Journal of Information Systems Engineering and Management
2024, 9(4s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Assessing the Impact of Cryptocurrencies on Contemporary Indian and Global Financial Markets

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ARTICLE INFO

Received: 20 Oct 2024

Revised: 15 Nov 2024

Accepted: 25 Dec 2024

ABSTRACT

The rapid growth of cryptocurrencies has introduced significant shifts in global financial markets, reshaping traditional financial structures and accelerating the pace of digital financial innovation. This paper examines the multifaceted impact of cryptocurrencies on financial markets, focusing on their role in fostering decentralised finance (DeFi), the increasing adoption of blockchain-based smart contracts, and the transformation of financial services through enhanced efficiency, transparency, and accessibility. At the same time, the study analyses the challenges posed by the inherent volatility of cryptocurrency markets, highlighting the heightened risks faced by investors and the implications for institutional participation, regulatory oversight, and market stability. By exploring both the opportunities and vulnerabilities associated with digital assets, this paper provides a comprehensive evaluation of how cryptocurrencies are redefining global financial interactions and influencing the future trajectory of the financial ecosystem.

Keywords*:* Cryptocurrency; impact; financial market; global; India.

Introduction: -

Cryptocurrency has existed in the financial market for the previous decade, although its identity remains ambiguous. Nakamoto (2008) proposed the notion of cryptocurrency. The fundamental characteristics of crypto markets are contentious due to their notable similarities with other assets, like the dollar, gold, bonds, and stocks. Regardless of being a commodity or currency, it is extensively utilized as a global medium of exchange, facilitating quick payments (Bouri et al., 2019). It possesses characteristics of various commodities and has been utilized as an investment asset. It should be regarded as digital currency for the present saving trends in the financial markets. The significance of Bitcoin has escalated inside crypto markets, attracting considerable attention from scholars and researchers. The cryptocurrency marketplaces have gained global prominence (Mnif et al., 2020). Researchers are diligently examining the cryptocurrency market to assess its performance by juxtaposing it with historical data of traditional assets and analyzing the price volatility and return changes of Bitcoin and Ethereum. The comparison is crucial and relevant as it offers vital insights for comprehending and acquiring profound knowledge of the rising financial market. Bradbury (2013) characterized Bitcoin as a unique currency with special attributes that set it apart from other financial assets. The analysis involves comparing the return disparities between cryptocurrencies (Bitcoin and Ethereum) and other financial assets. Cryptocurrency has become a recognizable notion. It possesses various exceptional attributes, functioning as both a medium of exchange in business transactions and an investment avenue. It promotes currency agreements among nations, improving financial market efficiency and international remittance services. Nevertheless, cryptocurrencies alone are inadequate

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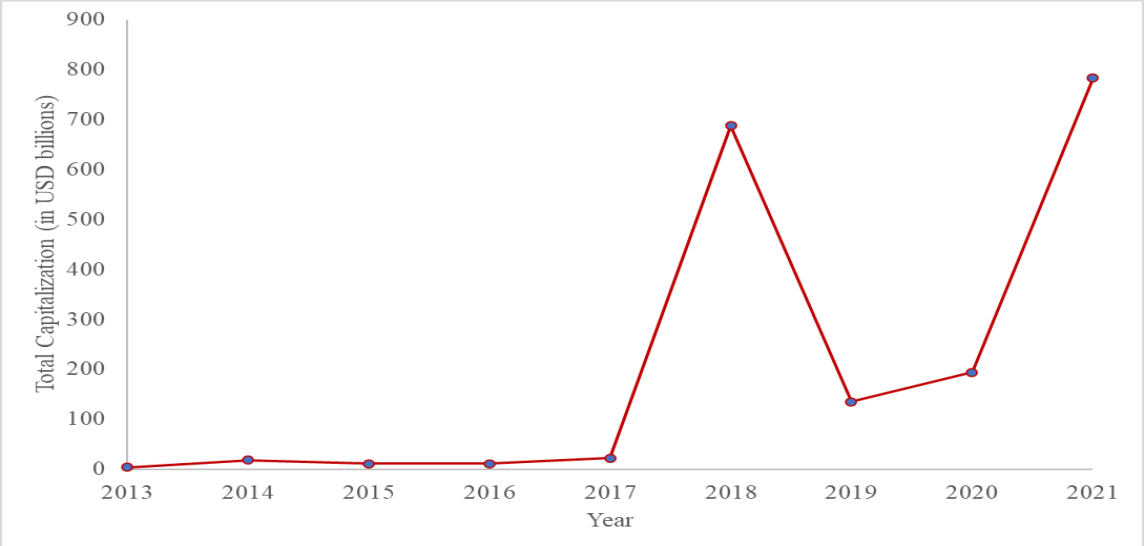
to fulfill policy objectives.

