



THE IMPACT OF BITCOIN ADOPTION ON THE BANKING SYSTEM: SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The rapid development of Bitcoin as the first cryptocurrency has sparked widespread discussion about its impact on the financial system, particularly the banking payment system. Blockchain technology underlying Bitcoin offers transaction efficiency, transparency, cost reduction, and disintermediation. However, price volatility, legal uncertainty, and regulatory challenges raise concerns about financial institutions' stability and readiness to adopt this innovation. This study finds that Bitcoin indirectly influences the banking payment system by accelerating blockchain adoption in the financial sector. Through blockchain, banks can develop more efficient, secure, and faster payment infrastructures. Yet, adoption remains limited due to regulatory ambiguity, infrastructure gaps, and resistance to changes in traditional banking models. Regulation is identified as a key factor influencing readiness, where inconsistent international legal frameworks, lack of clear standards, and weak global coordination hinder broader adoption. As digital financial activities grow outside the formal banking system, a regulatory approach that is adaptive, collaborative, and risk-based becomes essential to allow banks to participate actively in future financial ecosystems. This research contributes to the academic literature on crypto technology's impact on banking and provides practical insights for regulators and industry players to address both the opportunities and risks of financial digitalization.

Keywords: *Bitcoin, payment systems, banking, blockchain, regulation, digital transformation.*

1 INTRODUCTION

Bitcoin is a currency that allows parties to exchange value, much like paper money and gold. However, unlike previous currencies (Baur et al., 2018). Bitcoin is the first digital and decentralized (Kunjadić & Jović, 2016) Bitcoin was introduced by (Nakamoto, 2009) and has since experienced rapid growth, especially in the digital payments sector. In recent years, Bitcoin has been increasingly adopted in payment systems, offering faster, more transparent, and free transactions than traditional banking intermediaries (Karame et al., 2012). This phenomenon has raised a debate about its impact on the banking payment system: is Bitcoin an opportunity that can drive innovation or is it a threat that can shift the role of banking in financial transactions?(Atıcı, 2019).

On the one hand, the adoption of Bitcoin can be an opportunity for the banking industry to adopt new technological innovations, improve transaction efficiency, and reach a wider market, especially in areas with limited banking access (Guo & Liang, 2016). However, on the other hand, the decentralized nature of Bitcoin can also be a threat because it reduces the role of banks in processing transactions, poses regulatory challenges, as well as price volatility that can impact the stability of the financial system (Mbaidin, Alsmairat, & Al-adaileh, 2023). Although the study of cryptocurrencies in the financial system continues to grow (Arnadi Chairunnas et al., 2024; Guo & Liang, 2016; Jamil Safarli & Jamil Safarli, 2024; Kaushik & Khatri, 2021; Latipah et al., 2024), research that specifically addresses the impact of Bitcoin adoption on banking payment systems is still limited (Atıcı, 2019; Kunjadić & Jović, 2016). Most of the research focuses more on cryptocurrencies in general without considering Bitcoin's unique characteristics as the first digital asset with the largest market capitalization (Arnadi Chairunnas et al., 2024; Bilgin, 2024; Guo & Liang, 2016; Osmani et al., 2021). Therefore, this study seeks to answer several key questions, such as:

1. How *Bitcoin* affects the banking payment system
2. What are some of the challenges and opportunities banks face in adopting *Bitcoin*?
3. how does regulation affect banks' readiness in the face of Bitcoin adoption? As an institution that has a central role in the payment system (Angelini & Passacantando, 1992), Banks must understand how *the Bitcoin* adoption trend could change the landscape of financial transactions. As *Bitcoin adoption* increases, many banks are starting to consider the integration of *blockchain* technology in their payment systems as an adaptation step in the digital age (KUMAR, 2022).

There is still little research that specifically addresses the impact of Bitcoin on the banking payment system, especially in certain regulatory contexts (Atıcı, 2019; Karame et al., 2012; Kunjadić & Jović, 2016). Therefore, this study aims to explore how banks are responding to the Bitcoin adoption trend as well as its implications for existing payment systems.

