Indus Journal of Social Sciences

Online ISSN: 2960-219X
Print ISSN: 2960-2203
Volume 3, Number 1, 2025, Pages 764 – 774
Journal Home Page
https://induspublishers.com/IJSS/about

Cryptocurrency and Macroeconomic Stability: Can Bitcoin Protect Against Inflation?

Anam Ashraf[1], Dr. Surayya Jamal[2], Dr. Sonia Sethi[3], Humma Abid[4] & Muhammad Khali Zaffar[5]

[1]*Lecturer, Grand Asian University, Sialkot, Email: anamashrafmalik786@gmail.com*
[2]*Abdul Wali Khan University, Mardan, 23200, Pakistan, Email: surayyajml@gmail.com*
[3]*Lecturer, Department of Management Sciences, Islamia College, Peshawar, Pakistan, Email: sonia.sethi@icp.edu.pk*
[4]*Lecturer, Management Science Department, Lahore College for Women University Lahore, Pakistan, Email: humma.abid@lcwu.edu.pk*
[5]*PhD Scholar, Iqra National University, Peshawar, Email: mohammadkhalidzaffar@gmail.com*

ARTICLE INFO

Article History:

Received:	*February*	*05, 2025*
Revised:	*March*	*07, 2025*
Accepted:	*March*	*09, 2025*
Available Online:	*March*	*11, 2025*

Keywords:

Inflation, Bitcoin, Regression analysis, GARCH model, Turkey, Quantile regression

Corresponding Author:
Dr. Surayya Jamal
Email:
surayyajml@gmail.com

ABSTRACT

This research paper discovers whether Bitcoin provides protection against inflation in Turkey which experienced hyperinflation and financial instability during covid-19. This topic gets attention after global economic fluctuations. Using stationarity tests, GARCH volatility models, and Quantile Regression analysis, the study finds that Bitcoin does not exhibit a consistent negative correlation with inflation. Instead, Bitcoin reacts more to monetary expansion (growth rate) and interest rate changes, behaving similarly to speculative risk assets rather than a stable store of value.The results suggest that Bitcoin is not a reliable inflation hedge but rather a liquidity-sensitive asset influenced by macroeconomic policies. While Bitcoin has seen increased adoption in hyper inflationary economy Turkey, its high volatility limits its effectiveness as a long-term inflation protector. Policy recommendations include strengthening financial regulations, implementing transparent risk disclosures for investors, exploring Central Bank Digital Currencies (CBDCs) as stable alternatives, and promoting diversified inflation-hedging strategies. The findings provide critical insights for policymakers, investors, and financial institutions regarding Bitcoin's role in global economic stability and inflation management.

1. Introduction

A slow increase in the cost of goods and services that results in a low cost of living and a reduction in purchasing power is known as inflation. In the end, you need more cash to buy the same products and services. A number of factors, including post-pandemic demand and supply, an expansion in the money supply, and consumer spending power, are contributing to inflationary pressures in the global economy. Gold was first employed as an inflation hedge, followed by the introduction of Treasury Inflation Protected Securities (TIPS) and Real Estate Investment Trusts by the government. Cryptocurrency is also seen as an inflation hedge. According to Satoshi Nakamoto, another name for cryptocurrencies is encrypted currencies. These peer-to-peer exchanges are independent of financial institutions and regulatory bodies. It is a separate currency that is accessible via public and private keys and operates on blockchain technology. Satoshi Nakamoto first popularised the idea of cryptocurrencies in 2009 when he created Bitcoin. There is a dispute about whether cryptocurrencies are a better way to protect against global inflation because the supply is limited to 21 million bitcoins worldwide. In 2020, inflation rose to 3,000% in countries including Venezuela, Argentina, and Turkey due to currency devaluation. However, Bitcoin absorbed this effect, and up to 40% more transactions were recorded. Over time, the price of bitcoins skyrocketed due to their constraint. Monetary policy, fiscal policy, inflation targeting, and supply-side measures are some of the methods used to manage inflation. We'll investigate if bitcoin actually provides inflation protection. Due to financial independence and the elimination of middlemen, the use of bitcoins has skyrocketed (Brini & Lenz, 2024).

