



Cryptocurrency and Real Estate Transactions

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1 INTRODUCTION

There is pervasive unanimity among economists and research scholars that the real estate is always deemed to be one of the main economic growth engines, and an imperative biometer to indicate the economic strength and well-being of a region or a country. The significant contribution of real estate sector to an economy is derived from various factors, in a nutshell, this sector provides job opportunities to vast percentage of population and contributes in increasing the level of individual and national income alike. According to the United Nations Environment Programme report of 2018, the real estate industry contributes to global total wealth by USD 200 trillion and accounted for almost 40% of global energy demand, also the global real estate investments are almost

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twice the size of investments in stock markets (Miah, 2022). Despite its economic and social significance, the importance of real estate sector has not only been confined on the value creation and money circulation, however, the real estate sector can play a significant role as a trigger for financial crises and serve as a conduit through which economies recover after seismic crises effects simultaneously. For instance, the real estate sector was the main trigger for the global financial crisis in 2008 (initially caused by the burst of U.S. housing price bubble), and on the other hand the sector was the road to economic recovery following the global financial crisis in 2008. Recently, the increase in population and need for residential properties accompanied by the tremendous growth of e-commerce technology have all contributed to the sector's growth. The development prospects of this sectors seem to have considerable temptation to investors and capital providers, according to McKinsey Global Institute Report (2021),¹ the growth of the real estate sector has been more than tripled since 2000, and it is expected to achieve high growth percentage by the end of 2023 as compared to 2022. Notwithstanding, the digital maturity of this sector is consistently considered as being low compared to some other industries, and this signals substantial potentials for enhancing the size of trade alongside with its productivity through the more prevalent adoption of digitalization (Manyika et al., 2015).

The evolution of financial technology (FinTech) in recent years is a main remarkable feature of the contemporary technological advancement in this century. The trajectory of FinTech is mainly propelled by the enhancement in high-speed internet connections and the notorious popularity of mobile applications among youth and financial markets stakeholders. One of the main phenomena of FinTech is the blockchain technology. The blockchain can be described as a series or sequence of digital records lined together through the so called 'cryptography'. Each block is verified, distributed, and managed in a peer-to-peer network. blockchain is a distributed database (Hassan et al., 2022). The blockchain technology enables combining and recording various transactions into secure and decentralized ledger system by establishing a chain of chronological pieces of data. This system allows for immediate authentication of transactions without a need for third party for intermediation. The blockchain application is extended to independent vehicles that rely on

¹ https://www.mckinsey.com/~/_/media/mckinsey/featured%20insights/mckinsey%20global%20surveys/mckinsey-global-surveys-2021-A-year-in-review.pdf.

machine learning and methods from the field of artificial intelligence, it is proving, day by day, its ability to deliver advantages to trade and investment transactions. It enables creating an encrypted and integrity-protected data storage that can be used to conduct trading transactions in many industries, and the real estate is one of them. With many types of cryptocurrencies subsumed under blockchain technology, the security, transparency, and anonymity of transactions and payment systems can be significantly improved. For instance, in their whitepapers of 2019, Leshner and Hayes have introduced the concept of ‘Compound Finance’ defined as a set of money market algorithmic protocols that allows investors to lend and borrow assets using the blockchain technology via wrapping cryptocurrencies as a collateral for efficient lending (Leshner & Hayes, 2019). Although the main pervasive and most controversial potential for cryptocurrencies is, primarily, their ability to serve as a medium of exchange, however, empirical examination of cryptocurrencies’ use in real estate transactions should come to the fore in the very near future.

