

BITCOIN, LQ45, GOLD, AND RUPIAH EXCHANGE RATE: A COMPARATIVE STUDY FOR INVESTMENT DECISIONS



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Abstract

This study aims to compare the performance of four investment instruments: the cryptocurrency Bitcoin, LQ45 stocks, gold, and the rupiah exchange rate against the dollar in determining investment decisions. The growing public interest in various forms of investment, particularly digital assets like Bitcoin, has emphasized the importance of analysis that considers risk and return. This study employed a quantitative method with a comparative approach. The data used were the annual closing prices of each investment instrument for the period 2014 to 2023. Performance analysis was conducted using three evaluation methods: the Sharpe, Treynor, and Jensen methods. The results show significant differences in performance between investment instruments depending on the measurement method used. Bitcoin exhibits high returns but also carries high risk, while gold demonstrates greater stability, and LQ45 stocks have experienced a post-pandemic recovery. The rupiah exchange rate against the dollar is influenced by external factors such as monetary policy and global economic conditions. This study contributes to investors' selection of investment instruments that align with their risk profiles and serves as a reference for financial institutions and academics in understanding the characteristics of each instrument.

Keywords: Investment, Bitcoin, LQ45 Stocks, Gold, Rupiah Exchange Rate, Risk, Return, Sharpe, Treynor, Jensen

INTRODUCTION

In the ongoing era of globalization, technology and information are developing rapidly, and the financial sector is no exception. Every day, people face endless financial needs, both for current and future purposes. Therefore, many individuals prepare their financial conditions by engaging in investment activities. The impact of globalization is felt significantly in investments, whether in the context of short-term or long-term investments.

According to Nanda et al. (2018), investment is an action or belief undertaken in the present regarding money, assets, or other resources owned, with the expectation of receiving a return in the future. Besides benefiting individuals, investment also influences a company's ability to expand, which can enhance corporate performance and contribute to a better national economy.

Investments are categorized into two types: investments in financial assets and investments in real assets (Halim, 2005). Data from the Single Investor Identification (SID) in Indonesia, monitored by PT Kustodian Sentral Efek Indonesia (KSEI), shows that the number of investors in the Indonesian capital market continued to increase until September 2023, reaching a total of 11,729,977 investors. This number is higher compared to SID investors in mutual funds, C-BEST, and government securities (SBN). Based on this data, it can be concluded that stocks are one of the most popular financial market instruments, as they offer attractive returns. These returns can take the form of capital gains and dividends received by investors when investing their capital. However, besides potential gains, investors must also consider risks associated with investing in stocks, such as capital loss and liquidity risk.

Previously, Indonesians primarily invested in capital market instruments such as stocks, bonds, and deposits. Over time, with the rapid advancement of technology, public interest has expanded to other forms of investment, including gold, foreign currencies, and more recently, digital currencies. Since the COVID-19 pandemic, cryptocurrency has become a popular choice among investors (Raharjo, 2021).

According to information obtained from Investing.com, each investment instrument differs in terms of risk and return. These differences are influenced by factors such as market conditions, economic circumstances, and the laws of supply and demand. Based on the Bitcoin price chart above, it can be observed that this virtual currency experiences highly dynamic price fluctuations, so its exchange value can change rapidly over different periods of time.

Bitcoin's price has experienced extreme fluctuations over the years. On January 1, 2015, it was valued at \$218.5, rising 69.24% to \$369.8 by January 1, 2016. On January 1, 2018, Bitcoin surged by 963.22%, followed by a sharp correction of -66.52% on January 1, 2019, trading at \$3,437.3 per Bitcoin. In 2020, Bitcoin entered a Bull Run after the previous year's correction, driven by halving in May 2020, where mining rewards are reduced every four years, and stimulus measures by the U.S. Federal Reserve due to the COVID-19 pandemic. This led to a significant increase in Bitcoin's price from \$9,349.1 to \$33,108.1 between January 2020 and January 2021. In November 2021, Bitcoin reached its All-Time High at \$69,000, before correcting to \$23,125.1 by January 1, 2023.

Similarly, stocks also experience fluctuations due to global events affecting supply and demand. However, stock price movements tend to be more stable compared to Bitcoin.

The LQ-45 index reached its lowest point in March 2020 during the first COVID-19 case in Indonesia, at Rp. 605, but recovered to Rp. 1,080 by early 2023.

