Journal of Indonesian Management Vol: 5, No 4, 2025, Page: 1-10

Analysis of Determinants of Virtual Currency and Portfolio Investment In Asean Countries

Indah Febrita Sari*, Hasdi Aimon

Universitas Negeri Padang

DOI:
https://doi.org/10.53697/jim.v5i4.3366
*Correspondence: Indah Febrita Sari
Email: indahfebritasari@gmail.com

Received: 24-10-2025
Accepted: 24-11-2025
Published: 24-12-2025

Abstract: This study aims to analyze the influence of Customer Trust on This study aims to analyze the determinants of virtual currency and portfolio investment in ASEAN countries. The data used in this study is time series data in monthly form, from June 2020 to December 2021, while cross-sectional data is from four ASEAN countries (Indonesia, Malaysia, Singapore, and Thailand). The data analysis model uses panel regression. The results show that gold prices, interest rates, and exchange rates have a significant effect on virtual currency in ASEAN countries, while stock prices do not have a significant effect on virtual currency in ASEAN countries. Furthermore, interest rates, exchange rates, and virtual currency have a significant effect on portfolio investment in ASEAN countries, while inflation has no significant effect on portfolio investment in ASEAN countries.

Keywords: Virtual Currency, Portfolio Investment, Gold Price, Stock Price, Interest Rate, Exchange Rate, Inflation.

Introduction

Capital flows for all countries, particularly developing countries, have provided significant benefits in achieving development and economic growth through investment financing, facilitating consumption, diversifying risks, and expanding economic opportunities. This makes capital flows a focus of attention for policymakers and central banks in each country (Tahir et al, 2024).

The level of return and risk are crucial for investors in maximizing wealth, and one way to do this is by determining appropriate investment types and selecting portfolios with superior performance. The portfolio investment model advises investors to avoid risk and maximize returns in every investment decision. Portfolio investment can be defined as the act of allocating available capital among specific investments to minimize risk. The decision to allocate capital to investment proposals with future benefits must be carefully considered (Jiang et al, 2023).

Various reports from global economic institutions such as the World Bank and the IMF also state that ASEAN is a promising region for investors. Capital flows in the form of portfolio investment are important to observe and study further because they are linked to macroeconomic risks, financial instability, and capital flow reversal risks. Table 1.1 shows portfolio investment movements in ASEAN countries: Malaysia, Thailand, Indonesia, and Singapore (Kuswanto et al, 2020).

Table 1. Development of Portfolio Investment in ASEAN Countries

Month	Indonesia	%	Malaysia	%	Singapore	%	Thailand	%
Jun-20	726.5	1.0	8674.9	1.4	72562.8	0.9	4403.4	2.5
Jul-20	733.6	1.0	8785.2	1.3	73192.2	0.9	4511.7	2.5
Aug-20	740.6	1.0	8889.4	1.2	73824.4	0.9	4620.1	2.4
Sep-20	747.6	0.9	8987.3	1.1	74459.2	0.9	4728.5	2.3
Oct-20	754.5	0.9	9079.0	1.0	75096.8	0.9	4836.9	2.3
Nov-20	761.4	0.9	9164.5	0.9	75737.0	0.9	4945.4	2.2
Dec-20	768.2	0.9	9243.7	0.9	76379.9	0.8	5054.0	2.2
Jan-21	775.0	0.9	9316.8	0.8	77025.6	0.8	5162.6	2.1
Feb-21	781.7	0.9	9383.6	0.7	77673.9	0.8	5271.2	2.1
Mar-21	788.3	0.8	9444.2	0.6	78325.0	0.8	5379.9	2.1
Apr-21	794.9	0.8	9498.5	0.6	78978.7	0.8	5488.6	2.0
May-21	801.4	0.8	9546.7	0.5	79635.1	0.8	5597.4	2.0
Jun-21	807.8	0.8	9588.6	0.4	80294.3	0.8	5706.2	1.9
Jul-21	814.2	0.8	9624.3	0.4	80956.1	0.8	5815.1	1.9
Aug-21	820.6	0.8	9653.8	0.3	81620.7	0.8	5924.0	1.9
Sep-21	826.9	0.8	9677.0	0.2	82287.9	0.8	6033.0	1.8
Oct-21	833.1	0.8	9694.1	0.2	82957.9	0.8	6142.0	1.8
Nov-21	839.3	0.7	9704.9	0.1	83630.5	0.8	6251.1	1.8
Dec-21	845.4	0.7	9709.5	0.0	84305.9	0.8	6360.2	1.7

