

International Journal of Frontiers in Science and Technology Research Journal homepage: https://frontiersrj.com/journals/ijfstr/

ISSN: 2783-0446 (Online)

(REVIEW ARTICLE)



# Adoption of cryptocurrencies in small and medium-sized enterprises: A strategic approach to enhancing financial inclusion and innovation

Njideka Ihuoma Okeke <sup>1,\*</sup>, Godwin Ozoemenam Achumie <sup>2</sup> and Somto Ewim <sup>3</sup>

<sup>1</sup> Independent Researcher, Washington, United States.

<sup>2</sup> Independent Researcher, Australia.

<sup>3</sup> Independent Researcher, USA.

International Journal of Frontiers in Science and Technology Research, 2024, 07(02), 001-010

Publication history: Received on 28 August 2024; revised on 05 October 2024; accepted on 08 October 2024

Article DOI: https://doi.org/10.53294/ijfstr.2024.7.2.0051

# Abstract

This review paper explores cryptocurrency adoption's strategic benefits and challenges for small and medium-sized enterprises (SMEs), emphasizing its potential to enhance financial inclusion and drive innovation. The paper overviews cryptocurrencies' history, key characteristics, and current adoption trends in various sectors. The paper examines the importance of financial inclusion and innovation for SMEs through a comprehensive literature review, highlighting how cryptocurrencies can reduce transaction costs, increase access to global markets, and improve financial transparency and security. The analysis also addresses the significant challenges SMEs face, such as regulatory and legal issues, technological and operational barriers, and market volatility. Practical recommendations for SMEs considering cryptocurrency adoption are provided, including steps for compliance, technological integration, risk management, and leveraging new business models. This paper aims to offer a balanced perspective, guiding SMEs in navigating the complexities of cryptocurrency adoption while maximizing its benefits.

**Keywords:** Cryptocurrency Adoption; Financial Inclusion; SME Innovation; Blockchain Technology; Regulatory Challenges; Risk Management

# 1. Introduction

The digital revolution has significantly reshaped the financial landscape, giving rise to innovative technologies that are transforming traditional economic models. Among these innovations, cryptocurrencies have emerged as a powerful force, challenging conventional financial systems and offering new opportunities for economic participation (January, 2020). Cryptocurrencies, which are decentralized digital currencies secured by cryptography, were first introduced with the launch of Bitcoin in 2009 by an anonymous entity known as Satoshi Nakamoto. Since then, thousands of alternative cryptocurrencies (altcoins) have been developed, each with unique features and applications (Sharma, Pant, Sharma, & Brahmachari, 2020).

Rapid technological advancements and increasing adoption across various sectors have marked the evolution of cryptocurrencies. Initially met with skepticism, cryptocurrencies have gradually gained acceptance as viable financial instruments (Sakız & Gencer, 2020). Their underlying technology, blockchain, offers unparalleled security and transparency, making it attractive for businesses looking to streamline operations and reduce costs. As cryptocurrencies continue to mature, they are being integrated into mainstream financial systems, signaling a shift towards more decentralized and inclusive financial models (Wronka, 2023).

Small and medium-sized enterprises (SMEs) are the backbone of many economies, driving innovation, employment, and economic growth. However, SMEs often face significant challenges in accessing traditional financial services. Limited

<sup>\*</sup> Corresponding author: Njideka Ihuoma Okeke

Copyright © 2024 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution Liscense 4.0.

access to credit, high transaction fees, and bureaucratic hurdles can impede their growth and competitiveness (Rosyadah, Mus, Semmaila, & Chalid, 2022). Financial inclusion, which ensures that individuals and businesses have access to useful and affordable financial products and services, is crucial for the sustainability and expansion of SMEs (Nurohman, Kusuma, & Narulitasari, 2021).

Innovation plays a critical role in enhancing SMEs' financial inclusion. By leveraging new technologies, SMEs can overcome traditional barriers and access a broader range of financial services. Cryptocurrencies, with their decentralized nature and ability to facilitate seamless cross-border transactions, present a unique opportunity to enhance financial inclusion. They offer a way for SMEs to access new markets, reduce transaction costs, and improve financial transparency, thus fostering a more inclusive and innovative economic environment (Zhang, 2020).

## 1.1 Problem Statement

Despite their importance, SMEs often struggle within traditional financial systems. These challenges are multifaceted, ranging from stringent regulatory requirements to high operational costs. For instance, obtaining credit from conventional financial institutions can be daunting for SMEs, often requiring extensive documentation and collateral that many small businesses cannot provide. Additionally, cross-border transactions can be prohibitively expensive and slow, limiting the ability of SMEs to engage in international trade.

The potential role of cryptocurrencies in addressing these challenges is significant. Cryptocurrencies can provide SMEs with a decentralized alternative to traditional banking, enabling faster and cheaper transactions. The transparency and security offered by blockchain technology can reduce the risk of fraud and enhance trust in financial transactions. Furthermore, the use of cryptocurrencies can democratize access to financial services, allowing SMEs in underserved regions to participate in the global economy. This potential necessitates a strategic examination of how cryptocurrencies can be integrated into the financial practices of SMEs to enhance financial inclusion and innovation.

