

[Review Article] Impact of Cryptocurrency on Global Economy in the Twenty-First Century: A Comprehensive Review

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Abstract

Cryptocurrency has become a disruptive force in the twenty-first century's quickly changing world, completely changing how we view and interact with conventional financial institutions. This in-depth analysis intends to give insight on the underlying technology, economic ramifications, and legal difficulties that have formed this digital phenomena in order to examine the origins, development, and effect of cryptocurrencies over the past two decades. This article begins by exploring the history of cryptocurrencies, tracing its origins back to the mysterious Satoshi Nakamoto and the invention of Bitcoin in 2009. It analyses the underlying blockchain technology that underpins cryptocurrencies, giving readers a thorough understanding of its decentralised nature and the potential it has to revolutionise a number of industries outside of banking. The study also looks at the wide variety of cryptocurrencies that have appeared since the popularity of Bitcoin, including Litecoin, Ethereum, and Ripple, among countless others. It explores their distinctive characteristics, use cases, and market dynamics, stressing their potential for financial inclusion, international trade, and smart contract applications. The economic effects of cryptocurrencies are also examined in this paper, along with how they affect decentralised finance (DeFi), traditional banking systems, and financial innovation. It also looks at the difficulties presented by cryptocurrencies, including their volatility, scalability, and security issues, as well as the ongoing discussions surrounding their regulation and widespread use

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Introduction

Digital or virtual currency known as cryptocurrency uses cryptography for security and is not controlled by a central bank. It is decentralised and manages the issue of new units using blockchain technology (Ahmed et al., 2016; Nelson, 2018). In 2009, Bitcoin became the first cryptocurrency; since then, numerous more cryptocurrencies have been developed. With the launch of Bitcoin in 2009, cryptocurrencies have become a revolutionary financial technology for the twenty-first century (Matsumura, 2018). Numerous cryptocurrencies have since appeared on the market, offering cutting-edge solutions and upending established financial structures. Researchers, decision-makers, and business experts have all taken notice of cryptocurrencies' quick development and growth (Zheng et al., 2017). For stakeholders across multiple industries, it is imperative to comprehend the effects and ramifications of this digital currency revolution.

A paradigm shift in how we view and interact with conventional financial systems has been brought about by the rise of cryptocurrencies in the twenty-first century (Zheng, et al., 2017). A worldwide interest in learning about cryptocurrencies' genesis, underlying technologies, economic ramifications, and legal difficulties has been generated by their explosive growth and broad use. In-depth analysis of cryptocurrencies in the context of the twenty-first century is the goal of this exhaustive review, which also offers insightful analysis and a comprehensive knowledge of this digital phenomena. The mysterious individual known as Satoshi Nakamoto, who released Bitcoin in 2009, is credited with starting the cryptocurrency boom (Sharma, et al. 2020). Blockchain is a ground-breaking technology that served as the foundation for Bitcoin, the first decentralised digital currency. Since then, a plethora of additional cryptocurrencies that have entered the market have been built on top of this technology, which acts as a transparent and impenetrable ledger.

Because of its potential to upend established financial systems, democratise access to financial services, and ease international trade, cryptocurrencies have drawn a lot of attention (Ahmed et al., 2022). Peer-to-peer transactions are made possible by the decentralised nature of cryptocurrencies, which eliminates the need for intermediaries like banks or other financial institutions (Peters & Panayi, 2016). In areas with limited access to conventional banking services, in particular, this has created new opportunities for financial inclusion. Cryptocurrencies have extensive and varied economic ramifications (Sharma et al. 2020). It might encourage financial innovation, encourage economic expansion, and revolutionise a number of industries outside of banking. Decentralised finance (DeFi), which aspires to displace conventional financial intermediaries and provide financial services directly to individuals through smart contracts and blockchain-based platforms, has been made possible thanks to cryptocurrencies.

However, cryptocurrencies also present considerable obstacles in addition to the potential. For cryptocurrencies to become widely used, critical challenges like volatility, scalability, security worries, and regulatory ambiguity must be resolved. In order to balance consumer protection, innovation, and financial stability, governments and regulatory agencies around the world are debating how to regulate cryptocurrencies (Peters & Panayi, 2016). The goal of this in-

depth analysis is to give readers a thorough knowledge of cryptocurrencies in the twenty-first century by looking at its historical context, technological underpinnings, economic ramifications, regulatory issues, and potential future applications. This study aims to serve as a useful resource for academics, policymakers, industry professionals, and individuals interested in gaining a deeper understanding of the transformative power of cryptocurrencies in our increasingly digital world by synthesising existing research and examining current trends.

