



# Revolutionizing Foreign Exchange Market: A Critical Analysis of Blockchain's Opportunities and Challenges

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## Abstract:

The fast use of blockchain technology, cryptocurrencies, and electronic trading has had a profound influence on the world's foreign exchange market, creating both difficulties and potential for market regulation and exploitation. Blockchain has the capability to completely transform the foreign exchange business by bringing improved transparency, efficiency, and security. Blockchain allows for the construction of transparent, tamper-proof transaction records since it uses distributed ledger technology. Lately, Blockchain technology and Forex trading have experienced tremendous growth in popularity in recent years, but it's important

to remember that they also include hazards that investors need to be aware of. The goal of this study is to determine how blockchain technology might be applied to boost the Forex market, highlighting the advantages of decentralization, efficiency, security, and transparency. This study aims to explore the potential contribution of blockchain technology to the foreign exchange market. The research employs a literature review and analysis approach to investigate the relationship between blockchain technology and the foreign exchange market. The findings of the study indicate that blockchain technology has the potential to revolutionize the foreign exchange market. The paper concludes that the use of distributed ledger technology enables the creation of transparent and tamper-proof transaction records, addressing existing challenges of transparency and security in the Forex market.

**Keywords:** *Forex, Blockchain, challenges of contemporaneous corporate governance.*

## Introduction

The global currency trading market and Blockchain technology, a decentralized ledger system, offer potential synergies. Blockchain's secure ledger enables secure Forex transactions, Bitcoin and others can be traded on Forex platforms. Currently, Blockchain's impact on Forex is limited, but the integration could produce a direct peer-to-peer platform, cutting out middlemen, increasing transparency and lowering costs. Blockchain could enhance

transaction efficiency, security and fraud prevention. However, widespread adoption in Forex is early due to complexity. Blockchain's untapped potential in Forex suggests an early stage. It improves Forex through secure and efficient peer-to-peer transactions, reducing middlemen and fraud. However, complex implementation challenges widespread integration.

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## Materials and Methods

The research employs a literature review and analysis approach to investigate the relationship between blockchain technology and the foreign exchange market. Relevant scholarly articles, industry reports, and case studies are reviewed to gather insights into the application of blockchain in the Forex market. The study also considers the risks and hazards associated with blockchain and Forex trading, providing a comprehensive examination.

## Literature review

### Developments' of Blockchain

As already known, blockchain technology would record each transaction in a block, which would then be inserted into a series of blocks in a consecutive interval, creating an immutable record of all transactions (Popovski et al., 2018). This technology can be approached from different angles, as it could be a subcategory of know-how in which the registration is organized as a series of squares comprising exchanges and whose approval depends on a validation mechanism, circulated to all nodes of the system in case of blockchain approval to a lesser or open extent or on all hub nodes that are approved to inquire about the exchange's approval handle to be enrolled in the scenario of public or private blockchains.

Blockchain works in an arrangement and basically empowers us to oversee a disseminated database. As a substitute for centralized databases, it encourages information review through the collaborative efforts of organizational members, empowering shared, open, and dispersed information among all parties. Thus, it allows the administration of confirmation and authorization information, without requiring a centralized specialist. Blockchain has started to be used for cryptocurrencies. The first Bitcoin block, which launched the Bitcoin network, was mined in January 2009. Other cryptocurrencies that have used the same blockchain technology over time include Ethereum, Litecoin, and Ripple. The

exploitation of cryptocurrencies as a payment method is currently expanding (Andrianto & Yoda, 2017; Moșteanu & Faccia, 2021). In addition to its use in cryptocurrencies, blockchain's potential applications have expanded to include supply chain management, healthcare, voting, and more. The first non-cryptocurrency application of blockchain technology was the creation of colored coins, which allowed users to represent other assets or securities on the blockchain.

Today, blockchain technology is being explored and implemented by individuals, companies, and governments around the world as a means to create more secure, transparent, and efficient systems. Although still in its infancy, the promise of blockchain technology is substantial and is expected to continue to evolve and shape the future of various industries.