## 1.2 Objectives of the Paper

This paper explores the strategic benefits of adopting cryptocurrencies in SMEs and analyzes their impact on financial inclusion and innovation. The primary objectives are to:

- Examine the strategic advantages of cryptocurrency adoption for SMEs, focusing on how these digital currencies can enhance operational efficiency, reduce costs, and open up new market opportunities.
- Analyze the role of cryptocurrencies in promoting financial inclusion, particularly for SMEs that are underserved by traditional financial systems. This involves exploring how cryptocurrencies can provide more accessible and affordable financial services.
- Identify the challenges and risks associated with cryptocurrency adoption for SMEs, including regulatory, technological, and market-related obstacles.
- Propose strategies and best practices for SMEs to effectively adopt and integrate cryptocurrencies into their financial operations, ensuring they can leverage the benefits while mitigating potential risks.

By addressing these objectives, the paper aims to contribute to understanding how SMEs can strategically adopt cryptocurrencies to enhance financial inclusion and drive innovation. It seeks to offer insights that are valuable not only to SMEs but also to policymakers, financial institutions, and other stakeholders involved in the digital economy. Through a comprehensive analysis, this paper will demonstrate the transformative potential of cryptocurrencies and provide a roadmap for their effective implementation in the SME sector.

# 2. Literature Review

## 2.1 Overview of Cryptocurrencies

Cryptocurrencies, a revolutionary form of digital currency, have dramatically altered the financial landscape since their inception. The first cryptocurrency, Bitcoin, was introduced in 2009 by an anonymous entity known as Satoshi Nakamoto (Cunha, Melo, & Sebastião, 2021). Bitcoin was created as a response to the global financial crisis of 2008, with the aim of providing a decentralized and transparent alternative to traditional banking systems. Unlike conventional currencies, Bitcoin operates on a peer-to-peer network without a central authority, relying on blockchain technology to secure transactions (Mandić, 2021).

Following the success of Bitcoin, numerous other cryptocurrencies, collectively referred to as altcoins, have been developed. These include Ethereum, Ripple, Litecoin, and many others, each with unique features and applications.

Ethereum, for example, introduced the concept of smart contracts, which are self-executing contracts with the terms directly written into code. This innovation has expanded the potential uses of blockchain technology beyond simple financial transactions (Richardson, 2024).

Rapid technological advancements and increasing adoption across various sectors have marked the development of cryptocurrencies. The rise of Initial Coin Offerings (ICOs) in the mid-2010s further fueled interest and investment in the cryptocurrency space, enabling startups to raise capital through the issuance of new digital tokens. Despite regulatory challenges and market volatility, cryptocurrencies continue to evolve and gain acceptance as viable financial instruments (Mikhaylov, 2020). Cryptocurrencies possess several key characteristics that distinguish them from traditional forms of money. These include decentralization, transparency, security, and limited supply. Decentralization means that any central authority, such as a government or financial institution do not control cryptocurrencies. This feature is achieved through blockchain technology, a distributed ledger that records all transactions across a network of computers (Shah et al., 2023).

Transparency is another fundamental characteristic, as all transactions are recorded on the blockchain and are publicly accessible. This ensures that transactions are secure and immutable, reducing the risk of fraud. Cryptocurrencies also use cryptographic techniques to secure transactions and control the creation of new units, enhancing their security (Zakarneh, Qaroush, & Dawabsheh, 2022).

There are various types of cryptocurrencies, each designed for specific purposes. Bitcoin, often referred to as digital gold, is primarily used as a store of value and a medium of exchange. On the other hand, Ethereum is a platform for decentralized applications (dApps) and smart contracts. Ripple (XRP) focuses on facilitating real-time global payments, while privacy-focused coins like Monero and Zcash offer enhanced transaction anonymity. Stablecoins like Tether and USD Coin are pegged to stable assets like fiat currencies to minimize volatility (Olorundare, Fagboyo, Onyijen, Oni, & Adebunmi, 2023).

## 2.2 Cryptocurrencies in Business

The adoption of cryptocurrencies in business has been gaining momentum across various sectors. Initially, the use of cryptocurrencies was limited to niche markets and tech-savvy individuals. However, as the technology matured and regulatory frameworks developed, mainstream businesses began to explore and implement cryptocurrency solutions (Toufaily, Zalan, & Dhaou, 2021).

In the financial sector, cryptocurrencies are being used for cross-border payments, remittances, and asset tokenization. Companies like PayPal and Square have integrated cryptocurrency services, allowing users to buy, sell, and hold digital currencies. The real estate industry is also exploring blockchain for property transactions and title management, enhancing transparency and reducing fraud. The retail sector has seen a growing number of merchants accepting cryptocurrencies as payment (Al-Mohamad, Khaki, & Sraieb, 2024). Major companies like Microsoft, Overstock, and Shopify support cryptocurrency transactions, catering to a broader customer base. In the supply chain and logistics industry, blockchain technology is being used to track and verify the authenticity of goods, improving efficiency and reducing costs (Soufaih, 2020).