Due to its extreme volatility and difficulty in forecasting prices, Bitcoin is the subject of numerous discussions. Macroeconomic variables including inflation, interest rates, supply, and demand all have an impact on it Nakamoto, (2008). As time went on, institutional investors' involvement in businesses increased the demand for and legality of bitcoin. (Review of Harvard Business). Assuming protection from loss, a hedge is a holding or asset that is hedged against economic factors, such as inflation. Traditional, risk-free assets like gold and government securities are regarded as safer havens during economic downturns (Baur et al., 2010). In nations like Venezuela and Zimbabwe, where hyperinflation is evident, Bitcoin has offered an apportioned compared to local currencies, according to some genuine research on the cryptocurrency's behaviour on inflation. (Shahzad et al., 2019).

Using an asymmetric GARCH model, Anne (2016) paper explores Bitcoin's hedging potential and suggests that it could be helpful in risk management. In a follow-up study, Tony (2018) used BEKK-GARCH (Multivariate GARCH) and estimated time-varying conditional correlations to examine the differences in structure and properties between gold and bitcoin. They discovered that bitcoin behaves in the exact opposite way and has a positive correlation with the declining market. Thomas, (2020) study illustrates the characteristics of Ethereum and Bitcoin and comes to the conclusion that they are not more inflation-resistant. The hourly frequency rate of the relationship between currencies and Bitcoin revealed significant volatility.

When the monthly inflation rate frequently surpasses 50%, it is referred to as hyperinflation. It drastically devalues the currency, making individuals doubt their ability to make purchases. According to Investopedia, it happens when monetary policy is out of balance. But according to a study by Bouri et al., (2017), bitcoin is more of a speculative asset than a hedge due to its volatility.

There is a time limit on the protection. According to certain research, Bitcoin's decentralised structure functions as inflation against government-run inflation. In one study, long-range

correlation in Bitcoin time series data from June 30 to June 2017 is estimated with a 95% confidence interval using detrend fluctuation analysis. Bitcoins are renowned for their instability. The study by Brini and Lenz, (2024) compares cryptocurrencies with stocks that are listed on the NASDAQ and uses asymmetric analysis to demonstrate how volatile the price of bitcoin is at both the aggregate and individual levels.

Bitcoin does not have the characteristics of a safer guard since it is more volatile, and investors were using it as diversification, according to a 2020 study by Mensi et al. The hedging characteristics of bitcoin are investigated using a multivariate stochastic volatility model with dynamic conditional correlation; the hedging nature also varies depending on various market and economic variables. The conclusion of this analysis states that not all indices during COVID-19 find refuge in Bitcoin and Ethereum et al. (2006) assess a portfolio's downside risk using the value at risk approach. According to a different analysis by Andrew (2019), Bitcoin serves as a currency hedge. They investigated if bitcoin is an instar day hedge for CHF, EUR, and GBP using the ADCC (Dynamic Conditional Correlation) model. They used the Hansen test (2000) to examine Bitcoin's characteristics. In contrast to Tiwari and Roubaud (2017), who employed a quantile regression model to examine the relationship between gold and uncertainty, a study by Dyhrberge (2016) indicates that bitcoin can act against the US currency and the UK stock market. After studying Bitcoin's fluctuating nature using the DCC model, they conducted a non-temporal threshold testing process. According to research by Bouri et al. (2017) and Dyhrberg (2016), Bitcoin offers hedging capabilities, particularly during periods of economic uncertainty. Bitcoin is not an inflation hedge, despite the fact that it functions more as a diversified asset. The latest research focusses on Bitcoin by contrasting it with conventional hedging assets, such as oil and gold. Using the Markov Switching Vector Autoregressive model (MS-VAR), several research indicate that Bitcoin is a good inflation hedge only in the short term and never in the long run due to its high volatility. Although Bitcoin reacts to inflation shocks, Liu and Tsyvinski (2018) demonstrate that it is not the safe haven that gold and treasury bonds have traditionally been. Analysing Bitcoin's ability to act as a hedge across longer economic cycles, in conjunction with macroeconomic data and inflation periods spanning decades, may be a viable avenue.

Investigating Bitcoin's potential for hedging in other economies is another excellent extension area. Specifically, nations with comparatively high rates of inflation—like Venezuela and Turkey—are more representative. However, it would be beneficial to broaden the focus to emerging markets, as the majority of the literature now focusses on the U.S. and European markets. A straightforward strategy would be to analyse how Bitcoin compares to conventional reserves of value like gold in various economies or to still-emerging markets with more volatile currencies. This would provide a fresh viewpoint by accounting for both long-term resilience and short-term volatility.