Online transactions depend on the ability to believe that the person we are dealing with is trustworthy. For example, a social network like Facebook can tell us that our friends have only seen our posts about personal events. Moreover, it may be a postal service provider that announces that the said mail has been sent. It is true that the digital age is exciting, it presents more advantages than disadvantages, but the truth is that there is a clear dependence on a third party to ensure the safety and privacy of our resources and transactions in the virtual environment. However, these resources can be hacked, manipulated or compromised. This is where blockchain technology comes in handy. It can completely change the electronic world by creating a distributed consensus that allows any current or previous electronic payment activity that requires digital resources to be attested at a convenient time. It does this without compromising user privacy and e-purchasing. Secrecy and distributed agreement become decisive properties of Blockchain technology. This paper describes what a Blockchain is, how it works, and its disruption to the forex market.

Currently, according to Marthews and Tucker (2023), Blockchain can be incredibly beneficial. A clever combination of economic incentives and cryptocurrencies is used to create an

immutable audit of digital transactions that can cheaply verify data integrity. This allows companies and individuals to come to an agreement on the true state of the global market without costly intermediaries.

Looking ahead, Blockchain has the ability to completely change the way we communicate and conduct business (Zhou et. al., 2020). Almost anything with significant economic value can be owned and exchanged on this chain, reducing unintended consequences and increasing the efficiency of participants. Whether in banking, healthcare or the military, businesses and governments are reimagining high-tech paradigms with Blockchain technologies.

Adopting an open, publicly available Blockchain can eliminate the need to rely on local or central authorities to track transactions and resolve disputes. This is due to the immutable distributed ledger records built into the trust-promoting technology. Blockchain technology, which combines peer-to-peer networks and public-key cryptography to solve trust difficulties, is believed by many to be one of the key Internet inventions (Efanov & Roschin, 2018). Although it is generally recognized that technology still needs to develop, people must be prepared to implement this new archetype (Kumar & Pradeep, 2018). Blockchain technology's ability to fundamentally alter interactions should generate critical considerations for governments and society.

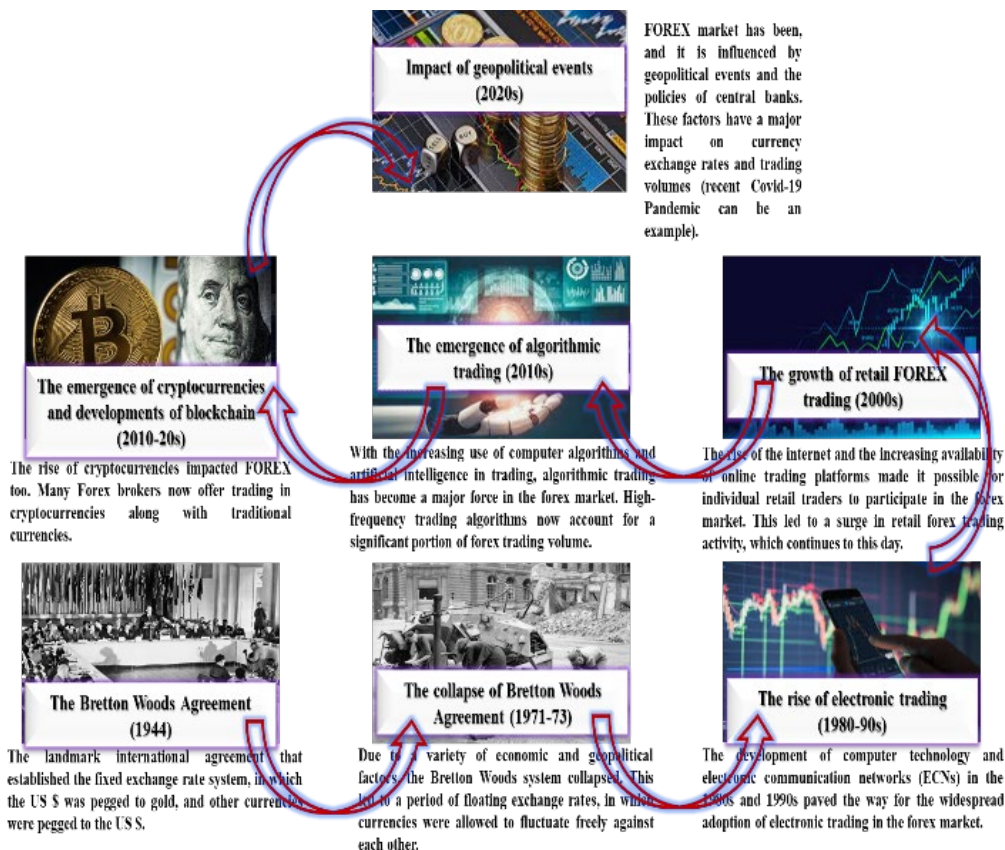
With a few key exceptions, a Blockchain is fundamentally based on the trust of a conventional interactive database (Zhao et. al., 2019). First, the types of data that can be stored vary widely. Second, the decentralization feature changes the state of the database (Jabbar & Dani, 2020). Finally, a Blockchain can serve as a permanent record due to its immutable property, which may appear to be a poor information systems practice, as there is a chance of data being duplicated. However, the consensus algorithm and miners eliminate this risk (Iansiti & Lakhani, 2017). Bitcoin is an excellent well-known example of an item that uses Blockchain technology. Because of its role in the growth of an unregulated, multibillion-dollar global