The blockchain technology has started gaining attention and recognition across a wide range of market participants. Its impact on financial system in general, and financial service industry in particular has prominently emerged in the last few years. Figure 1 demonstrates the value of investments in proptech companies attributed to venture capitalists between 2008 and 2022, as can be seen, the importance of blockchain adoption in real estate industry has gained a strong momentum since 2017 and intensified in 2022. Although the main aim of blockchain is to provide more developed mechanism for financial system, however it has also been able to break through to reach other industries and functions such as healthcare, management, supply chain, and entertainment. For instance, the current huge wave of cryptocurrency (based on blockchain technology) is tremendously pursuing big impacts on payment system, and foreign exchange transactions. Also, the funds raising and financial market investment are notoriously upended by what so called ‘Initial Coins Offering’ (ICOs) which can also serve as a venture capital and loan provider to startup businesses. The cryptocurrency, simply, is an assets or value item created by software. It exists digitally, not physically. All types of cryptocurrencies can be exchanged for US dollars, fiat currencies, or for other cryptocurrencies. These digital assets are transferred from one account to another and recorded on specific transaction databases (Silverstein, 2022). The databases pertinent to all sorts of cryptocurrencies’ transactions including their inceptions, and change of ownership

are verified and recorded. The cryptocurrencies have become the first assets can be moved and transferred over the internet without a third-party improvement, means from owner to owner, once the transaction is recorded on blockchain ledge, then it cannot be reversed. The cryptocurrency market is currently centralized in terms of market capitalization, wherein bitcoin and Ethereum are the main market dominants, nonetheless, there are thousands of these digital currencies are circulated among investors nowadays.

As a matter of fact, the real estate transactions aren't escaping the blockchain disruption either. Beforehand, the real estate transactions are usually conducted offline based on face-to-face arrangements among various entities. However, nowadays the blockchain technology is opening up ways to change this transaction mechanism. For instance, the introduction and application of smart contracts in blockchain podiums allow real estate assets to be tokenized and traded like cryptocurrencies. It can be obviously noticed that at the real estate market participant, as well as, research scholars and policy makers are currently heating the discussions over the potential benefits can be brought by digital currencies to real estate market, such as facilitating real estate transactions, enhancing the pace and transparency of real estate contacts, promotes the security of transactions' records, and makes homeownership possible for larger population span through tokenization. This chapter attempts to corroborate and contribute to the academic literature on the future role of

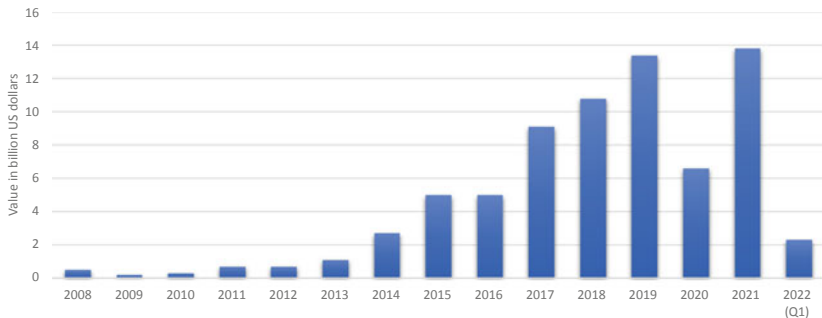


Fig. 1 Value of venture capital investments in proptech companies worldwide from 2008 to 2022 (Q1) (in billion US dollars (*Source* Deloitte, Statista, 2023 [Authors' Illustration]))

cryptocurrencies in reshaping and advancing the real estate market. The aim of this chapter is threefold; first, it demonstrates the imperativeness and the potential benefits of digital currencies to enhance the efficiency of real estate market transactions and transparency. Second, the chapter sheds the light on the level of readiness of real estate market's participants and stakeholders for further incorporation of cryptocurrency in real estate contracts. Third, the chapter provides an explanation of real estate transactions using cryptocurrencies. The chapter is organized as follows: Sect. 2 lists the potential benefits of cryptocurrencies and blockchain technology to real estate sector. Section 3 reviews the previous literature and empirical work in the field. Section 4 explains the mechanism of using cryptocurrencies in real estate transactions, and Sect. 5 concludes the chapter.