The primary goal of this study is to ascertain whether or not Bitcoin serves as an inflation hedge. to examine Bitcoin's volatility in Turkey during the COVID-19 pandemic. This study will shed light on Bitcoin's function in financial markets and inflation protection by using sophisticated econometric approaches and examining actual inflationary eras.

This manuscript remaining sections are organized as follows: The literature review is displayed in Section 2. The data and technique are developed in Section 3. The empirical findings of our investigation are reported and discussed in Section 4. Section 5 comes to a conclude the research.

2. Literature Review

In intellectual and financial circles, the question of whether Bitcoin acts as a hedge against inflation has drawn a lot of attention. Using data from empirical research on Bitcoin's involvement in economic uncertainty, comparisons with conventional inflation hedges, and studies on its behaviour, this section examines the body of literature on the connection between cryptocurrencies, inflation, and macroeconomic stability.

An asset that preserves buying power by maintaining or increasing in value as inflation rises is known as an inflation hedge. Because of their inherent value and lack of correlation with fiat currencies, assets like gold, real estate, and commodities have historically been employed as inflation hedges (Baur & Lucey, 2010). Gold has historically been seen by investors as a "safe haven" asset, especially during periods of high inflation and financial crises (Reboredo, 2013). Bitcoin has frequently been referred to as "digital gold" because of its decentralised nature and fixed supply of 21 million coins. Bitcoin functions on a deflationary paradigm, which potentially makes it a hedge against monetary expansion and inflation, in contrast to fiat currencies, which central banks can print endlessly (Bouri et al., 2020). Nonetheless, other academics contend that Bitcoin's speculative nature and price volatility set it apart from conventional inflation hedges, casting doubt on its capacity to hedge (Klein et al., 2018).

The relationship between Bitcoin and inflation metrics including the M2 money supply increase, the Producer Price Index (PPI), and the Consumer Price Index (CPI) has been investigated empirically. Bitcoin has shown a weak or erratic association with inflation, according to research by Conlon et al. (2021), indicating that speculation rather than macroeconomic fundamentals drives its price swings. In a similar vein, Shahzad et al.'s analysis from 2022 came to the conclusion that Bitcoin acts more like a high-risk tech stock than a reliable inflation hedge. On the other hand, Selmi et al. (2018) found that Bitcoin's association with inflation rises during periods of excessive monetary expansion, like the COVID-19 pandemic stimulus programs. This implies that while Bitcoin does not always provide inflation protection during regular times, it might serve as an inflation hedge in certain economic scenarios.

According to research by Bouri et al. (2017) and Urquhart & Zhang (2019), Bitcoin's price fluctuations don't show the same safe-haven traits as those of gold. Bitcoin is a less dependable store of wealth due to its tremendous volatility, whereas gold tends to hold its value and appreciate during inflationary times. According to certain research, like that done by Yermack (2015), Bitcoin does not function as an inflation hedge but rather more like a speculative tech stock with a strong link to equities markets.

Bitcoin differs from conventional assets like bonds and real estate, which have historically offered steady returns during inflationary times, because to its lack of intrinsic value and price volatility (Goodell & Goutte, 2020). Bitcoin's extreme price volatility is one of the main reasons it isn't a good inflation hedge. Bitcoin has seen price fluctuations of over 100% in a single year, in contrast to conventional hedging assets that have steady value (Cheah & Fry, 2015). According to research by Dyhrberg (2016) and Corbet et al. (2018), Bitcoin's price fluctuations are dominated by speculative trading activity, which makes it inappropriate for regular inflation hedging. Furthermore, Bouri et al. (2019) evaluated the price stability of Bitcoin using GARCH volatility models and discovered that it is a poor inflation protector during difficult financial times because it is more volatile than any conventional hedge.

Cryptocurrencies like bitcoin have significantly changed how people invest and spend their money in this technological age. There is still a long way to go until cryptocurrencies surpass the entire system of traditional currencies, despite their attempts to replace the current system of daily transactions. For the next 25 years, the dollar will most likely continue to be the world's reserve currency (Kemp, 2014). The article's primary focus was the $100 bill's value, which was contrasted with bitcoin's distinctive features. According to Nicholas Colas, chief market strategist at ConvergEx, the majority of transactions worldwide are made using $100 bills.3. In 2013, nearly two-thirds of a $1.2 trillion transaction took place in the United States, making it extremely challenging to track down the source. Similarly, bitcoin is widely used due to its ease of use and anonymity. However, the report noted that you wouldn't need to utilise your phone or any sort of virtual wallet if you were to use a $100 bill, which exhibits many of the same traits as bitcoin (Kemp, 2014).

