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Efficient Market of Indonesia Shariah Index during Covid

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ABSTRACT. *The capital market is a place to gain capital at there. There is efficient market that past stock price reflects the current recent price. Unfortunately, the stock price is volatile and it is difficult to predict. The concept of random walk also occurs in stock price or stock index. During the covid, the stock price decrease and it is so interesting to predict the stock whether follow the random walk or not. In order to forecast shariah index , the investor should know the price of the stock. The objective of the study is to prove the efficient market id shariah index during covid. the study also make a forecasting of the shariah index if it is necessary. The data we collect is the shariah index price among the covid. We employ descriptive statistics and also the causal relationship of the index price. We do some test to make sure the data doe follow random walk. The adf and KPSS test show the Jakarta shariah index does not follow random walk, meaning the index can be forecast. The result of the test shows the best model is ARIMA (5,1,2). Arima is a best forecasting method that can predict stock price. The Model has passed Ljung Box, ACF Graphics and also PACF Graphics.*

Keywords*: Shariah Index; Market capital; ARIMA; Forecasting; Random Walk*

INTRODUCTION

Capital market is a place for trading valuable goods. The investor try finding some gain from the market. To do that they have to know the price of the stick to predict and forecast the benefit that can they get. Investing in capital market is increasingly attractive due the capital gain (Wahyuningsih et al., 2017). With the arrival of COVID-19, its change the investing. The advent of the COVID-19 pandemic significantly altered the investment landscape, leading to a decline in various financial indices. This shift has impacted the potential for substantial capital gains through investments, as the overall market conditions have become less conducive to generating favorable returns.

To achieve capital gains in the market, a savvy investor understands the importance of not only assessing the fundamental aspects of a company's stock but also incorporating technical analysis into their strategy. Fundamental analysis involves evaluating a company's assets. This analysis is best for the long term investment. However, coupling fundamental analysis with technical analysis enhances the investor's ability to make well-informed decisions. Technical

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analysis involves studying market trend. This analysis interested in market price and volume. By analyzing patterns and trends in stock price charts, investors can identify optimal entry and exit points, helping them maximize their capital gains in the dynamic and ever-changing stock market. Integrating both fundamental and technical analysis allows the investor to make a comprehensive assessment, making informed decisions and increasing their chances of achieving profitable returns in the market (Thompson, 2023).

Some investor believe that the stock price tomorrow also represents the past stock price. The stock price made a pattern that it can be predicted by the investor. Some said that the information also influence the stock movement but no one can predict the information because it is fully uncertain (Malkiel, 2003). Understanding the real-time price of a stock is paramount for implementing the "buy low, sell high" investment strategy effectively. This strategy hinges on acquiring a stock at a price deemed lower than its intrinsic or potential value and later selling it at a higher price to secure a profit. Monitoring stock prices in real-time allows investors to identify opportune moments to enter the market and make informed decisions regarding buying or selling. It entails keeping a close eye on market trends, analyzing financial indicators, and utilizing appropriate tools and platforms that provide up-to-date and accurate pricing information. Without this crucial data, investors would struggle to make timely and profitable moves in the stock market. Researcher attempting to evaluate market efficiency often encounter a diverse range of outcomes in their studies. Sometimes, their findings suggest the market do not adhere the principles of a random walk, while at other times, they observe opposite. These variation result can attribute of a multitude of factors, including the specific time frame under examination, the assets or markets being studied, and the methodologies employed. As such, it is crucial for researchers to meticulously design their experiments, consider the unique characteristics of the markets question, and employ a variety of analytical tools to gain a comprehensive understanding of market behavior.

Many studies shows that ARIMA is a good method for forecasting some economic data analysis such as exchange stock market price index and other The research of shariah index is rarely (Bakar et al., 2018). This study is conducted to analyze the movement of the Shariah index price and determine if it follows a random walk pattern. Upon establishing that the Shariah index does not adhere to a random walk, we employ an ARIMA model to delve deeper into the analysis and gain insights into its behavior.

LITERATURE RIVIEW

Islamic Capital Market

The development of the efficient market it is not about intrinsic value only. The concept is relate to the accuracy of return, the availability of information and ability to absorb information (Hartono, 2022).