This research has both theoretical and practical benefits. Theoretically, this study contributes to increasing the literature on the impact of Bitcoin adoption on the banking payment system, especially from a qualitative perspective. In addition, this research fills the academic gap by presenting an in-depth analysis of the challenges and opportunities faced by banks in dealing with the development of blockchain and Bitcoin technology in payment systems. Practically, this

study provides a better understanding for the public of how Bitcoin can affect the banking payment system. With the increasing adoption of digital assets, this research can assist individuals in understanding the changes that occur in the financial transaction system as well as how they can adapt to technological developments. For the authors, this study constitutes a valuable academic opportunity to deepen our understanding of Bitcoin adoption in payment systems as well as the challenges and opportunities faced in this context. This research process is also an opportunity for the author to develop analytical skills, critical thinking, and the ability to prepare scientific studies in the field of financial technology.

2 LITERATURE REVIEW

Disruptive Innovation Theory

Disruptive Innovation Theory was introduced by (Christensen, 1997) in his book *The Innovator's Dilemma* (1997). This theory explains how new innovations can disrupt established industries by offering more efficient, cheaper, or simpler solutions compared to previous technologies. Disruptive innovations often emerge by meeting the needs of market segments that were previously unreachable by old technology, until they can eventually replace existing systems.

In the context of this research, Bitcoin can be categorized as a disruptive innovation due to its decentralized nature and does not require intermediaries such as banks to process transactions. This has the potential to transform traditional banking payment systems by offering faster transactions, lower fees, and higher transparency. On the one hand, banks may see Bitcoin and blockchain technology as opportunities to improve efficiency and reduce operational costs. However, on the other hand, Bitcoin's presence can also be a threat as it can reduce the role of banking in the financial transaction process. Some major banks, such as JP Morgan, have started experimenting with blockchain technology and developing crypto-based products such as JPM Coin as a response to this innovation (Macaulay, 2019).

Agency Theory

The Theory of Agency is put forward by (Jensen & Meckling, 1976) says the relationship between the owner and the agent in which the agent acts on behalf of the owner, but often has his own interests that do not always align with the interests of the owner. In the traditional financial system, banks act as agents who manage customers' funds and process financial transactions on their behalf.

Bitcoin has the potential to change this agency dynamic because it allows direct transactions between individuals without the need for intermediaries such as banks. Thus, the role of banks as agents can be reduced, as users can directly conduct transactions with a decentralized system without having to rely on financial institutions (Guo & Liang, 2016). This can reduce transaction costs and improve efficiency, but it also presents new challenges, such as consumer protection and transaction security risks

3 RESEARCH METHODOLOGY

This study uses the Systematic Literature Review (SLR) method to explore the impact of *Bitcoin* adoption on the banking payment system. According to (Snyder, 2019) This method is a great approach to get a comprehensive overview of a topic by bringing together

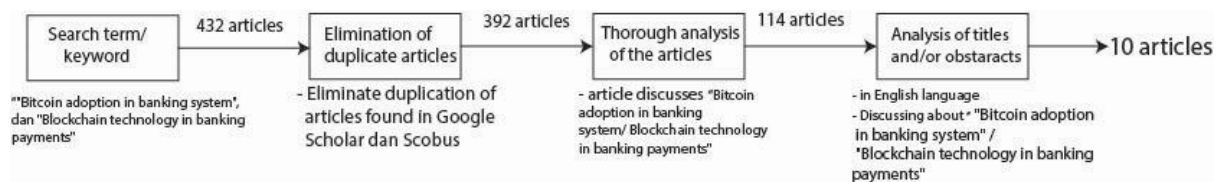


Figure 1. Article Selection Process

a wide range of relevant studies. SLR allows this research to identify patterns, trends, and gaps in the existing literature so that it can provide deeper academic insights. The literature collection process is carried out using the Systematic Literature Review (SLR) method to obtain sources relevant to the topic of Bitcoin adoption in the banking payment system. The first stage was carried out by searching 432 journals related to research topics through academic databases such as Google Scholar, scobus, and others. The keywords used in the search included English and Indonesian with the keywords "Bitcoin adoption in banking system", and "Blockchain technology in banking payments". After the journal is collected, the next stage is to conduct an in-depth analysis of the content of the article based on the inclusion and exclusion criteria that have been set, such as relevance to the banking payment system, the research method used, and the credibility of the source. To ensure relevance to the latest developments, this study only included articles published in the last 10 years (2015–2025). The literature selection process is carried out by establishing inclusion criteria, namely articles that discuss the impact of Bitcoin on the banking payment system, published in reputable academic journals or conferences, using

empirical approaches or case studies, and available in English or Indonesian. Meanwhile, the exclusion criteria include articles that only discuss the technical aspects of Bitcoin with no connection to the banking system, are not published in academic journals, or have no scientific basis for research. After the selection process, the selected articles are then analyzed using a descriptive-qualitative approach, where each study is categorized based on the research focus, research method used, and the main findings presented (Leksono et al., 2013).