industry for transaction anonymity, it is also the most contested. Consequently, people need to address the regulatory issues affecting numerous national governments and financial organizations through Blockchain. However, the technology behind Blockchains is undeniable; it has been in operation for all types of applications (financial or not) effectively for decades without encountering problems.

Five fundamental principles govern how Blockchain functions. Distributed databases come first. This database and related records are accessible to all members of the blockchain. One member needs to have authority over the details and information. Each participant can autonomously confirm the specifics of its trading partners minus the need for an intermediary. The following assumption is the transfer between peers. Peer-to-peer communications are used rather than a pivotal node. Information from all other vertices is received and stored by each node. Transparency with pseudonymity is the third rule. Anyone accessing the system can view each transaction and its value. A 30+ character alphabetic and numeric address is the Blockchain's distinctive identifier for each node and user. Users can choose to share their identities with others or to stay anonymous. In Blockchain, transactions occur across addresses (Lee, 2019). The fourth premise is that records cannot get altered. When a transaction is registered in the database, entries are locked, and accounting entries get upgraded since they get linked to all prior transaction records (therefore, the name chain). Several computational tools and procedures are employed to ensure that the information on the databases is everlasting, historically organized, and available to all users of the networks. The fifth principle is computational logic. As previously stated, this register is electronic in nature, and any or all blockchain transactions appear in the form of programs linked according to computational logic. As such, processes and procedures that automatically initiate operations between nodes can be developed by users (Lee, 2019). In a Blockchain, each transaction is technically contained within a block. A block is a fundamental unit to be confirmed by the

members and may include many transactions. A Blockchain gets created when a block involves a hash value of the header from the precedent block. Due to the interlocking mechanism of all blocks, their order is predictable, allowing each to act as a time slot for the transactions it contains, solving the problem of double spending. Each member keeps a copy of the entire blockchain so that all transactions can be independently verified. Depending on how the identity of network members is decided, a distinction can be made between blockchain systems. It can be with or without permission. Users of a permissionless Blockchain can add new blocks to the chain while remaining anonymous or using pseudonyms (Justinia, 2019). In a permissioned Blockchain, each participant's identity and ability to validate new blocks are restricted. The first uses proof-of-work to verify transactions, whereas the second uses proof-of-stake to verify transactions.

This new technology is one with distributed databases that are implemented to collect and manage digital transactions. Essentially, a blockchain is a series of blocks, where each block incorporates a collection of transactions. Each block is connected to the previous block, forming a continuous chain of blocks. This chain is maintained by a network of nodes (computers), which connect to each other to authenticate and record transactions. To add a new block to the chain, nodes must reach an agreement that the transactions in the block are legitimate. This makes blockchain a secure and transparent way to store and manage digital transactions. It eliminates the need for a central authority or an intermediary, as the network of nodes ensures the integrity of transactions. In addition, since all transactions are recorded in the system, it is easy to track and trace the movement of assets or other digital items.



**Figure 1. The Evolution of Forex**  
Source: (Moşteanu, 2023)

Since the launch of Bitcoin in 2009, cryptocurrencies have started to offer alternative payment methods. Now, investments include cheaper and faster money transfers that do not adhere to round-the-clock work. Over the past ten years, governments and prominent business leaders have begun programs to evaluate the benefits of integrating blockchain technology into standard operating procedures. Blockchain, which aims to improve the security and transparency of information by sharing encrypted data through peer-to-peer networks, is gradually gaining popularity in many industries, and this is because enhancing trust and security is an important growth factor in various fields of business (Moşteanu, 2023).