Several case studies illustrate the successful adoption of cryptocurrencies in business. One notable example is the use of Bitcoin by Overstock.com, an online retailer that began accepting Bitcoin payments in 2014. This move attracted tech-savvy customers and positioned Overstock as a forward-thinking company embracing innovative payment solutions. The integration of Bitcoin payments helped Overstock to increase its customer base and diversify its payment options (Yermack, 2024). Another case study involves Ripple, which has partnered with numerous financial institutions to facilitate real-time cross-border payments. Ripple's blockchain technology enables fast and cost-effective transactions, significantly reducing the time and cost associated with traditional banking methods. Financial institutions using Ripple's solutions have reported increased efficiency and improved customer satisfaction (Habeeb, 2020).

In supply chain management, IBM's Food Trust blockchain platform uses Hyperledger technology to track the journey of food products from farm to table. Major retailers like Walmart have adopted this solution to enhance food safety and traceability. By recording every step of the supply chain on the blockchain, companies can quickly identify and address issues, such as contamination, ensuring the integrity of their products (Tiwari, 2020).

## 2.3 Financial Inclusion and Innovation

Financial inclusion refers to the accessibility and availability of financial services to all individuals and businesses, regardless of their economic status or geographic location. It is a critical component of economic development, as it

enables people to save, invest, and manage their finances effectively. Financial inclusion promotes economic stability and growth, reduces poverty, and empowers marginalized communities by providing them with the tools to improve their livelihoods (Ozili, 2020).

For SMEs, financial inclusion is particularly important. Access to credit, affordable payment systems, and secure financial services are essential for the growth and sustainability of small businesses. Traditional financial systems often fail to meet the needs of SMEs, particularly in developing countries, where financial infrastructure may be lacking, and regulatory environments can be restrictive (Ozili, 2021).

Innovation plays a vital role in enhancing the competitiveness of SMEs. By adopting new technologies and business models, SMEs can improve their operational efficiency, reduce costs, and access new markets. Cryptocurrencies and blockchain technology offer several innovative solutions that can address the challenges faced by SMEs (Merugula et al., 2021). For example, blockchain-based smart contracts can automate and streamline various business processes, reducing the need for intermediaries and minimizing administrative overhead. Cryptocurrencies enable faster and cheaper cross-border transactions, allowing SMEs to engage in international trade without the high fees associated with traditional banking systems. Additionally, blockchain technology can enhance transparency and security in supply chain management, building trust with customers and partners (Safiullin, Yelshin, & Sharifullin, 2023).

Innovative financial products, such as decentralized finance (DeFi) platforms, provide SMEs with alternative sources of funding. DeFi platforms use blockchain technology to create decentralized financial services, offering loans, savings accounts, and investment opportunities without the need for traditional banks. This can be particularly beneficial for SMEs that struggle to access credit from conventional financial institutions (Soremekun, Abioye, Sanyaolu, Adeleke, & Efunniyi, 2024b).

## 2.4 Theoretical Framework

Several theories and models support the adoption of cryptocurrencies by SMEs, emphasizing the benefits of decentralization, innovation, and financial inclusion. One relevant theory is the Diffusion of Innovations (DOI) theory, proposed by Everett Rogers. According to DOI theory, the adoption of new technologies follows a predictable pattern, with innovators and early adopters leading the way, followed by the early majority, late majority, and laggards. Understanding this adoption curve can help SMEs strategically implement cryptocurrencies, targeting early adopters and gradually expanding to a broader customer base.

The Technology Acceptance Model (TAM) is another theoretical framework that explains how users come to accept and use a technology. According to TAM, perceived usefulness and perceived ease of use are the primary factors influencing technology adoption. For SMEs, demonstrating the practical benefits of cryptocurrencies, such as cost savings and improved efficiency, can drive acceptance among business owners and stakeholders (Kamal, Shafiq, & Kakria, 2020).

The Theory of Planned Behavior (TPB), proposed by Icek Ajzen, also provides insights into the factors influencing cryptocurrency adoption. TPB suggests that attitudes, subjective norms, and perceived behavioral control shape behavioral intentions. For SMEs, positive attitudes towards cryptocurrencies, supportive social norms, and the perceived ability to implement and use digital currencies can encourage adoption (Nuryyev et al., 2020). Finally, the firm's resource-based view (RBV) highlights the importance of leveraging unique resources and capabilities to achieve competitive advantage. Cryptocurrencies and blockchain technology can be viewed as strategic resources that provide SMEs with distinctive capabilities, such as enhanced financial transparency, reduced transaction costs, and access to global markets (Muchran et al., 2024).