This analysis aims to understand the extent to which Bitcoin adoption affects banking payment systems as well as how banks respond to this phenomenon. With a systematic SLR method, this study is expected to provide a clearer understanding of the challenges and opportunities facing the banking industry in dealing with the development of blockchain technology and cryptocurrencies, as suggested in the approach (Snyder, 2019) that SLR can be used to inform academic policy and decisions based on empirical evidence that has been systematically reviewed. From the results of the analysis, 10 main journals were obtained that were the most relevant and had a significant contribution to this research. These journals are then used as a basis for compiling theoretical frameworks and analyzing the impact of Bitcoin adoption on the banking system. To maintain objectivity in the selection of articles, the author applies a gradual screening approach. The initial stage is a review of titles and abstracts, followed by a thorough review of the full content of articles that passed the initial selection. Each article is then assessed in terms of topic suitability, methodological quality, as well as theoretical and practical contributions to the topic of Bitcoin's impact on the banking system. The author also pays attention to the diversity of geographical contexts and methodological approaches in the selected articles, to gain a more comprehensive perspective. In addition, to improve transparency and replicability, all entries are recorded in a literature review table, complete with author information, research methods, key findings, and limitations of their respective studies. In the data analysis process, this study adopts a thematic coding approach to group findings based on key issues such as payment system efficiency, impact on financial intermediation, regulatory implications, and banks' institutional response to blockchain technology. Theme categories are formed inductively based on the content of the article being reviewed. After the theme is formed, the author conducts a narrative synthesis to explain the general patterns, contradictions, and emptiness in the literature. With this approach, the research not only presents a summary of the

content of the article but also provides a critical interpretation of the dynamics and direction of the development of the study on Bitcoin in the banking system.

4 RESULTS AND DISCUSSION

A total of 10 articles has passed the screening process, as explained in the methodology section. The list of selected article titles, author names and year of publication, journal names, and journal classifications are presented in Table 1. To answer the research questions, the information in each article was analyzed, including the research methods used, the main findings, whether the article showed that Bitcoin or blockchain technology had an effect on the banking payment system, as well as the main limitations of each study.

Based on the results of a selection and analysis of ten articles that met the inclusion criteria, the study identified that most of the research views Bitcoin as an early trigger in the exploration of blockchain technology by the banking sector, rather than as the primary means of payment within the banking system itself. Therefore, the discussion of the results in this study is focused on the three main questions that have been mentioned in the introduction. A summary of this information can be seen in Table 2. Further discussion is presented to answer the objectives and questions in this study.

Tabel 1 List of Featured Articles to Review

1	Understanding and applying Blockchain technology in banking: Evolution or revolution?	Mark Buitenhek (2016)	Journal of Digital Banking
2	Systematic literature review on blockchain adoption in banking	Anjali Kaushik, Arun Khatri (2021)	Pressacademia
3	From Skepticism to Integration: The Banking Sector's Evolving Relationship with Cryptocurrency and Blockchain Technology	Ela BILGIN (2024)	Expert Journal of Economics
4	Blockchain Application in Banking System	Minhaj Uddin Chowdhury (2021)	Scientific Research Publishing
5	Blockchain application and outlook in the banking industry	Guo, Ye Liang, Chen (2016)	Financial Innovation
6	THE IMPACT OF CRYPTOCURRENCY ADOPTION ON TRADITIONAL BANKING SYSTEMS: A THEORETICAL STUDY	Jamil Safarli, Gulzar Jamil Safarli, Arzu (2024)	Elmi Əsərlər
7	Blockchain Application for Central Banks: A Systematic Mapping Study	NATALIA DASHKEVICH (2020) Raphael Auer, Marc	IEEE