Gold, as a commodity, attracts investors during market fluctuations and economic uncertainty. Studies show gold acted as a safe haven during the 2008 economic crisis and protects investors' assets (Baur & Lucey, 2010). Gold prices remained relatively stable until May 2019, then peaked at \$66,461.93/kg on August 5, 2020, due to COVID-19 and U.S. economic instability. Afterwards, prices slightly declined but remained stable.

The Indonesian Rupiah's exchange rate against the U.S. dollar affects trade and investment. A decline in the Rupiah, influenced by the strengthening of the U.S. dollar (DXY), impacts commodity prices and investor decisions, creating potential economic instability.

Investors must consider both **risk and return**. High-return assets like Bitcoin offer significant potential profits but come with high risks. Research indicates that Bitcoin may outperform stocks and gold in returns, although the risk is higher. Investors can use diversification strategies based on Markowitz's portfolio theory to balance risk and maximize returns. While some studies suggest Bitcoin is the best investment instrument (Adiyono et al., 2021), other research (Liang et al., 2019) indicates cryptocurrencies are highly volatile and less suitable for investment compared to stocks and foreign exchange.

Overall, selecting the best investment instrument requires empirical data rather than subjective opinion, taking into account risk, return, and portfolio evaluation. Cryptocurrency, especially Bitcoin, has gained popularity in Indonesia for its high return potential, highlighting the need for regulatory frameworks to mitigate associated risks.

Therefore, this study is an extension of previous research trials conducted by several researchers. This study compares the performance of various investment instruments with the goal of finding the best investment instrument for investors, given the growing public interest in investing. The main difference between this study and previous studies is the research period. This study involves a longer period and utilizes annual closing price data, compared to previous studies that accounted for significant price fluctuations in each investment instrument due to the Covid-19 pandemic.

In general, previous studies indicated that cryptocurrencies carry the highest risk but provide the highest returns. However, the graph shows a significant increase in gold investment since 2019, indicating stability. Furthermore, stocks have continued to grow since the Covid-19 pandemic-induced decline in March 2020. Therefore, to gain a more accurate understanding of the comparison, further research is needed, considering both benefits and risks, and incorporating other methods such as Treynor, Sharpe, and Jensen. Therefore, the most suitable investment instrument for investors can be identified along with the increasing investment interest.

LITERATURE REVIEW

Investment

According to Hidayati (2017), investment refers to the act of placing funds in one or more assets with the intention of gaining future profits. Meanwhile, according to Tandelilin (2010:2), investment is a commitment of funds made with the aim of achieving future profits.

Cryptocurrency

The creation of cryptocurrency began with reference to a whitepaper compiled by Nakamoto (2008). This whitepaper reflects the early stages of cryptocurrency development and has become an important foundation for understanding cryptocurrency and blockchain technology.

Stocks

According to Aziz, Mintarti, & Nadir (2015), stocks are defined as a form of ownership or investment instrument held by investors, both individual and institutional, for a number of assets they have invested in a company.

Gold

Gold is recognized as a metal with high value globally, especially when processed into jewelry. Gold previously played a central role in the international monetary system, where the value of currencies is tied to the price of gold. However, this currency system ended in 1973, resulting in the decline of gold's role in the international monetary system (IMF, 2022).

Exchange Rate

According to Ardiyanto & Ma'ruf (2014), an exchange rate is the process of exchanging two currencies that have a relative value or price. Exchange rate policies are not only based on domestic economic factors but also consider foreign policy, macroeconomic conditions, political stability, and economic growth and development.

Risk and Return

Risk is a fundamental element that investors need to consider when investing. Risk refers to the difference or gap between actual and expected returns. The greater this difference, the higher the risk faced by the investor, as explained by Tandelilin (2017). Meanwhile, according to Fahmi (2015), return is the profit an investor anticipates in the future from an amount of invested funds.

RESEARCH METHOD

Type of Research

The type of research used in this study is a quantitative method. Quantitative research is an empirical approach that uses measurable or quantifiable data as the basis for analysis (Niisky Tiinangon, Jantje Tiinangon, 2022).

This study applies a comparative method by testing population parameters to compare the risks and returns of cryptocurrency investment instruments, bitcoin, LQ 45 stocks, gold, and the rupiah exchange rate against the dollar.

Population

According to Sugiyono (2017), a population is a domain of generalization that includes objects or subjects with certain qualities and characteristics, determined by the researcher to be studied and then conclusions drawn. The population of this study is the prices of four investment instruments: bitcoin cryptocurrency, LQ45 shares, gold, and the rupiah exchange rate against the dollar.