A multitude of cryptocurrencies exists globally, with Bitcoin and Ethereum being the most prominent and recognized. Bitcoin and Ethereum are significant cryptocurrencies that function on blockchain technology, facilitating a peer-to-peer trust system grounded in majority node consensus. Libra, a significant cryptocurrency, was created by Facebook with the objective of streamlining the monetary system and financial infrastructure (Anh, 2019). The Libra Association, located in Geneva, Switzerland, is a non-profit entity responsible for the advancement of Libra. It guarantees the value of Libra with a tangible asset reserve fund and regulates the blockchain's protocols. Moreover, other prominent cryptocurrencies comprise XRP (created by Ripple) and Litecoin. In this context, decentralized platforms offer financial services more swiftly, economically, and inclusively, attracting clients from conventional banks and payment processors. In contrast, financial institutions investigate methods to leverage blockchain technology for enhancing operational efficiency and transparency (Umar et al., 2021). The crux of the matter is that the emergence of private cryptocurrencies has prompted central banks to contemplate a competitive tool and a novel electronic currency referred to as central bank digital currencies (CBDCs), thereby blurring the distinctions between traditional finance and decentralized digital assets. In view of this, the paper aims to understand the cryptocurrencies and their impact on financial markets.

Rise of Cryptocurrencies: An Overview: -

Cryptocurrencies constitute a comparatively novel innovation in the domain of finance. Their research has gained significant prominence in academic studies during the previous decade. The initial investigations of cryptocurrencies predominantly focused on their technological foundations, particularly concerning blockchain technology. The foundational reference for cryptocurrency studies is the research conducted by Xiao et al. (2021), which focuses on Bitcoin, the inaugural basis of decentralized virtual currency. During the development of Bitcoin, significant deficiencies were recognized in traditional monetary systems: excessive dependence on middlemen and a lack of openness. Consequently, it aimed to provide an alternative that is peer-to-peer, decentralized, and safe through cryptographic techniques. As of today, numerous thousands of cryptocurrencies have been created, with Ethereum, established by Buterin in 2013, being one of the most prominent, as it introduced smart contracts and expanded the capabilities of blockchain technology beyond just value transfer.

Fig 1: Year-Wise Variation in Total Cryptocurrency Market Capitalization



Source: Jeris et al. (2022)

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As cryptocurrencies have proliferated, research studies have surged, initially concentrating on their potential to disrupt conventional financial systems and the attributes of digital currencies, including decentralization, anonymity, and transparency, as noted by Dwyer (2015). With the increasing popularity of Bitcoin and other cryptocurrencies, researchers have begun to examine their broader implications for finance, including their classification as an asset class, the volatility associated with that asset class, and the potential diversification advantages they offer in investment portfolios. Subsequently, more studies concentrated on examining the behavior of Bitcoin and other cryptocurrencies in relation to conventional financial instruments. Corbet et al. (2018) and Bouri et al. (2017) observe that the characteristics of these emerging digital assets hamper the integration of global financial institutions. The advent of cryptocurrencies transformed the global economy. The increasing market capitalization of Bitcoin, Ethereum, and other prominent cryptocurrencies has become a topic of study in several research publications due to their rising impact on global markets. At the onset of 2021, Bitcoin's market valuation had surpassed $1 trillion, positioning it among the globe's most valuable assets.