2 CRYPTOCURRENCIES AND REAL ESTATE MARKET: POTENTIAL BENEFITS AND APPLICATIONS

The blockchain technology has recently been hogging the limelight deservedly. That of the types of recent financial innovations, the blockchain technology is by far the most important phenomena gained a ubiquitously traction among real estate market participants including households, investors, real estate developers, brokers, and agents. The residential real estate segment has seen the highest level of blockchain technology adoption due to lower transaction costs and less stakeholders involved compared to typical real estate transaction. Concurrently, mortgage lender, propelled by the aim of expanding their investment portfolios, have started initiating cryptocurrency-based mortgages, where the underwriting service is based on the value of crypto wealth of borrowers and the value of the property of interest. In pursuit of listing the benefits are brought to real estate sector by blockchain technology adoption, we base our discussion on the following:

1. Improve Property Construction and Development, and Enhances Real Estate Assets Management

The property and construction projects nowadays are becoming upended by the arrival of blockchain technology. The typical project requires the involvement of different parties and subcontractors where

the procurement practices and authenticity of construction goods, at their points of origins, should be carefully mentored. The blockchain technology enables the automation of the contract agreements among the project management and subcontractors through smart contracts. It also generates substantially richer data to facilitate better decision making. Moreover, the NFTs (non-fungible tokens) that is a unique digital identifier recorded on a blockchain, allows for proving the authenticity of items and supplies pertinent to construction projects. The adoption of blockchain technology in construction projects enables construction managers to pursue better and more securely track of project accomplishment status and share it with corresponding stakeholders and this increases the project management efficiency. Moreover, the property management companies bear some inefficiencies in their global real estate portfolio management due to the time required to collect money and profit from property renting and trade. The regulatory compliance and access to transactions history are also matters of concern. Blockchain technology facilitates rental collections and payments to property owners and secure data sharing. It also provides extra management capabilities and due diligence across their international property portfolio. The digitization of real assets through tokenization decreases the costs and upgrades the pace of transaction in those assets. This increases operational efficiency and allows for time- and cost-savings.

2. Enhance Liquidity of Real Estate Assets

The real estate assets have long been considered an illiquid asset due to the length of time it requires the owner to convert them into cash. A paramount technological innovation embedded in blockchain technology is the tokenization of real estate assets. Asset tokenization represents an expansion of blockchain, it refers to creating a blockchain tokens acting as a digital representation of fraction of real estate assets. Tokenization at permits digital assets to be traded on blockchains and helps create liquid, transparent, and universally acceptable investments. Nevertheless, the tokenization of properties is still in its inception, where obstacles exist and need to be overcome before the wave of widespread adoption (Sazan-drishvili, 2020). The real estate market benefits greatly through the rapid growth of the tokenization technology through increasing accessibility and transparency of real estate acquisition. Tokenizing the physical real

estate assets encompasses dividing up the real estate asset into proportions that can be traded separately using cryptocurrencies and tokens, and this in turn makes the assets readily to use where the asset's owner or seller does not need to find a buyer who can afford to pay for acquisition of the whole real estate asset. International investors and funds always seek to diversify some parts of their portfolios from outside traditional assets such as shares and bonds (Khaki et al., 2023). the blockchain technology enhances the real estate sector's liquidity by promoting the pace of trading processes and enabling the creation of an efficient primary and secondary trading platforms, and this allows investors to improve their portfolio management and diversification through faster liquidize of real estate investment.

3. Facilitate Capital formation and Enhance Real Estate Investment

Analogous to crowdfunding, the application of blockchain technology enables investors with small amounts of capital to pool their capital investment in large-size real estate construction projects. The tokenization technology can convert the real estate properties into financial products by transforming them to digital assets. Through tokenization, investors can simply access multiple trading applications to buy and sell fractions of tokens which represent an ownership claims in real estate assets. Such fractional ownership helps investors save time, cost, and efforts associated with managing their properties themselves such as maintenance costs and any troublesome issues related to dealing with lessees and tenants. Furthermore, the cryptocurrencies which represent a conspicuous feature of blockchain technology can serve as collaterals used to back real estate mortgages. With regard to the real estate investment management, the use of cryptocurrencies is expected to improve the investment income distribution among participants and investors. For instance, the profit generated for equity holders of industrial buildings or multifamily apartments can be more efficiently distributed through stable coins and other types of cryptocurrencies through fast and recorded digital mechanism.

