

The Implementation and Volatility Analysis of Sharia Cryptocurrencies

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Keywords:

Implementation, Sharia Cryptocurrency, Volatility, Sharia Objectives, Islamic Finance.

Abstract: This study analyzes the implementation of Sharia-compliant cryptocurrency and compares its volatility with Bitcoin and the Composite Stock Price Index (IHSG). Using a mixed-method approach through a sequential exploratory design, the study combines a literature review on Sharia compliance with time-series analysis using the ARIMA model. The analysis focuses on two gold-based cryptocurrencies, namely OneGram Coin (OGC) and GOLDX. The findings show that although OGC and GOLDX meet several key Sharia criteria, such as asset backing, avoidance of maysir, gharar, and riba, supervision by the Sharia Supervisory Board, and philanthropic fund allocation (tabarru'), their volatility is higher than that of Bitcoin and the IHSG. This indicates that, despite being designed for Sharia compliance, Sharia-compliant cryptocurrencies are currently less stable and less effective as a medium of exchange compared to conventional financing. Additionally, the absence of government regulation and the lack of Sharia-based profit-sharing models such as mudharabah or musyarakah are significant weaknesses. This study recommends stronger collaboration between developers and regulators to improve the regulatory framework and align the Sharia-based cryptocurrency system with the principles of justice, stability, and sustainability as outlined in maqashid syariah.

Kata Kunci:

Implementasi, Mata Uang Kripto Syariah, Volalitas, Maqashid Syariah, Keuangan Islam.

Abstrak: Penelitian menganalisis implementasi mata uang kripto (cryptocurrency) yang sesuai syariah serta membandingkan volatilitasnya dengan Bitcoin dan Indeks Harga Saham Gabungan (IHSG). Penelitian menggunakan metode mixed-method melalui desain sequential exploratory, penelitian berupaya menggabungkan tinjauan literatur tentang kepatuhan syariah dengan analisis runtun waktu (time-series) menggunakan model ARIMA. Analisis difokuskan pada dua mata uang kripto berbasis emas, yaitu OneGram Coin (OGC) dan GOLDX. Temuan menunjukkan bahwa meskipun OGC dan GOLDX memenuhi beberapa kriteria utama syariah, seperti dukungan aset (asset backing), penghindaran maysir, gharar, dan riba, adanya pengawasan oleh Dewan Pengawas Syariah, serta alokasi dana filantropi (tabarru'), volatilitasnya lebih tinggi dibandingkan Bitcoin dan IHSG. Hal ini mengindikasikan, bahwa meskipun dirancang untuk kepatuhan syariah, mata uang kripto syariah saat ini kurang stabil dan kurang efektif sebagai alat tukar dibandingkan dengan pendanaan yang bersifat konvensional. Selain itu, ketiadaan regulasi pemerintah dan tidak adanya model bagi hasil berbasis syariah seperti mudharabah atau musyarakah menjadi kelemahan yang signifikan. Penelitian ini merekomendasikan adanya kolaborasi yang lebih kuat antara pengembang dan regulator untuk memperbaiki kerangka regulasi serta menyelaraskan sistem mata uang kripto berbasis syariah dengan prinsip keadilan, stabilitas, dan keberlanjutan sebagaimana diuraikan dalam maqashid syariah.

INTRODUCTION

The rapid growth of cryptocurrencies since the introduction of Bitcoin¹ in 2009 has transformed global payment and investment systems, but at the same time has raised serious concerns regarding their compatibility with Islamic principles, particularly in relation to excessive volatility, speculative behavior, and the absence of intrinsic value. From an Islamic perspective, these issues are directly connected to the prohibition of maysir, gharar, and riba², as well as to broader objectives of justice, stability, and protection of wealth formulated in the framework of *maqashid sharia*.³

¹ Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," n.d.

² Zulfahmi and Nora Maulana, "Batasan Riba, Gharar, Dan Maisir (Isu Kontemporer Dalam Hukum Bisnis Syariah)," *Syarah: Jurnal Hukum Islam Dan Ekonomi* 11, no. 2 (2022): 134–50, <https://doi.org/https://doi.org/10.47766/syarah.v11i2.863>.

³ Nora Maulana et al., "Transformasi Pasar Modal Syariah Indonesia: Menavigasi Tantangan Digitalisasi Dan Inklusi Keuangan Di Era 5.0," *Jurnal Iqtisaduna* 10, no. 2 (2024): 447–69, <https://doi.org/10.24252/iqtisaduna.v10i2.52677>.

A growing body of literature has examined cryptocurrencies from Islamic legal and economic viewpoints, yet findings remain divergent. Scholars such as Kameel and Meera⁴ and Muhammad⁵ reject conventional cryptocurrencies like Bitcoin as sharia-noncompliant due to lack of asset backing, high speculation, and minimal oversight, creating user risk and injustice. Conversely, Billah advocates for a conditional framework of acceptance, arguing that cryptocurrencies could be rendered permissible if structured with robust asset backing, comprehensive regulatory supervision, Sharia Supervisory Board (DPS) certification, and embedded Islamic financial instruments including risk-sharing contracts (*mudharabah*, *musyarakah*) alongside philanthropic allocations (*tabarru*), thereby aligning with *maqashid sharia* imperatives.⁶ Amri and Mohammed extend this position by emphasizing *maqasid sharia* as the evaluative criterion⁷, while Umam et al. highlight the necessity of asset-supported systems that actively mitigate elements of gambling and usury to fulfill Islamic economics social mission.⁸

Emerging in direct response to these scholarly debates, practical initiatives have materialized in the form of purportedly gold-backed sharia-compliant cryptocurrencies such as OneGram Coin (OGC)⁹ and GOLDX¹⁰, which explicitly claim adherence to Islamic principles through mechanisms including physical gold asset backing, formal oversight by Sharia Supervisory Boards, and structured philanthropic fund allocations. While targeted academic studies, most notably those by Lucero¹¹ and Abdeldayem et al.¹², acknowledge the conceptual and structural innovations embedded in these instruments designs, such analyses have remained predominantly descriptive in nature. They tend to focus narrowly on isolated aspects of contractual compliance rather than conducting systematic, comprehensive testing against the

⁴ Ahmad Kameel and Mydin Meera, "Cryptocurrencies From Islamic Perspectives: The Case Of Bitcoin," *Bulletin of Monetary Economics and Banking* 20, no. 4 (April 2018): 475–92, <https://doi.org/10.21098/bemp.v20i4>.