Research Questions

- i. What is cryptocurrency and how does it work?
- ii. What are the advantages and disadvantages of cryptocurrency?
- iii. How has cryptocurrency impacted the global economy?
- iv. What is the potential for cryptocurrency to disrupt traditional financial systems?

Objectives of The Study

This study aims to investigate how cryptocurrencies have affected the world economy in the twenty-first century. The advantages and disadvantages of cryptocurrencies as well as its potential for disrupting established financial systems are explored in this study.

Literature Review

Cryptocurrency is a digital or virtual type of currency that uses cryptography for security and operates independently of a central bank. It is decentralized and based on a technology called blockchain, which is a distributed ledger that records all transactions conducted with cryptocurrencies. The most well-known cryptocurrency is Bitcoin, which was developed in 2009 under the pseudonym Satoshi Nakamoto by an unidentified person or group of individuals (Sharma, et al. 2020). Cryptocurrencies give consumers a mechanism to transmit and store value digitally while still being secure and anonymous.

History and Development of Cryptocurrency

The first attempts to create digital currencies were made by computer scientists in the latter half of the 20th century, which is when cryptocurrency first emerged. When David Chaum suggested the idea of "ecash" in the 1980s, the first attempt to develop a cryptocurrency was made. Ecash was intended to allow safe and untraceable digital transactions. However, cryptocurrencies didn't start to receive much attention or popularity until the late 2000s. A essay titled "Bitcoin: A Peer-to-Peer Electronic Cash System," written by the mysterious Satoshi Nakamoto in 2008, described the idea behind Bitcoin and the blockchain technology that underpins it (Nakamoto, 2008; Sharma et al., 2020). The cornerstone for the development of Bitcoin was put out in this whitepaper, which was published in 2008 (Nakamoto, 2008). Due to its

decentralised structure and possibility for financial privacy, Bitcoin has grown in popularity (Matsumura, 2018). Numerous other cryptocurrencies, including Ethereum, Ripple, Litecoin, and many more, have developed in the wake of the success of Bitcoin. Although every cryptocurrency differs in the features and functions it offers, they are all based on the same technology: blockchain.

Types of Cryptocurrency

There are currently thousands of cryptocurrencies, each with a distinct set of characteristics and applications. Nakamoto (2008), Pilkington (2017), Peters & Panayi (2016), and (Sharma, et al. 2020) list some of the most well-known varieties of cryptocurrencies as follows: (i) Bitcoin (BTC): The original and best-known cryptocurrency, distinguished by its decentralised structure and constrained quantity. (ii) Ethereum (ETH): A decentralised platform that lets programmers create and run decentralised apps (DApps) and smart contracts. (iii) Ripple (XRP): Ripple aims to transform the conventional banking system by providing quicker, more affordable international money transactions. Litecoin (LTC), fourth: Litecoin, sometimes referred to as the silver to Bitcoin's gold, provides quicker confirmation times for transactions and uses a different hashing algorithm. Monero (XMR): Monero, which prioritises privacy and anonymity, uses sophisticated cryptographic methods to guarantee the confidentiality of transactions. These are only a few of the several types of cryptocurrencies that are now in use.

Related Works

The goal of earlier research on cryptocurrencies was to examine a variety of topics related to this digital currency, such as its economic ramifications, technological developments, regulatory frameworks, and user behaviour (Ahmed, Adamu, Kawure, 2022; Ahmed et al., 2022; Ferrari et al., 2020; Ji & Shen, 2021; Keister & Monnet, 2020). The analysis of the effects of cryptocurrencies on monetary policy, economic growth, and international trade has been the topic of previous studies (Tapscott & Tapscott, 2016; Yli-Huumo, et al., 2016; Pilkington, 2016; Zheng, Xie, Dai, Chen & Wang, 2017). They want to comprehend the advantages and disadvantages of using and adopting cryptocurrency.

The recent research (Sharma, et al. 2020; Pilkington, 2017; Matsumura, 2018) have focused on the underlying blockchain technology that underpins cryptocurrency. They want to investigate blockchain's technological properties, scalability, security, and possible uses outside of cryptocurrencies. AML regulations, taxation, consumer protection, and investment safety are just a few of the legal and regulatory frameworks surrounding cryptocurrencies that have been the subject of research (Mougayar, 2016). The objective is to offer insights into the creation of efficient rules in a changing environment.