Bitcoin is a cryptocurrency that functions on blockchain technology. It is predominantly exchanged on internet cryptocurrency platforms. In contrast to central banks that can capriciously modify the supply of fiat currencies, the supply of Bitcoin is immutable and impervious to political influence (Son, 2021). Bitcoin is a digital currency that is neither issued by a government nor a financial institution, but rather generated and managed by a peer-to-peer computer network (Bien and Oanh, 2021). As a digitally recorded virtual currency, Bitcoin is susceptible to hacking, theft, data manipulation, and trading suspensions (Thoa, 2017). Bitcoin may compel financial institutions to upgrade or incorporate existing technologies, modify charge structures, and improve services or expertise to monitor and comprehend governmental regulatory matters. Blockchain technology can enhance efficiency in the financial services sector, potentially saving consumers billions annually (Gandal and Hałaburda, 2014). Moreover, the capacity to assess Bitcoin and associated cryptocurrencies is becoming vital for their recognition as genuine financial assets (Hayes, 2017).

Ethereum was conceived by founder Vitalik Buterin in late 2013 and officially released in 2015. It is the preeminent and most established decentralized software platform. As of January 2021, Ethereum possesses a market capitalization of $138.3 billion, approximately 19% of Bitcoin's market size. Like the Bitcoin blockchain, the Ethereum blockchain serves as a platform that transcends the mere facilitation of a singular digital currency. The primary distinction resides in Ethereum blocks, which encompass not just block numbers and difficulty levels but also a compilation of recent transactions and states. Every transaction in the list generates a new state by utilizing the preceding state (Vujicic et al., 2018).

Following Bitcoin, Ethereum, and XRP, Litecoin ranks as the fourth largest cryptocurrency by market capitalization. Litecoin operates in a manner akin to Bitcoin; however, transactions are executed at a much-accelerated pace compared to Bitcoin. This renders Litecoin an appealing alternative cryptocurrency for monetary transactions. The greater availability of Litecoin through mining results in a lower price per Litecoin compared to Bitcoin, facilitating transactions. Bitcoin is frequently characterized as "gold," while Litecoin is perceived as "silver." Litecoin possesses a lesser value than Bitcoin; yet, it is more accessible and more adapted for routine transactions. The generation and transmission of Litecoin rely on an open-source protocol and are unregulated by any central authority.

Table 1: Market Overview of Leading Cryptocurrencies

Rank	Cryptocurrency	Price (€)	Market Capitalisation (€)
1	Bitcoin (BTC)	€ 20,143.46	€384.23 billion
2	Ethereum (ETH)	€ 1,144.94	€138.87 billion

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3	Tether (USDT)	€ 0.95	€63.35 billion
4	USD Coin (USDC)	€ 0.95	€52.76 billion
5	BNB (BNB)	€ 226.61	€36.99 billion
6	XRP (XRP)	€ 0.35	€16.88 billion
7	Binance USD (BUSD)	€ 0.95	€16.49 billion
8	Cardano (ADA)	€ 0.48	€16.05 billion
9	Solana (SOL)	€ 38.74	€13.25 billion
10	Dogecoin (DOGE)	€ 0.06	€8.43 billion

Source: CoinMarketCap (2022)

In addition to the expansion of market capitalization, there is a heightened integration of cryptocurrencies into conventional financial systems. Research has identified that, over time, cryptocurrencies are being integrated into the banking system, with prominent financial institutions already providing services associated with digital assets. This encompasses custodial services for cryptocurrencies, cryptocurrency-based financial derivatives like ETFs, and payment processing systems facilitating digital currencies as a payment method. Recently, cryptocurrencies have influenced international stock markets as cryptocurrency-related firms, such as Coinbase and MicroStrategy, were publicly listed, hence strengthening the connection between the stock market and the cryptocurrency sector. Daskalakis and Georgitseas (2020) observed that since 2020, the price of BTC has consistently increased in alignment with a global economic recovery.