4. Real Estate Mortgage Securitization

The infiltration of blockchain technology into real estate and banking sectors offers banks a secured and single form of digital verification of

information required to initiate real estate mortgages and conduct transactions with more efficient data sharing, secured payment settlements, and immutable monitoring of transaction. This also provides a protection against double-pledging of assets. The digitization of real estate mortgages is programmed to contain related data pieces such as loan payment history and ownership rights to support banking services and decisions. By using smart contracts, banks can gather and distribute payments to beneficiary, and provide up-to-date data and reports to corresponding regulators. This process provides investors with on demand proof of real estate assets' performance and enables for more efficient cash life cycle management by avoiding settlement delays occur due to multiple cash reconciliations across different phases of the transaction's life cycle. The global real estate is worth trillions of dollars however, it is dominated by the wealthy and large corporations and rich investors. The application of blockchain technology enables more households and market participants to perform transactions transparently. Real estate transactions may ultimately become truly direct peer-to-peer transactions with blockchain-powered platforms conduct most of the transactions.

5. Make Homeownership More Accessible

The utilization of cryptocurrencies in property ownership is expected to make homeownership is easier and more accessible to a large sample of households. As a matter of fact, a large proportion of households are deterred from property ownership due to unfavorable conditions of real estate market or lack of credit profile criterion that qualify for a mortgage in a traditional setting. Also, many families and household are normally deterred from homeownership due to a lack of down payment funds or a low credit score. However, as more private lenders and banking institutions are adopting the blockchain technology, the background and credit worthiness checking will be less determining factor in favor of accepting cryptocurrencies of borrowers as a collateral. Hence, this enables the households without all-cash buying abilities to pledge their cryptocurrencies as a collateral and get qualified for mortgages and real estate ownership. It has been claimed that the absence of credit check would lead to increase in interest rate charges on such mortgages with cryptocurrencies pledged as collateral, however, there is a variety of local and international real estate developers along with real estate brokers believe

that the borrowers will still prefer to pay higher interest on real estate mortgages rather than waiting for an unknown time periods as the real estate prices could change drastically.

6. Enhance Due Diligence and Prevent Crises

The blockchain technology improves the due diligence in real estate market through making the background check process faster, and identity verification. It also creates a sequence of recorded transactions with which all information pertinent to properties is kept, it also enables efficient identity verification. verify identities. Thus, the parties involved in a contract or real estate transaction can access it with a personal digital key which enables reducing the likelihood of fraud (Chang & Wang, 2021). It has also been claimed that the adoption of blockchain and cryptocurrency technologies prevents the potential disastrous property bubble burst in future, as they contribute to overcome vital challenges in real estate market such as; reduce suspicious and bad trading practices, promote better property investment arrangements, implement stricter terms and rules on mortgages, control risky derivative trading on secondary markets.

3 REVIEW OF LITERATURE

The global real estate industry accounts for a considerable amount of invested capital with almost twice the size of investments in stock markets. This sector is by far considered as a main source of trusted investments since it provides a steady source of income in the form of lease and rents. Hence, a new wave of empirical and theoretical studies have recently emerged in an attempt to provide empirical insights into the benefits and applications of blockchain technologies in real estate transactions. Where a significant portion of these studies have assiduously attempted to explore the potentials for blockchain technology to lead a transition and impose major sectoral changes in real estate transaction and services (Bennett et al., 2019).