### Developments of Forex

At the beginning, financial intermediation was largely conducted within national borders, with local banks and financial institutions serving as intermediaries between savers and borrowers (Skog et.al., 2018). However, as international trade and investment began to grow, there was a need for financial intermediaries to facilitate cross-border transactions. International financial markets began to develop as a result, allowing investors and borrowers from different countries to trade and access capital. The creation of a path for currency exchange, which allowed people and businesses to convert one currency to another for their international activities, was made possible by the foreign exchange market, which made a substantial contribution to this development. The global financial markets' development has left a crucial mark on the world economy because it has made it more facile for companies to get finance from a variety of sources and to transport capital, products, and services across international boundaries. Nonetheless, it has also brought about new difficulties, such as the need for more regulatory oversight to ensure the secure and stable operation of financial markets (Moşteanu & Faccia, 2021).

Forex, or foreign exchange, is the trading of one currency for another. The Forex as we know it today was established in the 1970s when

governments around the world began to move away from the pegged exchange rate regime that had been in place since the Bretton Woods Agreement. Under this system, currencies were pegged to the US dollar, which in turn was backed by gold.

Banks and financial institutions began to trade currencies for their own accounts, and a new industry of forex brokers emerged to provide retail traders with access to the market. Currently, Forex has become the leading financial market worldwide. This is largely since the market is open 24/7, but also to the volatility of the exchange rate for most transactional currencies.

### Results and Findings

An enormous increase in interest in Blockchain applications for forex trading has recently been observed. Given the wide range of applications it offers in numerous businesses and sectors, it is not unexpected that the forex market has embraced this technology. Blockchain's advantages surpass its implementation costs. Moreover, thanks to this technology, the foreign exchange trading business is undergoing a total transformation. Digital disruption is a rapidly developing process by which technological innovation transforms the known and accepted logic for creating and capturing value by untying and recombining links between resources or creating new ones (Nguyen, 2016). Additionally, digital disruption gets identified by its three fundamental components: innovation, ecosystem, and value logic.

Digital disruption has left an important stamp on the Forex market, transforming the way traders operate and changing the nature of competition within the industry. Figure 2 presents possible ways of digital disruption that have or may have affected Forex.

Already in 2008, Nguyen stated that he emphasized the anticipation of the rapid adoption of the new technology, considering that it offers significant benefits to both

consumers and the financial and banking systems, at the micro and macroeconomic level. According to Lewis (Lewis et. al., 2017), blockchain technology plays a crucial role in stimulating innovation in the financial market. A blockchain database consists of several blocks that are linked together by a reference in each block to the previous block. Each block documents one or more transactions, which represent changes in the ownership of listed assets. Integrating blockchain technology within the Forex market presents both opportunities and threats.

Present research revealed the following advantages and opportunities associated with the integration of blockchain within Forex (Gatteschi et. al., 2018; Moşteanu, 2020; Najaf et.al., 2021): increased security of transactions; faster and secure financial settlements; reduce the cost of transactions and increase the efficiency; increased the transparency of trading; faster transactions due to decentralized network; automatized trading transactions; implementing and using smart contracts; and, compliance with rule and regulations (as a result of transparency of records). Figure 3 presents the opportunities

for using blockchain, and the opportunities can be set as follow:

- Ensure a high level of confidence by using cryptographic algorithms to secure transactions. This makes it more difficult for hackers to breach the system and steal sensitive information. Blockchain technology offers greater security than traditional Forex trading, because transactions are verified by multiple parties, and once they are entered to the blockchain, they cannot be modified or removed.
- Enable fast and secure transactions, which could reduce settlement times for Forex trades. This could result in faster trading cycles and more efficient use of capital. With blockchain, transactions can be executed and settled almost instantly, cutting the need for intermediaries, and diminishing the risk of errors and delays.
- Reduce the cost of Forex trading. By eliminating middlemen, trading on Forex becomes more accessible for most traders, individuals or companies, with small or large trading volume and capital.