Sample

A sample is a small number of the quantities and characteristics possessed by the population being studied. In quantitative research, samples produce sample statistics that are

used to estimate population parameters. A researcher can examine all aspects or members of a population through a census, or select specific elements from a population/sample study. The sample of this analysis is the annual closing price of four investment instruments, namely bitcoin cryptocurrency, LQ45 stocks, gold, and the rupiah exchange rate against the dollar. The period is December 31, 2014 - December 31, 2023, so that 10 data points can be obtained from each instrument. The sampling technique used in this analysis is the saturated sampling technique, which involves selecting all annual closing price data from the four instruments so that the number of data obtained from each investment instrument is 40 data.

RESULT AND DISCUSSION

Data Analysis

Normality Test

Table 1.
Normality Test
Tests of Normality

Instrument		Shapiro-Wilk		
		Statistic	df	Sig.
Return	Bitcoin	0,617	10	0,000
	LQ45	0,926	10	0,411
	Gold	0,542	10	0,000
	Rupiah Exchange Rate Against Dollar	0,911	10	0,287
Risk	Bitcoin	0,891	10	0,173
	LQ45	0,793	10	0,012
	Gold	0,930	10	0,447
	Rupiah Exchange Rate Against Dollar	0,847	10	0,053
Sharpe	Bitcoin	0,708	10	0,001
	LQ45	0,840	10	0,044
	Gold	0,948	10	0,645
	Rupiah Exchange Rate Against Dollar	0,676	10	0,000
Treynor	Bitcoin	0,570	10	0,000
	LQ45	0,928	10	0,431
	Gold	0,729	10	0,002
	Rupiah Exchange Rate Against Dollar	0,797	10	0,013
Jensen	Bitcoin	0,880	10	0,130
	LQ45	0,944	10	0,594
	Gold	0,901	10	0,227
	Rupiah Exchange Rate Against Dollar	0,938	10	0,531

Source: (Data processing, 2025).

Normally distributed data is data with a significance value > 0.05 . The normality test shown above shows that most data have a significance value > 0.05 , indicating that there are differences between the return, risk, Sharpe, Treynor, and Jensen performance data used in this study that are normally distributed. However, there is still some data that is not distributed normally, including bitcoin return performance, gold return performance, LQ45 risk performance, bitcoin share performance, LQ45 sharpe performance, sharpe performance Rupiah exchange rate against the dollar, bitcoin treynor performance, gold treynor performance and treynor performance of the rupiah exchange rate against the dollar which have a significant value < 0.05 . Therefore, although some data are normally distributed, some are not, it can be concluded that the results of the Saphiro-Wilk data normality test in this study are not normally distributed.

Homogeneity Test

Table 2.
Homogeneity Test

Test of Homogeneity of Variance

		Levene	df1	df2	Sig.
		Statistic			
Return	Based on Mean	5,336	3	36	0,004
	Based on Median	1,875	3	36	0,151
	Based on Median and with adjusted df	1,875	3	17,295	0,172
	Based on trimmed mean	3,784	3	36	0,019
Risk	Based on Mean	5,922	3	36	0,002
	Based on Median	5,036	3	36	0,005
	Based on Median and with adjusted df	5,036	3	11,511	0,018
	Based on trimmed mean	5,099	3	36	0,005
Sharpe	Based on Mean	2,265	3	36	0,098
	Based on Median	1,153	3	36	0,341
	Based on Median and with adjusted df	1,153	3	19,253	0,353
	Based on trimmed mean	1,856	3	36	0,155
Treynor	Based on Mean	5,160	3	36	0,005
	Based on Median	1,753	3	36	0,174
	Based on Median and with adjusted df	1,753	3	16,571	0,195
	Based on trimmed mean	3,856	3	36	0,017
Jensen	Based on Mean	7,067	3	36	0,001
	Based on Median	6,022	3	36	0,002
	Based on Median and with adjusted df	6,022	3	9,347	0,015

Based on trimmed mean	6,136	3	36	0,002
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Source: (Data processing, 2025).

To assess whether the data used in the research is homogeneous or the same, a homogeneity test is carried out, as shown in the table above. Research data can be considered homogeneous if it has a significance value > 0.05 . And based on the homogeneity test on this research data, it shows that almost all data have a significance value < 0.05 , so it can be concluded that the data is not homogeneous or not the same. Because the data used in this study are not homogeneous and not normally distributed, the difference test used is a non-parametric statistical test, namely the Kruskal-Wallis test.