Market efficiency implies that past stock price is reflective to the recent stock price. A research show that the shariah index does not exhibit the random walk pattern(Agustin, 2019). There is no real perfect efficient market, which price intrinsic value equivalent to nominal value. There only two kind of the market

where the nominal value almost similar to intrinsic value and market where the nominal value is different to intrinsic value (Handini & Astawinetu, 2020).

The concept efficient market is misguided because the statement of hypothesis (Ross, 2013). According to Law No. 8 Year 1995 concerning Capital Market (UUPM), Capital Market is defined as: An activity concerned with the public offering and trading of securities, the Public Company relating to the issuance of securities, as well as the institutions and professions related to securities.

Based on this definition, the terminology of Islamic capital market can be defined as the activity in capital markets as provided for in UUPM that does not against Islamic principles. Therefore, the Islamic capital market is not a separate system to the capital market system as a whole. In general, Islamic Capital Market activity has no difference with the conventional capital market, but there are some special characteristics of Islamic capital market, which are the products and the transaction mechanism do not against Islamic principles (OJK, n.d.).

The Islamic capital market is a place where capital are traded but does not against the against sharia laws. there are some condition that capital are traded such as the company are not or less related with interest (riba). The principle conventional and Islamic capital low is not same.

There is some condition that the company are included in Islamic capital market, such as : the halal products/services from business activities because just Islamic just receive the benefit from the halal and good activities b) the company has specific business and there is no doubt in profit calculation c) the existence of a mechanism for a fair outcome, either profit or loss, according to the participation of each party d) The market mechanism were reasonable and the precautionary principle both the issuer and principles. The capital market is a way to distrubate the wealth among the people. the ordinary people can get benefit by investing few money at the company. The capital market is part of muammalah activity. The transaction is allowed *(mubah)* as long it does not against Islamic law (Hamimi & Ginting, 2019).

The Islamic capital market has transmitting economic growth in Malaysia. The research found the causality between Islamic capital market turnover and Malaysia economy (Musa et al., 2020). Islamic capital market grow and has potential to increase. There is need to developed the some product that do esn not against the shariah (Maiyaki, 2013).

Shariah Index

A Shariah Index is a curated selection of stocks that adhere to specific Islamic ethical and financial principles. In the Indonesian stock market, there are at least two prominent Shariah Indices: the Jakarta Islamic Index and the Indonesia Shariah Index (Hayati & Sutijo, 2016). These indices are designed to provide Muslim investors with a means of investing in companies that comply with Islamic law, which prohibits activities such as charging or paying interest (riba) and engaging in businesses related to alcohol, gambling, and pork products. By focusing on companies that align with Islamic values, these indices offer a way for investors to build portfolios that are in harmony with their religious beliefs

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while participating in the dynamic Indonesian stock market.

The Dow Jones Shariah Markets Index, established in 1999, was the pioneering Shariah index designed to cater to the specific interests of Muslim investors in the stock market. The fundamental objective of the Shariah index is to facilitate and encourage Muslim participation in stock investing while adhering to Islamic principles. To be included in the Shariah Index, stocks must meet stringent Shariah criteria, ensuring that they comply with the ethical and religious guidelines outlined in Islamic finance. This initiative has played a pivotal role in enabling Muslim investors to engage confidently in the financial market while aligning with their faith-based values and beliefs (Khan et al., 2021).

Random Walk Some investors in market also analyst the stock price. They have abundant information about the predicted stock. they believe the stock also make patterns they follow a random walk.

The fundamental on the other hand they believe the stock market price also reflect the information and also the performance of the company. while some investor purchases the stick due to because the prospectus, the stock increase unpredictable. This the is the random walk. the action to anticipate the stock price make the unpredictable action make the pattern of the stock is not similar to the pattern and it makes one pattern only. In random walk theory, the information immediately influence the stock price (Malkiel, 2003).

As the uncertainty the stock movement that is difficult to predict the stock movement. Some difficult to predict that move like a random. The concept of random walk become important on predicting stock market. Some believe that past stock price represents to current stock price. (Rehman et al., 2018). Other add that the random walk is a benchmark of forecasting, meaning any times series forecast should begin with the random walk Before do some forecasting methods, the researcher have to check whether the data follow random walk or not (Hassani et al., 2015).