8	Banking in the Shadow of Bitcoin? The Institutional Adoption of Cryptocurrencies	Farag (2023)	Ifo Institute – Leibniz Institute for Economic Research at the University of Munich
9	Banking on Blockchain: Costs Savings Thanks to the Blockchain Technology	Luisanna Cocco, Andrea Pinna, and Michele Marchesi (2017)	<i>Future Internet</i>
10	Blockchain adoption for sustainable development in developing countries: Challenges and opportunities in the banking sector	Hisham O. Mbaidin, Mohammad A.K. Alsmairat, and Raid Al- Adaileh (2023)	ELSEVIER

Writer	Research Methods	Key Findings	Does Bitcoin Affect the Banking Payment System?	Major Limitations
(Buitenhek, 2016)	Conceptual Studies and Industry Perspectives. The	Blockchain has great potential in overhauling	Yes. Bitcoin as an early form of blockchain technology sparked	Not using formal scientific methods or

<p>(Kaushik & Khatri, 2021)</p>	<p>article was written by an industry practitioner (Global Head of ING Transaction Services) and describes strategic thinking as well as real-world examples of the use of blockchain by banks, without primary data collection.</p>	<p>payment systems, settlements, and trade finance. This technology enables cost efficiency, increased transparency, and process automation through smart contracts. In the long run, it can replace the need for third parties such as clearing houses.</p>	<p>massive exploration by banks of the potential efficiency and disintermediation that blockchain offers. Bitcoin is not the focus, but it is considered a trigger for awareness of the potential of this technology.</p>	<p>empirical data; be reflective and conceptual; does not include systematic trials or evaluation of field data. Focus on the views of practitioners and not the results of academic research.</p>
<p>(Bilgin, 2024)</p>	<p>Systematic Literature Review (SLR) from articles to 2019. No specific number of articles is mentioned, but it covers global studies.</p>	<p>Blockchain has the potential to drastically change the banking industry, especially in efficiency, transparency, and speed of transactions. Adoption is still limited, but more and more global banks are exploring and testing.</p>	<p>Yes, indirectly. Bitcoin as an early form of blockchain shows the potential for disintermediation in the payment system and is a trigger for the adoption of blockchain technology by banks.</p> <p>Yes. Bitcoin as a pioneer is driving attention to blockchain. Although the immediate adoption of</p>	<p>The study is literature with no empirical testing; most of the data only covers up to 2019; It does not reflect the latest conditions after the increase in global crypto adoption.</p> <p>Public secondary data-driven studies; does not</p>

	<p>based on case studies (Citigroup, JPMorgan, HSBC, Goldman Sachs). Analysis of the strategy of the big banks.</p>	<p>Major banks are shifting from skepticism to active adoption of blockchain and crypto technologies. For example: JPMorgan (JPM Coin), Citigroup (Citicoins), HSBC (blockchain for trade finance), and Goldman Sachs (crypto trading desk).</p>	<p>Bitcoin is limited, its presence is accelerating the exploration of blockchain-based payment systems.</p>	<p>include strategic internal dynamics; limitations due to the rapid evolution of crypto and blockchain technology.</p>
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Writer	Research Methods	Key Findings	Does Bitcoin Affect the Banking Payment System?	Major Limitations
(Chowdhury et al., 2021)	<p>Conceptual review. This article is a narrative literature with a descriptive approach to blockchain technology, its working</p>	<p>Blockchain can improve efficiency, security, transparency, and reduce bank operating costs. The use of blockchain is also able to speed up</p>	<p>Yes. Bitcoin is said to be the first crypto that drove the emergence and development of blockchain. Although Bitcoin is not the focus, its</p>	<p>The article does not include empirical data or actual case studies at financial institutions. The analysis is theoretical and</p>