⁵ Marjan Muhammad, "Shari'ah Analysis of Cryptocurrency: Bitcoin," no. November (2017).

⁶ Mohd Ma'Sum Billah, "Islamic Cryptocurrency," *Islamic Financial Products*, 2019, 413–34, https://doi.org/10.1007/978-3-030-17624-2_30.

⁷ Mohamed Cherif El Amri and Mustafa Omar Mohammed, "The Analysis of Cryptocurrency Based on Maqasid Al-Shari'ah," *Halal Cryptocurrency Management*, 2019, 119–31, https://doi.org/10.1007/978-3-030-10749-9_8.

⁸ Ahmada Khoiril Umam, Onny Herlambang Putra Wardhana, and Ira Humaira Hany, "Dinamika Cryptocurrency Dan Misi Ekonomi Islam," *An-Nisbah: Jurnal Ekonomi Syariah* 7, no. 2 (2020): 366–86, <https://doi.org/10.21274/an.v7i02.3366>.

⁹ Miguel Angel Garcia Ramos Lucero, "Cryptocurrencies Regulation in the Islamic Environment: OneGram Case Study," *Journal of Sociology and Theory of Religion* 11, no. 1 (2021): 1–9.

¹⁰ Marwan Mohamed Abdeldayem, Saeed Hameed Al Dulaimi, and Fuaad Hameed Al Dulaimi, "A Qualitative Approach to Evaluate the Reconciliation of GOLDX and OneGram in Islamic Finance," *Zbornik Radova Ekonomskog Fakultet Au Rijeci* 39, no. 1 (2021): 113–34, <https://doi.org/10.18045/zbfri.2021.1.113>.

¹¹ Lucero, "Cryptocurrencies Regulation in the Islamic Environment: OneGram Case Study."

¹² Abdeldayem, Al Dulaimi, and Al Dulaimi, "A Qualitative Approach to Evaluate the Reconciliation of GOLDX and OneGram in Islamic Finance."

fuller spectrum of *maqashid*-derived criteria articulated by foundational scholars including Billah, Amri and Mohammed, Umam et al., and Kameel and Meera.

Furthermore, although the scholarly consensus recognizes that cryptocurrency volatility fundamentally undermines their suitability as just and equitable medium of exchange, a point consistently emphasized by Jati and Zulfikar¹³ as well as Siswantoro et al.¹⁴ and reinforced through *maqasid* analysis by Amri and Mohammed, empirical research remains strikingly limited in scope. Rigorous quantitative comparisons pitting sharia-compliant tokens against established benchmarks such as Bitcoin or the Indonesia Stock Exchange Composite Index (IHSG) are virtually nonexistent. Critically, no prior investigation has quantitatively evaluated whether asset-backed instruments like OGC and GOLDX demonstrate empirically lower volatility profiles than their conventional cryptocurrency counterparts through sophisticated time-series methodologies.

RESEARCH METHOD

This study employs a mixed-methods approach utilizing a sequential exploratory design, comprising two interconnected phases: (1) a qualitative literature review and document analysis to evaluate sharia compliance implementation of OneGram Coin (OGC) and GOLDX; and (2) quantitative time-series analysis using the ARIMA model to measure and compare their volatility against Bitcoin and the Indonesia Stock Exchange Composite Index (IHSG).

This specific design was deliberately selected for three compelling methodological reasons. First, sharia compliance criteria for cryptocurrencies remain theoretically fragmented across scholars such as Billah, Amri & Mohammed, Umam et al., and Kameel and Meera, necessitating an initial exploratory qualitative phase to synthesize these diverse criteria into a comprehensive, operational evaluation framework before quantitative testing. Second, the sequential structure ensures direct integration, where qualitative findings inform quantitative instrument development, specifically, the selection of sharia-compliant cases (OGC, GOLDX) and volatility benchmarks, enhancing measurement validity through a "building blocks" approach.¹⁵ Third, unlike convergent parallel designs requiring pre-existing validated instruments, the exploratory sequence is optimally suited to emerging phenomena like

¹³ Hardian Satria Jati and Ahmad Arif Zulfikar, "Transaksi Cryptocurrency Perspektif Hukum Ekonomi Syariah," *Jurnal Al-Adalah* 6, no. 2 (2021): 137–48.

¹⁴ Dodik Siswantoro, Rangga Handika, and Aria Farah Mita, "The Requirements of Cryptocurrency for Money, an Islamic View," *Heliyon* 6, no. 1 (2020): e03235, <https://doi.org/10.1016/j.heliyon.2020.e03235>.

¹⁵ "Creswell & Plano Clark, 2017 - Google Scholar," accessed December 21, 2025, https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=Creswell+%26+Plano+Clark%2C+2017&btnG=.

sharia cryptocurrencies, where theoretical constructs must first be empirically grounded before statistical analysis.¹⁶

The research objects comprise OGC and GOLDX (substituted with HelloGold HGT due to market availability), representing practical implementations of asset-backed sharia cryptocurrencies. Data were sourced from secondary documents including academic journals, OGC and GOLDX whitepapers¹⁷, and authoritative real-time market reports, among others CoinMarketCap documenting historical price movements¹⁸, and Yahoo Finance providing comprehensive cryptocurrency return databases.¹⁹

Phase 1 employs an interactive qualitative analysis approach, beginning with systematic data collection from journal articles, books, whitepapers, and official reports related to sharia-compliant cryptocurrencies. The collected data are then reduced by selecting, classifying, and organizing information that is directly relevant to the sharia criteria and implementation aspects of OneGram Coin and GOLDX/HGT. The reduced data are subsequently presented in the form of narrative descriptions and analytical tables, which facilitate the identification of patterns, similarities, and differences across scholars' views and regulatory frameworks. Finally, conclusions are drawn through a theory-driven interpretation process that links the empirical findings to the maqashid shariah framework and the conceptual models proposed by previous researchers.

