

Blockchain: cryptocurrencies projection in the banking and financial sector during the period (2009-2023)

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Abstract:

This study aimed to present the concepts of blockchain technology and digital currencies, as blockchain technology is the technical structure under which digital currencies operate, where the descriptive approach and the analytical approach were used to address the problem posed.

The study concluded that blockchain technology paves the way for the emergence of the second generation of the Internet, which will turn into a network of trust that allows the exchange of information with higher privacy and allows commercial and financial exchanges without the need for intermediary institutions that guarantee this, and It was able to solve many challenges including payment processing, manual settlement of several thousand financial transactions, payment and account management and online market trading

Keywords : Blockchain, cryptocurrencies, cryptographic, bank, finance.



I- Introduction:

Since the emergence of money as a means of commercial exchange, its forms have evolved over time. At the time, precious metals were replaced by paper currencies convertible into gold, which themselves, since the end of the Second World War, have been replaced by fiat currencies. which is a legal tender issued by the central authorities. Trust is the central element of the fiat monetary system (FIGUET Jean Marc, p. 325).

Money has three traditional functions. It can be an intermediary of exchanges to avoid barter, a unit of account and a store of value.

Technological developments. Have led to the emergence of a new form of currency: virtual currency or cryptocurrency. These currencies are created using an encryption protocol and are managed in a decentralized manner without the intervention of the state or an intermediary. This technology has become known. since 2008 the publication of a document entitled "Bitcoin": A Peer –to-Peer Electronic cash system.

The Blockchain depends on two technologies: first, the cryptocurrency or digital currency called a token which is used to transfer money on the blockchain. Secondly, distributed ledger technology, which is a secure and decentralized database, all transactions. performed on the blockchain network are recorded on this database, these two technologies together form the blockchain.

Bitcoin is a public blockchain, which means that anyone can access the network to transfer their money or pay with bitcoin.

Banks, startups and the. Large corporations and even central banks all want to participate in this innovation and survive decentralization and disintermediation.

Our research work addresses the following question: **are there future plans to include Blockchain in the financial and banking sectors?**

This question represents our point of. The following questions can also be asked:

- _ What are cryptocurrencies? And what are its challenges?
- _ What is Blockchain?
- _ Is an insertion of the blockchain. And cryptocurrencies on the financial and banking sectors is possible?

The purpose of this study is to present the concepts of blockchain technology and digital currencies, and to delve deeper into the monetary field, which has witnessed transformation throughout history, from a material to an immaterial character thanks to internet communication technology, eliminating financial intermediation, and the possibility of using Blockchain technology in the financial sector and the banking sector.

Our research work will focus, firstly, on the definitions of the concepts of cryptocurrency and blockchain, and secondly, we will address blockchain technology and its applications in the financial field

1. The challenges of cryptocurrencies.

In this section, we present the definition of cryptocurrency, its characteristics, and the determinants of cryptocurrency price development.

1.1. Definition:

Cryptocurrencies constitute. A new medium of exchange, they are a communication technology that allows transactions between people, peer-to-peer (P2P) and without the intervention of a third party (such as a bank). (Gerstein, 2015, p. 6).

1.2. Characteristics of cryptocurrencies:

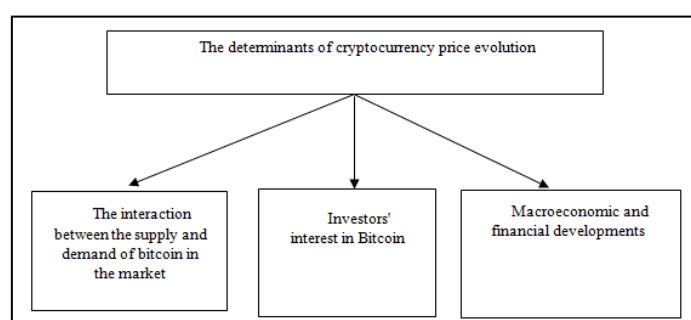
Three characters define cryptocurrencies:

- _These are virtual currencies, that is. digital representations of purely fiduciary securities, they are not issued or guaranteed by the central bank;
- _They use encryption and are designed and adapted to transfer value over the internet in a completely public and open environment, in complete security.
- _They operate in a decentralized system. where information is fully distributed among all participants and where transactions are identified and validated. (AMIAR Lila, 2022, p. 89).

1.3. Determinants of cryptocurrency price development:

Many scientific studies have attempted to analyze the determinants of cryptocurrency prices, in this case Bitcoin and their determinants can be grouped together. In three categories: market forces of supply and demand for Bitcoin, the attractiveness of Bitcoin for investors, and global macroeconomic and financial factors See the following chart.

