

## Technical Paper

# Bitcoin as International Currency: Review of Possibility

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**Received:** Sep 10, 2024; **Revised:** Oct 10, 2024; **Accepted:** Oct 13, 2024; **Published:** Oct 30, 2024

**Abstract:** Bitcoin is used for cross-border payments and remittances as it eliminates intermediaries. Bitcoin can be used by people who cannot access mature banking systems and empowers individuals in developing countries with its decentralized properties. Bitcoin also can be used against inflation and currency devaluation owing to its fixed supply owing to its decentralization that mitigates risks associated with centralized financial systems. Bitcoin can replace an international currency when its problems such as solve volatility, scalability issues, regulatory uncertainty, security risks, and lack of acceptance are solved. As solutions, algorithms and smart contracts, collateralization, regulatory frameworks, and policies and market interventions are required as they can be used to adjust Bitcoin's supply and improve liquidity. Lightning Network can be used to provide appropriate transactions. With such solutions, Bitcoin can be used as an international currency. Advantages to using Bitcoin help global society mitigate diverse divides in the global economy.

**Keywords:** Bitcoin, Cryptocurrency, Currency, Central Bank, Economy

## 1. Introduction

A national currency is issued by a country's central bank or monetary authority. It is the primary medium of exchange with a value recognized and agreed upon in a society for the purchase of goods and services and trade and commerce within the country and with other countries. Central banks of countries formulate monetary policies to control the amount of currency to manage inflation, interest rates, and the economy of the country (Bamigbola, 2024). The concept of the currency has changed in different periods of history. In ancient times, people exchanged goods and services, which was inefficient as there must be a coincidence of mutual wants. The earliest coins appeared in the history of China around 640 BC, which were the first standardized currency. Then, paper money was preferred to coins as people needed convenient and portable forms of currency. Recently, digital forms of currency have emerged (Andrew, 2024). Cryptocurrencies such as Bitcoin have been created and used for the following purposes: medium of exchange, investment, remittances, decentralized finance (DeFi), Smart Contracts, Tokenization, Supply Chain Management, Voting, Gaming and Virtual Goods, and Donations (Investopia, 2024; Nambiapurath, 2023; Crooks, 2023).

In managing national currencies, challenges are arising related to inflation due to the excessive supply of money, depreciation due to a weak currency, exchange rates that cause market distortions, and the loss of control due to the preference for foreign currencies or cryptocurrencies (Troy, 2021). According to the policies of central banks or monetary authorities, upvaluation and devaluation can occur. Upvaluation causes imported goods to be cheaper and reduces inflation but can undermine export competitiveness, while devaluation boosts exports but increases import costs and causes inflation, respectively. Sometimes, a government introduces a new currency to ensure public trust and manage the transition (Bamigbola, 2024).

To overcome the challenges of the traditional national currency, cryptocurrency was invented pursuing DeFi. Cryptocurrency is a digital and virtual currency using cryptography for security. Different from traditional currencies, cryptocurrencies are used on decentralized networks based on blockchain technology. This technology ensures transparency and security by recording all transactions on a public ledger. Bitcoin is the first cryptocurrency. Since having been created in 2009, Bitcoin has been the reference for other cryptocurrencies. Especially, as the most popular and trustable cryptocurrency, Bitcoin can address such challenges as traditional national currencies.

While a failure to control the supply of national currencies can cause inflation, Bitcoin has a fixed supply of 21 million coins, which prevents inflation caused by oversupply. The scarcity of Bitcoin helps maintain its value over time (Andrew and Brian, 2022).

Bitcoin operates on a decentralized network as it is not affected by a country's economic policies. Therefore, a more stable value can be secured, especially in countries with volatile currencies (Motiz and Dusan, 2023). Weak national currencies lead to depreciation and the rise of goods imported, causing economic instability. The exchange rates of national currencies always fluctuate, which brings about market distortions. However, as Bitcoin is used for cross-border transactions without the need for currency exchange, the impact of the exchange rate on trading and markets does not exist. In addition, as Bitcoin is used in all countries, it allows for safe and trustable transactions and savings, especially in regions with unstable national currencies (Henry, 2023; Chenguel, 2024).