Phase 2 applies ARIMA modeling to the return series of HGT, OGC, Bitcoin, and the IHSG, following standard time-series procedures to ensure the robustness of the volatility analysis. The process starts with normality testing of the return distributions, followed by stationarity assessment using the Augmented Dickey-Fuller (ADF) test to confirm the absence of unit roots. Once stationarity is established, model identification is conducted through examination of the autocorrelation function (ACF) and partial autocorrelation function (PACF) to determine appropriate AR and MA orders. The selected ARIMA models are then estimated, and their adequacy is evaluated using diagnostic tests, including ARCH tests for heteroscedasticity, Ljung-Box tests for residual autocorrelation, and Jarque-Bera tests for residual normality. In the final step, forecasting accuracy is assessed using the Mean Absolute Error (MAE), which provides a quantitative measure of each model's ability to capture and predict the volatility dynamics of the analyzed assets.

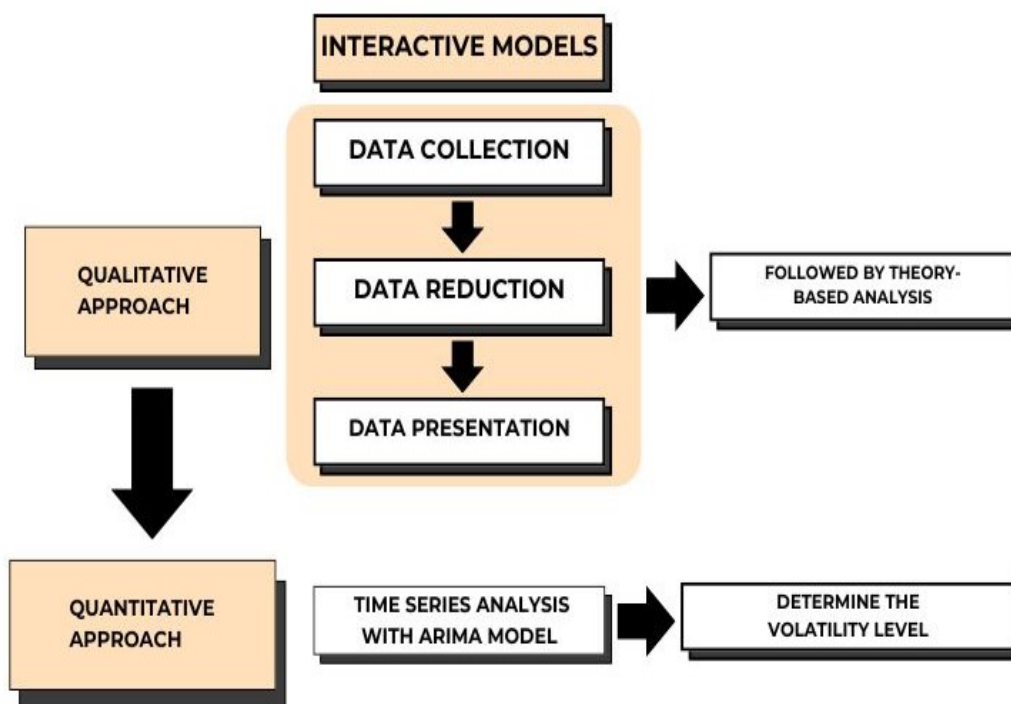
¹⁶ Nataliya V. Ivankova, John W. Creswell, and Sheldon L. Stick, "Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice," *Field Methods* 18, no. 1 (2006): 3–20, <https://doi.org/10.1177/1525822X05282260>; WEBSITE: WEBSITE: SAGE; ISSUE: ISSUE: DOI.

¹⁷ "HelloGold Foundation Technical Whitepaper," 2017.

¹⁸ "Cryptocurrency Prices, Charts And Market Capitalizations | CoinMarketCap," accessed December 26, 2025, <https://coinmarketcap.com/>.

¹⁹ "Yahoo Finance - Stock Market Live, Quotes, Business & Finance News," accessed December 27, 2025, <https://finance.yahoo.com/>.

Figure 1. Research Design



Source: Researcher's Document

RESULTS AND DISCUSSION

Cryptocurrency in Islamic Perspectives

Sharia cryptocurrency is inseparable from the concept of money in Islam, where since the time of the Prophet Muhammad PUBH. gold and silver have been used as a medium of exchange and a store of value. Under certain conditions, Islam also allows the use of alternatives, such as camel skin money, to overcome resource limitations²⁰. Currently, money functions more as a means of exchange for goods and services used by the general public. Islamic scholars generally agree that fiat money is only used as a means of exchange. According to Hoque, the motives for using money in Islam include transaction and precautionary motives, while buying and selling and speculative motives are strictly prohibited because they can be categorized as a form of *ikhtikar* (hoarding).²¹

Cryptocurrency is a digital currency based on blockchain technology that operates decentralized through a peer-to-peer network without involving third parties such as central banks. Cryptocurrency transactions are encrypted, recorded on the blockchain, and allow users to verify and calculate balances in digital wallets.

²⁰ Scott Morrison, "The Defining Characteristics of Money in Islamic Law Introduction 1," 2019.

²¹ Muhammad Nazmul Hoque, Jamaliah Said, and Prof (Assoc) Abu Umar Faruq Ahmad, "Money Laundering from Maqāsid Al-Sharī'Ah Perspective with Particular Reference to Preservation of Wealth (Hifz Al-Mal)," *SSRN Electronic Journal*, March 2021, <https://doi.org/10.2139/SSRN.3209775>.

According to Billah²², cryptocurrency has the potential to be a solution as an alternative currency in cross-border transactions. However, he also identified various risks and weaknesses, such as the lack of regulatory standards, unclear status as a currency or commodity, and ambiguity in aspects of privacy, supervision, and risk planning.

In the context of Sharia, an analysis by Muhammad²³ in the Shariah Fintech Forum shows that Bitcoin, despite having the largest market capitalization, does not meet the criteria as a currency, commodity, or financial asset because it does not have characteristics that comply with sharia principles. More details can be seen in the following table 1.