By integrating these theories and models, the literature review comprehensively explains the factors driving cryptocurrency adoption in SMEs. It highlights the potential benefits of cryptocurrencies in enhancing financial inclusion and innovation while acknowledging the challenges and risks associated with their use. This theoretical framework sets the stage for further exploration of how SMEs can strategically implement cryptocurrencies to achieve their business objectives.

# 3. Strategic Benefits of Cryptocurrency Adoption for SMEs

## 3.1 Improving Financial Inclusion

One of the most significant benefits of cryptocurrency adoption for small and medium-sized enterprises (SMEs) is the improvement in financial inclusion. Traditional financial systems often impose high barriers to entry for SMEs,

particularly in developing countries or underserved regions. Cryptocurrencies offer a decentralized alternative, reducing these barriers and enabling more businesses to participate in the global economy (Alshareef & Tunio, 2022). Firstly, cryptocurrencies can substantially reduce transaction costs. Conventional banking systems often impose high fees for international transfers, currency conversions, and other financial transactions. These costs can be prohibitive for SMEs, limiting their ability to engage in cross-border trade and expand their operations. Cryptocurrencies, on the other hand, facilitate peer-to-peer transactions without the need for intermediaries, significantly lowering transaction fees. This cost reduction enables SMEs to allocate more resources towards growth and innovation (Zakarneh et al., 2022).

Additionally, cryptocurrencies enhance access to global markets. Traditional financial systems are often fragmented by national borders, making it difficult for SMEs to engage in international trade. Cryptocurrencies operate on a global network, allowing seamless cross-border transactions. This accessibility opens new markets for SMEs, enabling them to reach a broader customer base and diversify their revenue streams. Cryptocurrencies provide a valuable tool for economic empowerment and growth for businesses in developing countries, where access to international markets is often restricted (Harvey & Rabetti, 2024).

#### 3.2 Enhancing Financial Transparency and Security

Another strategic benefit of cryptocurrency adoption for SMEs is the enhancement of financial transparency and security. Cryptocurrencies are built on blockchain technology, which offers unparalleled security and transparency in financial transactions (Mentlik). Blockchain technology is a decentralized ledger that records all transactions across a network of computers. Each transaction is time-stamped and linked to the previous one, creating an immutable chain of records. This transparency ensures that all transactions are visible and verifiable, reducing the risk of fraud and enhancing trust. This can be particularly beneficial for SMEs in building credibility with customers, investors, and partners (Bhutta et al., 2021).

Reducing fraud is a critical advantage of using cryptocurrencies. Traditional financial systems are vulnerable to various forms of fraud, including identity theft, chargebacks, and fraudulent transactions. Cryptocurrencies use cryptographic techniques to secure transactions, making altering transaction records or conducting fraudulent activities nearly impossible. This security feature is especially important for SMEs, which may lack the resources to implement sophisticated fraud prevention measures (Sanz-Bas, del Rosal, Náñez Alonso, & Echarte Fernández, 2021).

Moreover, the transparency provided by blockchain technology can streamline financial auditing and reporting. SMEs often face challenges in maintaining accurate and up-to-date financial records, leading to compliance issues and potential legal liabilities. Blockchain technology ensures that all transactions are recorded in real-time and are easily accessible for auditing purposes. This can simplify the auditing process, reduce administrative burdens, and ensure compliance with regulatory requirements (Bonyuet, 2020).

## 3.3 Driving Innovation and Competitiveness

Cryptocurrency adoption can also drive innovation and competitiveness for SMEs. By embracing new technologies, SMEs can develop innovative business models, create new revenue streams, and enhance their competitive edge in the market. One way cryptocurrencies facilitate innovation is by enabling new business models. For instance, the use of smart contracts, which are self-executing contracts with terms directly written into code, can automate various business processes. This automation can reduce the need for intermediaries, lower operational costs, and increase efficiency. SMEs can use smart contracts for supply chain management, customer agreements, and financial transactions, creating more streamlined and cost-effective operations (Raj, Jauhar, Ramkumar, & Pratap, 2022).

Cryptocurrencies also encourage the development of decentralized finance (DeFi) platforms, which offer financial services without traditional intermediaries. DeFi platforms directly provide lending, borrowing, and investment opportunities through blockchain technology. SMEs can access alternative funding sources through DeFi, bypassing traditional banking constraints. This can be particularly beneficial for startups and small businesses that struggle to secure loans from conventional financial institutions (Chohan, 2021).

Furthermore, cryptocurrency adoption fosters digital transformation within SMEs. Businesses are compelled to adopt other digital tools and technologies by integrating cryptocurrencies into their operations. This can lead to the modernization of business processes, improved data management, and enhanced customer experiences. The digital transformation driven by cryptocurrency adoption can position SMEs as forward-thinking and technologically advanced, attracting tech-savvy customers and partners (Sanyaolu, Adeleke, Azubuko, & Osundare, 2024a).