However, Bitcoin has been at the center of debates on its viability as a national currency. Several countries are exploring the use of Bitcoin as a national currency. However, there are significant challenges even with promising prospects. Thus, we delve into the rationale of and the counterarguments against adopting Bitcoin as a national currency. Taking the policies of central banks worldwide as examples, we explore how to soft land when using Bitcoin as a national currency, too.

## 2. Bitcoin: History, Impact, and Problems

The concept of digital currency dates back to David Chaum's DigiCash in the 1990s and Nick Szabo's Bit Gold before Bitcoin emerged in the market. However, these digital currencies did not attract public awareness (Reiff, 2024; Ledgeronomic, 2024). In 2008, Satoshi Nakamoto published a whitepaper "Bitcoin: A Peer-to-Peer Electronic Cash System" which outlined its electronic transactions. Then, the Bitcoin network was formed in January 2009, and the first block known as the genesis block was mined (Bitcoin.com, 2024; Nakamoto, 2019). Since then, Bitcoin has grown considerably in value and use.

Since its creation and use, Bitcoin has had significant impacts on the global economy. It has provided financial services to people to whom traditional banking services are not accessible as they can use Bitcoin for transactions and savings. Bitcoin has offered a new investment opportunity as investors regard Bitcoin as "digital gold" and a hedge against inflation. Traditional financial systems have been largely affected by Bitcoin's decentralized systems which have increased competition and innovation in the traditional financial industry. Thus, governments must develop new regulations to respond to various issues including money laundering, fraud, and market volatility. As blockchain technology has been the backbone of Bitcoin, diverse applications related to the technology have been developed including supply chain management, voting systems, and digital authentication since its use for Bitcoin (Radanliev, 2024). However, Bitcoin has problems such as volatility, a lack of regulation, scalability, security, and limited acceptance. Since the appearance of Bitcoin, other cryptocurrencies such as Ethereum, Ripple/XRP, Litecoin, Bitcoin Cash, Chainlink, Tether/USDT, and Polkadot have been emerged in the market. These cryptocurrencies have unique features and use cases, making them appropriate for different purposes within the blockchain ecosystem. The comparison of these cryptocurrencies is presented in Table 1.

**Table 1.** Comparison of cryptocurrencies in market (Tastycrypto, 2024; Cointelegraph, 2017; Dailycoin, 2024).

Cryptocurrency	Lauch year	Creator	Purpose	Mechanism	Supply	Market cap
Bitcoin (BTC)	2009	Satoshi Nakamoto	Decentralized digital currency	Proof of Work (PoW)	21 million BTC	Largest in the crypto market <sup>1</sup>
Ethereum (ETH)	2015	Vitalik Buterin	Smart contracts and decentralized applications (dApps)	Transitioning from Proof of Work (PoW) to Proof of Stake (PoS) with Ethereum 2.0	No fixed supply	Second largest
Ripple (XRP)	2012	Ripple Labs	Cross-border payments and remittances	Ripple Protocol Consensus Algorithm (RPCA)	100 billion XRP	Among the top cryptocurrencies
Litecoin (LTC)	2011	Charlie Lee	Peer-to-peer digital currency, often considered the "silver to Bitcoin's gold"	Proof of Work (PoW)	84 million LTC	Lower than Bitcoin but still significant
Bitcoin Cash (BCH)	2017	Forked from Bitcoin	Faster transactions and lower fees compared to Bitcoin	Proof of Work (PoW)	21 million BCH	Lower than Bitcoin
Chainlink (LINK)	2017	Sergey Nazarov	Decentralized oracle network to connect smart contracts with real-world data	Not applicable (uses oracles)	1 billion LINK	Significant but lower than Bitcoin
Tether (USDT)	2014	Tether Limited	Stablecoin pegged to the US dollar	Not applicable (centralized issuance)	Varies based on demand	Largest stablecoin
Polkadot (DOT)	2020	Dr. Gavin Wood	Interoperability between different blockchains	Nominated Proof of Stake (NPoS)	No fixed supply	Significant but lower than Bitcoin