Table 1. Characteristics of Bitcoin According to Sharia Principles

Characteristics	Criteria	Bitcoin
As Commodity	Recognized as valuable by Sharia	Yes
	Having intrinsic value	No
	Can be identified	Yes
	Can be moved	Yes
	Can be owned	Yes
As Currency	Medium of exchange	Yes
	Unit of account	Yes
	Store of value	Yes
	Widely accepted	Yes
	Legal means of payment	No
As Financial Assets	Value depends on time	Yes
	Recognized as valuable by Sharia	Yes
	Can be owned	Yes
	Identifiable/transferable	Yes
	Store of value	Yes
	Backed by valuable assets/sharia-compliant investments	No

Source: Shariah Fintech Forum (2017)

Currency stability reflects economic fairness in financial transactions. According to Amri and Mohammed, high cryptocurrency price fluctuations create injustice for its users. The limited number of units, such as Bitcoin, also causes price volatility and eliminates its function as a medium of exchange because no currency in the world is limited in number. Transparency in currency involves preventing ignorance, ambiguity, manipulation, and fraud. Cryptocurrencies often do not meet this standard, as seen in the case of the Bitcoin hack in 2013 that led to the temporary closure of the exchange. In addition, cryptocurrency trading is often dominated by speculation, which resembles gambling (*maysir*) and is contrary to sharia principles.

From an Islamic perspective, the government has the authority to regulate the monetary system, including currency issuance and market protection. However,

²² Billah, "Islamic Cryptocurrency."

²³ Muhammad, "Shari'ah Analysis of Cryptocurrency: Bitcoin."

cryptocurrencies do not meet these criteria of cooperation and integrity, so they are not in line with sharia values. Billah offers halal cryptocurrency management that is in accordance with the maqashid sharia. First, the cryptocurrency model must be based on guidelines, policies, and systems approved by the Sharia Supervisory Board. Blockchain technology and related components need to be screened to ensure their compliance with sharia principles. Second, a central storage system is needed that is supervised by authorities, both international and regional. Third, cryptocurrency can function as a medium of exchange or commodity, as long as it is in accordance with sharia. Fourth, recipients must be registered to ensure transparency and privacy. Fifth, the use of Initial Coin Offerings (ICO) is recommended as a sharia-based distribution method.

In addition, cryptocurrency activities and transactions must be facilitated by sharia doctrine, such as investments based on the principles of mudharabah or musyarakah. Transactions on the blockchain must follow the principle of al-bay wa al-shira (buying and selling), with the obligation of zakat and allocation of funds for social purposes based on the principle of *tabarru'*. Umam et al. added the importance of choosing the right market, using supporting assets (backup assets), and avoiding elements of maysir, gharar, and riba. Setting aside some funds for philanthropy and implementing blockchain in waqf schemes are also key recommendations to ensure the alignment of cryptocurrencies with the Islamic economic mission.

Table 2. Sharia Criteria for Cryptocurrency According to Researchers

Sharia Criteria for Cryptocurrency	Billah (2019)	Amri & Mohammed (2019)	Umam et al. (2020)	Kameel & Meera (2018)
Based on Maqashid Sharia	Yes	Yes	-	-
The need for a Sharia Supervisory Board/ Hisbah Institution	Yes	-	Yes	-
Avoid Maysir, Gharar, Riba	Yes	Yes	Yes	Yes
The Need for Government/Central Bank Regulation	Yes	Yes	-	Yes
Management and transactions according to Sharia	Yes	Yes	Yes	Yes
Cryptocurrencies must be backed by assets	-	-	Yes	Yes
Setting aside funds for tabarru'/philanthropy	Yes	Yes	Yes	-
Technology Security (Blockchain)	Yes	Yes	Yes	-

Source: The data was adapted from the respective references

Of the eight Sharia criteria for Cryptocurrency in table 2 above, there are only two criteria that all researchers mention. The first is that Sharia cryptocurrency must

be free from maysir, gharar and riba. According to Kameel and Meera²⁴, this is only possible if the cryptocurrency is backed by assets.

Second, management and transactions must be in accordance with Sharia. Among the several researchers, Billah²⁵ mentioned them in detail, including the use of the principles of *mudharabah* and *musyarakah* in cryptocurrency investment, service schemes based on the principles of *ju'alah* (reward), *wakalah* (agency) or *ujrah* (charge), and transactions on the blockchain platform based on *al-bay' wa al-shira* (buying and selling) as well as the implementation of zakat and the allocation of funds for social and humanitarian purposes (*tabarru'*).

Implementation of Sharia Cryptocurrencies

1. OneGram Coin (OGC)

OneGram is a Dubai-based startup that launched a sharia-compliant cryptocurrency in May 2017. During its initial coin offering (ICO), OneGram successfully issued 12,400,786 tokens and raised over \$500 million. Using blockchain technology, OneGram offers an innovative solution by integrating traditional assets in the form of gold with digital assets.²⁶

One of the main advantages of OneGram is the guarantee that each OneGram token is backed by at least one gram of physical gold. This guarantee provides basic price stability, limits volatility, and reduces speculation. This scheme is considered to be in accordance with sharia principles and has been certified by Dubai-based consultant Al-Maali. With this gold-based approach, OneGram creates a combination of a stable commodity with modern blockchain-based technology, making it a low-risk alternative to conventional cryptocurrencies. As the first certified sharia-compliant cryptocurrency, OneGram adopts a mechanism that is in line with Islamic values. From each transaction, 1% of the fee is allocated, with 70% of it used to purchase gold as a community reserve and guarantee of currency supply. In addition, 2.5% of the transaction fee is channeled to zakat, affirming OneGram's commitment to the principles of philanthropy in Islam.²⁷

2. GOLDX

In 2017, HelloGold Foundation (HGF), a Singapore-based fintech company, introduced an altcoin called GOLDX. The token is built on Ethereum ERC20 smart contract technology and is backed by physical gold securely allocated in the Bullion Star International vault in Singapore. Each GOLDX token represents one gram of

²⁴ Kameel & Meera (2018)

²⁵ Billah (2019)

²⁶ "OneGram & Dubai Trading Platform In \$500M 'Gold-Backed' Cryptocurrency Venture," accessed January 22, 2025, <https://www.forbes.com/sites/rogeraitken/2017/05/02/dubai-trading-platform-onegram-in-500m-gold-backed-crypto-venture-sharia-compliant/>.