Numerous research (Ahmed et al., 2022; Ferrari et al., 2020; Keister & Monnet, 2020; Nelson, 2018) have looked at user behaviour, motivations, and adoption trends in relation to cryptocurrencies. These studies seek to comprehend the variables affecting users' choices about cryptocurrency investments, the degree of trust in digital assets, and the influence of social and media influence on adoption rates. The privacy and security features of cryptocurrencies have also been the subject of some studies (Hong, 2021; Seifermann et al., 2023; Sengupta et al., 2019; Zhang, 2021). T Studying various

cryptocurrencies' weaknesses, the possibility for criminal activity, and coming up with methods to improve the privacy and security of cryptocurrency transactions are all part of this.

The goal of prior research on cryptocurrencies has generally been to educate policymakers, investors, and consumers about the prospects, difficulties, and ramifications of this rapidly developing area. Further study is required to expand on the body of currently known information and address the dynamic nature of cryptocurrencies because the precise findings and conclusions of these investigations fluctuate.

Materials and Methods

Research Design

The research methodology used to examine cryptocurrencies in the twenty-first century combines qualitative and quantitative methods. The qualitative component is studying previously published books, academic papers, and studies to learn more about the development and significance of cryptocurrencies. Understanding the trends, difficulties, and potential new advancements in the field is aided by this. In order to analyse statistical patterns and trends relating to cryptocurrencies, the quantitative part includes gathering data from numerous sources. Market information, transaction volumes, user demographics, and other pertinent data are some examples of this. The goal of the study strategy is to present a thorough grasp of the cryptocurrency ecosystem, taking into account both theoretical and practical aspects.

Data Collection Methods

There are various techniques that can be used to collect qualitative data. Interviewing professionals in the fields of economics, blockchain technology, and cryptocurrencies is one aspect of this. These interviews would offer first-person perspectives and insights into the subject. A thorough analysis of the current literature, scholarly works, and information from reliable sources will also aid in gaining a more comprehensive understanding of the subject. Numerous techniques can be used to acquire quantitative data. This includes mining publically available data from cryptocurrency exchanges, blockchain explorers, and other relevant sites. This data can include transaction volumes, market capitalization, price variations, and user activity trends. To collect demographic and attitudinal information, surveys and questionnaires can also be given to bitcoin users, investors, and followers.

Method of Data Analysis

Employing qualitative and quantitative methods, the data gathered to research cryptocurrencies in the twenty-first century is analysed. A thematic analysis strategy can be used to extract recurrent themes, patterns, and important ideas from interviews and written sources for qualitative data. The data must be coded and categorised in order to get important insights and reach conclusions. While statistical analysis methods like descriptive statistics and data visualisation can be used with quantitative data. With the aid of these methods, trends, correlations, and statistical significance can be found in

the data. Time series analysis and other sophisticated modelling methods can be used to predict future patterns in the cryptocurrency markets. By combining qualitative and quantitative data, researchers may get a comprehensive picture of the bitcoin ecosystem and use that information to draw well-informed conclusions and offer advice. A thorough understanding of cryptocurrencies in the twenty-first century can be attained by using a solid study strategy, data collection procedures, and analysis approaches.

Ethical considerations

The researchers ensured that the prior studies in the form of papers or conference proceedings and their contents were taken into consideration for the review based on the titles, abstracts, keywords, and primary contents in order to provide sufficient information appropriate for this study. Additionally, in accordance with research ethics, all of the sources consulted for this study were acknowledged.

Results and Discussion

(RQ₁) Overview of what cryptocurrency is in the twenty-first century

A notable technological and financial breakthrough of the twenty-first century is cryptocurrency, a digital or virtual form of money that leverages cryptography for security (Ahmed et al., 2022; Ji & Shen, 2021). This new era began with the launch of Bitcoin in 2009, and a plethora of cryptocurrencies have since appeared (Nelson, 2018). Blockchain technology and the decentralised nature of cryptocurrencies enable safe and transparent transactions without the use of middlemen like banks (Nelson, 2018). As shown in Figure 1 that international users and investment communities have been drawn to this features because they view cryptocurrencies as a possible replacement for established financial institutions.