Source: International Financial Statistics, (2022)

The goal of investing is to create sustainability in investing, obtain maximum profits, and create prosperity for investors. Currently, there are many investment instruments such as stocks, gold, bonds, property, and most recently, virtual currencies (cryptocurrency) (Otto et al, 2024). One virtual currency that is already known to the public as a digital asset is Bitcoin. Bitcoin is a cryptographic virtual currency that is considered the father of virtual currencies. Several countries in the world have legalized the buying and selling of Bitcoin, including several countries in ASEAN. Table 1.2 shows the development of Bitcoin in ASEAN countries.

Table 2. Bitcoin Development in ASEAN Countries

Month	INDONESIA	%	THAILAND	%	MALAYSIA	%	SINGAPURA	%
Jun-20	7.48	-69.7	10.07	47.2	0.47		0.61	-195.1
Jul-20	6.69	-11.8	10.61	5.1	1.07	56.1	0.28	-117.9
Aug-20	8.04	16.8	9.16	-15.8	1.43	25.2	0.34	17.6
Sep-20	5.64	-42.6	7.71	-18.8	1.05	-36.2	0.27	-25.9
Oct-20	4.96	-13.7	8.66	11.0	1.17	10.3	0.27	0.0
Nov-20	7.34	32.4	14.35	39.7	2.4	51.3	0.78	65.4
Dec-20	8.92	17.7	15.4	6.8	2.62	8.4	0.43	-81.4
Jan-21	11.75	24.1	29.17	47.2	4.69	44.1	0.73	41.1
Feb-21	7.97	-47.4	17.16	-70.0	4.18	-12.2	0.42	-73.8
Mar-21	4.89	-63.0	10.76	-59.5	2.34	-78.6	0.17	-147.1
Apr-21	5.05	3.2	7.96	-35.2	2.94	20.4	0.26	34.6
May-21	6.51	22.4	11.76	32.3	4	26.5	0.47	44.7
Jun-21	0.15	-4240.0	10.28	-14.4	2.46	-62.6	0.13	-261.5
Jul-21	3.31	95.5	8.31	-23.7	1.55	-58.7	0.1	-30.0
Aug-21	3.4	2.6	10.85	23.4	2	22.5	0.1	0.0
Sep-21	2.67	-27.3	8.01	-35.5	1.92	-4.2	0.1	0.0
Oct-21	3.73	28.4	10.29	22.2	2.03	5.4	0.1	0.0
Nov-21	3.05	-22.3	8.33	-23.5	1.99	-2.0	0.36	72.2
Dec-21	3.11	1.9	7.43	-12.1	2	0.5	0.18	-100.0

Source: Investing.com, (2022)

Previous research on the determinants of virtual currency concluded that gold prices, stocks, exchange rates, and interest rates are the determining factors for virtual currency (bitcoin). Meanwhile, the determinants of portfolio investment include interest rates, exchange rates, inflation, economic growth, and virtual currency (Garg et al, 2024).

Research Gap and Objectives

Gold is one of the world's commodities used as a medium of exchange or payment. Gold remains the most sought-after investment commodity because it is considered a hedge or safe haven. Gold is associated with virtual currencies to see whether prices and other common factors, readily available commodities can influence new commodities (virtual currencies) that appear on the market. As in research conducted by which suggests that there is a significant relationship between gold and virtual currencies (Bitcoin) and Bitcoin can be predicted through gold prices (Szabó et al, 2023).