²⁷ "The First Shari'ah Compliant Digital Asset Listed on an Exchange | by OneGram | Medium," n.d.

insured gold, providing a different basis for value stability than conventional cryptocurrencies.²⁸ Users can purchase GOLDX using Bitcoin or Ethereum, with the token price consistently tied to the price of physical gold. The issuance process is transparent, with the gold held in HGF's gold account after approval from three parties, including HGF's directors. Information related to the gold issued can be verified through HGF's public address on the Ethereum blockchain, ensuring transparency and reliability of transactions.²⁹

GOLDX is also designed to facilitate peer-to-peer transactions on the Ethereum blockchain. The token is divisible up to 18 decimal places, allowing for flexibility in its use. A small transaction fee is charged in Ether for each transfer between wallets. In addition, customers are charged a 2% annual management fee, which is calculated daily via a smart contract. A portion of HGF's revenue, 10% per month, is allocated to the grant fund, reflecting the company's commitment to philanthropic principles.

There are two ways to acquire GOLDX: (1) through a grant from HGF to HelloGold Token (HGT) holders as an add-on product; and (2) through direct purchase (over the counter, OTC) using Ether or Bitcoin, with a minimum purchase of 1 GOLDX. GOLDX holders also have the option to sell their tokens back to HGF at below-market gold prices or sell them through peer-to-peer transactions on the blockchain.

From a sharia perspective, GOLDX has been deemed compliant by Amanie Advisors Malaysia. This is because the process of buying and selling gold is carried out in real time and in accordance with permissible time norms. In addition, the backing of physical gold as collateral ensures that this token meets the principles of Islamic economics.³⁰

Currently, GOLDX is no longer traded on open markets such as Coin Market Cap or Coin Codex. Instead, HelloGold Token (HGT), another product of HGF, is used to illustrate the volatility of sharia-compliant cryptocurrencies. Innovations like GOLDX show great potential in developing a stable and sharia-compliant digital financial system, although sustainability challenges remain a major concern.

Analysis of Sharia Cryptocurrencies Implementation

OneGram and GOLDX can be categorized as financial assets because they are backed by physical gold as the underlying asset. This support fulfills one of the main criteria of sharia for cryptocurrency as proposed by Umam et al.³¹ and Kameel & Meera³². However, the existence of valuable assets such as gold does not fully guarantee the stability of cryptocurrency, which is an important factor in determining

²⁸ "HelloGold Foundation Technical Whitepaper."

²⁹ "HelloGold's GOLDX Cryptocurrency Is World's First to Earn Shariah-Compliance | The Asian Banker," n.d.

³⁰ "Malaysian Firm Adds Islamic Certification to GOLDX Cryptocurrency | Arab News," n.d.

³¹ Umam et al. (2020)

³² Kameel & Meera (2018)

its suitability as a medium of exchange. Price stability still needs to be further tested to ensure its compliance with sharia financial standards.

To analyze the implementation of sharia in OneGram and GOLDX, this study refers to the scheme proposed by Billah.³³ This scheme includes the principles of mudharabah and musyarakah in cryptocurrency investment. However, based on the available literature, OneGram and GOLDX have not adopted this profit-sharing mechanism. The absence of a mudharabah or musyarakah scheme indicates that these two cryptocurrencies focus more on asset-based transaction models than profit-sharing investments.

In terms of service fees, OneGram implements two main schemes. First, 70% of transaction fees are allocated to purchase gold as a community reserve and guarantee of money supply. This policy reflects the principle of cooperation (*ta'awun*) and integrity in maqashid sharia, as explained by Amri & Mohammed.³⁴ This gold reserve also functions to manage risk and provide stability to OneGram's financial system. Second, 2.5% of transaction fees are allocated to zakat and sadaqah. This allocation reflects the spirit of Islamic philanthropy which has become one of the standards proposed by Billah and Umam et al., where part of cryptocurrency income must be directed to social purposes.

GOLDX, on the other hand, takes a different approach to service fee management. HelloGold Foundation (HGF), as the manager of GOLDX, allocates 10% of the management fee income for grant purposes every month. In addition, customers are charged a service fee of 2% per year, part of which is also used for philanthropic purposes. With this mechanism, GOLDX shows its commitment to Islamic social values, although its approach is slightly different from the scheme proposed by Billah.

The compliance of OneGram and GOLDX Cryptocurrencies with Sharia principles can be seen more clearly through the following table 3:

Table 3. Sharia Principles Implementation of Sharia Cryptocurrencies

Sharia Criteria for Cryptocurrency	OneGram	GOLDX	Notes
There is A Sharia Supervisory Board/ Hisbah Institution	Yes	Yes	OneGram supervised by Al-Maali Consultant, GOLDX supervised by Amanie Advisors
Avoid Maysir, Gharar, Riba	Yes	Yes	Both cryptocurrencies implement sharia transaction and management schemes to avoid maysir, gharar and riba
There is A Government/Central Bank Regulation	-	-	There is no information or references that explain this

³³ Billah (2019)

³⁴ Amri & Mohammed (2019)

Management and transactions according to Sharia	Yes	Yes	Both cryptocurrencies focus more on asset-based transaction models than profit-sharing investments.
Assets Backed	Yes	Yes	Both cryptocurrencies backed by gold assets.
Setting aside funds for tabarru'/philanthropy	Yes	Yes	Both cryptocurrencies implement various Islamic philanthropic purposes
Technology Security (Blockchain)	Yes	Yes	GOLDX uses Ethereum blockchain technology

Source: Data was adapted from respective references

The qualitative analysis reveals that both OneGram Coin (OGC) and GOLDX satisfy seven out of eight sharia criteria synthesized from Billah, Amri & Mohammed, Umam et al., and Kameel & Meera. Table 3 demonstrates fulfillment of asset backing, avoidance of maysir, gharar and riba, Sharia Supervisory Board oversight, and philanthropic mechanisms, confirming their contractual sharia compliance.