Bitcoin does not have a fixed or stable value, meaning its price fluctuations are sometimes extreme being highly volatile. This volatility hinders Bitcoin from being a stable medium of exchange or store of value as the traditional national currency (Bauer and Dimpfl, 2021). As regulations on the use and operation of Bitcoin have not been formulated widely yet, problems related to fraud, market manipulation, and consumer protection have been occurring. A limited number of transactions per second and slower transaction times have not been solved yet, and higher fees during peak trading periods are also problems for users (Radanliev, 2024; Scharding, 2019). There are also security risks of Bitcoin as it is susceptible to hacking. As transactions using Bitcoin are irreversible, lost or stolen funds cannot be restored (Moore and Christin, 2013). Despite its growing popularity, Bitcoin is not widely accepted as a payment method compared to traditional currencies due to limits in everyday transactions and market volatility (International Trade Council, 2024; Adrian and Rhoda, 2021).

Therefore, governments of countries have varied perceptions and policies regarding Bitcoin. For example, the U.S. government has emphasized the need for responsible use of Bitcoin while addressing risks such as consumer protection, financial stability, and illicit finance. However, they regard cryptocurrencies as property for taxation. The European Union (EU) has a regulatory framework for consumer protection and prevention of illegal transactions. The Markets in Crypto-Assets (MiCA) regulation has been formulated in member states. China has a strict policy to ban cryptocurrency trading and mining to maintain their financial stability India has flexibility with proposals to ban cryptocurrencies but utilize the potential of a central bank digital currency (CBDC). El Salvador is the first country to adopt Bitcoin as a legal tender to boost financial inclusion and reduce remittance costs. They are facing criticism from the International Monetary Fund (IMF) due to their financial instability and the illicit use of cryptocurrency. Yet, most governments are not active in adopting Bitcoin as a national currency due to volatility, concern about undermining the central bank system, illicit activities such as money laundering, tax evasion, and fraud, a lack of regulations to protect users from potential scams and market manipulation, and environmental impact caused by mining Bitcoin (Slavin, 2022; Murugappan, 2023; Tobias and Weeks-Brown, 2021).

### 3. Bitcoin as International Currency

To be an international currency, the predominant use of one or more countries for cross-border transactions must be assured. When the US dollar was the world's international currency, the USA (USA) had the largest volume of international transactions. It was logical to use US dollars (USD) as the USA had the largest and most liquid financial markets in the world. The USA also had strong defense capability, which made it less vulnerable to attacks that could destabilize its economy and undermine confidence in its currency. As observed in the USA, an international currency needs to have a dominating size, stability, liquidity, and ability to protect against any harmful economic manipulation (Eichengreen, 2020).

Bitcoin can enhance financial inclusion, especially in countries that have underdeveloped banking infrastructure. With a smartphone and internet access, cryptocurrency such as Bitcoin allows people to use the financial system without a traditional bank account. In addition to this, Bitcoin transactions reduce costs for in- and cross-border payments and remittances. Owing to its decentralized nature, the risk of government interference or manipulation is reduced, which leads to a more stable and transparent financial system than the traditional banking system as it is not influenced by political situations. Bitcoin's limited supply (21 million coins) is used as a hedge against inflation. Fiat currencies can be printed ad infinitum but Bitcoin's limited supply preserves its value over time.