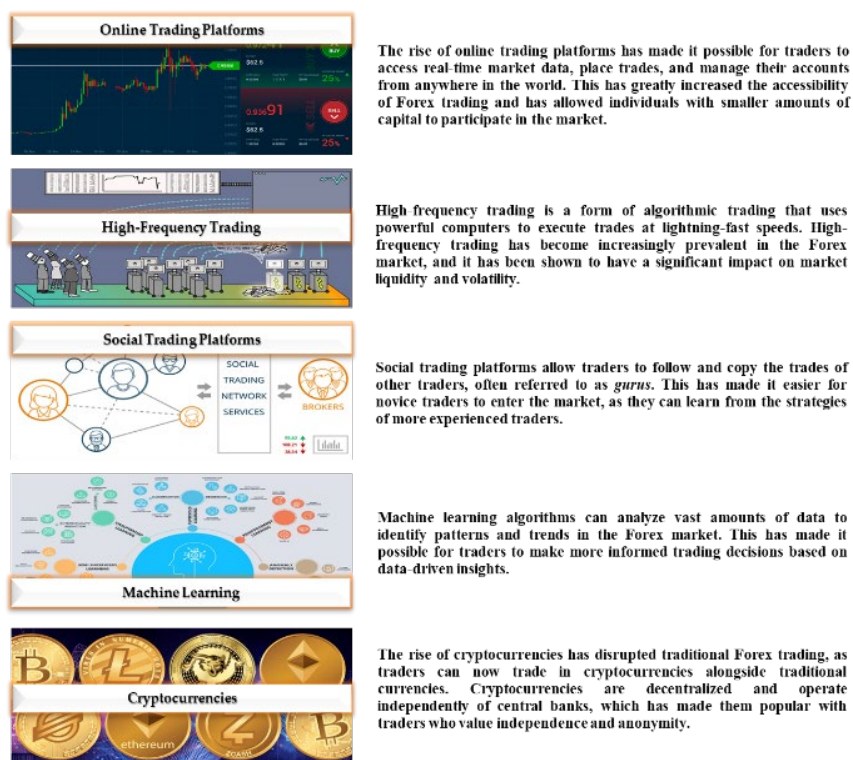


Figure 2. Digitalization and its Impact on Forex

- Increase transparency in the Forex market by providing a decentralized ledger that records all transactions. This could increase confidence in the market and decrease the fraud risk and other financial crimes. All parties involved in a transaction can access the same information, creating a level playing field.
- Open up new trading opportunities within the Forex market: trading in cryptocurrencies.
- Reduce the risk of corruption and manipulation as Blockchain technology operates on a dispersed network.
- Enable the creation of decentralized Forex trading platforms that are more transparent, secure, and resistant to manipulation.
- Enable automated Forex transactions using smart contracts. Smart contracts are written agreements, in a virtual environment,

between a buyer and a seller. The provisions of this agreement are drafted by means of a code. They facilitate the automatic execution of transactions, currency and assets, ensuring a high level of security and transparency. Through this contract, intermediaries are eliminated.

- Improve compliance by providing an absolute record of transactions. This can help regulators monitor and enforce compliance with relevant regulations.

Since this technology's appearance, many debates and opinions have been written with pro and cons opinion. According to contemporaneous researchers (Beck et. al., 2017; Lindman et. al., 2017; Faccia & Moşteanu, 2019; Osmani et. al., 2021) there are significant disadvantages or threats of implementing Blockchain within the financial industry. Figure 4 displays disadvantages, threats and risks associated with the integration of blockchain within Forex.



Figure 3. Benefits of implementing Blockchain

According to Beck (Beck et. al., 2017), a good start in exploiting the capabilities of this system is the detection and mitigation of security risks and other weaknesses. In the same line, to the present research found out that the main risks and disadvantages related to blockchain system most probably are:

- Regulatory uncertainty surrounding its use in Forex trading. There are not clear rules and regulations and not enough training in what really is and how it works. At the same time, there are significant regulatory hurdles to be disabled previously blockchain to be extensively implemented in the forex market. Regulators may be hesitant to embrace new technologies and may require significant changes to existing regulations.
- Market volatility, as traders adjust to new trading opportunities and market dynamics, enabling quicker and effective trading. This may lead to rapid price changes and increased risk for traders.