(RQ₂) What are the advantages and disadvantages of cryptocurrency?

- **Market Development:** Over the past ten years, cryptocurrency has grown remarkably. Bitcoin is the most well-known and extensively used cryptocurrency, and its market valuation has grown dramatically (Ahmed et al., 2022; Sharma et al., 2020). With a variety of features and functionalities, additional cryptocurrencies, often referred to as altcoins, have become popular (Liao, Wu, & Luo, 2018; Matsumura, 2018).
- **Volatility & Price Fluctuations:** Cryptocurrencies are notorious for their tremendous volatility, with values frequently and noticeably changing. Cryptocurrency values can be significantly impacted by market speculation, legislative actions, and outside variables like macroeconomic developments (Nakamoto, 2008; Matsumura, 2018). For investors, this volatility offers both opportunities and threats.
- **Adoption and Use Cases:** Cryptocurrency is becoming more widely accepted and used in a variety of industries. In addition to being used as a medium of exchange, cryptocurrencies are also finding utility in supply chain management, cross-border transactions, decentralised finance (DeFi), and digital identity verification (Liao, Wu, & Luo, 2018; Matsumura, 2018). In several industries, the inventive potential of cryptocurrencies is being investigated.
- **Regulatory Environment:** The regulatory landscape for cryptocurrencies is continuously developing and differs between

nations. According to Matsumura (2018) and Nakamoto (2008), certain nations have embraced cryptocurrencies and adopted supportive policies, while others have adopted a wary or even antagonistic stance. This legislative ambiguity makes it difficult for cryptocurrencies to develop further and find widespread adoption.

(RQ₃) *How has cryptocurrency impacted the global economy?*

The results covered above demonstrate how potential and revolutionary cryptocurrencies are in the twenty-first century. However, they also highlighted a number of crucial factors and difficulties that must be resolved in order for cryptocurrencies to be widely adopted and to continue to flourish (Liao, Wu, & Luo, 2018; Ahmed et al., 2022). The tremendous market growth of cryptocurrencies is one of the main conclusions. According to Huckle, Bhattacharya, White, and Beloff (2016), the exponential rise in market value is evidence of the increasing or decreasing the circulation of traditional currencies, which leads to popularity and confidence in these digital currencies (see *Figure 1*). This indicates that the lower the amount of currency in circular the higher the adoption and usage cryptocurrency. On the other hand the higher the amount of traditional currency in circulation the lower the adoption and usage of cryptocurrency. The birth of other altcoins with distinctive features and use cases was made possible by Bitcoin, the original cryptocurrency, which has achieved significant popularity and acceptance (Swan, 2020; Sharma, et al., 2020). This suggests that cryptocurrencies have the ability to transform the financial landscape and provide an alternative to established banking systems.