<p>(Guo & Liang, 2016)</p> <p>(Jamil Safarli & Jamil Safarli, 2024)</p>	<p>mechanism (authentication, proof of work, mining), and its applications in the banking sector. It does not list the number of articles or systematic methods such as SLR.</p> <p>Conceptual literature review. Explain the application and potential of blockchain in banking</p> <p>Theoretical study based on global literature review. Examining the disruption caused by crypto to banks.</p>	<p>transactions, eliminate the role of third parties, and improve information quality and regulatory compliance.</p> <p>Blockchain has the potential to revolutionize payment systems and banking credit information systems through high efficiency, disintermediation, and improved data security.</p> <p>Cryptocurrencies and blockchain challenge traditional banking systems by offering financial inclusion, transaction</p>	<p>role as a pioneer of blockchain technology is explicitly explained.</p> <p>Yes. Blockchain (including Bitcoin as its application) can speed up the payment process, reduce costs, and improve bank efficiency.</p> <p>Yes. Bitcoin as a pioneer of cryptocurrencies shows the potential for disintermediation in the banking system and encourages strategic change by traditional banks.</p>	<p>general. There is no in-depth discussion of specific adoption barriers nor any real implementation evaluation.</p> <p>Blockchain implementation still faces regulatory hurdles, limited efficiency in public systems, and difficulties in achieving full decentralization</p> <p>The study is theoretical; does not present empirical data or specific case studies; generalization on a global scale without focusing on a specific</p>
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		<p>efficiency, and decentralization. However, volatility and regulatory challenges remain major obstacles.</p>		<p>region or institution.</p>
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Writer	Research Methods	Key Findings	Does Bitcoin Affect the Banking Payment System?	Major Limitations
(Dashkevich et al., 2020)	Systematic Mapping Study (SMS). The study analyzed 72 peer-reviewed publications from 2008–2020	The study found that interest in blockchain applications in central banks is young and dominated by non-empirical contributions. The focus is on five areas: 1) Central Bank Digital Currency (CBDC), 2) Payment Clearing and Settlement, 3) Regulatory Compliance, 4) Asset Transfer & Ownership, and 5) Audit Trail. CBDC	Not directly. The study excludes Bitcoin and other cryptocurrencies in the article selection process. However, Bitcoin is recognized as the early originator of blockchain research and is used as a historical context for the development of the technology.	This study did not cover non-academic articles (industry grey literature) as a whole; does not address the effectiveness of actual implementation; The main focus is on research trends, not analysis of the real impact on central or commercial banks.
(Auer et al., 2023)	Quantitative study based on global data of banks. Using supervisory data until 2020.		Yes, indirectly.	The bank's data only covers up to 2020, is aggregated and limited; Crypto activity often takes
(Cocco et al., 2017)			Although the direct involvement of banks is small, the growth of	

<p>(Mbaidin, Alsmairat, & Al-Adaileh, 2023)</p>	<p>Quantitative and technical analysis. Simulation of Bitcoin's efficiency and its impact on the financial system.</p> <p>Systematic Literature Review (SLR). Accessing 4 main databases (Scopus, WoS, EBSCO, Google Scholar) out of</p>	<p>and regulation are the most intensively researched topics.</p> <p>Institutional adoption of crypto, including Bitcoin, is still limited to banks. However, the rapid growth of crypto activities outside the traditional financial system (shadow crypto financial system) presents a major challenge to financial supervision and stability.</p> <p>Blockchain offers great cost efficiencies in the global financial system. The study measured Bitcoin's</p>	<p>the crypto shadow financial system increases the potential for systemic risks and pressures banks to adapt.</p> <p>Yes. Bitcoin shows potential for efficiency and disintermediation but is limited by energy consumption and low scalability. This sparked the adoption of blockchain in banking to improve efficiency and sustainability.</p> <p>Not directly. The focus of the study is on blockchain in general, not Bitcoin, but Bitcoin is cited as</p>	<p>place outside of the officially supervised banking system.</p> <p>The focus is on Bitcoin's technical performance; has not considered real banking empirical data; Efficiency assumptions are based on simulations, not actual applications in the banking sector.</p> <p>Not presenting empirical data using only literature articles until 2022 focusing on developing countries without examples of specific implementations, Bitcoin is only mentioned briefly.</p>
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	<p>1,857 articles, only 17 were selected (2010–2022).</p>	<p>economic, operational, and service efficiency, but found that its efficiency was low due to its high energy consumption and block size limitations.</p> <p>Blockchain has great potential in improving efficiency, security, financial inclusion, and transparency in the financial systems of developing countries. However, its adoption is still hampered by scalability, regulation, cost, and lack of infrastructure.</p>	<p>the initial driver of the development of blockchain technology.</p>	
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How does Bitcoin affect the banking payment system?