Additionally, cryptocurrencies can create new revenue streams for SMEs. For example, businesses can accept cryptocurrencies as payment, attracting customers who prefer digital currencies. SMEs can also explore opportunities in the blockchain ecosystem, such as developing blockchain-based applications, providing consultancy services, or participating in cryptocurrency mining. These new revenue streams can diversify the business portfolio and increase financial resilience (Lottu et al., 2023). Lastly, embracing cryptocurrencies can enhance the overall competitiveness of SMEs. In a rapidly evolving digital economy, businesses that adopt innovative technologies are better positioned to adapt to market changes and seize new opportunities. Cryptocurrencies provide SMEs with the tools to enhance operational efficiency, reduce costs, and access new markets. This competitive advantage can lead to increased market share, higher profitability, and sustained growth (Purwaningsih, Muslikh, Suhaeri, & Basrowi, 2024).

# 4. Challenges and Considerations for SME Adoption

## 4.1 Regulatory and Legal Issues

The adoption of cryptocurrencies by small and medium-sized enterprises (SMEs) faces significant regulatory and legal challenges. Different regions have varying regulatory frameworks, which can create complexity and uncertainty for businesses seeking to integrate digital currencies into their operations. In many countries, the regulatory landscape for cryptocurrencies is still evolving (Whitford & Anderson, 2021). For instance, the United States has a fragmented regulatory approach, with different agencies like the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) providing overlapping and sometimes contradictory guidance. This inconsistency can make it difficult for SMEs to ensure compliance, especially when operating across state lines or internationally (Tarbert & Grimm, 2021). In contrast, some regions, like the European Union, are working towards more comprehensive regulatory frameworks. The EU's Markets in Crypto-Assets (MiCA) regulation aims to create a unified legal approach for cryptocurrencies across member states, providing clearer guidelines for businesses. However, until such frameworks are fully implemented, SMEs must navigate a complex and sometimes hostile regulatory environment (Soremekun, Abioye, Sanyaolu, Adeleke, & Efunniyi, 2024a).

Compliance challenges are significant for SMEs, which often lack the resources of larger corporations to deal with legal intricacies. Ensuring compliance with anti-money laundering (AML) and know-your-customer (KYC) regulations is essential but can be resource-intensive. Failure to comply with these regulations can result in hefty fines and legal repercussions, posing substantial risks to SMEs (Uzougbo, Ikegwu, & Adewusi, 2024). Moreover, the potential for regulatory changes creates an unstable environment for SMEs. Governments may alter their stance on cryptocurrencies, leading to sudden changes in legal requirements. This uncertainty can deter SMEs from adopting cryptocurrencies, as the risks associated with non-compliance or sudden legal shifts are high (Rijanto, 2024).

# 4.2 Technological and Operational Barriers

Beyond regulatory challenges, SMEs face significant technological and operational barriers when adopting cryptocurrencies. The required infrastructure and technical expertise present considerable hurdles for smaller businesses. Implementing cryptocurrency transactions necessitates specific infrastructure, such as digital wallets, secure storage solutions, and reliable internet access. Setting up and maintaining this infrastructure can be costly and complex for SMEs. Additionally, the need for cybersecurity measures to protect against hacking and theft further adds to the operational burden (Sanyaolu, Adeleke, Azubuko, & Osundare, 2024b).

Technical expertise is another critical barrier. Cryptocurrencies and blockchain technology are still relatively new, and finding skilled professionals who can manage and maintain these systems can be difficult. SMEs may not have the budget to hire dedicated blockchain experts, making it challenging to ensure the smooth integration and operation of cryptocurrency systems (Kumar, Rani, Rani, & Rani, 2024).

Integration with existing financial systems is another significant challenge. Traditional accounting and financial management systems are not designed to handle cryptocurrencies. SMEs must invest in new software or modify existing systems to accommodate digital currencies, which can be both time-consuming and expensive. Seamless integration is crucial to avoid disruptions in business operations and ensure accurate financial reporting. Furthermore, the fast-paced evolution of cryptocurrency technology means that SMEs must continuously update their systems and processes. Keeping up with technological advancements requires ongoing investment and a proactive approach to learning and adaptation, which can be taxing for smaller businesses with limited resources (Ramadan et al., 2021).

## 4.3 Market Volatility and Risk Management

One of the most prominent challenges of cryptocurrency adoption is market volatility. Cryptocurrencies are known for their significant price fluctuations, which can create substantial financial risks for SMEs. The volatility of cryptocurrency values can lead to unpredictable cash flows and financial instability. For instance, if an SME accepts payments in Bitcoin, the value of those payments can vary significantly from the time of transaction to the time of conversion to fiat currency. This unpredictability can complicate financial planning and budgeting, making it difficult for SMEs to manage their finances effectively (Ikejiofor, 2022).