Kruskal-Wallis Test

Kruskal-Wallis Test Results

Table 3.
Kruskal-Wallis Test

	Test Statistics ^{a,b}				
	Return	Risk	Sharpe	Treynor	Jensen
Kruskal-Wallis H	3,372	28,394	4,970	9,080	19,109
df	3	3	3	3	3
Asymp. Sig.	0,338	0,000	0,174	0,028	0,000

Source: (Data processing, 2025).

Based on the results of the Kruskal-Wallis test conducted using SPSS, the following research findings can be concluded:

1. Return performance has a significance level of $0.338 > 0.05$, indicating no significant difference between the return performance of cryptocurrency investment instruments, LQ45 stocks, gold, and the rupiah exchange rate against the dollar, which are the subjects of the research.
2. The risk performance has a significance level of $0.000 < 0.05$ so it can be concluded that there is a significant difference between the risk performance of cryptocurrency investment instruments, LQ45 shares, gold and the rupiah exchange rate against the dollar which are the subjects of the research.
3. Sharpe performance has a significance level of $0.174 > 0.05$ so it can be concluded that there is no significant difference between the Sharpe performance of cryptocurrency investment instruments, LQ45 shares, gold and the rupiah exchange rate against the dollar which are the subjects of the research.
4. Treynor performance has a significance level of $0.028 < 0.05$ so it can be concluded that there is a significant difference between the Treynor performance of cryptocurrency investment instruments, LQ45 shares, gold and the rupiah exchange rate against the dollar which are the subjects of the research.
5. Jensen's performance has a significance level of $0.000 < 0.05$, thus concluding that there is a significant difference between the Jensen performance of cryptocurrency investment instruments, bitcoin, LQ45 stocks, gold, and the rupiah exchange rate against the dollar, which are the subjects of the study.

Kruskal-Wallis Ranking Results

Table 4.
Kruskal-Wallis Ranking

		Ranks	
Instrumen		N	Mean Rank
Return	Bitcoin	10	25,30
	LQ45	10	17,30
	Gold	10	22,10
	Rupiah Exchange Rate Against Dollar	10	17,30
	Total	40	
Risk	Bitcoin	10	35,50
	LQ45	10	17,90
	Gold	10	20,60
	Rupiah Exchange Rate Against Dollar	10	8,00
	Total	40	
Treynor	Bitcoin	10	21,30
	LQ45	10	18,20
	Gold	10	13,60
	Rupiah Exchange Rate Against Dollar	10	28,90
	Total	40	
Jensen	Bitcoin	10	27,00
	LQ45	10	28,80
	Gold	10	17,60
	Rupiah Exchange Rate Against Dollar	10	8,60
	Total	40	

Source: (Data processing, 2025).

The ranking results above show the Mean Rank of the Sharpe, Treynor, and Jensen performance of each investment instrument. The table above shows that in terms of Return performance, Bitcoin ranks first with a Mean Rank of 25.30. Gold is in second place with a value of 22.10. Meanwhile, the LQ45 and the Rupiah Exchange Rate against the Dollar are in third place with Mean Rank values of 17.30 each. In the Risk performance, the first rank or highest risk is also held by Bitcoin with a Mean Rank of 35.50, then gold is in second place with a value of 20.60, then followed by LQ45 with a value of 17.90 and the Rupiah Exchange Rate against the Dollar has the lowest rank in terms of risk, which is only 8.00. In Treynor's performance, the first rank was ranked first by the Rupiah Exchange Value against the Dollar with a Mean Rank of 28.90, bitcoin was in second place with a value of 21.30, followed by LQ45 with a value of 18.20. Meanwhile, Gold is in last position with a Mean Rank of 13.60. Finally, in terms of performance, Jensen LQ45 occupies the highest ranking

with a value of 28.80, in the second position there is Bitcoin with a value of 27.00, followed by Gold in the third position with a value of 27.00. 17.60. The lowest ranking is again occupied by the Rupiah Exchange Rate against the Dollar with a Mean Rank of 8.60.

Thus, the four instruments have different performance characteristics. Bitcoin is superior in terms of return but has high risks, LQ45 shows efficiency in generating alpha against market risks, Gold tends to be in the middle with stable performance, and the Rupiah Exchange Rate against the Dollar is superior in stability and efficiency against systematic risks, even though the return and alpha are relatively low. The choice of investment instruments should be tailored to the risk profile and investment strategy of each investor.