A random walk is a statistical model utilized in finance to analyze the movements of stock prices and market behavior. This theory not only seeks to explain the dynamics of the stock market but also the volatility of the money market. The foundation of the random walk concept lies in the presence of uncertainty and unpredictable fluctuations, often attributed to factors like riba (usury or interest) and speculation.

In the realm of a random walk, the price of a stock is considered to be independent of the performance of the underlying company but rather determined by the forces of supply and demand within the market. This implies that market prices can follow a seemingly random pattern, influenced by numerous external factors, making precise predictions challenging. Additionally, stock prices can be influenced by insider information and insider trading, further contributing to the unpredictability and randomness observed in the market (Hafasnudin, 2008).

Most study concern on weak from and semi strong market efficiency. Random Walk make the investors are difficult to predict the stock. When the people are able to predict the stock so they are easily to get so much money in stock market (Timmermann & Granger, 2004). The stock price moves unpredictability, meaning follow random walk. It is impossible to forecast the stock price (Altin, 2015). In random walk, the stock price is serially independent and it does not depend on the past stock price changes. Some believe the price

also depend on the information but the information is fully uncertain. The nature of information can also be random, leading to random movement in stock asset price. There is evidence random walk in Nepse Microfinance Index in India (Rijal, 2019).

A study in Egypt has provided evidence that random walk behavior is a real phenomenon (Abdelzaher, 2021). There is evidence to that ANTM (which is a Jakarta Index shariah stock) also follow random walk (Faisal & Yulianto, 2023). Meanwhile in other place, there is no evidence random walk in India shariah stock (Ashraf & Deo, 2015).

RESEARCH METHOD

The research method is descriptive and causal relationship. we describe the data of shariah index along the Covid data that begin in March 2020 and end in June 2023. The study performs the runs test in order to check the validity of the weak form of efficient market hypothesis.

Data

This research design is descriptive. The aim of research to test random walk whether the Indonesia Shariah Index is efficient or not. To prove the hypothesis, we run the adf test. this test can prove the data follow random walk.

In this academic journal article, the time series data of the Jakarta Shariah Index is analyzed. The dataset, consisting of daily closed index values, was sourced from finance.yahoo.com. This research delves into the performance and trends of Shariah-compliant financial instruments within the Jakarta Stock Exchange. Employing robust statistical analysis and econometric methodologies, this study seeks to unveil critical insights into the dynamics and behavior of this particular market index over time, thereby enriching our comprehension of Islamic finance within the framework of Jakarta's financial sector.

The Shariah index's performance from March 23rd, 2020, to June 20th, 2023 is of particular significance, given that this period aligns with the announcement of the COVID-19 pandemic by President Jokowi. Indonesia's delayed acknowledgment of the pandemic was accompanied by a subsequent surge in confirmed cases, rendering this timeframe crucial for evaluating the market's reaction and recovery within a Shariah-compliant context. Analyzing the index's trajectory during this period offers valuable insights into how Islamic financial markets responded to the challenges posed by the pandemic, showcasing the resilience and adaptability of Shariah-compliant investments amidst a global health crisis.

Model

The model in this research is time series. Before, choose any time series model, we run first the autocorrelation data. Autocorrelation is a common characteristic in most time series data and also no stationers. With the first difference, it overcome the non-stationer data of time series (Neusser, 2016).

We will perform the ARIMA model if the time series are not proven follow random walk. The approach can hold on the intricate and dynamic nature of financial markets and provide valuable insight for both academics and