However, absence of government or central bank regulation remains the critical deficiency. In Indonesia, Peraturan Bappebti No. 8 Tahun 2021 explicitly classifies cryptocurrencies exclusively as tradable commodities subject to futures trading oversight³⁵, while Bank Indonesia maintains a prohibition on their use as payment instruments.³⁶ This regulatory gap aligns with Billah's maqashid requirement for state oversight to ensure investor protection (*hifz al-mal*) and systemic integrity, which is currently unaddressed in sharia cryptocurrency frameworks.

Volatility Analysis of Sharia Cryptocurrencies

This section will explain the process of finding the best ARIMA (p,d,q) model for the return of Sharia cryptocurrency, namely HelloGold (HGT) and OneGram (OGC), the return of Bitcoin (BTC) and also the return of the Indonesia Stock Exchange Composite Index (IHSG). In addition, it also explains the use of these models to compare the level of volatility between Sharia cryptocurrency (HGT and OGC) with the cryptocurrency with the largest market capitalization, namely Bitcoin (BTC) and also compare it with the volatility of IHSG. The researcher replaced GOLDX with HGT to analyze the level of volatility for two reasons. First, GOLDX is no longer available on the cryptocurrency market as previously explained. Second, because HGT and GOLDX are issued by the same company, namely HelloGold Foundation.

1. Descriptive Statistics of Cryptocurrencies and IHSG Return

The following table is a descriptive statistics of monthly return data for cryptocurrencies HelloGold (HGT), OneGram (OGC), Bitcoin (BTC) and IHSG consisting of 36 observations during 2019-2021:

³⁵ "Bappebti Website - SK/ Kep. Kepala Bappebti," accessed December 27, 2025, https://bappebti.go.id/srg/sk_kep_kepala_bappebti/detail/8952.

³⁶ "Peraturan BI No. 17/3/PBI/2015 Tahun 2015," accessed December 27, 2025, <https://peraturan.bpk.go.id/Details/135519/peraturan-bi-no-173pbi2015-tahun-2015>.

Table 5. Descriptive Statistics of Cryptocurrencies & IHSG Return

Statistik	HGT	OGC	BTC	IHSG
Mean	0.044154	-0.088285	0.095957	0.001581
Standard Dev.	0.406889	0.611792	0.233733	0.048005
Skewness	0.547226	3.173756	0.495614	-1.139992
Kurtosis	2.881112	17.33185	2.585117	5.791214
Probability	0.402939	0.000000	0.420633	0.000059
Observations	36	36	36	36

Source: Eviews data processing

Based on Table 5 above, it is evident that only OneGram (OGC) has a negative average return. This indicates that investing in cryptocurrency can yield significant profits. Even when compared to the average return of the IHSG, which is 0.001581, the average returns of cryptocurrencies such as HelloGold (HGT) and Bitcoin (BTC) are significantly higher, at 0.044154 and 0.095957, respectively.

However, the profits gained from investing are always accompanied by corresponding risks. This is reflected in the standard deviation of each cryptocurrency. OneGram (OGC) has the highest standard deviation at 0.611792, followed by HelloGold (HGT) at 0.406889. The IHSG has the lowest standard deviation among them. When linked to stability, it can be concluded that cryptocurrencies, in general, tend to be less stable than stock portfolios, as represented by the IHSG in this case.

Regarding data normality, as shown in the table, HelloGold (HGT) and Bitcoin (BTC) exhibit normal distribution, while OneGram (OGC) and the IHSG do not, as their probabilities are less than 5%. Next, data stationarity will be tested as part of the time-series analysis using the ARIMA Model.

2. Data Stationarity Test

Testing time-series data is closely tied to the stationarity of the data under investigation. Time-series data is considered stationary when its mean and variance do not change systematically over time, or in other words, when the mean and variance remain constant. If the data is non-stationary, it must be transformed into a stationary state before determining the best model. The researcher used the ADF unit root test to test the stationarity of the data.

Hypotheses:

H_0 : The data contains a unit root (non-stationary)

H_1 : The data doesn't contain a unit root (stationary)

Decision criteria: H_0 is rejected if the absolute value of the ADF statistic is greater than the critical value or if the ADF probability value is less than 5%.

The following are the results of the ADF unit root test on the returns of HelloGold (HGT), OneGram (OGC), Bitcoin (BTC), and the Indonesia Stock Exchange Composite Index (IHSG).

Table 6. ADF Unit Root Test Results

Crypto/Stocks		HGT		OGC		BTC		IHSG	
		t-Stat.	Prob.*	t-Stat.	Prob.*	t-Stat.	Prob.*	t-Stat.	Prob.*
ADF Test Statistic		-3.9695	0.0045	-6.5818	0.0000	-4.1400	0.0027	-4.9919	0.0003
Test Critical Values	1%	-3.632900		-3.632900		-3.632900		-3.632900	
	5%	-2.948404		-2.948404		-2.948404		-2.948404	
	10%	-2.612874		-2.612874		-2.612874		-2.612874	

*MacKinnon (1996) one-sided p-values

Source: Eviews data processing

The results of the ADF unit root test in Table 6 indicate that none of the data contain unit roots. This is evident from the ADF probability values for all return data (HGT, OGC, BTC, and IHSG) which are all less than 5%. Additionally, the absolute statistical values for each dataset exceed their corresponding critical values. Therefore, it can be concluded that all the data under study are stationary and can proceed to the next stage of testing.

3. ARIMA Model Development

All the data studied are already stationary so that there is no need to adjust the data. Therefore, the general form of the ARIMA model used is ARMA (p, q) or ARIMA (p, 0, q). The steps for developing an ARIMA (p, d, q) model are as follows:

a. Model Identification and Estimation

The first step is model identification. Identification can be done by observing the ACF and PACF correlograms using EViews data processing. The results are as follows:

Table 7. ARIMA Model Identification

Cryptocurrency/ Stock	ARIMA Model Identification
HGT	ARIMA (2,0,0), ARIMA (0,0,2), ARIMA (2,0,2)
OGC	ARIMA (1,1,0), ARIMA (0,1,1), ARIMA (1,1,1)
BTC	ARIMA (5,1,0), ARIMA (0,1,5), ARIMA (5,1,5)
IHSG	ARIMA (6,0,0), ARIMA (0,0,6), ARIMA (6,0,6)

Source: Eviews data processing

The second step to developing the ARIMA model is model estimation. The criteria for selecting the best ARIMA model include having a significant probability (less than 5%) and the smallest Schwarz Criterion (SIC) value. Based on these criteria, by processing data using Eviews, the best ARIMA model estimations for HGT returns are ARIMA (2,0,0) without a constant, ARIMA (0,0,2) with a constant, and ARIMA (0,0,2) without a constant.