Addressing the volatility of cryptocurrencies requires robust risk management strategies. One approach is to use stablecoins, which are cryptocurrencies pegged to stable assets like fiat currencies. Stablecoins can mitigate the risk of value fluctuations, providing more predictable financial outcomes. However, the use of stablecoins is not without its challenges, including regulatory scrutiny and the need for trust in the entities issuing the stablecoins. Hedging strategies can also help manage the financial risks associated with cryptocurrency volatility. SMEs can use financial instruments like futures contracts to lock in prices and protect against adverse price movements. However, these instruments can be complex and may require specialized knowledge to implement effectively (Rejeb, Rejeb, & Keogh, 2021).

Diversifying cryptocurrency holdings is another risk management strategy. By holding a variety of cryptocurrencies, SMEs can spread their risk and reduce exposure to the volatility of any single asset. However, this approach requires careful management and monitoring of multiple assets, adding to the operational complexity. Additionally, SMEs must establish clear policies and procedures for handling cryptocurrencies. This includes setting limits on the amount of cryptocurrency held, determining when and how to convert digital assets to fiat currency, and continuously monitoring market conditions. A proactive and well-planned approach to risk management is essential to mitigate the impact of market volatility (Chuen & Teo, 2021).

# 5. Conclusion and Recommendations

## 5.1 Summary of Key Findings

The adoption of cryptocurrencies presents numerous strategic benefits for small and medium-sized enterprises (SMEs). These include improving financial inclusion by reducing transaction costs and barriers to entry, enhancing access to global markets, and increasing financial transparency and security through blockchain technology. Cryptocurrencies drive innovation and competitiveness by facilitating new business models and encouraging technological adoption. However, the path to integrating cryptocurrencies is fraught with challenges, including regulatory and legal issues, technological and operational barriers, and the volatility of cryptocurrency markets.

The literature review highlighted that cryptocurrencies have evolved significantly since the introduction of Bitcoin in 2009. Their key characteristics, such as decentralization and cryptographic security, make them a viable alternative to traditional financial systems. Adoption trends show increasing interest across various sectors, with case studies demonstrating successful implementations. Theoretical frameworks underscore the potential of cryptocurrencies to enhance financial inclusion and foster innovation within SMEs.

## 5.2 Recommendations for SMEs

For SMEs considering the adoption of cryptocurrencies, several practical steps can help navigate the complexities and leverage the benefits effectively. Firstly, SMEs should conduct thorough research and stay informed about the regulatory environment in their region. Understanding the legal requirements and potential risks associated with cryptocurrency transactions is crucial for compliance and long-term sustainability. Engaging with legal experts and participating in industry forums can provide valuable insights and help anticipate regulatory changes.

Secondly, investing in the necessary technological infrastructure is essential. SMEs should ensure they have secure digital wallets, reliable internet access, and robust cybersecurity measures to protect against hacking and theft. Partnering with technology providers or consultants who specialize in blockchain and cryptocurrency solutions can facilitate a smoother integration process.

Building technical expertise within the organization is also vital. SMEs should consider training their staff on cryptocurrency and blockchain technologies. This can be achieved through workshops, online courses, and hiring professionals with relevant experience. A well-informed team is better equipped to manage and optimize cryptocurrency operations.

To manage the inherent volatility of cryptocurrencies, SMEs can adopt risk management strategies. Utilizing stablecoins for transactions can mitigate the impact of price fluctuations, providing more predictable financial outcomes. Additionally, SMEs should diversify their cryptocurrency holdings and consider using financial instruments like futures contracts to hedge against adverse price movements.

Implementing clear policies and procedures for cryptocurrency transactions is another critical step. SMEs should establish guidelines on the amount of cryptocurrency to be held, the process for converting digital assets to fiat currency, and continuous monitoring of market conditions. A proactive approach to risk management will help safeguard the business against financial instability.

Finally, SMEs should explore the potential for innovation and new business models enabled by cryptocurrencies. Embracing decentralized finance (DeFi) platforms, smart contracts, and blockchain applications can open up new revenue streams and operational efficiencies. By integrating these technologies, SMEs can position themselves as forward-thinking and competitive in an increasingly digital economy.

#### **Compliance with ethical standards**

#### Disclosure of conflict of interest

No conflict of interest to be disclosed.