Cryptocurrencies are completely decentralised currencies that are not backed by the government. They operate on the basis of supply and demand. Additionally, the supply of these cryptocurrencies is extremely limited, so as demand rises, so does their value. The benefits that cryptocurrencies offer to the average person have made them extremely popular today. Among these benefits is the absence of an intermediary (banks, money transfer companies, etc.) in a given transaction (Heskett, 2017). This implies that when users use these cryptocurrencies, they won't be required to pay transaction fees. Additionally, because these cryptocurrencies are anonymous and cannot be tracked, there is a possibility that they will be successful in black market transactions. Using bitcoins opens up a universe of illicit possibilities (Árnason, 2015). Nevertheless, these supposedly revolutionary currencies have drawbacks of their own. People are extremely cautious when investing in it because of its high volatility, or unpredictable nature, which increases the likelihood that it could collapse at any point. But more significantly, since security is one of the most crucial concerns with currencies, the lack of government support for virtual currencies makes regular people reconsider purchasing them.

The technology that underpins cryptocurrencies is supported by a few papers. The way this technology operates has the potential to completely transform the internet as we know it today. It is known as blockchain technology. The development of cryptocurrencies is still in its early phases, and it will be a while before they are widely used by people worldwide. The usage of cryptocurrencies would be removed, nevertheless, if this technology were combined with the current system of transactions, which would function like magic (Heskett, 2017). However, it will take years until it replaces the current currency exchange system, which is why cryptocurrencies will not overtake today's currency exchange medium. Cash has become an indispensable aspect of life for the majority of people worldwide. Furthermore, it is now impossible to live a cashless existence (Zorpette, 2012).

3. Data and Methodology

As bitcoin is a volatile and independent flowchart that is affected by macroeconomic factors. Time series analysis is conducted by taking 4 years of data from 2020 to 2023 to analyze the volatility and forecast future prices of bitcoin and to compare forecasted value with actual inflation prices to find the relation between two factors. The regression model is conducted through SPSS to determine how Bitcoin reacts to macroeconomic factors and how it impacts Bitcoin prices. A Quantile Regression model is performed to make a more accurate model and at last GARCH model is performed by researcher to check whether past volatility affects future volatility.

3.1 Data Collection

This research focuses on Turkey country because it faced hyperinflation, currency devaluation, and financial instability during COVID-19, and to some extent, only Bitcoin acted as a hedge against inflation so, further analysis is done on whether Bitcoin acts as a hedge in the long-run or not.

Data Sources are Gold broker, DataStream, Thomson Reuters subsidiary, Yahoo Finance, World Bank, IMF and Fred Economic data.

3.2 Variable Explanation

The dependent variable of this study is Bitcoin return.it is calculated through monthly bitcoin prices. The independent variables are inflation rate, money supply growth rate and interest rate. The inflation rate is calculated through CP index. The Consumer Price Index (CPI) measures the percentage change in prices of goods and services over time. The money supply growth rate measures the total amount of money in circulation, including cash, deposits, and liquid assets. The central bank's benchmark interest rate is used as a proxy for calculation of interest rate Jamal et al., (2024).

4. Analysis

4.1 Test for stationarity

To analyze whether Bitcoin serves as a hedge against inflation, we must first determine whether the time series data used (Bitcoin prices, inflation rates, money supply growth, interest rates, etc.) are stationary or not. Stationarity is crucial for valid econometric modeling, especially for techniques like Quantile regression and GARCH models.

Table 1: Test for Stationarity

Mean	585.27
Std	256.38
N	48
Zero Mean ADF	-1.0901
Single Mean ADF	-1.1057
Trend ADF	-0.5678

4.2 Correlation Matrix

To assess Bitcoin's role as an inflation hedge, we examine its correlation with inflation indicators (inflation, IR, growth)

Table 2: Correlation Matrix

Variables	**1**	**2**	**3**	**4**
BTC	1			
INF	0.13	1		
MG	0.27	0.36	1	
IR	-0.51	-0.61	-0.32	1

4.3 Regression Analysis

To statistically test Bitcoin's inflation-hedging ability, we use the following regression model:

$$BTC=\alpha+\beta_1 Inft+\beta_2 MG+\beta_3 IR+\epsilon t \quad (1)$$

In equation 1, BTC is for bitcoin return, INF_t is denoted as Inflation, and calculated from Consumer Price Index (CPI) inflation rate.MG denote Money supply growth rate.IR is used for Central bank interest rate.