Next, in the same way, the following results were obtained. The best ARIMA model estimates for OGC returns include ARIMA (0,1,1) with constant and

ARIMA (0,1,1) without constant. Meanwhile, the best ARIMA model estimates for BTC returns include ARIMA (5,1,0) without constant and ARIMA (0,1,5) without constant.

And finally, there are only two ARIMA model estimates that have significant probability for IHSG, namely ARIMA (6,0,6) with constant and ARIMA (6,0,6) without constant.

b. ARCH Effect Test

The ARCH effect test aims to determine whether or not there is a heteroscedasticity effect in the model. ARCH effect testing can be done using the ARCH-LM test model. The hypothesis is as follows:

H_0 : There is no ARCH effect

H_1 : There is an ARCH effect

Decision criteria:

If the Chi-Square calculated value > Chi-Square critical value or the probability value is not significant, then the null hypothesis is rejected. The following are the results of the ARCH effect test on the ARIMA (p,d,q) estimation model for each return.

Table 8. ARCH Effect Test Results

Cryptocurrency/ Stock	ARIMA Estimation Model	Prob. Chi-Square	ARCH Effect
HGT	ARIMA (2,0,0) without constant	0.6369	No
	ARIMA (0,0,2) with constant	0.9036	No
	ARIMA (0,0,2) without constant	0.9122	No
OGC	ARIMA (0,1,1) with constant	0.4462	No
	ARIMA (1,1,1) without constant	0.8325	No
BTC	ARIMA (5,1,0) without constant	0.5084	No
	ARIMA (0,1,5) without constant	0.5109	No
IHSG	ARIMA (6,0,6) with constant	0.7302	No
	ARIMA (6,0,6) without constant	0.0647	No

Source: Eviews data processing

Based on the results of the ARCH effect test above, it is evident that the overall ARIMA estimation models for each cryptocurrency return and IHSG have significant probabilities (greater than 5%), indicating that the null hypothesis is accepted. In other words, all the models show no ARCH effect and are free from heteroscedasticity.

c. Normality Test

After conducting the ARCH effect test and confirming that all ARIMA models are free from heteroscedasticity, the next step is to perform a normality test on the models. In this study, the Jarque-Bera test is used with the following hypotheses and criteria:

Hypotheses:

H_0 : The residuals are normally distributed.

H_1 : The residuals are not normally distributed.

Decision Criteria: H_0 is rejected if the Jarque-Bera statistic is greater than the Chi-Square distribution table value or if the probability is less than 5%. The following is a summary of the normality test results for the selected ARIMA models.

Table 9. Normality Test Results

Cryptocurrency/ Stock	ARIMA Estimation Model	Probability	Normality
HGT	ARIMA (2,0,0) without constant	0.814155	Yes
	ARIMA (0,0,2) with constant	0.406303	Yes
	ARIMA (0,0,2) without constant	0.485126	Yes
OGC	ARIMA (0,1,1) with constant	0.000000	No
	ARIMA (1,1,1) without constant	0.000000	No
BTC	ARIMA (5,1,0) without constant	0.505021	Yes
	ARIMA (0,1,5) without constant	0.601699	Yes
IHSG	ARIMA (6,0,6) with constant	0.191741	Yes
	ARIMA (6,0,6) without constant	0.937753	Yes

Source: Eviews data processing

Based on the table above, it can be observed that only the ARIMA models for OneGram (OGC) fail to meet the residual normality assumption. This is evident from their probability values being less than 5%. Therefore, the ARIMA model for OGC is considered the worst among the models in terms of residual normality.

d. Autocorrelation Test

Next, an autocorrelation test is conducted on the model. A time series model is considered good if the model's residuals are random (white noise). If not, the model contains autocorrelation. To determine whether the model contains autocorrelation, an autocorrelation test is performed, such as the Ljung-Box (LB) test, by observing whether the ACF and PACF coefficients are significant or not.

Based on the results of the autocorrelation test on the ARIMA models using EViews, there are several models that are not white noise or contain autocorrelation. These models include ARIMA (0,1,1) without a constant for OneGram (OGC), ARIMA (5,1,0) without a constant, and ARIMA (0,1,5) without a constant for Bitcoin (BTC), as well as ARIMA (6,0,6) without a constant for IHSG.

Of all the models that are not white noise, the ARIMA model for Bitcoin (BTC) can be considered the worst because none of them exhibit white noise, meaning they contain autocorrelation. However, one of the best models will still be selected for each cryptocurrency and IHSG. Next, the best ARIMA model will be selected based on the results of the tests conducted previously.

e. Selecting of the best ARIMA Model

The best ARIMA model is selected through a process of model estimation and diagnostic tests, including tests for data normality, heteroscedasticity, and autocorrelation. Based on the results of the previous tests, the best ARIMA model can be selected as follows:

Table 10. The Best ARIMA Model

Cryptocurrency/ Stock	The Best ARIMA Model
HGT	ARIMA (0,0,2) with constant
OGC	ARIMA (0,1,1) without constant
BTC	ARIMA (5,1,0) without constant
IHSG	ARIMA (6,0,6) with constant

Source: Eviews data processing

Based on Table 10, the best ARIMA models with their respective characteristics can be identified. The best ARIMA model for HelloGold (HGT) is ARIMA (0,0,2) with a constant, as it has the smallest Q-Stat value in the autocorrelation test compared to other estimated models. For OneGram (OGC), none of the estimated models are normally distributed, but the best model is still selected, which is ARIMA (0,1,1) without a constant, because it has the smallest Q-Stat value with a significant probability.