The stock price index is an indicator that shows stock price movements, where each movement will indicate changes in market conditions, namely events. According to, the index can reflect the level of macroeconomic and financial growth. Theoretically, when economic conditions are good, stock prices will increase. Changes in stock prices will be followed by changes in Bitcoin prices in the same direction. Bitcoin has been considered the same as other assets in portfolio investment research, showing that Bitcoin volatility is not influenced by other variables such as stock prices but is influenced by the price of each Bitcoin at past prices (Jang & Kim, 2023).

Interest rates also affect virtual currencies (bitcoin prices). When interest rates rise, the incentive to save is higher and borrowing becomes more expensive. As a result, the money supply generally decreases, and the value of bitcoin increases. Bitcoin prices impact the real exchange rate. In a theoretical model with bitcoin prices, finding that bitcoin prices influence the exchange rate would provide support for central banks' stances or policies regarding cryptocurrency trading. Therefore, this would be useful for other centers whose goal is to control the effects of cryptocurrencies on the monetary system. Implications for aggregate monetary modeling and forecasting suggest that when bitcoin prices increase, the exchange rate will appreciate. Therefore, it can be concluded that bitcoin price growth significantly affects the monetary system, especially the exchange rate.(Lei et al., 2022)

Interest rates have a significant influence on investment incentives. If interest rates increase, fewer investment projects are profitable and the quantity of investment goods will decrease. Therefore, it can be concluded that interest rates have a negative effect on portfolio investment. When interest rates are high, investment costs will increase, thereby reducing portfolio investment. Changes in exchange rates (depreciation and appreciation) will affect the amount of investment that will be invested in an investment area (regional or national), including in this context portfolio investment. Previous research on the influence of exchange rates on portfolio investment can be seen in the results of previous studies. The inflation rate reflects price increases in the economy. In an empirical study, inflation will cause a country's economic growth rate to be hampered (Otto et al, 2024).

Methodology

Data and Variables

This study uses panel data, with a monthly time series spanning from June 2020 to December 2021, and a cross-section of four ASEAN countries: Indonesia, Malaysia, Singapore, and Thailand. Furthermore, this study uses two categories for the types of variables used: endogenous and exogenous. The endogenous variables include virtual currency and portfolio investment. The exogenous variables include gold prices, stock prices, interest rates, exchange rates, and inflation. Based on the categories of variables used in this study, the relationships between variables can be determined within the research conceptual framework, as summarized in Figure 1

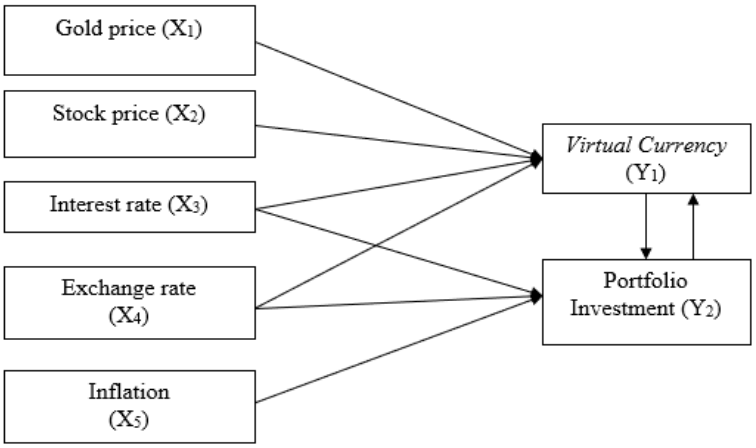

Figure 1. Relationship between Endogenous and Exogenous Variables

Data Analysis Techniques

This study uses a simultaneous equation model consisting of more than one dependent variable and more than one related equation. Furthermore, a variable has two roles at once, namely as an independent variable and as a dependent variable, which is called an endogenous variable and an exogenous variable as an independent variable in the simultaneous equation model. In general, the structural equations of the simultaneous equation model in this study are summarized in equations.