#### References

- [1] Al-Mohamad, S., Khaki, A. R., & Sraieb, M. (2024). Cryptocurrency and Real Estate Transactions. In Blockchain in Real Estate: Theoretical Advances and New Empirical Applications (pp. 103-122): Springer.
- [2] Alshareef, N., & Tunio, M. N. (2022). Role of leadership in adoption of blockchain technology in small and medium enterprises in Saudi Arabia. Frontiers in Psychology, 13, 911432.
- [3] Bhutta, M. N. M., Khwaja, A. A., Nadeem, A., Ahmad, H. F., Khan, M. K., Hanif, M. A., . . . Cao, Y. (2021). A survey on blockchain technology: Evolution, architecture and security. IEEE access, 9, 61048-61073.
- [4] Bonyuet, D. (2020). Overview and impact of blockchain on auditing. International Journal of Digital Accounting Research, 20, 31-43.
- [5] Chohan, U. W. (2021). Decentralized finance (DeFi): An emergent alternative financial architecture. Critical Blockchain Research Initiative (CBRI) Working Papers.
- [6] Chuen, D. L. K., & Teo, E. (2021). The new money: the utility of cryptocurrencies and the need for a new monetary policy. In Disintermediation Economics: The Impact of Blockchain on Markets and Policies (pp. 111-172): Springer.
- [7] Cunha, P. R., Melo, P., & Sebastião, H. (2021). From bitcoin to central bank digital currencies: Making sense of the digital money revolution. Future Internet, 13(7), 165.
- [8] Habeeb, J. M. (2020). Blockchain: the effects on cross-border transactions.
- [9] Harvey, C. R., & Rabetti, D. (2024). International business and decentralized finance. Journal of International Business Studies, 1-24.
- [10] Ikejiofor, E. O. (2022). The Perceived Impact of Cryptocurrency Adoption on the Financial Management Behaviors of SMEs in the United States: A Correlational Study: Northcentral University.
- [11] January, B. (2020). Cryptocurrencies and the Blockchain Revolution: Bitcoin and beyond: Millbrook Press.
- [12] Kamal, S. A., Shafiq, M., & Kakria, P. (2020). Investigating acceptance of telemedicine services through an extended technology acceptance model (TAM). Technology in Society, 60, 101212.
- [13] Kumar, J., Rani, G., Rani, M., & Rani, V. (2024). Blockchain technology adoption and its impact on SME performance: insights for entrepreneurs and policymakers. Journal of Enterprising Communities: People and Places in the Global Economy.
- [14] Lottu, O. A., Abdul, A. A., Daraojimba, D. O., Alabi, A. M., John-Ladega, A. A., & Daraojimba, C. (2023). Digital transformation in banking: a review of Nigeria's journey to economic prosperity. International Journal of Advanced Economics, 5(8), 215-238.

- [15] Mandić, A. (2021). Effects of cryptocurrencies on financial markets. University of Zagreb. Faculty of Economics and Business. Department of Finance,
- [16] Mentlik, R. Cryptocurrency and International Business.
- [17] Merugula, S., Dinesh, G., Kathiravan, M., Das, G., Nandankar, P., & Karanam, S. R. (2021). Study of blockchain technology in empowering the SME. Paper presented at the 2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS).
- [18] Mikhaylov, A. (2020). Cryptocurrency market analysis from the open innovation perspective. Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 197.
- [19] Muchran, M., Muchran, M., Arsal, M., Badollahi, I., Muchran, M., & Insirat, M. N. (2024). A Test of the Planned Behavior Theory: The Impact on Behavior in the Implementation of Central Bank Digital Currency in Indonesia. Review of Integrative Business and Economics Research, 13(3), 451-463.
- [20] Nurohman, Y. A., Kusuma, M., & Narulitasari, D. (2021). Fin-Tech, financial inclusion, and sustainability: a quantitative approach of Muslims SMEs. IJIBE (International Journal of Islamic Business Ethics), 6(1), 54-67.
- [21] Nuryyev, G., Wang, Y.-P., Achyldurdyyeva, J., Jaw, B.-S., Yeh, Y.-S., Lin, H.-T., & Wu, L.-F. (2020). Blockchain technology adoption behavior and sustainability of the business in tourism and hospitality SMEs: An empirical study. Sustainability, 12(3), 1256.
- [22] Olorundare, J. K., Fagboyo, R. J., Onyijen, O. H., Oni, M., & Adebunmi, A. A. (2023). Economic Prospect of Cryptocurrency: Nigeria as a Case Study. Journal homepage: www. ijrpr. com ISSN, 2582, 7421.
- [23] Ozili, P. K. (2020). Theories of financial inclusion. In Uncertainty and challenges in contemporary economic behaviour (pp. 89-115): Emerald Publishing Limited.
- [24] Ozili, P. K. (2021). Financial inclusion research around the world: A review. Paper presented at the Forum for social economics.
- [25] Purwaningsih, E., Muslikh, M., Suhaeri, S., & Basrowi, B. (2024). Utilizing blockchain technology in enhancing supply chain efficiency and export performance, and its implications on the financial performance of SMEs. Uncertain Supply Chain Management, 12(1), 449-460.
- [26] Raj, P. V. R. P., Jauhar, S. K., Ramkumar, M., & Pratap, S. (2022). Procurement, traceability and advance cash credit payment transactions in supply chain using blockchain smart contracts. Computers & industrial engineering, 167, 108038.
- [27] Ramadan, R. A., Aboshosha, B. W., Alshudukhi, J. S., Alzahrani, A. J., El-Sayed, A., & Dessouky, M. M. (2021). Cybersecurity and Countermeasures at the Time of Pandemic. Journal of Advanced Transportation, 2021(1), 6627264.
- [28] Rejeb, A., Rejeb, K., & Keogh, J. G. (2021). Cryptocurrencies in modern finance: a literature review. Etikonomi, 20(1), 93-118.
- [29] Richardson, M. (2024). Blockchain Technology: Learn Step by Step Smart Contracts, Monero, Blockchain Wallet, Bitcoin, Zcash, Ethereum, Ripple, Dash, Mining, Litecoin, IOTA: Mike Richardson.
- [30] Rijanto, A. (2024). Blockchain technology roles to overcome accounting, accountability and assurance barriers in supply chain finance. Asian Review of Accounting.
- [31] Rosyadah, K., Mus, A. R., Semmaila, B., & Chalid, L. (2022). The Relevance of Working Capital, Financial Literacy and Financial Inclusion on Financial Performance and Sustainability of Micro, Small and Medium-Sized Enterprises (MSMEs). American Journal of Humanities and Social Sciences Research (AJHSSR), 4, 203-216.
- [32] Safiullin, M., Yelshin, L., & Sharifullin, M. (2023). Prospects for using blockchain in the system of international supply chains and cross-border payments. Revista Gestão & Tecnologia, 23(4), 360-376.
- [33] Sakız, B., & Gencer, E. A. H. (2020). Cryptocurrencies, Blockchain Technology and Sustainability. ON EURASIAN ECONOMIES 2020, 200.
- [34] Sanyaolu, T. O., Adeleke, A. G., Azubuko, C. F., & Osundare, O. S. (2024a). Exploring fintech innovations and their potential to transform the future of financial services and banking.
- [35] Sanyaolu, T. O., Adeleke, A. G., Azubuko, C. F., & Osundare, O. S. (2024b). Harnessing blockchain technology in banking to enhance financial inclusion, security, and transaction efficiency.