Next, the best ARIMA model for Bitcoin (BTC) is ARIMA (5,1,0). This model still contains autocorrelation because there is a Q-Stat probability that is not significant. However, it is chosen because it has the smallest Q-Stat value among the other model estimates. Finally, the best ARIMA model for IHSG is ARIMA (6,0,6) with a constant. This model is selected because all the Q-Stat probabilities are significant, even though the Q-Stat value in this model is slightly higher than in other model estimates. Below are the equations of the best ARIMA models for each cryptocurrency and IHSG. HGT ARIMA Model Equation:

$$HGT_t = 0.059592 - 0.657547e_{t-2} + e_t \quad (1)$$

OGC ARIMA Model Equation:

$$\Delta OGC_t = -0.944665e_{t-1} + e_t \quad (2)$$

BTC ARIMA Model Equation:

$$\Delta BTC_t = -0.436014\Delta BTC_{t-5} + e_t \quad (3)$$

IHSG ARIMA Model Equation:

$$IHSG_t = 0.020977 + 0.605073IHSG_{t-6} - 0.976141e_{t-6} + e_t \quad (4)$$

f. Comparison of Volatility

After undergoing a series of processes including model estimation, diagnostic testing, and the development of the best ARIMA model, the final step is to determine and compare the level of volatility. The volatility level of the model can be assessed using indicators such as the Mean Absolute Error (MAE) and the proportion of variance. These values are derived from the model's forecasting results. The higher these indicators, the greater the level of volatility.

Table 11. The Forecasting Results of The Best ARIMA Model.

Cryptocurrency/ Stock	The Best ARIMA Model	Mean Absolute Error	Proportion of Variance
HGT	ARIMA (0,0,2) with constant	0.335	0.856
OGC	ARIMA (0,1,1) without constant	0.414	0.996
BTC	ARIMA (5,1,0) without constant	0.244	0.380
IHSG	ARIMA (6,0,6) with constant	0.003	0.173

Source: Eviews data processed

Based on Table 11 above, higher MAE signifies greater average prediction errors, meaning sharia cryptocurrency prices deviate more sharply from expected trajectories. Elevated variance proportion reflects larger unexplained fluctuations in returns. Statistically, these metrics confirm that OneGram (OGC) and HelloGold (HGT) are more volatile than Bitcoin (BTC) and substantially more volatile than IHSG.

From Islamic economics, stability constitutes a normative requirement for money and financial instruments, ensuring *al-adl* (justice) and *hifz al-mal* (wealth protection) by minimizing uncompensated losses from price swings. Extreme volatility creates disproportionate risk exposure resembling *maysir* (gambling) and *gharar* (excessive uncertainty), undermining equitable exchange. Thus, despite contractual sharia compliance, the superior volatility of sharia cryptocurrencies limits their practical alignment with maqashid objectives of financial stability and justice.

These findings confirm established literature documenting cryptocurrency's extreme volatility exceeding traditional assets, as systematically demonstrated by Jati & Zulfikar³⁷ and Siswantoro et al.,³⁸ including Bitcoin's consistently higher risk profile relative to conventional equity indices. However, results challenge prevailing assumptions that gold-backed tokens inherently reduce volatility compared to speculative cryptocurrencies, as articulated by Lucero.³⁹ Specifically, OGC and HGT demonstrate empirically greater instability

³⁷ Jati and Zulfikar, "Transaksi Cryptocurrency Perspektif Hukum Ekonomi Syariah."

³⁸ Siswantoro, Handika, and Mita, "The Requirements of Cryptocurrency for Money, an Islamic View."

³⁹ Lucero, "Cryptocurrencies Regulation in the Islamic Environment: OneGram Case Study."

than Bitcoin itself, revealing a critical disconnect between theoretical design expectations and actual market performance.⁴⁰

This discrepancy may stem from low liquidity and limited market adoption of sharia tokens, amplifying price sensitivity to small trades, factors less pronounced in Bitcoin's mature market. Unlike stablecoin studies showing reduced volatility through fiat reserves, gold-backing alone appears insufficient without broader market infrastructure.

Although OGC and HGT fulfill most sharia contractual criteria, their higher empirical volatility reveals a critical disconnect between normative design and market performance. From a *maqashid* perspective:

- 1) *Hifz al-mal* (wealth preservation). Unpredictable price swings expose users to substantial capital erosion risk, contradicting Islamic finance's protective mandate.
- 2) *Al-adl* (justice). Extreme volatility enables wealth transfers through speculation rather than productive exchange, violating equitable transaction principles.
- 3) Systemic stability. Without regulatory frameworks and sufficient market depth, sharia cryptocurrencies risk contributing to financial instability rather than mitigating it.

Thus, achieving *maqashid* compliance requires not only contractual innovation but also market-level stability through enhanced liquidity, regulation, and profit-sharing models (*mudharabah/musyarakah*).

CONCLUSION

This study concludes that while OneGram Coin (OGC) and GOLDX fulfill several fundamental sharia principles, such as being backed by tangible assets, avoiding *maysir*, *gharar*, and *riba*, involving sharia supervisory oversight, and allocating funds for *tabarru'*, they exhibit higher volatility compared to both Bitcoin and the Indonesia Stock Exchange Composite Index (IHSG). This high level of fluctuation challenges their effectiveness as stable mediums of exchange, which is a critical requirement for any currency from both economic and sharia perspectives. Although the asset-backing and philanthropic components position these cryptocurrencies closer to Islamic ethical standards, their financial performance currently undermines their functional utility in real-world economic transactions. Moreover, the absence of official regulatory frameworks and the lack of sharia-based investment structures such as *mudharabah* or *musyarakah* further weaken their potential to operate as credible, sharia-compliant financial instruments. Therefore, the study highlights the urgent need for developers and regulators to work together in creating more robust, regulated, and sharia-aligned cryptocurrency systems. This includes not

⁴⁰ Abdeldayem, Al Dulaimi, and Al Dulaimi, "A Qualitative Approach to Evaluate the Reconciliation of GOLDX and OneGram in Islamic Finance."

only improving stability and governance but also ensuring alignment with the broader goals of *maqashid sharia*. For future research, it is recommended to explore Sharia-based profit-sharing schemes such as *mudharabah* or *musyarakah* in cryptocurrencies and to develop regulatory frameworks that can enhance the stability and acceptance of Sharia-compliant cryptocurrencies. Additional research should also focus on technological innovations in blockchain that can reduce volatility and improve security in Sharia-compliant cryptocurrency transactions.

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