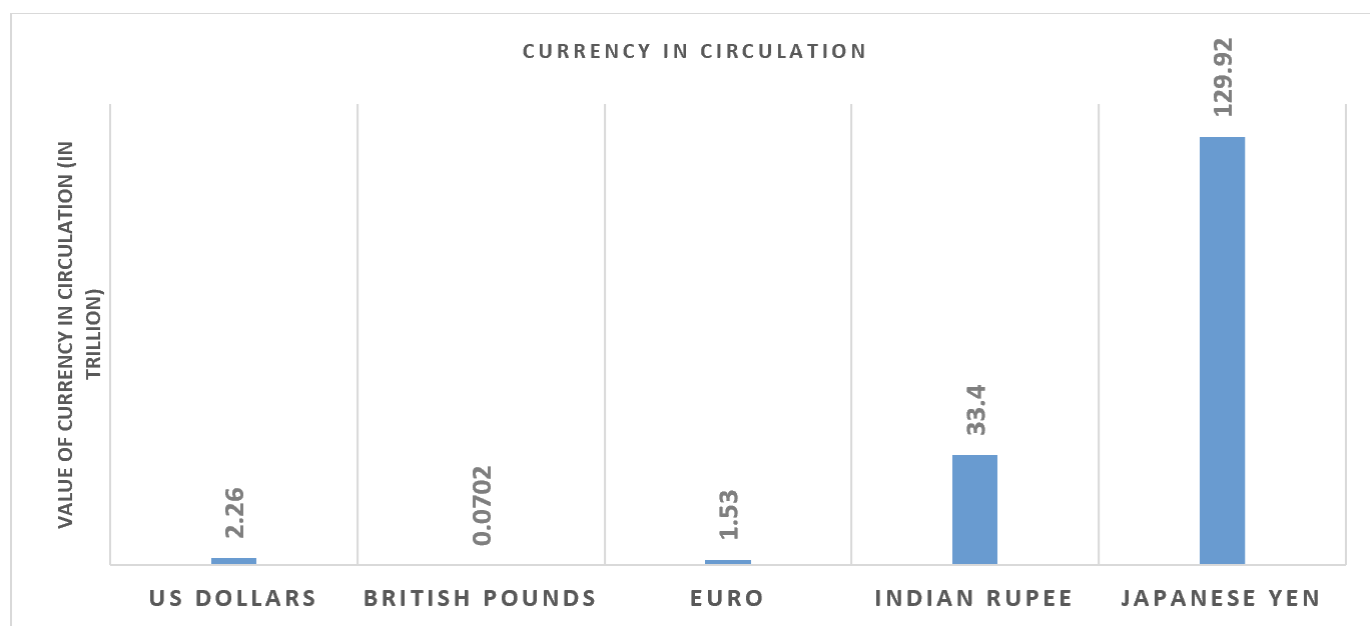


Figure 1. Popular currency in circulation (in Trillions) (Source: Raynor de Best (Statista, 2023))

However, Figure 2 shows that there are substantial hurdles because to the high volatility and price swings (Fanning, & Centres, 2019). While volatility presents hazards and threatens the stability and viability of cryptocurrencies as a medium of exchange, it can also present opportunities for traders and investors (see Figure 2). The significant price swings can make it challenging to estimate the true value of cryptocurrencies, which could impede their acceptance by the general public (Narayanan et al., 2016). Based on the market cap Bitcoin dominate the market with the value of 399.95 billion

dollars, while Bitcoin cash is the least with 2.27 billion dollars.