A group of studies have measured the role of blockchain technologies in enhancing the quality, speed, and transparency of real estate transactions. For instance, Krupa and Akhil (2019) claimed that the utilization of blockchain technology can enhance the quality and pace of real estate

transactions as it improves the authenticity and confidentiality of operational data generated from lease, sell, and purchase transactions. That multiple information relevant to the same property can be digitized and kept as a decentralized database with lower likelihood of manipulation and fraud. Kalyuzhnova (2018), further identified the potential benefits and advantages of blockchain technologies, through tokenization, the blockchain technology enables cost reduction and improves the investors participation in real estate sector. The outcomes of the paper suggested that information asymmetry dilemma can be considerably eradicated by digital transformation of information which can prevent fraud and ownership manipulation. Similar outcomes were presented by Pankratov et al. (2020), who studied the efficacy of blockchain usage in real estate sector in different countries. They concluded that the time and cost needed for processing real estate transactions with blockchain technology is eradicated sharply, however, the safety and security of transactions can be improved noticeably. Smith et al. (2019) investigated the potential value additivity of blockchain technology to real estate transactions through multiple points of view, including blockchain application in real estate investment and to real estate asset representation. The outcomes of their paper indicate that multiple benefits can be obtained out of blockchain technology adoption mainly through the tokenization of real estate assets which facilitates the real estate trading and transactions. Zheng and Sandler (2022) also attempted to explore the potentials for blockchain tokenization in solving fundamental inefficiencies within the real estate market. They claimed that tokenization is expected to lead to drastic shifts in asset ownership and profits in real estate investments through the fractionalization of real estate property and providing digital representation of real estate assets.

A wide strand of literature examined the role of blockchain technologies in enhancing real estate investment volume through tokenization as a solution for cost reduction and increase market liquidity. For instance, Latifi et al. (2019), found that the employment of smart contract can solve classical deficiencies pertinent to lack of liquidity and number of investors as compared to other financial markets, and they enhance the stability of the real estate market as well. The majority of transactions phases can be fastened to reduce the time between the signing of the preliminary sales agreement before the notary. One of the biggest impacts of blockchain on commercial real estate would be the faster and smoother administration of the contract management process. Gupta et al. (2020),

affirmed that blockchain has potential in enhancing liquidity, transparency, and profit distribution of real estate transactions. They argue that the Ethereum cryptocurrency enhances the efficiency of real estate investment as it facilitates the representation of the value of physical or monetary assets on a digital format. The robustness of cryptocurrencies-based smart contracts can enable the efficient transmission and distribution of income generated from real estate investment among investors. Alketbi et al. (2020) attempted to propose a practical application of suggested blockchain model that can be applied by real estate market participants, as well as regulatory authorities in order to enhance the efficacy of real estate transactions. The outcomes of the paper affirmed that these technologies can promote security and transparency of transactions along with making housing rentals and governance smoother and more transparent. Alessie et al. (2019), have also shed the light on the positive impact of blockchain technology adoption on reducing bureaucracy, enhancing the efficiency of governmental administrative processes. They also shed more light on the need for filling the gap and reducing the incompatibility among the blockchain-based practices and existing legal and organizational frameworks. In the same line, Chand and Wang (2021) argued that blockchain technology helps lower fraud risk and improves trust and efficiency. They also concluded that blockchain technology can bind economic interest and convert legal rights into programmable blockchain-based digital tokens.

A handful proportion of money is circulated in real estate sector is anchored on leasing and renting contracts including land renting, apartments renting, and lease-purchases agreements. The leasing and renting transactions have been always known by intermediary dependencies and inefficiencies due to lack of trust and manipulation. In this respect, literature provides some evidence highlighting the potential combination of blockchain technology and real estate lease and rental services. For instance, Thota (2019), assumes that the representation of real estate property by smart tokens, consists of different tiers as general information, technical information, commercial information, and financial information, enables all stakeholders including lessors and lessees to rely on the same datasets without the need for repeated inspection. This in turn improves the due diligence and efficiency of real estate transactions including leasing and rental contracts. Analogously, Kibet et al. (2019), the existing leasing contracts suffer from high transaction cost, lack of transparency, and landlord-tenant conflicts sometimes, in addition to time waste and