$$Y_{1it} = \alpha_{1.0} + \alpha_{1.1}X_{1it} + \alpha_{1.2}X_{2it} + \alpha_{1.3}X_{3it} + \alpha_{1.4}X_{4it} + \varepsilon_{1it}$$
$$Y_{2it} = \alpha_{2.0} + \alpha_{2.1}X_{3it} + \alpha_{2.2}X_{4it} + \alpha_{2.3}X_{5it} + \alpha_{2.4}Y_{1it} + \varepsilon_{2it}$$

Where:
α = Parameter coefficient
i = Cross section
t = Time series
ε = Error term

The next step after determining the form of the structural equation of the simultaneous equation model is to conduct an identification test of the simultaneous equation model through the order condition which can be determined using equation. The possibilities that occur from the identification of the simultaneous equation model are under-identified, exactly identified, and over-identified. Based on the order condition, the simultaneous equation model is said to be identified if all structural equations meet the following requirements:

$K - k \geq m - 1$
$K - k = m - 1$, the simultaneous equation model is said to be identified
$K - k > m - 1$, the simultaneous equation model is said to be over identified

Where:
M = The sum of all endogenous variables in the simultaneous equation model
m = The sum of endogenous variables in a particular equation
K = The sum of all exogenous variables in the simultaneous equation model
k = The sum of exogenous variables in a particular equation

Based on the results of the identification test, if overidentification is performed, simultaneous equation analysis is performed using the two-stage least squares (TSLS) approach. If correctly identified, simultaneous equation analysis is performed using the indirect least squares (ILS) approach. The application of TSLS produces a single estimate, while ILS produces multiple estimates. TSLS has no difficulty in estimating standard errors, because the structural coefficients are estimated directly from the OLS regression in the second step, while ILS has difficulty in estimating standard errors. Based on this explanation, this study uses simultaneous equations with the TSLS approach. This is based on the results of the order condition summarized in equation.

Persamaan Y1 ⊚ 5 – 4 > 1 – 1 (overidentified)
Persamaan Y2 ⊚ 5 – 3 > 2 – 1 (overidentified)
This study uses a simultaneous equation model with the 2SLS (Two Stage Least Squares) method because the simultaneous equations contain overidentified equations. The simultaneous equation model used in the equation above is estimated using equations 1 and 2, formulated as the result of the order condition is an overidentified equation, so the TSLS method is used to overcome the emergence of simultaneous bias.

Result and Discussion

Analysis of Virtual Currency Functions (Y_1)

In this initial stage, the virtual currency function (Y1) is regressed with the exogenous variables of gold prices, stock prices, interest rates, and exchange rates which are summarized in the equation (6)

$Y_1(BTC) = 54184{,}95 – 0{,}005\ Y_2(IP) – 5456{,}560\ LogX_1(GLD) + 1261{,}660\ LogX_2(IHSG) – 1256{,}736\ X_3(IR) + 97{,}609\ X_4(ER)$

The information in equation (6) shows a constant value of 54184.95. This means that if portfolio investment, gold, stocks, interest rates, and exchange rates remain constant, or if other factors not mentioned in this study increase by 1 percent, virtual currency will increase by 54184.95 percent.

The parameter estimation results in the model shown in the table above indicate that the portfolio investment variable does not significantly affect virtual currency in ASEAN countries. This means that every one percent increase in the amount of portfolio investment does not cause a decrease or increase in virtual currency.

The parameter estimation results in the model shown in the table above indicate that the gold variable (X1) has a significant and negative effect on virtual currency (Y1) in ASEAN countries at the 1% significance level. This means that every one percent increase in the amount of gold causes a decrease in virtual currency of 5456.560 units when ceteris paribus conditions are met.