- Scalability has always been a big concern. Blockchain can struggle with scalability, particularly when it approaches handling significant levels of transactions. This could restrict the adoption of blockchain in the forex market and make it less efficient than traditional trading methods.

- The forex market is a complex ecosystem that involves multiple stakeholders and platforms. Ensuring that different blockchain-based systems can communicate with each other seamlessly could be a major challenge.

While blockchain technology is inherently secure, there are still cybersecurity risks associated with its use, including the potential for hacking, malware, and other attacks. This could compromise the integrity of the Forex market and undermine confidence in the technology.

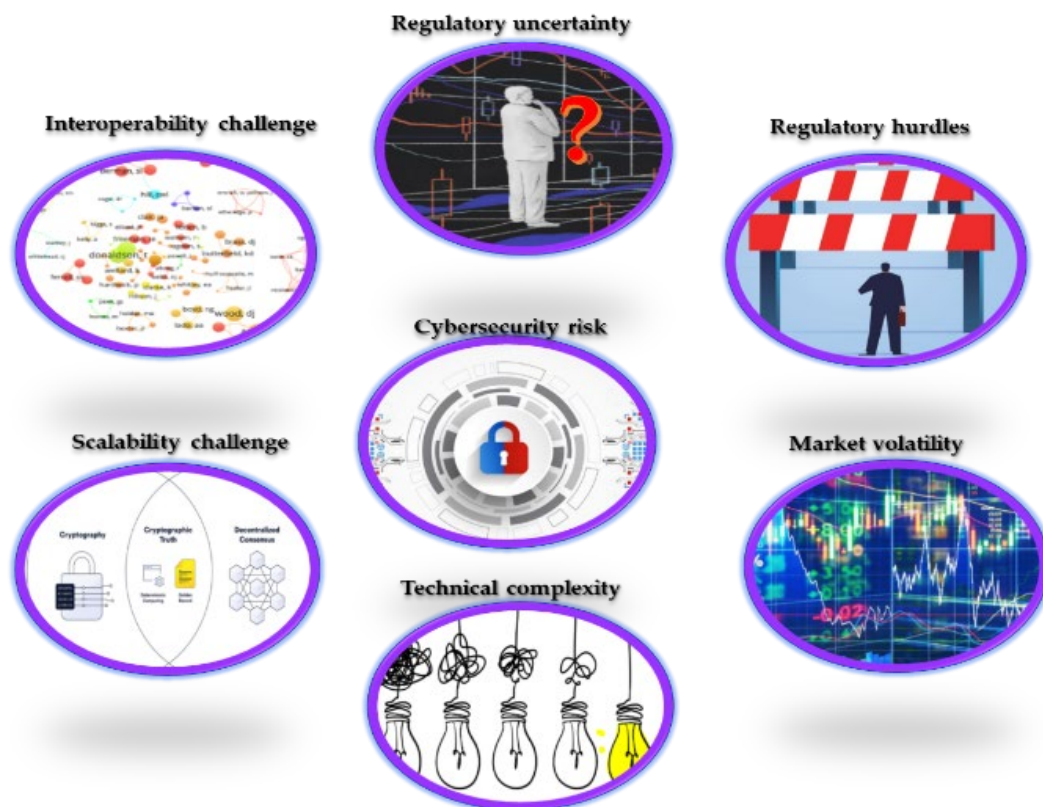


Figure 4. Challenges of implementing Blockchain



While developments and implementations of blockchain technology in the forex market has the capabilities to carry significant advantages, there are also possible dangers and risks that must be addressed. These challenges better be cautiously evaluated and controlled to confirm that blockchain can be implemented effectively and safely in the forex market.

## Discussion

The informatization and computerization of society have brought about many opportunities for new activities and ways of interacting with the world. However, there are also potential consequences and challenges linked with this process. To minimize the risks of undesired consequences and challenges, it is important to address the informatization and computerization of society with a critical and thoughtful mindset. This includes addressing issues of access and equity, promoting digital literacy and responsible use of technology, and developing regulations and policies to ensure that technology is implemented ethically and for the advance of all members of community. The most recent disruptive innovation to grab academics' attention is Blockchain. It is the technology that supports virtual cryptocurrencies like Bitcoin. As for stockholders, including programmers, entrepreneurs, and technophiles, Blockchain can revolutionize the architecture of economics, legislation, governance, and society (Moşteanu & Faccia 2020; Mäntymäki et. al., 2020; De Oliveira Dias, et. al., 2023).