Based on the results of a systematic literature review of 10 articles. Bitcoin affects the banking payment system indirectly through the underlying blockchain technology. Bitcoin as the

first cryptocurrency served as an early trigger that prompted banking institutions to explore and adopt blockchain technology. Some studies such as (Guo & Liang, 2016) emphasized that blockchain, the technology behind Bitcoin has the potential to overhaul the banking payment system, improve efficiency, security, and transparency, and reduce the need for intermediaries in transactions. Although Bitcoin itself is rarely adopted outright as a means of payment by banks, its existence introduces the concept of disintermediation in financial services, which prompted banks to develop new blockchain-based systems. This is seen in the case of several major banks such as JPMorgan, Citigroup, and HSBC, which were reported in studies (Bilgin, 2024) and (Chowdhury et al., 2021) where they started creating internal digital currencies (e.g. JPM Coin) and using blockchain for trade finance transactions in response to the trend pioneered by Bitcoin. Further, the study (Buitenhok, 2016)) states that Bitcoin although not the main focus, has shifted the banking industry's perception of digital payment systems and created pressure to innovate, especially in terms of transaction speed and cost efficiency. However, some studies such as (Auer et al., 2023) and (Mbaidin, Alsmairat, & Al-adaileh, 2023) emphasize that banking involvement is still cautious and limited, especially due to concerns about the systemic risks and volatility inherent in Bitcoin as a public asset. Bitcoin has a significant impact on the banking payment system as a catalyst for technological transformation, rather than as a currency directly adopted by the formal banking system. Bitcoin's main influence lies in its ability to inspire the exploration and implementation of blockchain technology in modern bank operations. In addition, a study conducted by (Kaushik & Khatri, 2021) shows that although the adoption of Bitcoin as a means of payment is still not significant, its indirect influence is very felt in the form of increased interest in banks towards the integration of blockchain systems to strengthen payment efficiency and transparency. They emphasized that blockchains that are widely introduced through Bitcoin can automate the payment process through the implementation of smart contracts, as well as enable real-time transaction tracking that minimizes fraud. The study also underlines that the presence of Bitcoin has triggered the banking sector to evaluate their legacy technology systems, particularly in terms of settlement, clearing, and risk management, which have been time-consuming and costly. Therefore, it can be concluded that Bitcoin's influence on the banking payment system is not only technical, but also strategic because it encourages the emergence of digital transformation pressures in the internal structures of financial institutions.

Table 3. Evidence of Bitcoin's Influence on the Banking Payment System

Writer	Evidence of Bitcoin's Influence on the Banking Payment System
(Guo & Liang, 2016)	Blockchain speeds up the payment process and reduces costs. Bitcoin is referred to as the main trigger.
(Bilgin, 2024)	The adoption of blockchain by major banks was triggered by Bitcoin's early existence
(Buitenhek, 2016)	Bitcoin encourages the exploration of blockchain technology by banks, not the focus but being the trigger.

What Are the Challenges and Opportunities Banks Face in Adopting Bitcoin?

The study found that the emergence of Bitcoin provoked a dualistic reaction in the banking sector: on the one hand as an opportunity for financial technology innovation, and on the other hand as a new source of risk that requires special attention. In terms of opportunities, Bitcoin introduces blockchain technology that offers various advantages that have the potential to revolutionize the banking payment system. This technology enables transaction efficiency through distributed recording, automation of payment processes using smart contracts, increased transparency due to the immutable nature of record-keeping and reduced operational costs by reducing the need for intermediaries such as clearing houses or clearing houses. Studies by (Guo & Liang, 2016) and (Kaushik & Khatri, 2021) state that blockchain can significantly reduce the reliance on third parties in the payment process, which has been one of the cost and time barriers in traditional banking systems. In addition to efficiency, blockchain adoption can also speed up the transaction verification process and improve data security because all devices in the blockchain network keep identical and complete records of transactions, making them difficult to manipulate. In addition, (Mbaidin, Alsmairat, & Al-adaileh, 2023) emphasized that blockchain technology also has the potential to expand access to formal financial services, especially in developing countries that have low levels of financial inclusion. With a structure that does not depend on a central institution, blockchain can be used to reach populations that do not have access to conventional banking systems, such as people in remote areas, micro-entrepreneurs, or individuals without legal documentation. (Bilgin, 2024) notes that the pressure from Bitcoin