Performance Comparison Between Bitcoin, LQ45 Stocks, Gold, and Rupiah Exchange Rate Against the Dollar Using Return Measurement

Return is a primary indicator in assessing the performance of an investment instrument. It reflects the profit earned by investors from changes in asset prices over a period. In this context, the Kruskal-Wallis test results showed a significance value of 0.338 (> 0.05), indicating no statistically significant difference in returns between Bitcoin, LQ45 stocks, gold, and the Rupiah exchange rate against the dollar.

Bitcoin's high return is closely related to extreme crypto market volatility and high speculation. However, it is important for investors to understand that high returns are accompanied by high risk (high risk, high return). Therefore, high return alone is insufficient as a basis for investment decisions without considering associated risks (Markowitz, 1952).

Performance Comparison Between Bitcoin, LQ45 Stocks, Gold, and Rupiah Exchange Rate Against the Dollar Using Risk Measurement

Risk in investment refers to the uncertainty or potential losses that may occur. In this study, the Kruskal-Wallis test results showed a significance value of 0.000 (< 0.05), indicating a significant difference in risk levels among the four investment instruments.

The Rupiah exchange rate against the dollar, which has the lowest risk, can be an option for investors prioritizing capital stability and wishing to avoid sharp fluctuations in investment value. Meanwhile, gold and LQ45 stocks occupy a middle position and tend to be more stable compared to Bitcoin.

Performance Comparison Between Bitcoin, LQ45 Stocks, Gold, and Rupiah Exchange Rate Against the Dollar Using Sharpe Measurement

The Sharpe ratio measures investment performance based on excess return relative to total risk taken. The higher the Sharpe ratio, the better the investment performance, as it provides higher returns per unit of total risk (Sharpe, 1966). In this study, the Kruskal-Wallis test significance value was 0.174 (> 0.05), indicating no significant difference in Sharpe ratios among the four investment instruments.

Studies by Adiyono et al. (2021) and Lumbantobing & Sadalia (2021) also found that Bitcoin exhibits a high Sharpe ratio despite its high risk. LQ45 and gold provide relatively stable performance with moderate Sharpe ratios.

Performance Comparison Between Bitcoin, LQ45 Stocks, Gold, and Rupiah Exchange Rate Against the Dollar Using Treynor Measurement

Unlike Sharpe, the Treynor ratio calculates investment returns exceeding the risk-free rate relative to systematic risk measured by beta. In this context, the Kruskal-Wallis test results showed a significance value of 0.028 (< 0.05), indicating a significant difference in Treynor performance among the investment instruments.

The significant difference in Treynor measurements shows that systematic risk affects each instrument differently, depending on how the instrument responds to macro-level market changes. The Rupiah exchange rate against the dollar, as a macroeconomic indicator, is more stable and defensive compared to other instruments.

Performance Comparison Between Bitcoin, LQ45 Stocks, Gold, and Rupiah Exchange Rate Against the Dollar Using Jensen's Alpha

Jensen's Alpha measures a portfolio's ability to generate returns exceeding expected market returns based on the CAPM. The Kruskal-Wallis test results showed a significance value of 0.000 (< 0.05), indicating a significant difference in Jensen performance among the instruments.

This finding aligns with Kusuma & Asandimitra (2017), who found that LQ45 consistently produces positive alpha in the Indonesian stock market. A high alpha indicates effective portfolio management or market strategy that optimally captures opportunities.

Investment Instruments with the Best Performance for Investors

Based on research calculations of return, risk, and performance measured by Sharpe, Treynor, and Jensen, results show that each investment instrument performs differently depending on the measurement method. In this study, Treynor measurement was used to assess investment efficiency in generating returns relative to systematic risk measured by beta. This ratio considers investment returns exceeding the risk-free rate against overall market volatility.

Based on the Kruskal-Wallis mean rank results, the Rupiah exchange rate against the dollar ranks first (28.90), followed by Bitcoin (21.30), LQ45 stocks (18.20), and gold (13.60). Although the Rupiah is not a conventional investment instrument like stocks or gold, its performance in terms of systematic risk is notable due to relative stability influenced by global macroeconomic factors and monetary policy, resulting in more predictable market responses.