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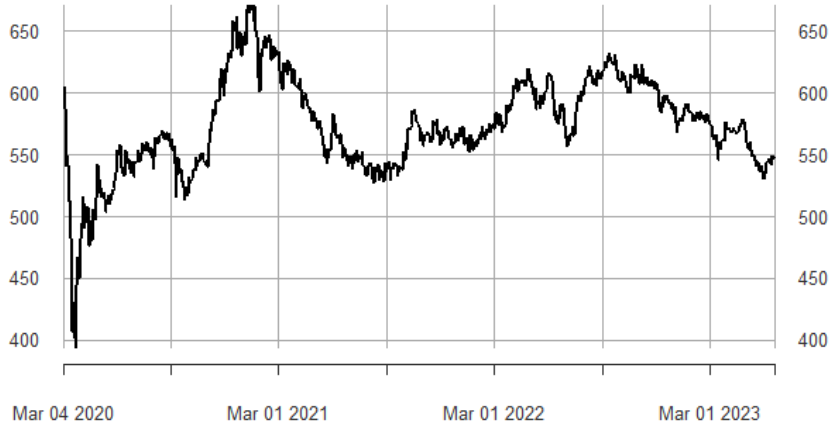
precautions seeking to navigate them effectively. one method than has been used by researcher is ARIMA that contain Auto Regressive, difference and moving average. The ARIMA method predates Artificial Neural Network (ANNs) and has proven to more effective in time series prediction than ANNS.(Pandey & Bajpai, 2019) The ARIMA model such as:

$$X_t = \theta_0 + \varphi_p X_{t-p} - e_t - \theta_q e_{t-q}$$

RESULTS AND DISCUSSION

Descriptive Statistics

Figure 1. The Gold Price per troy ounce



Source: finance.yahoo.com (2023)

Based on the figure 1 the data of the index declined but after a week the data try to climb to peak until the peak its peak in January 2021. So, the data declined to September 2022 and its going to increase and volatile but the till end the index have never go to the peak again. The descriptive data of Jakarta Shariah index is presented in table 1.

Table 1. The descriptive statistics of Index syariah Jakarta March 2021 - June 2023

Mean	Standard Deviation	Skewness	Excess Kurtosis	Min	Max
573,9939	38.19558	-0,433341	1,673364	393,86	671,59

Source: data is processed from finance.yahoo .com(2023)

The descriptive analysis of the dataset reveals a notable range, spanning from 393.86 to 671.59. The substantial difference between these values, almost doubling, contributes to a sizable standard deviation of approximately 573.9939.

Additionally, the skewness, measuring the asymmetry of the distribution, is observed to be -38.19558, indicating a pronounced negative skew or leftward asymmetry. This implies that the distribution's tail on the left side is thicker, signifying a higher occurrence of extreme values in that region. Furthermore, the excess kurtosis is slightly positive, suggesting that the peak of the distribution is more pronounced than a typical normal distribution, indicating slightly heavier tails and a more peaked central region.

Unit Root Test

In the pursuit of analyzing time series data, it becomes imperative to ascertain the presence of autocorrelation, as it can significantly influence the statistical properties and subsequent modeling efforts. In this study, we employed various tests to detect autocorrelation within our time series dataset. The results unequivocally confirmed the existence of autocorrelation, signifying a dependence between observations at different time points. To address this, we subsequently undertook a differencing procedure, a common technique in time series analysis. This transformation not only aids in mitigating the autocorrelation issue but also facilitates the attainment of stationarity, a prerequisite for many time series models. By taking this crucial step, we aimed to enhance the accuracy and reliability of our analysis, ensuring that our findings and conclusions are grounded in robust statistical methodology. The data was found to be non-stationary in the initial test. Consequently, a second test was conducted on the first differencing of the Jakarta Shariah Index. We perform Augmented Dickey Fuller.

Table 2. THe Result of Augmented Dickey-Fueller Test

Augemented Dickey Fueller Test	Dickey-Fueller	Lag Order	P value
	-12,573	9	0,01

Source: RStudio output (2023)

When dealing with time series data, it's common to encounter non-stationarity, where statistical properties like mean and variance change over time. To address this issue, a widely used technique is differencing. Differencing involves compu ting the differences between consecutive observations, which helps stabilize the mean and transform the data into a stationary form. By taking the first difference , we essentially remove trends or patterns that may cause non-stationarity, resulti ng in a more consistent and stationary time series. This transformation is essenti al for facilitating meaningful analysis and modelling, enabling us to make more accurate predictions and gain valuable insights from the time series data.

The result show the dickey Fuller value is 12,573 with lag order nine . The probability value of the test is 0,01, meaning the test reject the Ho Hypoth esis.

The probability value of the Augemented Dickey_Fuller Test is 0,01, meaning the test reject the nil hypothesis. The data is stationer and does not follow random walk.