Cryptocurrencies are increasingly impacting international trade. Some experts assert that cryptocurrencies could disrupt the international payments sector due to significant reductions in transaction costs and settlement durations (Sami & Abdallah, 2020). Bitcoin has been particularly utilized for remittance transfers in nations with poor or costly banking institutions, hence complicating financial transactions. The diminished cost of money transfer, inherent to cryptocurrencies, might substantially enhance overseas trade. This is particularly true in underdeveloped nations where access to financiers and financial enablers poses a substantial problem (Luchkin et al., 2020).

Financial Market Implications of Cryptocurrency Growth: -

The advent of cryptocurrencies has profoundly altered international finance, influencing conventional banking and financial markets, especially in India. The inception of Bitcoin in 2009 heralded the emergence of a dynamic ecosystem of digital assets utilizing blockchain technology for safe, decentralized transactions. This system guarantees openness and security, appealing to both individual and institutional investors. The incorporation of cryptocurrencies into India's financial system presents apprehensions related to money laundering, terrorism financing, and tax evasion, in addition to the intrinsic volatility that jeopardizes both individual investors and the wider financial market. Upadhyay (2022) seek to assess the influence of cryptocurrencies on financial markets by analyzing their effects on exchange rates, gold prices, oil prices, and stock indexes. The research findings demonstrated that cryptocurrencies influence the financial sector. The analysis specifically discovered the inverse relationship between currency pairs and cryptocurrencies, as well as the interactions among various cryptocurrencies. Thus, financial market authorities, particularly the agency tasked with overseeing the fluctuations of cryptocurrencies, exchange rates, gold prices, oil prices, and stock indexes, has a foundation for formulating suitable strategies. Sajeev and Afjal (2022) investigated the contagion effect of Bitcoin on the National Securities Exchange, Shanghai Stock Exchange, London Stock Exchange, and Dow Jones Industrial Average by analyzing volatility spillover and correlations between these markets to comprehend the short-term and long-term impacts of this volatility, particularly during the period from March 2017 to May 2021. Despite the fluctuations in the cryptocurrency market, an increasing number of investors are allocating their funds to it. The

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empirical results reveal a low overall time-varying connection between Bitcoin and the stock markets, suggesting that Bitcoin may serve as a hedge against the risks associated with these markets. It was also apparent that these stock markets reacted more significantly to negative shocks during 2018 and 2021 than to positive shocks in the Bitcoin market.

Furthermore, the swift advancement of cryptocurrencies has profoundly impacted global financial markets by fostering financial innovation and altering the current financial ecology. A significant result of this transition is the rise of decentralized finance (DeFi), which utilizes blockchain technology and smart contracts to establish financial services that function autonomously from conventional banking institutions. This decentralized architecture has numerous benefits, such as expedited transaction execution, diminished operational expenses, more transparency and accessibility, and increased financial autonomy for consumers. Consequently, DeFi is evolving into a whole ecosystem that includes lending, trading, payment systems, and insurance services, thus fostering equitable financial development and transforming traditional financial frameworks. Smart contracts, which are automatic, self-executing agreements documented on the blockchain, are fundamental to the operation of DeFi and other cryptocurrency applications. These contracts facilitate efficient and safe procedures, including automated payments, asset management, and transaction settlement, while also presenting prospective applications in new financial derivatives, decentralized identity verification, and advanced digital asset management. Their transparency and immutability diminish dependence on intermediaries and offer a more dependable framework for executing financial transactions. Nonetheless, in conjunction with these developments, the cryptocurrency market is marked by significant price volatility, presenting considerable obstacles for investors seeking to mitigate risk. Sudden movements caused by market emotion, speculative actions, regulatory changes, or technical elements necessitate that investors implement methods such diversification, establishing stop-loss limits, and consistently assessing their portfolios. The insufficient regulation in cryptocurrency markets increases investors' exposure to risks such market manipulation, fraudulent schemes, and unethical actions, highlighting the necessity for caution and comprehensive due diligence. This volatility affects all market participants variably: short-term traders may capitalize on swift price changes for profit but encounter increased risk, whilst long-term investors must endure substantial variations when deciding to purchase or sell digital assets. Institutional investors and conventional financial entities face heightened issues with risk management and compliance, necessitating the formulation of specialized methods that correspond with the volatile and unpredictable characteristics of cryptocurrency markets. These characteristics illustrate that although cryptocurrencies offer remarkable innovation and efficiency in financial markets, they also present new complexities and hazards that all participants must meticulously manage (Danyang, 2021).