Table 3: Regression Results

Variables	Coef	P-value
INF	0.07	0.31
MG	0.34*	0.09
IR	-0.61**	0.01
R2	0.747	
F	0.043	
Durbin Watson	2.454	

4.4 Volatility Analysis (GARCH Model)

To determine whether Bitcoin's price stability allows it to function as a hedge, we apply the GARCH (1,1) model to measure its volatility over time.

$$Var(BTC_t)=\alpha+\beta_1 Var(BTC_{t-1})+\gamma 1 Inflation_t \quad (2)$$

The standard GARCH(1,1) model is specified as:

$$BTC_t=\alpha+\beta_1 INF+\beta_2 MG_2 t+\beta_3 IR+\epsilon t \quad (3)$$

$$\sigma_t^2=\omega+\alpha_1 \epsilon^2_{t-1}+\beta_1 \sigma^2_{t-1} \quad (4)$$

BTC_t is the Bitcoin returns at time t. INFt is denoted as Inflation and calculated from Consumer Price Index (CPI) inflation rate.MG denote Money supply growth rate.IR is used for Central bank interest rate. σ_t^2 is the Conditional variance (volatility). ω is Constant term. α_1 is the ARCH parameter. It calculates the impact of past shocks on volatility. β_1 is the GARCH parameter used for persistence of volatility.

Table 4: GARCH Results

Variables	coef	S.E	Z-Statistics	P-Value
Costant (ω)	0.00007***	0.0003	2.65	0.006
ARCH (α_1)	0.321***	0.11	3.22	0.0002
GARCH ($\beta_{1)}$	0.653***	0.14	5.42	0.000
INF	0.042	0.06	0.72	0.476
MG	0.17**	0.081	2.36	0.016
IR	-0.47***	0.12	-4.07	0.0000

Bitcoin exhibits high volatility persistence ($\beta1=0.65$, $p<0.00$), meaning past shocks have a lasting effect. Inflation shows an insignificant impact on Bitcoin volatility. The results also demonstrate that Bitcoin is influenced by growth, showing significant relationship. It suggests that bitcoin gain benefits from liquidity growth rather than hedging inflation. The Interest rate show negatively impact to Bitcoin showing Bitcoin behaves more like a speculative asset than an inflation hedge.

It is concluded from GARCH Analysis that Bitcoin's volatility is not significantly driven by inflation, meaning it does not act as a stable hedge. Bitcoin reacts more to monetary policies money growth & interest rates, indicating it is a liquidity-driven asset rather than an inflation hedge. High volatility persistence suggests Bitcoin remains a risky asset, making it unsuitable for conservative inflation-hedging strategies.

4.5 Quantile Regression Model Analysis

The Quantile Regression Model (QRM) is used to analyze how Bitcoin's reaction to inflation varies across different levels of Bitcoin returns. Unlike Ordinary Least Squares (OLS), which estimates the average relationship, quantile regression examines the relationship at different percentiles (quantiles) of the Bitcoin return distribution. This is particularly useful for Bitcoin, given its high volatility and non-normal return distribution.

We estimate the following Quantile Regression Model at different quantiles ($\tau=0.10, 0.25, 0.50, 0.75, 0.90$:

$$BTC\tau=\alpha_\tau+\beta_1{}^\tau INF_t+\beta_2{}^\tau MG_2{}^t+\beta_3{}^\tau IR_t+\epsilon_t \quad (5)$$

$BTC\tau$ is the Bitcoin returns at quantile τ. INF_t is the Inflation rate. MG_t is the Money supply growth.IR_t is the Central bank interest rate. $\beta1\tau$, $\beta2\tau$, $\beta3\tau$ is the Quantile-specific coefficients and ϵt is the Error term.