Additionally, we employ the Kwiatkowski-Phillips-Schmidt-Shin

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(KPSS) test, which further corroborates our findings regarding the stationarity of the data. The KPSS test helps ascertain whether the data is consistent with a random walk or exhibits non-stationary behavior. The results of the KPSS test reject the null hypothesis, providing evidence that the data is indeed stationary and not following a random walk. Specifically, the test statistic significantly deviates from zero, with a corresponding probability below the conventional threshold of 0.05. This rejection of the null hypothesis strengthens our confidence in the stationarity of the time series data.

ARIMA Model

This implicate the data can be predict by time series model or the market is efficient. We begin the predict the stock index with ARIMA model. The ARIMA model that we choose from RStudio.

After Processing the data using RStudio and employing an auto ARIMA model, the most suitable ARIMA model obtained is ARIMA. Auto ARIMA selects the model by examining the lowest value of AIC and BIC.

It is not easy to determine the model of ARIMA because we have to check all the possibility of the order. The determine the order is subjective and difficult to apply. There have been several attempts in automate ARIMA at least for 25 years (Hyndman & Khandakar, 2008).

$$X_t = \theta_0 + \varphi_1 X_{t-1} + \varphi_2 X_{t-2} + \varphi_3 X_{t-3} + \varphi_4 X_{t-4} + \varphi_5 X_{t-5} + \varphi_2 X_{t-2} + \varphi_p X_{t-p} - e_t - \theta_1 e_{t-1} - \theta_2 e_{t-2} - \theta_q e_{t-q} \quad \text{.....(2)}$$

The model meaning has five lagged passed value, one differencing and two lagged. Forecast error to predict future value. We also employ some test to make sure the model is the best.

Table 3. Result Ljung Box Test of Jakarta Shariah Index

lags	statistic	df	P value
6	0,2759952	6	0,9996049
12	10,4811321	12	0,5738286
18	16,0841260	18	0,5866761
24	29,4343655	24	0,2042110
30	34,5497209	30	0,2593924

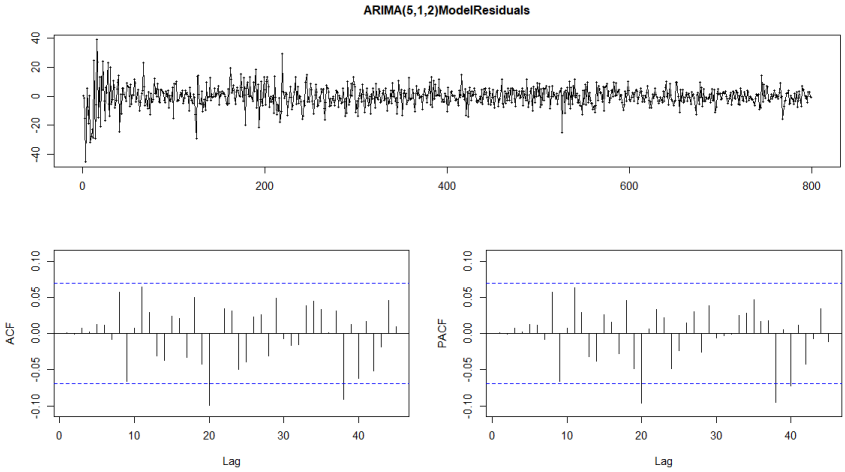
Source: output Rstudio (2023)

Using the Ljung-Box test, we fail to reject the null hypothesis at lag values of 6, 12, 24, and 32, as the probability values (P>0.05) exceed the significance level of 0.05. This suggests that the autocorrelations at these lags do not significantly deviate from zero. Furthermore, extending the analysis to 30 lags, the Ljung-Box test continues to yield probability values greater than 0.05, reaffirming our conclusion that the autocorrelations in the data series do not display significant departures from zero up to the 30th lag.

Residual Test

The examination of residuals demonstrates the stationary nature of the data, a crucial indicator of the model's appropriateness. This insight is visually represented in the accompanying graph below. The graph's header clearly illustrates that the forecasted values maintain stationarity, reinforcing the robustness of the model. Additionally, the Autocorrelation Function (ACF) plot affirms the stability of the forecast, with most spikes comfortably contained within the bounds defined by the blue line. This observation underlines the model's reliability and its ability to capture the underlying dynamics accurately, further bolstering confidence in its forecasting capabilities.