Figure (1): the determinants of cryptocurrency price evolution



source : developed by us

1.3.1. The interaction between the supply and demand of bitcoin in the market: the supply of bitcoin is determined. by its stock which is considered constant, and what seems most striking in the bitcoin economy is the juxtaposition of supply certainty and demand uncertainty.

1.3.2. Investor Interest in Bitcoin: In this regard, negative information about Bitcoin's security such as cyberattacks, reduces Bitcoin's appeal to. investors. On the other hand, positive information about the security of the Bitcoin system, such as software upgrades aimed at further strengthening the security of the Bitcoin network, increases the attractiveness of Bitcoin for investors in general, and an increased demand for. Bitcoin due to the increased appetite could increase pressure on the price of Bitcoin while a decrease in attractiveness will lead to a decrease in the demand for Bitcoin and its price.

1.3.3. Macroeconomic Developments and Financial Developments: When the macroeconomic situation is favorable, it can boost the demand for Bitcoin trading. and have a positive impact on its price, which confirms that variables that are close to macroeconomic and financial development, such as stock market indices, exchange rates, and the price of oil are the determining factors that affect the price of Bitcoin. (TRINNOU Gnêmèho, 2021)

1.4. The historical evolution of cryptocurrency:

In this article, we introduce you. in detail the price history of Bitcoin, year after year, around the events that made an innovative monetary system.

Table (1): Bitcoin price history

Year	Begin	High	weak	Eoy	% performance
2010	\$0.003	\$0.40	\$0.00	\$0.30	9900%
2011	\$0.30	\$32	\$0.29	\$4.70	1467%
2012	\$4.70	\$16	\$4	\$13.30	183%
2013	\$13.30	\$1163	\$13	\$805	5953%
2014	\$805	\$936	\$310	\$318	-61%
2015	\$318	\$465	\$172	\$434	36%
2016	\$434	\$981	\$351	\$966	123%
2017	\$966	\$19892	\$784	\$14245	1375%
2018	\$13657	\$18343	\$3217	\$3809	-72%
2019	\$3844	\$13017	\$3401	\$7240	88%
2020	\$7200	\$29096	\$3850	\$28951	302%
2021	\$28951	\$68789	\$29796	\$46430	60%
2022	\$46379	\$47835	\$18490	\$16535	-64%
2023	\$16537	-	-	-	-

Source: (BITCOIN Magazine, 2023)

On October 31, 2008, the pseudonymous person or group known as Satoshi Nakamoto published the Bitcoin whitepaper. Then, on January 3, 2009, the Bitcoin network has. was put into operation with mining of the Genesis block, which allowed the first transaction group to start a blockchain. This block contained a textual note that read: "Chancellor on the verge of a second bank bailout" this was a reference to a London Times article on the 2008-2009 financial crisis, when commercial banks were receiving billions in bailout money from banks. and governments. This event helped drive down the initial price of Bitcoin. The actual adoption of Bitcoin began to take place about two years later.

On October 12, 2009, a member of the Bitcoin talk forum traded 5050 BTC for \$5.02 via PayPal, which implies a price of \$0.00099 per coin and one of the prices per BTC. lowest.

On May 22, 2010 Laszlo Hanyecz bought two pizzas for 10000 bitcoins, which is the first iconic exchange of bitcoin for a real-world product, the Bitcoin pizza day was born.

In February 2011, BTC reached for the first time. times \$1.00 reaching parity with the U.S. dollar. A few months later, the price of BTC reached \$10 and then quickly climbed to \$30 on the MT exchange. GOX. Bitcoin has multiplied by. 100 compared to the year's starting price of about \$0.30

On August 9, 2012, a problem at Mount Gox a. Boosted the price of Bitcoin to \$1 billion each on the exchange, 11 days later on August 20, the price dropped by 50% passing. from \$15.28 to \$7.60, the price of Bitcoin at the end of the year was \$13.50.

In 2013, the EFF started accepting Bitcoin again, and that year was the strongest in price history. of Bitcoin in terms of percentage of gains. The cryptocurrency posted a gain of 6600% against \$13 at the beginning of the year and the price of Bitcoin soared to nearly \$250 in April before correcting downwards by more than 50% the price consolidated for about six months until another historic rally in November and December of the same year, when the price peaked at \$805. the world's first Bitcoin ATM has also been installed in Vancouver, allowing people to convert from the liquid agent to crypto.

January 2014-December 2017, this period is defined by the emergence of altcoins and the injection of significant funds into the cryptocurrency market, part of the ICO craze in 2017 went from \$800 in 2014 to nearly \$20000 on December 20, 2017, and it was followed as one would expect by a decline until 2018 and 2019.

2020 will be remembered as the year of covid by the end of this year, the price of Bitcoin had returned to its previous ATH of \$20000 and surpassed it, closing on December 31 at over \$29000.