- [36] Sanz-Bas, D., del Rosal, C., Náñez Alonso, S. L., & Echarte Fernández, M. Á. (2021). Cryptocurrencies and fraudulent transactions: Risks, practices, and legislation for their prevention in Europe and Spain. Laws, 10(3), 57.
- [37] Shah, A. S., Karabulut, M. A., Akhter, A. S., Mustari, N., Pathan, A.-S. K., Rabie, K. M., & Shongwe, T. (2023). On the vital aspects and characteristics of cryptocurrency—A survey. IEEE access, 11, 9451-9468.
- [38] Sharma, D. K., Pant, S., Sharma, M., & Brahmachari, S. (2020). Cryptocurrency mechanisms for blockchains: models, characteristics, challenges, and applications. Handbook of research on blockchain technology, 323-348.
- [39] Soremekun, Y. M., Abioye, K. M., Sanyaolu, T. O., Adeleke, A. G., & Efunniyi, C. P. (2024a). Conceptual framework for assessing the impact of financial access on SME growth and economic equity in the US.
- [40] Soremekun, Y. M., Abioye, K. M., Sanyaolu, T. O., Adeleke, A. G., & Efunniyi, C. P. (2024b). A conceptual model for inclusive lending through fintech innovations: Expanding SME access to capital in the US.
- [41] Soufaih, A. (2020). Revolutionizing international remittance payments using cryptocurrency and blockchainbased technology.
- [42] Tarbert, H. P., & Grimm, D. J. (2021). The CFTC's Swap Data Overhaul. Fla. St. U. Bus. Rev., 20, 1.
- [43] Tiwari, U. (2020). Application of blockchain in agri-food supply chain. Britain International of Exact Sciences (BIoEx) Journal, 2(2), 574-589.
- [44] Toufaily, E., Zalan, T., & Dhaou, S. B. (2021). A framework of blockchain technology adoption: An investigation of challenges and expected value. Information & Management, 58(3), 103444.
- [45] Uzougbo, N. S., Ikegwu, C. G., & Adewusi, A. O. (2024). International enforcement of cryptocurrency laws: jurisdictional challenges and collaborative solutions. Magna Scientia Advanced Research and Reviews, 11(1), 068-083.
- [46] Whitford, A. B., & Anderson, D. (2021). Governance landscapes for emerging technologies: The case of cryptocurrencies. Regulation & Governance, 15(4), 1053-1070.
- [47] Wronka, C. (2023). Financial crime in the decentralized finance ecosystem: new challenges for compliance. Journal of Financial Crime, 30(1), 97-113.
- [48] Yermack, D. (2024). Is Bitcoin a real currency? An economic appraisal. In Handbook of digital currency (pp. 29-40): Elsevier.
- [49] Zakarneh, S. K., Qaroush, Z., & Dawabsheh, A. (2022). Cryptocurrencies advantages and disadvantages: a review. International Journal of Applied Sciences and Smart Technologies, 4(1), 1-20.
- [50] Zhang, Y. (2020). Developing cross-border blockchain financial transactions under the belt and road initiative. The Chinese Journal of Comparative Law, 8(1), 143-176.