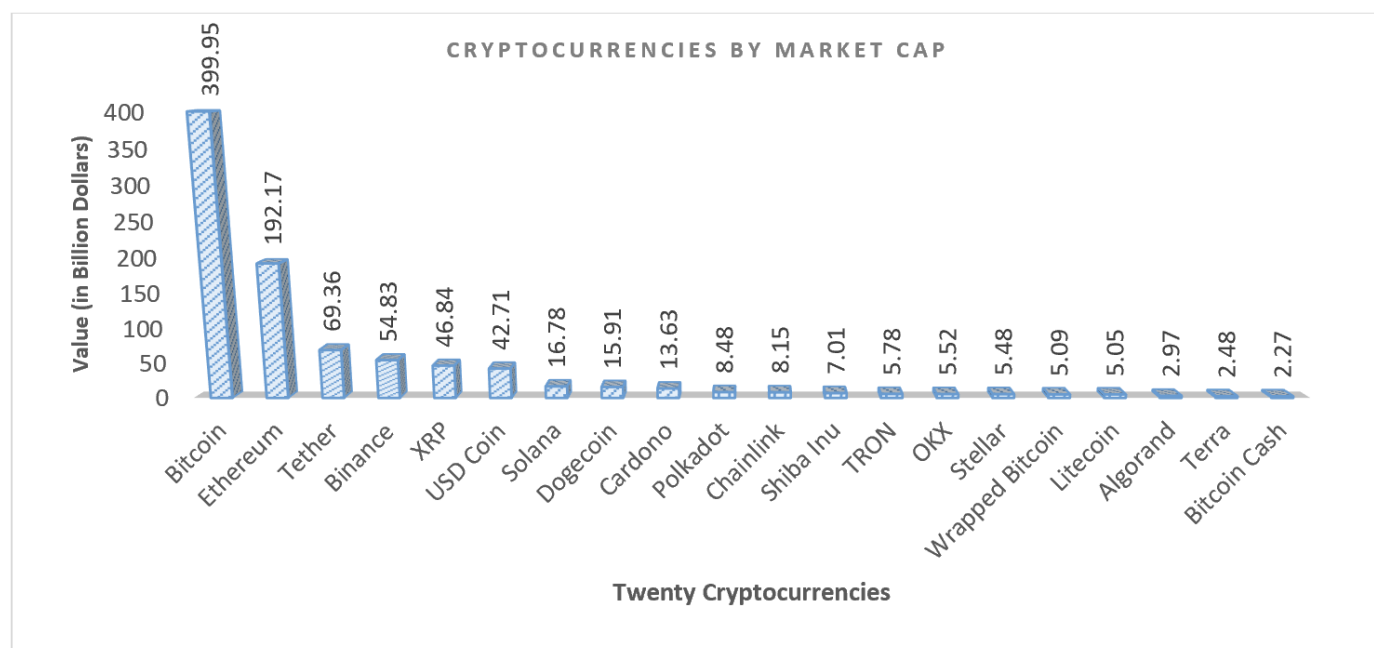


Figure 2. Cryptocurrencies by market cap (Source: World of Statistics, 2023)

(RQ₄) What is the potential for cryptocurrency to disrupt traditional financial systems?

The variety of use cases and growing adoption of cryptocurrencies are important factors to take into account as well (Pilkington, 2017). Beyond only being a medium of exchange, cryptocurrencies are now finding use in supply chain management, cross-border transactions, decentralised finance, and digital identity verification. This adaptability demonstrates how cryptocurrencies have the power to transform entire industries and advance financial inclusion. As illustrates in Figure 3 that about 16% of global financial and non-financial institutions penetration with regards to cryptocurrency. Moreover, there is about 8% global cryptocurrency adoption in business. This shows that there is need for more effort to be made regarding cryptocurrency penetration and adoption in business to boost economy.

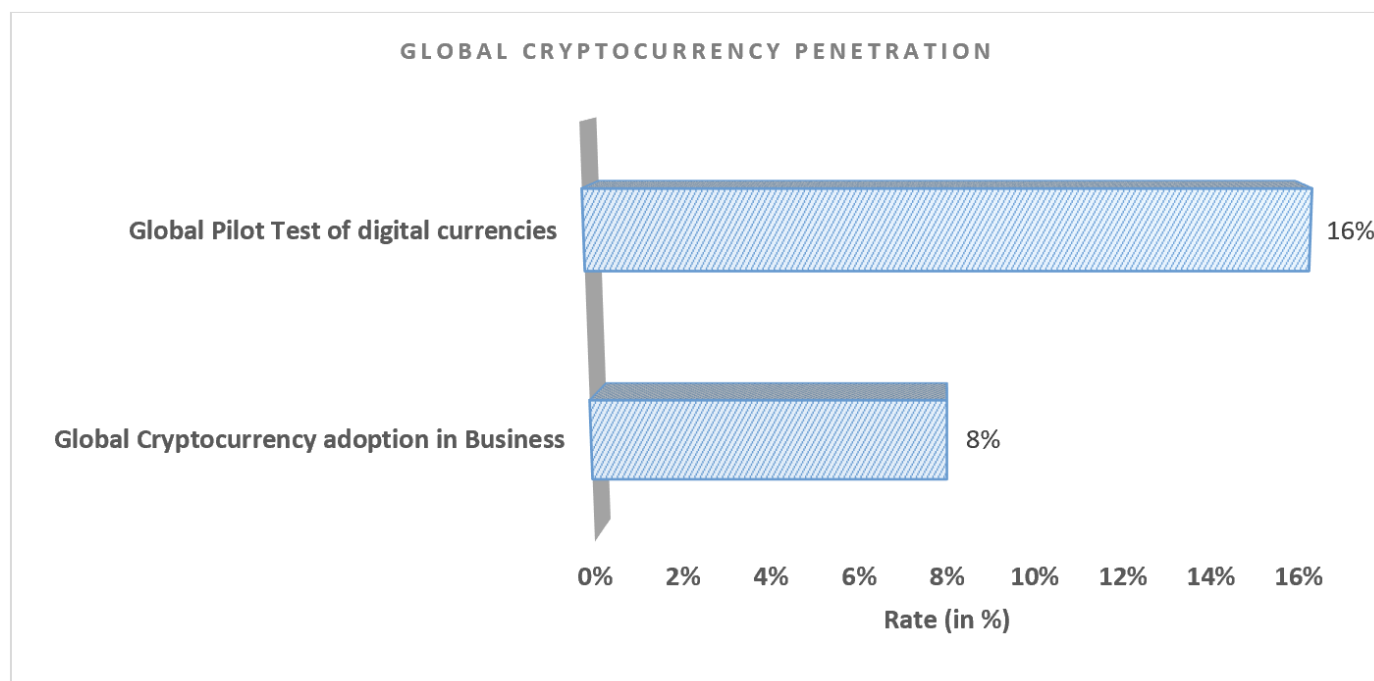


Figure 3. Rate of Global Cryptocurrency penetration (source: Raynor de Best, Statista, 2023)