The parameter estimation results in the model shown in the table above indicate that the stock variable (X2) has a significant and positive effect on virtual currency (Y1) in ASEAN countries at the 1% significance level. This means that every one percent increase in the number of stocks causes an increase in virtual currency of 1,261,660 units, ceteris paribus.

The parameter estimation results in the model shown in the table above indicate that the interest rate variable (X3) has a significant and negative effect on virtual currency (Y1) in ASEAN countries at the 1% significance level. This means that every one percent increase in the number of interest rates causes a decrease in virtual currency of 1,256,736 units, ceteris paribus.

The parameter estimation results in the model shown in the table above indicate that the exchange rate variable (X4) has a significant and negative effect on virtual currency (Y1) in ASEAN countries at the 1% significance level. This means that every one percent increase in the exchange rate causes a decrease in virtual currency of 97,609 units, ceteris paribus.

Statistically, the model used is appropriate (fit) and valid, as indicated by the F-statistic probability value of 0.000 at a significance level of 5 percent, which means H0: simultaneous independent variables do not significantly influence the dependent variable is rejected and H1: at least one independent variable influences the dependent variable is accepted.

The R-Squared value obtained in the model is 0.986, which means all independent variables in this study are able to explain 98.6 percent of the variance in the dependent variable, while the remaining 1.4 percent is explained by other variables outside the model.

Analysis of Portfolio Investment Function (Y_2)

The analysis of the portfolio investment function (Y2) in regression with exogenous variables of interest rates, exchange rates, inflation and virtual currency is summarized in the equation.

LogY2(IP) = 17,306 - 0.779 Y1_Pred(BTC) - 0.787 X3(IR) – 0.010 X4(ER) – 0.047 X5(INF)

The information in equation (7) is a constant value of 17.306. This means that if the virtual currency (Y1), interest rate (X3), exchange rate (X4), and inflation (X5) remain constant and the constant value or changes in other factors not mentioned in this study increase by 1 percent, portfolio investment (Y2) increases by 17.306 percent. This means that if the interest rate, exchange rate, and inflation increase by 1 percent, portfolio investment will increase by 17.306 percent. This means that every one percent increase in the virtual currency causes a decrease in portfolio investment of 0.779 units, all else being equal. This means that the higher the virtual currency, the lower the portfolio investment.

The parameter estimation results in the model shown in the table above indicate that the interest rate variable (X3) has a significant and negative effect on portfolio investment (Y2) in ASEAN countries at the 1% significance level. This means that every one percent increase in the interest rate causes a decrease in portfolio investment of 0.787 units, all else being equal. This means that the higher the interest rate, the lower the portfolio investment.

The parameter estimation results in the model, as shown in the table above, indicate that the exchange rate variable (X4) has a significant and negative effect on portfolio investment (Y2) in ASEAN countries at the 1% significance level. This means that every one percent increase in the exchange rate causes a decrease in portfolio investment of 0.010 units, all other things being equal. This means that a higher exchange rate will reduce portfolio investment.

The parameter estimation results in the model, as shown in the table above, indicate that the inflation variable (X5) does not significantly affect portfolio investment (Y2) in

ASEAN countries at the 1% significance level. This means that every one percent increase in inflation causes a decrease in portfolio investment of 0.047 units, all other things being equal.

Statistically, the model is fit and valid, as indicated by the F-statistic probability value of 0.000 at the 5% significance level. This means that H0: simultaneous independent variables have no significant effect on the dependent variable is rejected, and H1: at least one independent variable has an effect on the dependent variable is accepted. The R-Squared value obtained in the model is 0.977, which means that all independent variables in this study are able to explain the proportion of diversity (variance) of the dependent variable of 97.7 percent, while the remaining 2.3 percent is explained by other variables outside the model.

Conclusion

Portfolio investment variables do not significantly impact virtual currency in ASEAN countries. Gold prices significantly impact virtual currency in ASEAN countries. Stock prices significantly impact virtual currency in ASEAN countries. Interest rates significantly impact virtual currency in ASEAN countries. Exchange rates significantly impact virtual currency in ASEAN countries.