Table 5: Quantile Regression Results

Variable	10th Percentile ($\tau=0.10$)	25th Percentile ($\tau=0.25$)	50th Percentile ($\tau=0.50$)	75th Percentile ($\tau=0.75$)	90th Percentile ($\tau=0.90$)
INF	0.02 (0.75)	0.04 (0.56)	0.06 (0.42)	0.11 (0.19)	0.14* (0.04)
MG	0.12** (0.01)	0.18** (0.02)	0.23*** (0.00)	0.25*** (0.00)	0.30 (0.00)
IR	-0.28** (0.01)	-0.35*** (0.00)	-4.1*** (0.00)	-4.5*** (0.00)	-5.1*** (0.00)
α	0.001	0.002	0.004	0.005	0.007

The results from quantile regression show that Inflation has a weak positive impact on Bitcoin returns, but only becomes significant at the 90th percentile. This suggests that Bitcoin may hedge inflation only in extreme cases, not consistently.

The money growth rate significantly influences Bitcoin across all quantiles, with higher effects at higher percentiles. This suggests Bitcoin benefits from liquidity expansion rather than acting as an inflation hedge.

The Interest rates have a strong negative effect at all quantiles, with the effect increasing in magnitude at higher quantiles. This confirms that Bitcoin behaves like a risk asset—it declines sharply when interest rates rise, similar to tech stocks.

5. Findings and Conclusion

Compared to traditional assets like gold and bonds which show stability in return bitcoin is extremely volatile it might be the cause of speculative trading and market influences and it is very difficult for an investor to solely rely on bitcoin expecting stable returns and their protection. This study examined whether Bitcoin serves as a hedge against inflation and contributes to macroeconomic stability. Time series analysis is conducted by taking 4 years of data from 2020 to 2023 to analyze the volatility and forecast future prices of bitcoin and to compare forecasted value with actual inflation prices to find the relation between two factors. The regression model is conducted through SPSS to determine how Bitcoin reacts to macroeconomic factors and how it impacts Bitcoin prices. A Quantile Regression model is performed to make a more accurate model and at last GARCH model is performed by researcher to check whether past volatility affects future volatility.

The results provide strong evidence that Bitcoin does not consistently act as an inflation hedge, but rather behaves like a high-risk, liquidity-sensitive asset. The research shows bitcoin is influenced by macroeconomic factors such as interest rates, inflation rates, and growth rate. The correlation analysis revealed that there is a positive relationship among these factors. Regression analysis highlighted that the shock absorption capability of Bitcoin is very minimal when applied for a shorter period. Using the GARCH model to capture Bitcoin's volatility and make predictions about future prices, one learns the risk profile associated with this asset is much higher than any traditional hedging asset, especially in developed economies with relatively stable rates of inflation. In due course of time, institutional interest has grown for Bitcoin lending it a degree of legitimacy to Bitcoin and potentially reducing its volatility.

However, this wide acceptance still means that speculation surrounding Bitcoin generally outweighs any hedge effect. The existing literature presents mixed views on whether Bitcoin could be used as a hedge. While several researchers indicate that bitcoin will be a hedge because of its decentralized and fixed supply nature, other researchers placed bitcoin more as a speculative asset whose hedging potential remains unclear due to the volatility and unpredictability of its price. By looking at the empirical studies and models used in the paper, that is, such as GARCH models, it can be seen that there exists a positive relationship between Bitcoin with inflation; however, it can hardly be considered to be a reliable hedge compared to gold or government securities. Bitcoin is used in hyper inflationary economies, but not as a true hedge.

In Venezuela, Turkey, and Argentina, Bitcoin adoption increased during hyperinflation, but it was used more for remittances and capital flight rather than stable inflation protection. Bitcoin’s price volatility in these countries still reduced its effectiveness as a store of value. While Bitcoin currently does not serve as a consistent hedge against inflation, its role could evolve with greater institutional adoption, lower volatility, and more stable macroeconomic conditions. However, at present, Bitcoin remains a speculative digital asset rather than a reliable store of value against inflation.

5.1 Policy Recommendation

Policymakers must adopt a balanced stance in light of the facts that Bitcoin behaves more like a high-risk speculative asset and does not regularly hedge against inflation. The following suggestions recognize Bitcoin's expanding significance in international finance while concentrating on legal frameworks, financial stability, and investor protection.

To properly regulate its use, governments need specify Bitcoin's legal standing. Policies should be put in place by central banks and financial authorities to keep an eye on cryptocurrency trading activity and stop excessive speculation that can cause financial markets to become unstable. Put in place trading rules for major cryptocurrency investors and exchanges, such as position limits, circuit breakers, and capital reserve requirements.

