. discusses the volatility of the GMV portfolio compared to benchmark indexes. GMV method aims to lower the risk in order to gain a certain amount of return. However, this study found that in most of the Period, GMV volatility is higher than benchmark indexes. Therefore, in terms of volatility performance, GMV still produces a higher standard deviation and still cannot beat the market.

Table 4. Volatility Comparison between GMV and Indexes

Portfolio Construction Date	GMV	IHSG	LQ45	ISSI	JII
Jun-14	6.12%	1.62%	2.01%	2.20%	2.43%
Dec-14	16.80%	4.27%	5.38%	3.90%	4.88%
Jun-15	18.58%	4.41%	5.62%	4.59%	4.80%
Dec-15	12.53%	1.93%	2.45%	2.45%	2.67%
Jun-16	13.39%	3.05%	3.93%	3.11%	3.93%
Dec-16	7.68%	1.05%	1.23%	1.34%	1.48%
Jun-17	8.31%	2.50%	3.21%	2.57%	2.83%
Dec-17	13.34%	3.17%	3.62%	2.99%	3.63%
Jun-18	13.12%	2.43%	3.01%	2.01%	2.04%
Dec-18	21.67%	2.91%	3.30%	2.93%	3.82%
Jun-19	11.36%	2.69%	3.23%	2.85%	2.55%
Dec-19	38.74%	7.09%	8.65%	7.01%	8.84%
Aug-20	20.41%	2.46%	2.69%	2.16%	1.98%
Dec-20	8.12%	2.88%	3.40%	2.99%	3.13%
Aug-21	7.67%	2.10%	3.30%	1.09%	1.74%
Dec-21	13.31%	2.26%	4.11%	2.65%	3.69%
Jul-22	1.48%	2.25%	3.70%	2.04%	2.26%
Average Annual Volatility	**19.28%**	**4.06%**	**5.21%**	**4.02%**	**4.65%**
Average Annual Volatility After Covid-19	**20.96%**	**4.42%**	**6.04%**	**4.08%**	**4.91%**
No. Of Index's Superior Periods	**N/A**	**16**	**16**	**16**	**16**
No. of Index's Superior Periods After Covid	**N/A**	**5**	**5**	**5**	**5**

Lastly, the performance that is being compared in this study is the risk-adjusted return performance of the portfolio compared to the benchmark indexes. GMV portfolio has more than half of the observation period, which is superior in terms of risk-adjusted return compared to the LQ45, ISSI, and JII in the overall observation period. The Sharpe ratio of GMV could beat LQ45, ISSI, and JII in the overall observation period and could beat LQ45 and JII in the Period after the covid-19 Period. This means that at least with the same investment universe, GMV can consistently outperform the JII risk-adjusted return. This result is similar to the finding from Pysarenko et al. (2019) that the sharp ratio of portfolios constructed using GMV and the S&P 500 as its investment universe can help them outperform the S&P 500 index itself.

Table 5. Risk-Adjusted Return Comparison between GMV and Indexes

Portfolio Construction Date	GMV	IHSG	LQ45	ISSI	JII
Jun-14	(0.84)	2.85	3.77	1.08	0.95
Dec-14	(0.28)	(3.25)	(2.73)	(3.67)	(2.51)
Jun-15	(1.57)	(3.27)	(2.35)	(3.66)	(3.51)
Dec-15	1.90	4.75	3.42	6.71	6.53
Jun-16	0.05	1.49	0.14	0.60	(0.86)
Dec-16	0.35	10.39	9.39	5.55	5.38
Jun-17	(0.19)	3.91	3.65	0.21	(0.43)
Dec-17	(1.35)	(4.97)	(7.09)	(5.26)	(6.29)
Jun-18	(0.08)	2.22	2.40	2.25	1.15
Dec-18	0.13	(0.17)	0.08	(0.92)	(1.25)
Jun-19	(0.07)	(1.80)	(1.07)	(0.78)	(0.13)
Dec-19	(0.42)	(2.96)	(1.63)	(1.31)	0.60
Aug-20	1.01	6.88	(0.11)	(1.54)	(14.70)
Dec-20	(1.96)	0.23	(3.48)	(1.36)	(6.49)
Aug-21	2.27	4.81	3.32	10.19	2.77
Dec-21	0.49	2.07	0.96	3.38	1.55
Jul-22	3.41	(2.50)	(2.69)	2.72	(2.64)
Overall Sharpe Ratio	**(0.00)**	**0.18**	**(0.42)**	**(0.13)**	**(1.35)**
Sharpe Ratio After Covid-19	**0.34**	**0.73**	**(0.65)**	**0.72**	**(2.12)**
No. Of GMV's Superior Periods	**N/A**	**7**	**9**	**8**	**10**
No. of GMV's Superior Periods After Covid	**N/A**	**2**	**4**	**3**	**3**

CONCLUSION

From the result and discussion section, we can conclude several findings. By constructing a portfolio using The GMV as a portfolio weighting method, there is possible to gain a return greater than JII. The portfolio performs better than the index that becomes the investment universe in this research. It even has a greater yearly average return than an index with a more significant number of stocks in their constituent lists, such as ISSI and LQ45. In terms of volatility, even though the GMV portfolio is constructed to have the minimum variance and construct a portfolio with the lowest risk, the volatility of the GMV portfolio constructed is more significant compared to all four benchmark indexes, which means the portfolio has a more significant risk compared to those benchmark indexes that used to represent the stock market. Lastly, this study found similar results to Pysarenko et al. (2019) that GMV can consistently outperform the JII risk-adjusted return using the same investment universe. Moreover, the Sharpe ratio of GMV could beat LQ45 and ISSI in the overall observation period and could beat LQ45 in the Period after the covid-19 Period. Therefore in most cases, the GMV portfolio weighting method can help the investor to get better performance compared to the market, especially in terms of return and risk-adjusted return.

There is some limitation to this study; this study has not compared GMV performance to other portfolio weighting method and has not considered the transaction cost as a deduction point to the return generated. Therefore, a more comprehensive follow-up study that considers the transaction cost might be needed in the future. However, to the best author's knowledge, this is the first research that discussed the application of Global Minimum Variance in the Indonesia Islamic Stock Market using the Jakarta Islamic Index as an investment universe and including the data from the Covid-19 outbreak to the observation period. Therefore the finding in this study might still benefit investors in choosing which portfolio weighting method can help them beat the market and achieve their financial goals. in order to choose which portfolio weighting method that can help them to beat the market and achieve their financial goals.

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