Interest rates significantly impact portfolio investment in ASEAN countries. Exchange rates significantly impact portfolio investment in ASEAN countries. Inflation does not significantly impact portfolio investment in ASEAN countries. Virtual currency significantly impacts portfolio investment in ASEAN countries.

Suggestions for Future Researchers

1. Expand the Scope of Countries and Time Periods

Future studies are encouraged to include a larger number of ASEAN countries or extend the observation period beyond 2021. This would allow for a deeper understanding of long-term trends and provide more robust empirical results.

2. Incorporate Additional Macroeconomic and Financial Variables

Subsequent research may integrate other potential determinants of virtual currency and portfolio investment, such as global economic uncertainty, geopolitical risk, investor sentiment indices, or financial market volatility measures (e.g., VIX).

3. Use Alternative Econometric Approaches

It is recommended that future researchers apply different or more advanced econometric techniques—such as Vector Error Correction Models (VECM), Generalized Method of Moments (GMM), or panel cointegration tests—to validate and compare findings across methodologies.

4. Analyze Different Types of Virtual Currencies

This study focuses primarily on Bitcoin. Future researchers may examine other major cryptocurrencies such as Ethereum, Ripple, or stablecoins to observe whether the determinants differ across virtual currency categories.

5. Consider Structural Breaks and Crisis Periods

Future work could assess how events such as the COVID-19 pandemic, global financial shocks, or regulatory changes influence the relationship between macroeconomic variables and virtual currency/portfolio investment in ASEAN countries.

6. Include Behavioral or Micro-Level Data

A deeper analysis may involve investor-level data or surveys to capture behavioral aspects—such as risk perception, technological literacy, and investment motivations—that may influence both cryptocurrency adoption and portfolio investment decisions.

7. Evaluate Policy Implications More Deeply

Further studies can assess how monetary policy, financial regulations, and cryptocurrency laws across ASEAN countries shape the dynamics found in this research, providing insights for policymakers and financial institutions.

References

Aharon, D. Y., & Qadan, M. (2019). Bitcoin dan Efek Hari-Dalam-Minggu. Surat Penelitian Keuangan 31 (Desember 2017):415–24. https://doi.org/10.1016/j.frl.2018.12.004.

Aimon, H., Putra, H. S., & Husein, F. (2020). Kausalitas Pertumbuhan Harga Bitcoin dengan Kondisi Moneter di Indonesia. 124(2):300–313. https://doi.org/10.2991/aebmr.k.200305.083.

Alfarina, N. & Aimon, H. (2020). Intervensi Kebijakan Moneter Terhadap Investasi Portofolio: Kasus Indonesia Dan Amerika Serikat. Jurnal Kajian Ekonomi Dan Pembangunan 2(1):1. https://doi.org/10.24036/jkep.v2i1.8793.

Angela, O. (2014). Faktor-Faktor Yang Mempengaruhi Harga Ethereum. Ilmu Implementasi 39(1):1–15.

Bouoiyour, J., & Selmi, R. (2017). Formasi Harga Bitcoin: Di Luar Sumber Fundamental Untuk Mengutip Versi Ini: HAL Id: Hal-01548710 Formasi Harga Bitcoin: Di Luar Sumber Fundamental.

Culha, A.A. (2006). Analisis VAR Struktural tentang Penentu Aliran Modal ke Turki, Tinjauan Bank Sentral, 2: 11-35.

De Vita, G. & Kyaw, K. S. (2008). Penentu Aliran Modal ke Negara Berkembang: Analisis VAR Struktural, Jurnal Studi Ekonomi, 35 (4): 304-322.

Garg, R., Chhikara, R., Agrawal, G., Rathi, R., & Arya, Y. (2024). Sustainable marketing mix and supply chain integration: A systematic review and research agenda. *Sustainable Futures*, 8(July), 100269. https://doi.org/10.1016/j.sftr.2024.100269.