The regulatory framework is still a crucial topic of discussion, though. Businesses, investors, and users are left in the dark due to the inconsistent approaches and lack of harmonisation across jurisdictions (Tapscott & Tapscott, 2016). To safeguard market integrity, safeguard consumer protection, and stop illegal activity, regulations must be clear (Sharma et al. 2020). For the cryptocurrency ecosystem to develop healthily and mature, it is crucial to strike the correct balance between encouraging innovation and enacting required rules (Nakamoto, 2008). Additionally, the results highlight some issues that must be resolved in order to guarantee the long-term profitability and sustainability of cryptocurrencies (Fanning, & Centres, 2019). The significance of strong security measures and user education is highlighted by security weaknesses such as hacking attacks and frauds (Swan, 2020). Concerns about cryptocurrency mining's sustainability and environmental impact are also raised by the energy it consumes. Briefly put, the findings and discussion of bitcoin trends and patterns offer a thorough picture of the advancements and difficulties facing the cryptocurrency industry in the twenty-first century. Cryptocurrencies have a lot of promise for innovation and disruption, but there are still a lot of issues that need to be resolved, such as market stability, regulation, security, and sustainability. The entire potential of cryptocurrencies can be realised by addressing these issues, opening the path for a more inclusive, safe, and effective financial system.

Conclusion and Recommendation

There are still many study gaps on the psychological and behavioural elements of cryptocurrencies, despite the fact that current literature has made major contributions to understanding the history, economic implications, and legal aspects of cryptocurrencies. To fully understand the effects of cryptocurrencies on people and society and to create appropriate regulations, interventions, and educational activities in this fast growing industry, further research into these issues is

essential. Since the invention of cryptocurrency in 2009 with the introduction of Bitcoin, it has expanded quickly. With a large selection of cryptocurrencies now readily available, it has experienced significant global popularity. Blockchain, the underlying technology of cryptocurrencies, has demonstrated potential outside of banking and is being investigated in a number of industries. Because it allows for decentralised and international transactions, cryptocurrencies have upended the established financial system. Greater financial inclusion is made possible by it, particularly in areas with limited access to conventional banking services.

For widespread acceptance, however, issues with legislation, security, and scalability must be resolved. The marketplaces for cryptocurrencies are notoriously volatile, with prices seeing large swings. Cryptocurrency values can be significantly impacted by investor sentiment, market speculation, and outside variables including legislative actions and broader economic developments. It is critical to comprehend and forecast investor behaviour in this developing sector. Despite the built-in security safeguards of blockchain technology, there have been cases of bitcoin exchange breaches and scams. The anonymity of transactions and potential illegal activities have also aroused privacy concerns. Enhancing security measures and dealing with legal frameworks can boost investor and user confidence.

Overall, this in-depth analysis offers a holistic knowledge of cryptocurrencies in the twenty-first century, taking into account their historical context, technological underpinnings, economic ramifications, regulatory issues, and potential futures. It intends to be a useful tool for researchers, decision-makers, business experts, and anybody else interested in learning more about the revolutionary potential of cryptocurrencies in our increasingly digital society.

Based on the findings, a number of areas for additional bitcoin research emerge: Regulation and policy - Ongoing research is required to create strong regulatory frameworks that strike a balance between consumer protection and innovation. It is essential to investigate the effects of various regulatory strategies on market dynamics, investor mood, and the stability of the financial system. Additional study is required to examine the possible uses of blockchain technology outside of cryptocurrencies. Understanding how it affects things like voting systems, healthcare, supply chain management, and identity verification might help us better understand its potential advantages and drawbacks. Economic and Social Impacts - It's crucial to comprehend how the adoption of cryptocurrencies will affect the economy and society. The impact of cryptocurrencies on conventional financial systems, monetary policy, economic inequality, financial inclusion, and their ability to empower underserved people can all be the subject of research. Market dynamics and investor behaviour A deeper understanding of this unusual asset class can be gained by looking into investor behaviour in cryptocurrency markets, including the variables influencing investment choices, risk perception, and the effect of social media and news sentiment on market volatility.

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