adoption is pushing major global banks to experiment with blockchain-based payment systems, such as JPMorgan’s launch of JPM Coin, as well as HSBC and Citigroup initiatives in Blockchain-based trade finance projects. This initiative reflects the bank's strategic response to the financial technology trends triggered by the emergence of Bitcoin. However, behind these opportunities, banks also face a number of complex challenges. The first challenge is Bitcoin's extremely high price volatility, making it unfeasible as a stable medium of exchange or store of value

Table 4. Evidence of Challenges and Opportunities Banks Face in Adopting Bitcoin

Writer	Findings Related to Challenges and Opportunities for Bitcoin Adoption by Banks
(Guo & Liang, 2016)	Blockchain improves efficiency, transparency, and reduces the role of third parties in payments.
(Kaushik & Khatri, 2021)	Blockchain technology supports automation, smart contracts, and payment process efficiency, but still faces Human Resources challenges.
(Cocco et al., 2017)	Bitcoin is considered efficient in simulation, but it is highly volatile and unstable as a medium of exchange in the banking system.
(Bilgin, 2024)	Banks responded to pressure from Bitcoin with internal digital innovations but were still hampered by legal and reputational uncertainty.

in the banking payment system This is confirmed by (Cocco et al., 2017) and (Jamil Safarli & Jamil Safarli, 2024) who state that price fluctuations are one of the main obstacles to direct adoption by financial institutions. The second challenge is regulatory uncertainty. Studies such as (Bilgin, 2024) and (Dashkevich et al., 2020) show that the lack of uniform policies and

clear legal frameworks regarding the use of Bitcoin raises doubts among banks, especially regarding legal and reputational risks. In addition, there is also a third structural challenge, namely the limitation of digital infrastructure and the readiness of human resources in the banking sector. The implementation of blockchain-based systems requires core technology updates, strengthening cybersecurity, and improving literacy and technical competence among bank employees. (Kaushik & Khatri, 2021) note that without organizational readiness and systemic support, the adoption of this technology risks leading to significant technical and operational errors. This is also a barrier for small or developing banks that have limited access to infrastructure and technology investments. Thus, while Bitcoin and its accompanying technologies open up a wide range of strategic opportunities for payment system reform, the realization of these opportunities still faces fundamental challenges that need to be addressed holistically through regulation, technology capacity building, and cross-sector collaboration.

how will regulation affect banks' readiness to adopt *Bitcoin*?

Regulation plays a crucial role in determining the readiness and strategy of Bitcoin adoption by the banking sector. Based on the findings of the analyzed study, it can be concluded that regulatory uncertainty and inconsistency are one of the most dominant inhibiting factors to the active involvement of banking institutions in the crypto asset ecosystem, including Bitcoin. Studies by (Bilgin, 2024) and (Dashkevich et al., 2020) show that most banks are still conservative towards Bitcoin adoption due to the lack of a clear and uniform legal framework. In many countries, Bitcoin's legal status is still ambiguous, considered an asset, a commodity, a virtual currency, or even a speculative instrument, depending on the jurisdiction. This uncertainty leaves banks facing high legal and compliance risks if they start integrating Bitcoin-related services into their systems. Furthermore, as explained by (Auer et al., 2023) The increase in crypto-based financial activities outside the official banking system known as shadow crypto finance is a challenge for regulators in various countries. These activities are often not directly supervised by financial authorities, increasing risks to the stability of the financial system. This condition raises the need for clearer, more integrated, and international regulations, especially to regulate cross-border transactions, customer identification processes (*Know Your Customer / KYC*) and anti-money laundering (AML). In the absence of legal certainty in these aspects,

banking institutions tend to delay their involvement in Bitcoin-based services due to the high potential for legal risks and reputational damage.