IMF. (2012). Laporan Tahunan Dana Moneter Internasional 2012: Bekerja sama untuk mendukung pemulihan global. Dana Moneter Internasional. https://www.imf.org/en/Publications/AREB/Issues/2016/12/31/International-Monetary-Fund-Annual-Report-2012-Working-Together-To-Support-Global-Recovery-26104.

Jang, Y., & Kim, S. (2023). The Factors Influencing Users' Trust in and Loyalty to Consumer-to-Consumer Secondhand Marketplace Platform. *Behavioral Sciences*, 13(3). https://doi.org/10.3390/bs13030242.

Jiang, Q., Deng, L., & Yang, C. (2023). The Impact Mechanism of Consumer's Initial Visit to an Automobile 4S Store on Test Drive Intention: Product Aesthetics, Space Image, Service Quality, and Brand Image. *Behavioral Sciences*, 13(8). https://doi.org/10.3390/bs13080673.

Jongwanich, J. & Kohpaiboon, A. (2006). Investasi Swasta: Tren dan Penentu di Thailand. Jurnal Ekonomi 0970. Desember. hlm.1-29.

Kasmir. (2008). *Analisis Laporan Keuangan*. Penerbit Rajawali Pres. Jakarta:

Korap, L. (2010). Identifikasi Faktor Penarik dan Pendorong Aliran Portofolio: Bukti SVAR dari Ekonomi Turki, Dogus Unversitesi Dergisi, 11 (2): 223-232.

Kuswanto, A., Sundari, S., Harmadi, A., & Hariyanti, D. A. (2020). The determinants of customer loyalty in the Indonesian ride-sharing services: offline vs online. *Innovation and Management Review*, 17(1), 75–85. https://doi.org/10.1108/INMR-05-2019-0063.

Lei, Z., Duan, H., Zhang, L., Ergu, D., & Liu, F. (2022). The main influencing factors of customer satisfaction and loyalty in city express delivery. *Frontiers in Psychology*, 13(October), 1–9. https://doi.org/10.3389/fpsyg.2022.1044032.

Mankiw, N. G. (2007). *Ekonomi Makro*. edisi ke-5. New York: Layak Penerbit.

Narayan, P. K., Narayan, S., Rahman, R. E. & Setiawan, I. (2019). Pertumbuhan Harga Bitcoin dan Sistem Moneter Indonesia. Ulasan Pasar Berkembang 38:364–76. https://doi.org/10.1016/j.ememar.2018.11.005.

Otto, S., Bertel, L. B., Lyngdorf, N. E. R., Markman, A. O., Andersen, T., & Ryberg, T. (2024). Emerging Digital Practices Supporting Student-Centered Learning Environments in Higher Education: A Review of Literature and Lessons Learned from the Covid-19 Pandemic. *Education and Information Technologies*, 29(2), 1673–1696. https://doi.org/10.1007/s10639-023-11789-3.

Szabó, R. M., Buzás, N., Braunitzer, G., Shedlin, M. G., & Antal, M. Á. (2023). Factors Influencing Patient Satisfaction and Loyalty as Perceived by Dentists and Their Patients. *Dentistry Journal*, 11(9), 1–16. https://doi.org/10.3390/dj11090203.

Tahir, A. H., Adnan, M., & Saeed, Z. (2024). The impact of brand image on customer satisfaction and brand loyalty: A systematic literature review. *Heliyon*, 10(16), e36254. https://doi.org/10.1016/j.heliyon.2024.e36254.

Wah. (2014). Legalitas Bitcoin Sebagai Alat Pembayaran Di Indonesia.

Warsito, O. L. D., & Robiyanto. (2020). Analisis Volatilitas Cryptocurrency, Emas, Dollar, Dan Indeks Harga Saham (Ihsg). Jurnal Internasional Ilmu Sosial dan Bisnis 4(1):40–46. https://doi.org/10.23887/ijssb.v4i1.23887.