Figure 2. ARIMA Graphics of Gold Price



The result of test is not different to united states shariah Index and it also employ ARIMA to predict the US Shariah Index (Khan et al., 2021). The research findings align with similar studies conducted during the unprecedented COVID-19 period, specifically focusing on stock returns within the pharmaceutical sector. Over the course of the one-year duration encompassing the pandemic, the observed stock returns for pharmaceutical companies have provided compelling evidence against the random walk hypothesis. Contrary to the expectations set by the random walk model, the stock returns in this sector exhibit patterns and trends that are distinct and predictable, defying the traditional notion of random fluctuations. These results underline the unique dynamics at play during the pandemic, urging a reevaluation of standard financial modeling assumptions, particularly concerning the pharmaceutical industry's stock market behavior (Purnomo, 2021).

The ACF and PACF graphics shows that most spike below the blue strip line but un twenty and thirty-eight lag we found, two spikes beyond the blue strip line, meaning it could be autocorrelation. We have to make sure there is no evidence of autocorrelation that make the forecast bias.

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CONCLUSION

The research findings unequivocally reject the null hypothesis of a random walk for the Jakarta Shariah Index, providing compelling evidence of market efficiency within this domain. This signifies that traditional random walk models are inadequate for explaining the observed behavior of the Shariah Index. Furthermore, the absence of evidence supporting a random walk suggests the viability of employing forecasting techniques for the Jakarta Shariah Index, enhancing the potential for informed investment decisions.

After careful analysis and testing, the most suitable ARIMA model order is identified as ARIMA (5,1,2). This choice is substantiated by successful passing of several rigorous tests, including the Autocorrelation Function (ACF), Partial Autocorrelation Function (PACF), and Ljung-Box Test. These positive outcomes affirm the model's validity and reliability in capturing the underlying patterns and dynamics of the Jakarta Shariah Index, offering a promising avenue for predictive modeling and improved market forecasting.

REFERENCES

Abdelzaher, M. A. (2021). Study the Efficiency Hypothesis in the Egyptian Stock Market. *International Journal of Economics and Financial Issues*, *11*(1), 18–25. https://doi.org/10.32479/ijefi.10634.

Agustin, I. N. (2019). Testing Weak Form of Stock Market Efficiency at The Indonesia Sharia Stock Index. *Muqtasid: Jurnal Ekonomi Dan Perbankan Syariah*, *10*(1), 17. https://doi.org/10.18326/muqtasid.v10i1.17-29.

Altin, H. (2015). Efficient market hypothesis, Abnormal Return and Election Period. *European Scientific Journal*, *11*(9783319661032), 101–110. https://doi.org/10.1007/978-3-319-66104-9_9.

Ashraf, S., & Deo, M. (2015). Non-Linear Dependence of Indian Shariah Market. *Journal of Islamic Economics Banking and Finance*, *10*(2), 88–101. https://doi.org/10.12816/0025171.

Bakar, N. A., Rosbi, S., & Uzaki, K. (2018). View of Evaluating Forecasting Method Using Autoregressive Integrated Moving Average (ARIMA) Approach for Shariah Compliant Oil and Gas Sector in Malaysia.pdf. *Joural of Mathrmatics and Computing Science*, *3*(1), 19–33.

Faisal, A., & Yulianto, K. I. (2023). *Analisis random walk saham ANTM di bursa efek Indonesia selama covid-19*. *29*(1), 1–8.

Hafasnudin. (2008). Rancang Bangun Pasar Finansial Syariah. *Jurnal Telaah & Riset Akuntansi*, *1*(2), 156–162.

Hamimi, S., & Ginting, Y. R. F. (2019). The Development Of Islamic Capital Markets In Indonesia. *Proceeding International Seminar on Islamic Studies*, *1*(1), 275–276.

Handini, S., & Astawinetu, E. D. (2020). *Teori Portfolio dan Pasar Modal Indonesia* (D. Setiawan (ed.)). Scopindo Media Pustaka.

Hartono, J. (2022). *Portfolio dan Analisis Investasi* (Kedua). Penerbit ANDI.