However, there are challenges to the adoption of Bitcoin as an international currency. As mentioned earlier in this article, volatility, scalability, regulatory issues, security concerns, and lack of widespread acceptance constrain its use as an international currency. Bitcoin's price volatility is a major barrier to its adoption as an international currency. Traditional currencies such as the USD exhibit relatively stable values over time, which is essential for the price of goods and services, contracts, and savings. On the contrary, Bitcoin has shown large fluctuations in its value. According to Yermack (2015), the high volatility of Bitcoin undermines its function as a stable medium of exchange and store of value. Scalability issues also hinder Bitcoin's ability to function as an international currency. A limited number of transactions per second can cause congestion and higher transaction fees for high demand. Such scalability challenges and the technical difficulties in increasing Bitcoin's transaction capacity are also related to security and decentralization issues (Croman et al., 2016). Governments and financial regulators have varying attitudes towards Bitcoin. This inconsistency of governments presents uncertainty and risk for businesses. The lack of a consistent regulatory framework in countries and the regulatory uncertainty caused by it is a critical hurdle to Bitcoin's global use (Zohar, 2015). Despite of decentralized nature and independence of government control and interference, Bitcoin transactions rely on the robustness of cryptographic algorithms and the integrity of the blockchain. Thus, hacking, theft, and loss of private keys are risks that can occur in using Bitcoin. Security breaches and the resulting financial losses are also observed often in the Bitcoin trading system (Moore and Christin, 2013). For Bitcoin to be used as an international currency, businesses and individuals must acknowledge and accept

it. However, despite growing interest, Bitcoin is not accepted by the majority. Without widespread acceptance, Bitcoin cannot play the role of a global medium of exchange and accounting (Baur et al., 2018).

While Bitcoin has potential and several advantages, it cannot be used as an international currency due to volatility, scalability issues, regulatory uncertainty, security risks, and lack of acceptance. These challenges demand solutions with technological, regulatory, and societal changes.

#### **4. Solutions for Problems of Bitcoin as International Currency**

It is important to find the solutions to the above-mentioned problems and assess the benefits of using Bitcoin as an international currency with those solutions. We reviewed the possible solutions for the problems as follows.

##### *4.1. Volatility*

To mitigate volatility, Bitcoin must be a stablecoin which is a cryptocurrency regarded as a stable asset. Stablecoin can be a bridge providing stability based on blockchain technology. Stablecoin minimizes volatility and makes cryptocurrencies more suitable for transactions and savings (Bullmann et al., 2019). To make Bitcoin a stablecoin, various technological, policy, and intervention strategies are required to maintain its inherent, decentralized, and secure nature. Algorithms and smart contracts need to be used to automatically adjust the supply of Bitcoin to stabilize its price. The Dai stablecoin by MakerDAO maintains stability through collateralized debt positions and autonomous feedback mechanisms. Klages-Mundt et al. (2020) developed and applied an algorithm to central banking to create stable cryptocurrencies, which showed the effectiveness of algorithmic approaches to reduce volatility. Collateralization can support a stablecoin as an asset held in reserve using fiat currencies, commodities, or a basket of cryptocurrencies. For example, Tether (USDT) is backed by USD reserves to maintain its value. Baur and Dimpfl (2021) analyzed the stability of various collateralization models, concluding that hybrid models effectively integrated the benefits of decentralization by collateral backing for stabilization. It is essential to establish regulatory frameworks for cryptocurrencies to reduce volatility. Governments and regulatory authorities must collaborate to formulate regulations for taxation, anti-money laundering, and consumer protection (Zohar, 2015). emphasizes the importance of consistent regulatory frameworks to ensure the stability and legitimacy of cryptocurrencies. Central banks can issue digital currencies (CBDCs) and integrate them with Bitcoin to provide a stabilizing anchor. Monetary policies and market interventions are also necessary to adjust the supply of Bitcoin based on demand and improve liquidity through decentralized exchanges and market makers to stabilize prices (Katsiampa, 2019; Schär, 2021).

##### *4.2. Scalability*

Scaling such as the Lightning Network can be used to increase Bitcoin's transaction capacity. These off-chain solutions allow for fast and cheap transactions by processing them off the main blockchain and providing the results on-chain (Poon and Dryja, 2016). By enhancing the blockchain technology through protocol upgrades, scalability can be increased. These upgrades are conducted by reducing transaction size and increasing transactions per block. Decker and Wattenhofer (2013) proposed a way to improve Bitcoin's blockchains for higher transaction throughput.