However, when considering consistency across other measures like Jensen and Sharpe, LQ45 stocks demonstrate more stable and nearly optimal performance. LQ45 may not rank highest in Treynor, but it occupies a consistent middle position with relatively small differences between methods. This distinguishes LQ45 from Bitcoin and gold, which have more extreme rank fluctuations.

Unlike the Rupiah, which shows the highest Treynor performance, Bitcoin shows weakness in this measurement, ranking in the middle and even lower than the Rupiah. This indicates that although Bitcoin can provide high returns (as seen in Sharpe), it does not generate optimal returns per unit of systematic risk. In other words, large Bitcoin price fluctuations do not directly correlate with market return changes.

These results contrast with previous studies by Adiyono et al. (2021) and Mahessara & Kartawinata (2018), which suggested Bitcoin has the highest Treynor performance. Differences may be due to varying research periods and data ranges involving high volatility during crises or pandemics, which significantly affect the crypto market.

Overall, Treynor measurement provides important insights for investors considering market risk in decision-making. Although the Rupiah shows the best statistical result in Treynor, for long-term investments with stable expected return and alpha, LQ45 stocks remain the superior choice considering cross-measure consistency. Meanwhile, Bitcoin can be a speculative option but requires careful risk management.

CONCLUSION

Based on the results of the research conducted, the conclusions obtained are as follows:

1. Investment performance measured using return shows no statistically significant differences among the four investment instruments, namely Bitcoin, LQ45 stocks, gold, and the Rupiah exchange rate against the dollar, with a significance value of 0.338 (> 0.05). However, in terms of ranking, Bitcoin occupies the highest position, followed by gold, while LQ45 stocks and the Rupiah exchange rate against the dollar share the lowest position.
2. Performance measurement based on risk shows significant differences among the investment instruments, with a significance value of 0.000 (< 0.05). Bitcoin has the highest risk level, whereas the Rupiah exchange rate against the dollar has the lowest risk, indicating the highest stability among the four instruments.
3. Measurement using the Sharpe method shows no significant differences among the investment instruments, with a significance value of 0.174 (> 0.05). This indicates that the efficiency of returns relative to total risk across the four instruments does not differ statistically.
4. Performance measurement using the Treynor method shows significant differences among the instruments, with a significance value of 0.028 (< 0.05). The Rupiah exchange rate against the dollar ranks highest in terms of efficiency of return relative to systematic risk, followed by Bitcoin, then LQ45 stocks, and finally gold.
5. Measurement using Jensen's method shows significant differences among the investment instruments, with a significance value of 0.000 (< 0.05). LQ45 stocks rank highest in generating alpha relative to market risk, followed by Bitcoin, gold, and lastly, the Rupiah exchange rate against the dollar.
6. The investment instrument with the best overall performance, measured using return, risk, and Sharpe, Treynor, and Jensen indicators, is LQ45 stocks. This instrument demonstrates the most consistent and nearly optimal performance across all five measurement methods. LQ45 ranks highest on the Jensen indicator, occupies a middle position on Treynor, and shows good stability in both risk and return, making it an ideal choice for moderate to conservative investors who prioritize market risk efficiency and stable returns.

The second-best investment option after LQ45 stocks is the Rupiah exchange rate against the dollar, as it ranks highest in the Treynor measurement, which assesses return efficiency relative to systematic risk. Although not a conventional investment instrument, the Rupiah demonstrates strong performance in market risk management.

Bitcoin excels in terms of return but has the highest risk level and performs less efficiently in the Treynor and Jensen indicators, making it more suitable as a speculative instrument that requires strict risk management. Meanwhile, gold shows the lowest and least consistent performance across the five measurement methods, making it less recommended as a primary choice for investors seeking stable and efficient investment performance.