Hassani, H., Silva, E. S., Gupta, R., & Segnon, M. K. (2015). Forecasting the price of gold. *Applied Economics*, *47*(39), 4141–4152. https://doi.org/10.1080/00036846.2015.1026580.

Hayati, F. N., & Sutijo, B. (2016). Peramalan Harga Saham Jakarta Islamic Index

Menggunakan Metode Vector Autoregressive. *Joernal Sains Dan Seni ITS*, *5*(2), 408–413.

Hyndman, R. J., & Khandakar, Y. (2008). Automatic time series forecasting: The forecast package for R. *Journal of Statistical Software*, *27*(3), 1–22. https://doi.org/10.18637/jss.v027.i03.

Khan, A., Khan, M. Y., Khan, A. Q., Khan, M. J., & Rahman, Z. U. (2021). Testing the weak form of efficient market hypothesis for socially responsible and Shariah indexes in the USA. *Journal of Islamic Accounting and Business Research*, *12*(5), 625–645. https://doi.org/10.1108/JIABR-02-2020-0055.

Maiyaki, A. A. (2013). Principles of Islamic Capital Market. *International Journal of Academic Research in Accounting*, *3*(4), 278–283. https://doi.org/10.6007/IJARAFMS/v3-i4/477.

Malkiel, B. G. (2003). The Efficient Market Hypothesis and Its Critics. *Journal of Exonomics Perspectives*, *17*(1), 59–82.

Musa, G. I., Bahari, Z., & Aziz, A. H. A. (2020). The impact of islamic capital market on malaysian real economy. *Jurnal Ekonomi Malaysia*, *54*(2), 91–103. https://doi.org/10.17576/JEM-2020-5402-08.

Neusser, K. (2016). Time series econometrics. In *Introductory Econometrics: A Practical Approach*. Springer. https://doi.org/10.1017/cbo9780511814839.012.

OJK. (n.d.). *Sharia Capital Market*. Retrieved February 27, 2024, from https://ojk.go.id/en/kanal/syariah/tentang-syariah/pages/pasar-modal-syariah.aspx.

Pandey, V. S., & Bajpai, A. (2019). Predictive efficiency of ARIMA and ANN models: a case analysis of nifty fifty in Indian stock market. *International Journal of Applied Engineering Research*, *14*(2), 232–244.

Purnomo, D. T. (2021). Apakah Saham Farmasi Di Bursa Efek Indonesia Mengikuti Hipotesis Random Walk Saat Pandemi Covid-19? *Jurnal Riset Ekonomi Dan Bisnis*, *14*(1), 18. https://doi.org/10.26623/jreb.v14i1.3170.

Rehman, S., Chhapra, I. U., Kashif, M., & Rehan, R. (2018). Are Stock Prices a Random Walk? An Empirical Evidence of Asian Stock Markets. *Etikonomi*, *17*(2), 237–252. https://doi.org/10.15408/etk.v17i2.7102.

Rijal, A. (2019). Test of Random Walk Occurrences of Microfinance Sub Index in NEPSE. *The Journal of Economic Concerns*, *10*(1).

Ross, S. J. (2013). Fundamentals of Fundamentals of. In *Zitelli and Davis' Atlas of Pediatric Physical Diagnosis* (eight edit, Vol. 5, Issue March). Mc Graw Hill. https://www.crcpress.com/Fundamentals-of-Picoscience/Sattler/p/book/9781466505094#googlePreviewContainer.

Thompson, C. (2023). *Fundamental vs. Technical Analysis: What's the Difference?* Investopedia. https://www.investopedia.com/ask/answers/difference-between-fundamental-and-technical-analysis/#:~:text=Fundamental analysis focuses on financial,trends to identify investment opportunities.

Timmermann, A., & Granger, C. W. J. (2004). Efficient market hypothesis and forecasting. *International Journal of Forecasting*, *20*(1), 15–27. https://doi.org/10.1016/S0169-2070(03)00012-8.

Wahyuningsih, N., Daryono, B. U., & Zatadini, R. A. D. (2017). Pendekatan

Vol. 12 No 1, April 2024: 33-44, ISSN (cet): 2355-1755 | ISSN (online): 2579-6437

Model Ekonometrika Untuk Memprediksi Indeks Saham Syariah Indonesia. *Universitas Airlangga*, *294*.