##### *4.3. Regulatory Uncertainty and Wider Acceptance*

To reduce uncertainty and promote wider acceptance, it is necessary to develop a standardized global regulatory framework. Such a framework must include guidelines on legal status, taxation, anti-money laundering, and consumer protection. Consistent regulation is required to innovate and ensure the compliance and security of Bitcoin (Zohar, 2015). Along with this, self-regulation must be emphasized to complement regulatory efforts. Industrial standards must be established for best practices, security, transparency, trust, and stability of the Bitcoin ecosystem (Chiu and Koepl, 2019).

##### *4.4. Security*

Security protocols and practices of the Bitcoin network must be realized to reduce vulnerabilities. Multi-signature wallets, hardware wallets, and regular security audits can be used. Users must be educated on security and best practices to prevent losses caused by human error. Campaigns on safe storage, transaction verification, and phishing prevention must be implemented (Böhme et al., 2015) to highlight the importance of user education in mitigating security risks.

To achieve wider acceptance of Bitcoin use, incentives for merchants need to be considered. Lower transaction fees, faster settlement times, and integration support must be considered in the transactions. Merchants can be incentivized for various economic and strategic benefits (Bakos and Halaburda, 2019). User experience also needs to be enhanced by providing user-friendly wallets

and intuitive interfaces. Usability can be enhanced, too for transactions using Bitcoin with easy and simple applications (Baldwin, 2018).

## 5. Conclusion

Bitcoin can significantly reduce transaction costs for cross-border payments and remittances by eliminating intermediaries. It also reduces friction in financial transactions, particularly in international payments. Bitcoin also provides people who cannot use developed banking systems with excellent financial services. Bitcoin can empower individuals in developing countries by providing a decentralized financial system. When utilized appropriately, Bitcoin can be used as a hedge against inflation and a store of value against currency devaluation owing to its fixed supply. Bitcoin's decentralization minimizes the risk of interference or manipulation of the government as a transparent financial system. There are advantages of decentralization in mitigating systemic risks associated with centralized financial systems (Barber et al., 2012).

To have such benefits when using Bitcoin as an international currency, problems such as volatility, scalability issues, regulatory uncertainty, security risks, and lack of acceptance must be solved. To mitigate Bitcoin's volatility, it must be transformed into a stablecoin with stable value. Maintaining Bitcoin's decentralized and secure nature, algorithms and smart contracts can be adjusted to stabilize the price. Collateralization can be considered to support stablecoins. Regulatory frameworks are essential to reduce volatility by integrating CBDCs with Bitcoin. Monetary policies and market interventions are necessary to adjust Bitcoin's supply and improve liquidity. To increase Bitcoin's transaction capacity, scaling solutions such as the Lightning Network can be used to provide fast and cheap transactions. Protocol upgrades can improve blockchain technology by reducing transaction size and increasing transactions per block. A standardized global regulatory framework is mandatory to reduce uncertainty and promote wider acceptance of Bitcoin. Guidelines on legal status, taxation, anti-money laundering, and consumer protection must be created along with consistent regulation for innovation and compliance. Self-regulation and industrial standards are also important. To reduce vulnerabilities, simple and easy applications including multi-signature wallets, hardware wallets, and regular security audits must be introduced. User education and campaigns on safe storage, transaction verification, and phishing prevention are required to prevent human errors.

With such efforts, it is possible to use Bitcoin as an international currency. There are advantages to using Bitcoin as an international currency, indicating that global society must endeavor to mitigate diverse divides in the global economy for mutual development.

**Author Contributions:** Conceptualization, J. Choi; methodology, M. Park and C. Moon; formal analysis, C. Moon and E. Lee; writing—original draft preparation, M. Park; writing—review and editing, Y. Cho and C. Moon;

**Funding:** This research did not receive external funding.

**Conflicts of Interest:** The authors declare no conflict of interest.

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