REFERENCES

- Adiyono, W. A., Rahmawati, D., & Pradana, D. A. (2021). Analisis Kinerja Portofolio Saham, Emas dan Bitcoin Menggunakan Pendekatan Sharpe, Treynor dan Jensen. *Jurnal Ilmu Manajemen*, 9(2), 245–256.
- Adiyono, M., Suryaputri, R. V., Efan, & Kumala, H. (2021). Analisis Alternatif Pilihan Investasi Pada Era Digitalisasi. *Jurnal Akuntansi Trisakti*, 8(2), 227-248.
- Al-Yahyaee, K. H., Mensi, W., & Yoon, S. M. (2018). Efficiency, multifractality, and the long-memory property of the Bitcoin market: A comparative analysis with stock, currency, and gold markets. *Finance Research Letters*, 27, 228–234. <https://doi.org/10.1016/j.frl.2018.03.017>
- Bouri, E., Jain, A., Roubaud, D., & Kristoufek, L. (2017). Bitcoin's volatility and the role of investor attention. *Economics Letters*, 165, 58–61.
- Chkili, W., Ben Rejeb, A., & Arfaoui, M. (2021). Does bitcoin provide hedge to Islamic stock markets for pre- and during COVID-19 outbreak? A comparative analysis with gold. *Resources Policy*, 74(August), 102407. <https://doi.org/10.1016/j.resourpol.2021.102407>
- Dynand, M. R., & Kartawinata, B. R. (2018). Comparative Analysis of Cryptocurrency in Forms of Bitcoin, Stock, and Gold as Alternative Investment Portfolio in 2014 – 2017 Analisis Perbandingan Cryptocurrency Bitcoin, Saham dan Emas sebagai Alternatif Portfolio Investasi Tahun 2014 – 2017. *Jurnal Sekretaris & Administrasi Bisnis*, II(2), 38–51.
- Dyhrberg, A. H. (2016). Bitcoin, gold and the dollar – A GARCH volatility analysis. *Finance Research Letters*, 16, 85–92.
- Ichsani, S., & Pamungkas, A. (2022). Analisis Perbandingan Kinerja Aset Kripto, IHSG dan Emas sebagai Alternatif Investasi Periode 2017-2021. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, 5(6), 2025–2034. <https://doi.org/10.54371/jiip.v5i6.674>
- Isbahi, M. B., Zuana, M. M. M., & Mariana, E. R. (2022). The Technology Strategy in Website Communication Media in Improving Business Activities. *Majalah Journal of Islamic Finance and Management*, 1(2), 126–138. <https://doi.org/10.31538/mjifm.v1i2.17>
- Isbahi, M. B., Zuana, M. M. M., & Toha, M. (2024). The Multi-Social Relation of the Cattle Industry in the Plaosan Subdistrict Animal Market of Magetan Regency. *Malacca: Journal of Management and Business Development*, 1(1), 31–46. <https://doi.org/10.69965/malacca.v1i1.51>
- Klein, T. Thu, H. P., & Walther, T. (2018). Bitcoin is not the New Gold – A Comparison of Volatility, Correlation, and Portfolio Performance. *International Review of Financial Analysis*.
- Liang, J., Li, L., Chen, W., & Zeng, D. (2019). Towards an understanding of cryptocurrency: A comparative analysis of cryptocurrency, foreign exchange, and stock. *IEEE International Conference on Intelligence and Security Informatics, ISI 2019*, 137–139. <https://doi.org/10.1109/ISI.2019.8823373>
- Kusuma, G. H., & Asandimitra, N. (2017). Pengaruh Return Saham dan Beta terhadap Jensen's Alpha pada Saham LQ45 di Bursa Efek Indonesia. *Jurnal Ilmu Manajemen*, 5(1), 23–30.

- Lumbantobing, D. C., & Sadalia, I. (2021). Perbandingan Kinerja Investasi Bitcoin, Saham, dan Emas Menggunakan Rasio Sharpe, Treynor dan Jensen. *Jurnal Manajemen dan Keuangan*, 10(3), 87–98.
- Masduki, C., Chasanah, A. N., Yovita, L., dan Prawitasari, D. (2023). Analisis keuntungan investasi bitcoin dengan IHSG. *Journal of Economics and Business UBS*, 12(4), 2506-2515.
- Markowitz, H. (1952). Portfolio Selection. *The Journal of Finance*, 7(1), 77–91.
- Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business*, 39(1), 119–138.
- Toha, M., Zuana, M. M. M., & Isbahi, M. B. (2024). Acculturation of Mataraman Local Wisdom with Islamic Values: Implications for Social and Economic Development. *Danadyaksa: Post Modern Economy Journal*, 2(1), 33–47. <https://doi.org/10.69965/danadyaksa.v2i1.143>
- Verma, S., & Hirpara, B. (2016). Comparative Analysis of Mutual Fund Schemes Using Sharpe, Treynor and Jensen Measure. *International Journal of Business and Management Invention*, 5(10), 14–21.
- World Gold Council. (2021). *Gold Demand Trends Full Year 2020*. Retrieved from <https://www.gold.org>