inefficiencies due to the involvement of number of intermediaries such as brokers, agents, and other services providers. The outcomes of the paper affirm that the blockchain-based smart contracts can resolve many of these inefficiencies and reduce the housing cost and conflicts through eliminating the middleman in the management and process of transactions. A more recent evidence by Yu et al. (2021), proposes a blockchain-based resolution for real estate rental contracts to achieve peer-to-peer sharing of information in an intermediary-free means. This solution, as they claim, is enabled by the programmatic conversion of traditional lease agreements into smart lease contracts, which in turn advances the efficacy of the leasing transactions, and store records for the leasing process to afford legal protection for tenants and landlords alike. Morena et al. (2020), also attempt to measure the power of blockchain technology in advancing real estate rental services. They found that blockchain through its widespread advantages such as smart contracts, timestamping, secured digital ledger have a great potential to facilitate transactions for individuals with severe disabilities. Research regarding the blockchain and real estate administration has evolved fast in recent years. According to Markunas (2019), blockchain technology can grant a mutual access of parties who operate in the same profession including buyers, sellers, real estate agents, tax officials, banks, and land registries to a network of smart property records. Hence, enables the final field data and notes to be automatically uploaded to the chain for authentication, allows safe keeping and reference, digitizes and uploads hard-copy documentations, stores information models safely that can support decision making, and saves parcels and tax identification of buildings and utilities. Ganter and Lützkendorf (2019) argued that in real estate management, there are some question and issues hover around the market participants minds and thought. For instance, real estate administrators are always concerned about the life-long and storage of quality data relevant to real estate property. How to assure a high data quality and how to store it over a long period of time, they are also concerned about the traceability of property ownership data at any point of time to manage compliance and legal issues, on top of that what are the main updates in technological models for designers or other service providers? Unless resolved, these questions could remain impediments of efficient real estate management. In response to these questions, the blockchain technology exhibits a potential for enhancing the current approaches regarding documentation retracing and accessibility of real estate properties and life cycle-related information. In the

same line, Shalin (2020), affirmed that the blockchain technology binds together information about specific property and grants access to parties who require this information. Through this binding, all parties interested in the specific property can provide a data input pertinent to the property history, value, and maintenance records. The real estate mortgage providers are enabled though to check the financing more easily and monitor cash flows and income. Lemieux (2017), investigated the role of blockchain technology as a solution to create and preserve trustworthy digital records. The outcomes of the analysis indicate that blockchain technology can be used to address issues associated with information integrity. However, this technology could have several limitations in terms of guaranteeing the reliability of information especially in the long term. Bennett et al. (2019) measured the potential contribution of blockchain technology in property and land administration. The results indicated for a positive prospect for this new technology in making real estate management more efficient and less time consuming.

4 THE USE OF CRYPTOCURRENCIES IN REAL ESTATE TRANSACTIONS

The cryptocurrency can be defined as digital money that is enabled through and exists on blockchain technology. They can be also seen as another application of the blockchain technology for the advancement of money. The Bitcoin and Ethereum are the most popular cryptocurrencies which occupy the top of the market capitalization list of all types of cryptocurrencies. The intersection and connectedness among cryptocurrencies and the real estate industry is considered as one of the most significant innovation in recent years since this sector is known as capital intensive and necessitates pooling of money from different parties. The cryptocurrencies have created a substantial impact on payments, foreign exchange, and real estate transactions. As a matter of facts, the volume of cryptocurrencies-based payments, made by real estate sector participants, for everyday transactions in real estate sector has been increasing sharply in the last two years. The move toward blockchain technology has been observed since 2008 where cryptocurrencies, mainly bitcoin, started being popular. Since then, enthusiasts and cryptocurrencies' developers understood the need for more accessible and flexible financial system distinct from traditional banking system and organizations in order to

process cryptocurrencies transactions. Hence, these enthusiasts and developers started using the blockchain-based smart contracts to create a decentralized financial system, indicated for as DiFi since then. The application and utilization of cryptocurrencies in the execution of real estate real estate transactions goes through multiple phases. The first use of digital currencies in real estate transactions was the case of Aspen Coin, in 2018 the successful real estate issuance on the blockchain representing a mixture of technical innovation and a thorough campaign that raised \$18 million for St. Regis Aspen Ski Resort.