The advent of Blockchain over the past ten years has spawned numerous attempts to reimagine financial systems through cryptocurrencies and, in some cases, to start disrupting them. Due to the disruption they create to social networks and information systems, these developments can significantly impact businesses and sectors. The numerous technologies and practices that affect changes in behavioral patterns in clients, individuals, and organizations are exciting to information management. According to

proponents of Blockchain technology, the technological processes include AI and the IoT.

FinTech advancements have been made possible by quickly developing distributed ledger and Blockchain technologies. Currently, blockchain-based products and services have been launched by central banks and stock exchanges, venture capital firms and FinTech firms. Over the past three to five years, several central banks have launched exploratory and experimental projects using Blockchain technology as a possible step toward central bank-issued digital currencies (Giri et. al., 2021). Overall, there is a heated dispute among experts and academics about whether or how much the use of Blockchain for things like cryptocurrencies will disrupt the international financial system, central banks supervision systems, or the dominance of physical normal used currencies.

The Forex market is probably the most significant monetary market. Still, its primary players are only giant banks and businesses, all of whom demand excessive fees in return for their services. Blockchain technology can assist in saving costs, speeding up transactions, and securing the entire infrastructure of any financial transaction when used correctly. Relevant studies have been developed on applying Blockchain to the foreign exchange market. The traditional cross-border currency exchange method aims to call on an intermediary, usually a bank, which makes the transaction ensure a degree of security and safety, but at the same time, there are significant aspects related to the cost of these transactions, changes in currency values between sender and recipient are accompanied by important commissions and operational costs. Thus appeared the possibility of a two-phase commit is used to help several procedures in collaboration to decide whether to commit or abandon all transaction procedures to reduce settlement risks.

Lower transaction fees have been tested by forex brokers who employ Blockchain technology to carry out their transactions. After years of attempting to lower foreign transaction fees, banks and other financial institutions have finally

succeeded. They now enjoy success thanks to a speedy and transparent system that benefits banks, traders, and clients simultaneously. The cross-border payment network Ripple serves as a prominent example of this. The network functions as a real-time trading system with inexpensive transaction costs. A wide range of currencies, including virtual ones like Bitcoin, can be used to make payments through the system's broad network of banks and financial institutions. Contrary to what traders may believe, the forex market still needs to be decentralized. Central banks expertly set exchange rates. Governmental entities create the game, but broker-dealers and small enterprises are excluded from the public. Nobody influences changes in currency values and trends except for central banks. Nevertheless, as Blockchain technology is more extensively used in the forex market, everyone will have instant access to essential data like currency price movements, and nobody will be mistreated. Blockchain will soon alter the forex market in some other way, offering improved security to traders, banks, and other stakeholders. The specifics, private information, and records will be kept secure for millions of transactions. The currency market is highly volatile. Vast amounts of cash can be transmitted without affecting or influencing exchange rates. Even though this is frequently a considerable advantage, the approach has several flaws. Trading accounts are thus susceptible to fraud, human error, and cybercrime. Dishonest traders may completely drain honest traders' accounts, cause them to incur huge losses, and give them the little prospect of returning their money.

## Conclusion

The most significant benefit of adopting Blockchain technology is the enhanced transparency people will soon experience in the Forex market. As discussed, intermediaries will become unnecessary once Blockchain technology is adopted widely. As a result, this type of business will open. It will also change how the sector is governed. Several significant players largely support the forex market. The

system comprises banks, traders, investment funds, brokers, businesses, and governments. The main advantage of Blockchain technology is, without a doubt, its higher levels of transparency. Using the distributed ledger that sets Blockchain technology apart, records may be recorded transparently and securely. Nobody is allowed to change or update these. To track transactions and currency movements, every aspect of this situation—laws, currency quotes, regulations, and transactions—will be protected in a reliable and unchanging manner. In this situation, the foreign exchange market can create a unique, independent, open database. The data will always be available to all parties engaged in a transaction.

## Conflict of interests

No conflict of interest.

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