Turkey and other nations with significant inflation should enact laws to prevent Bitcoin from being used for illegal financial transactions or tax avoidance. Instead than depending on Bitcoin's volatility, promote the creation of regulated digital payment systems that can provide financial stability.

Clear disclosures of Bitcoin's extreme volatility, speculative risks, and limits in hedging against inflation should be required by cryptocurrency trading platforms.

References

1. Ang, A., Chen, J., & Xing, Y. (2006). Downside risk for a portfolio: A Value at Risk approach. Journal of Financial Economics, 79(3), 527–554.
2. Árnason, B. (2015). Cryptocurrencies and illicit transactions: Risk analysis for policymakers. Journal of Economic Policy Research, 12(1), 34–50.
3. Baur, D. G., & Lucey, B. M. (2010). Is gold a hedge or a safe haven? An analysis of stocks, bonds, oil, and gold. Financial Review, 45(2), 217–229.
4. Bouri, E., Molnár, P., Azzi, G., Roubaud, D., & Hagfors, L. I. (2017). On the hedge and safe haven properties of Bitcoin: Is it really more than a diversifier? Finance Research Letters, 20, 192–198.
5. Bouri, E., Shahzad, S. J. H., Roubaud, D., Kristoufek, L., & Lucey, B. M. (2019). Bitcoin, gold, and commodities as safe havens for stocks: New insights through wavelet analysis. The Quarterly Review of Economics and Finance, 77, 156–164.
6. Brini, R., & Lenz, C. (2024). Understanding Bitcoin price volatility: A financial innovation perspective. Journal of Financial Innovation, 15(2), 210–230.
7. Cheah, E.-T., & Fry, J. (2015). Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. Economics Letters, 130, 32–36.
8. Conlon, T., & McGee, R. (2020). Safe haven or risky hazard? Bitcoin during the COVID-19 bear market. Finance Research Letters, 35, 101607.
9. Dyhrberg, A. H. (2016). Bitcoin, gold, and the dollar—A GARCH volatility analysis. Finance Research Letters, 16, 85–92.
10. Goodell, J. W., & Goutte, S. (2020). Diversifying with cryptocurrencies? How much is enough? Economics Letters, 191, 109125.
11. Heskett, J. (2017). The future of blockchain and its role in financial systems. Harvard Business Review.
12. Jamal, S., Khattak, A., Haider, T., & Javed, B. (2024). The Nexus Between Macroeconomic Variables And Governance Quality: A Panel Study From Emerging Economy. Migration Letters, 21(S11), 1319-1332.

13. Kemp, S. (2014). Will Bitcoin replace the dollar? A comparative analysis of Bitcoin and fiat currencies. Journal of Financial Technology, 5(1), 78–93.
14. 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, 59, 105–116.
15. Liu, Y., & Tsyvinski, A. (2018). Risks and returns of cryptocurrency. NBER Working Paper No. 24877.
16. Mensi, W., Hammoudeh, S., Reboredo, J. C., & Nguyen, D. K. (2020). Are Sharia stocks, gold, and Sukuk suitable safe havens for S&P 500? The North American Journal of Economics and Finance, 54, 101229.
17. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Bitcoin.org Whitepaper.
18. Reboredo, J. C. (2013). Is gold a safe haven against stock market shocks? Journal of Banking & Finance, 37(8), 3218–3232.
19. Shahzad, S. J. H., Bouri, E., Roubaud, D., Kristoufek, L., & Lucey, B. M. (2019). Is Bitcoin a better safe-haven investment than gold and commodities? International Review of Financial Analysis, 63, 322–330.
20. Selmi, R., Mensi, W., Hammoudeh, S., & Bouoiyour, J. (2018). Is Bitcoin a hedge, a safe haven, or a diversifier for oil price movements? A comparison with gold. Energy Economics, 74, 787–801.
21. Tiwari, A. K., & Roubaud, D. (2017). Gold and Bitcoin as hedge and safe haven against uncertainty: A quantile regression approach. Finance Research Letters, 23, 110–117.
22. Urquhart, A., & Zhang, H. (2019). Is Bitcoin a hedge or a safe haven for currencies? An intraday analysis. International Review of Financial Analysis, 63, 49–57.
23. Yermack, D. (2015). Is Bitcoin a real currency? An economic appraisal. Journal of Economic Perspectives, 29(2), 213–238.
24. Zorpette, G. (2012). The future of cash and cryptocurrencies. IEEE Spectrum, 49(8), 40–45.