4.1 How Does Cryptocurrency Affect Real Estate Transactions?

The process of using cryptocurrencies in real estate transactions begins with a transformation of the ownership title into digital form known as non-fungible tokens (NFTs thereafter). The NFTs are cryptographic assets based on blockchain technology and represent a digital form of ownership right in a business or an asset. These cryptographies are created using a similar type of programming of cryptocurrencies, however, they cannot be exchanged or traded consistently like other cryptographic assets. The NFTs are considered as ideal for use in the digital ownership and trading of real estate. With the help of blockchain technology, NFTs are improving the levels of security, transparency, and ownership rights to the real estate industry. Following the creation of the digital ownership of real estate assets, the second phase of the cryptocurrency-based real estate transactions includes a creation of smart contracts by the seller or the selling agent of the property. The smart contracts can be defined as saved computer programs on the blockchain that can automatically control, document, and execute relevant events and actions on a decentralized network in the blockchain. They also represent prewritten terms agreed upon by corresponding participants in property transaction. These contracts can be used to simplify over-the-counter transactions among investors, and can even ease complex trading and lending market transactions. Once the smart contract is signed by anonymous parties, the gets stored on a secured public ledger. As the triggering event occurs, a simultaneous execution of the contract will take place, where the smart contract transfers the payments among parties and settles the accounts. The utilization of the smart contract through blockchain technology enables for vast potential application of fractional ownership in real estate field. The sellers of the property can use the smart contracts to specify a sequence or set

of actions which trigger the execution of the transactions once the pre-determined conditions are met, these conditions in turn can be based on price and/or means of exchange specifications. The smart contracts are considered as a reliable mechanism through which the transactions requiring transparency and trust can be conducted, such as real estate transactions. The smart contracts outline the terms and conditions of the sale of NFTs.

For clarification, assume a real estate company intends to use the smart contracts technology for real estate trade/sell, then the company needs to assure that all partakers agree upon the terms and conditions based on which the smart contract will be initiated. For instance, these terms can be; trade amount, duration of the contract, security deposit, payment deadline, and other terms that will be coded into an agreement. Once all terms are agreed upon by partakers, the company creates a smart contract which regulates the relationship among involved parties. Upon the satisfaction and completion of the coded terms and conditions (trigger), the transaction is automatically executed, and proceeds are transferred to the seller whereas the ownership title NFT is shifted to the buyer. One of the most popular ways real estate market participants and traders are attempting to include digital currencies into real estate transactions is through creating new tokens and currencies for buying, trading, renting, and investing in real estate, without a need to perform traditional transaction. This is more like acquiring shares in a company that owns portfolio of real estate properties. The use of cryptocurrencies in real estate transactions helps also market traders to list properties, where sellers and agents are using bitcoin to create more buzz and attention for their properties, or require for payments split among US dollars and bitcoins. These approaches appeared to be a growing trend since many investors gained profits in cryptocurrency and are looking for converting them into tangible real estate assets. Some other market participants, such as landlords, have started accepting rent fees in cryptocurrencies, especially bitcoin. This approach is becoming increasingly popular for lease and rent contracts. Accepting and sending payments in cryptocurrency will safeguard transaction parties' assets and identities. The conduct of real estate transactions online is more of the norm as a blockchain-based technology continues advancing the digital world. It has been clearly claimed by real estate developers and participating parties that using cryptocurrency in real estate transactions exhibits many advantages such as; easier conducting of local and international and overseas transactions,

enhance liquidity in real estate investing, avoid tax on transferring property rights, and reduce the cost transactions. Another important aspect through which blockchain and cryptocurrency can change the real estate transactions is the tokenization of real estate properties. The tokenization of real estate property encompasses the issue of tokens, representing the right to a part of the property. Such process is called initial coin offering (ICO). Tokenization attracts potential buyers and investors into real estate market and allows involving a larger number of investors and households in the purchase of real estate. In other words, the tokenization represents a joint investment in the development of properties with granting rights to the following acquisition of a part of the asset to the ownership, the use of tokens enables to convert the economic value of property objects into a more liquid form. This can improve the effectiveness of ownership of real estate through including the unemployed resources in the economic turnover. Another way cryptocurrency can emerge in real estate transactions is buying properties in the metaverse, that investors and developers are alike using metaverse platforms to gain real-time insights on the latest trends in real estate market prices and trends prior to investing in real estate properties in real life. The use of cryptocurrencies in real estate transactions can enhance transparency associated with a decentralized network can also cut costs of real estate transactions. There are other costs related to property registration fees, inspections costs, loan fees, and taxes. These can be reduced or even eliminated from the equation as digital platforms automate.