Some literature, such as those put forward by (Jamil Safarli & Jamil Safarli, 2024) emphasizes that the role of regulators is not only important in limiting risks, but should also be geared towards encouraging innovation. The existence of a *regulatory sandbox*, active consultations with industry players, and efforts to establish a *Central Bank Digital Currency* (CBDC) are examples of how regulations can be directed as an enabler of digital transformation, not solely as a limiting tool. However, regulatory responses that are too slow, unresponsive to technological dynamics, or even too restrictive, can actually widen the gap between technological developments and the readiness of financial institutions to adopt them (Mbaidin, Alsmairat, & Al-Adaileh, 2023). Banks operating within regions with a progressive and clear regulatory approach (e.g. with special licenses for testing crypto products) tend to be more prepared and bold to engage in the development of blockchain-based payment infrastructure. Thus, it can be concluded that the readiness of banks in the face of Bitcoin adoption is highly dependent on the clarity, consistency, and openness of regulators. Regulations that are adaptive, collaborative, and risk-based will be an important foundation for banks to take a strategic role in the era of financial digitalization triggered by technologies such as Bitcoin and blockchain.

Table 5 Evidence Related to the Influence of Regulation on Banks' Readiness to Adopt Bitcoin Writer	Findings Related to Regulation and Banking Readiness
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(Bilgin, 2024)	Banks tend to be reluctant to adopt Bitcoin outright due to legal uncertainty and the lack of consistent regulation.
(Dashkevich et al., 2020)	The unpreparedness of banks in adopting Bitcoin is due to the lack of an adequate regulatory framework and is not yet in sync globally.
(Jamil Safarli & Jamil Safarli, 2024)	Overly stringent regulations can stifle innovation, but approaches such as the regulatory sandbox can improve banking readiness.

5 CONCLUSIONS

This study aims to answer three main questions regarding the influence of Bitcoin adoption on the banking system using the Systematic Literature Review (SLR) approach. Based on the results of the analysis of ten relevant scientific articles, a few important findings were obtained that provide a deeper understanding of the dynamics of the relationship between crypto technology and the banking sector. First, the findings show that Bitcoin affects the banking payment system not directly through its use as a medium of exchange but indirectly using the underlying blockchain technology. The presence of Bitcoin encourages banking institutions to explore and adopt blockchain-based payment systems as a form of innovation and response to digital disruption. Blockchain technology is considered to be able to improve transaction efficiency, reduce dependence on third parties, speed up the clearing and settlement process, and provide better transparency and security in transaction recording. Although Bitcoin itself is not yet widely used in banking operations, its presence has been a catalyst in driving the renewal of modern payment systems.

Second, the adoption of Bitcoin in the banking sector has a dual impact in the form of strategic opportunities as well as structural challenges. On the one hand, the opportunities offered include increasing operational efficiency, implementing automation through smart

contracts, reducing transaction costs, and expanding access to financial services, especially in areas that have not been reached by the formal banking system. Additionally, the technology introduced by Bitcoin allows for faster and cheaper cross-border payment processes. On the other hand, banking institutions also face major challenges, especially related to the high volatility of Bitcoin's price, regulatory uncertainty in various jurisdictions, potential legal and reputational risks, as well as limited technology infrastructure and human resource readiness. This has led banks to choose to adopt blockchain technology selectively, rather than integrating Bitcoin directly into their systems.

Third, the readiness of banks in responding to Bitcoin adoption is greatly influenced by the existence and clarity of regulations governing crypto assets. The literature reviewed shows that the incongruity of regulatory approaches between countries, as well as the lack of established legal standards regarding the status and treatment of Bitcoin, are the main obstacles that make banking institutions to be cautious. The phenomenon of increasing crypto-based financial activities outside the banking system (shadow crypto finance) has also encouraged regulators to immediately develop policies that are able to accommodate the dynamics of this technology, without sacrificing the stability of the financial system. Adaptive, collaborative, and risk-based regulations are considered the key to creating a safe, inclusive, and sustainable digital financial ecosystem, while providing legal certainty for banks to take an active role in the midst of global financial transformation. Thus, it can be concluded that although the direct adoption of Bitcoin in the banking system is still limited, its influence on the evolution of payment systems and the development of financial technology cannot be ignored. The future of the banking sector's involvement in the crypto ecosystem is largely determined by how collaboration between regulators, financial institutions, and technology innovators is carried out in creating systems that are responsive, secure, and drive overall digital advancement.

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