Prior research has investigated the economic and technical underpinnings of cryptocurrencies (Narayanan et al., 2016; Vigna & Casey, 2016) as well as their speculative characteristics (Baur et al., 2018). Nonetheless, research on their influence in emerging economies such as India is lacking. Research demonstrates that India is a prominent country in cryptocurrency adoption, especially among younger populations. Cryptocurrencies provide expedited and cost-effective payment alternatives, novel credit rating methodologies, and evolving investment practices, while simultaneously posing hazards such as market volatility and regulatory ambiguity. The Indian government is prudently progressing with measures such as the Central Bank Digital Currency (CBDC) and proposed laws to tackle these concerns. Recommendations for banks encompass the integration of blockchain technology, the provision of cryptocurrency-related services, and partnerships with fintech startups. Policymakers are urged to create regulatory frameworks and promote public-private collaborations. The cryptocurrency sector ought to prioritize self-regulation and the education of investors.

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Conclusion: -

The present study illustrates that cryptocurrencies have become a transformative influence in global financial markets, altering conventional financial frameworks while concurrently presenting new opportunities and problems. Since the inception of Bitcoin in 2009 and the emergence of Ethereum, Litecoin, and various other digital assets, cryptocurrencies have transitioned from a technological experiment to a crucial element of modern financial dialogue. Their decentralized character, supported by blockchain technology, has transformed the domains of payments, investments, credit systems, and international transactions. The report emphasizes that innovations like decentralized finance (DeFi) and smart contracts have broadened the scope of financial services by providing quicker, more transparent, and cost-effective alternatives to traditional banking systems. These advancements not only enhance financial inclusion but also need a fundamental revaluation of financial interactions within a digital context. The findings reveal that the swift proliferation of cryptocurrencies poses significant dangers, especially due to excessive market volatility, speculative trading practices, and insufficient regulatory control. This volatility impacts all market players, both short-term traders pursuing rapid profits and long-term investors and institutions with intricate risk management and compliance issues. Moreover, empirical research demonstrates substantial connections between cryptocurrency markets and global financial indicators, including exchange rates, stock indices, and commodity prices, highlighting their increasing systemic importance. In rising economies such as India, cryptocurrencies demonstrate significant potential alongside considerable uncertainty: they foster innovation, enhance financial inclusion, and introduce novel investment trends, yet they also provoke apprehensions about monetary stability, illicit financial transactions, and regulatory deficiencies. As India progresses cautiously with efforts such as the Central Bank Digital Currency (CBDC), the necessity for a balanced regulatory framework becomes increasingly apparent. The study indicates that cryptocurrencies will persist as a significant element of the global financial ecosystem, contingent upon the coordinated efforts of regulators, financial institutions, investors, and technology developers to reduce risks while leveraging their transformational potential. Enhancing regulatory clarity, facilitating technical integration, improving investor education, and encouraging responsible innovation are crucial measures to ensure that the advantages of bitcoin adoption are achieved without jeopardizing financial stability.

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