4.2 Challenges Facing the Adoption of Cryptocurrencies in Real Estate Transactions

Despite the potential benefits and upgrades can be brought to real estate transactions, however, there is still a limited adoption of digital currencies in the real estate industry, and this is by far can be attributed to some theoretical and technical weaknesses. For instance, the excessive volatility of cryptocurrencies reduces the interest of real estate market participants to take more initiatives in using digital currencies for real estate transactions. Hence, the need to strengthen the crypto-market is an important part of ensuring the stability of the adoption of blockchain technologies. Furthermore, the cybersecurity-threatening blockchain tools, such as smart contracts, should have a continuing audit to prevent hacks and assaults. Also, the tokenization is yet subject to specific technological

malfunctions. One promising solution for this issue could be by incorporating sophisticated Hi-tech companies into the smart contract, which guarantees a mechanism to attain data from the external sources and assures that all information is updated automatically. The dispute resolution is also arising as a potential obstacle for the speed adoption of digital currencies in real estate transactions. Where the negotiation of asset-based tokens has the potential to result in a disagreement which creates a jurisdictional concern pertinent to determining the specific regulatory authority which has jurisdiction to handle these disputes. The disclosure and licensing requirements also consume a significant amount of time and cost to settle. The regulation in many countries, as of now, does not clearly specify the legal framework that governs and organizes the use of cryptocurrencies and tokens. Most countries recognize that tokens are nothing but codes with no legal value. Consequently, the real estate market participants might lack a legal basis to associate themselves with specific pieces of property. Hence advancing the regulatory clarity is necessitated to empower greater access for blockchain technologies and to take big steps forward.

5 CONCLUSION

In this chapter, we attempt to shed the light on the role of cryptocurrencies and blockchain technology, which are described as one of the main financial innovations fall within FinTech ambit, in the contemporaneous real estate sector. For this purpose, the chapter firstly identified the main benefits of cryptocurrencies inclusion in real estate transactions. The outcomes indicate that various benefits can be brought to real estate from blockchain technology, these benefits include, but not limited to, improve the property development, promote real estate assets' management, enhance the liquidity of real estate market, facilitate capital formation, advances real estate investment, make homeownership more feasible, promotes due diligence and prevent financial crises. The discussion in this chapter demonstrates the main terminologies and variables of real estate transactions using cryptocurrencies. The NFTs can be seen as a main tool through which blockchain real estate operates. The NFTs are cryptographic assets that represent the digital form of ownership right in real estate properties. They are created by similar type of programming of cryptocurrencies. The tokenization of real estate asset also forms a main phase of the transaction, where properties are divided up into equivalent

pieces of digital shares for investment purposes. The cryptocurrencies can then be used as a means of exchange to purchase these fractional digital rights. Consequently, cryptocurrencies assist market traders to list properties, and enable investors and potential households to make payments using cryptocurrencies or split among cryptos and any other fiat currency. These approaches appeared to be a growing trend since many investors gained profits in cryptocurrency and are looking for converting them into tangible real estate assets. On the other hand, the chapter highlighted the main disruptions and potential barriers for blockchain real asset market. These barriers are basically, related to threats of cybersecurity attacks, extreme volatility of cryptocurrencies market, and well as the lack of the fully-fledged legal framework required to govern and organize legality cryptocurrencies in general, and their use in real estate transactions, in particular. Henceforth, the regulatory authorities need to set the proper and well-developed laws in order to enhance and promote the crypto-based real estate transaction in order to help families and households seeking home ownerships, and also to investors and other real estate market participants to enhance national markets and promotes foreign direct investments.

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