In August 2021, the price of Bitcoin was oscillating around. of \$4600 and on November 10, 2021, BTC reached its all-time high of more than \$68789. However, towards the end of 2021, the price of Bitcoin dropped to around \$47191, a loss of almost 30%, the price drop is partly due to the fact that China asked its citizens to shut down Bitcoin mining operations, as well as the global energy crisis and geopolitical turmoil due to Russia's war. against Ukraine.

In May 2022, BTC fell below \$30000 for the first time since July 2021 and the rapid fall of FTX shocked the financial sector and the crash has a massive ripple effect on the crypto market, the price of Bitcoin continued to fall it closed the year at \$16537, down 64% compared to 12 months.

On January 21, 2023, Casey Romodor launched Ordinal, which enables on-chain Bitcoin native digital artifacts. The price rose 45% in January at \$23150 and showing signs of a strong recovery.

In addition, Bitcoin mining has reached a new. high at the end of February, this signals the interest of miners, which some traders consider a bullish indicator (Brian NIBLEY, March 01, 2023).

2. The Blockchain:

In this section, we present the definition and operation of Blockchain.

2.1. Definition:

Although there is no official definition of blockchain technology, it can be described as a technology for decentralized digital storage and data transmission. (Patrick Waelboeck, 2017, pp. 10-19)

Blockchain refers to a series of blocks in which information of all kinds is stored. Blockchain is generally defined as a transparent and secure. technology for storing and transmitting information that operates without a central control body (Marion PIGNEL, 2019, p. 4).

The Blockchain is carried out through a decentralized peer to peer network. On this network, transactions are verified, validated and grouped into blocks. The blocks are. then connected to each other to form a chain. (The Main Division of Direct Federal Taxation, 2021, p. 2)

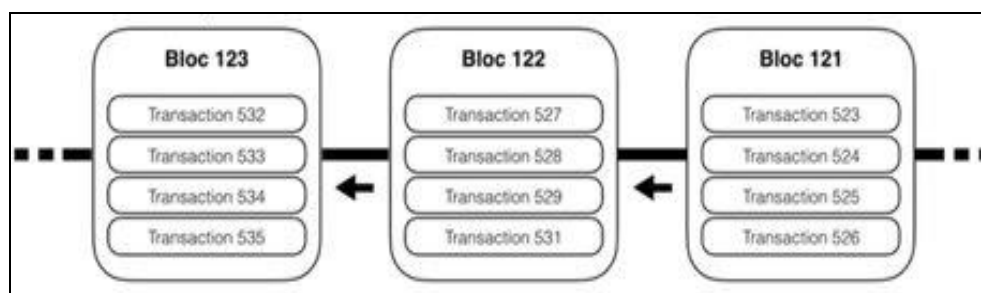
2.2.How the blockchain works:

We will now go over how it works. through three main modules, taking the example of the most famous Bitcoin.

2.2.1. Blockchain chain:

Blockchain technology works from crypto assets. i.e. from a currency or token called a "token" that corresponds to the underlying asset.

Figure (2): Blockchain



Source: (Naomi BAKARY, 2019-2020, p. 15)

2.2.2 Cryptography:

Cryptocurrencies are currencies that use an encryption system to validate transactions and create money in the spirit of crypto, which allows messages to be sent by protecting them with keys thanks to a mathematical algorithm, only people holding the specific keys of the household file can decode it and have access to it. These wallets are called "Wallet" which is assigned an address in the form of a public key (in relation to the principle of RIB in the banking system) which has the role of distributed and kept the private key secret. These two keys are used during transactions to encrypt and decrypt messages, ensuring the confidentiality of the information exchanged, when sending a message, the sender can use their private key to encrypt the message, and the recipient will then use the corresponding public key to decrypt it. Thus, this digital signature system makes it possible to verify the identity of the author and recipient of the message and also to preserve its confidentiality.

2.2.3. Mining activities:

The metal runs a specific algorithm called SHA252 several billion times per second for several minutes before finding the block according to certain Bitcoin parameters, and once the correct hash is found, the metal sends it to all nodes in the network that verify this result and add it to its blockchain. Mining reveals the computing power of today, for example it is impossible to mine with a simple computer, and the tools used by miners today can It deploys an average power of about 400,000 MHz per second (400 million hashes per second) and will soon be able to reach 1,500,000 MHz per second. Since mining is an activity that requires time and above all a lot of energy and investment, miners get rewarded by the network and for this they must provide proof of their work and the resources used such as the entity identifier, the block he exploited, the serial number, as well as the hash that was found. This point is very important in the Bitcoin system because if miners are not paid, they will not be encouraged to invest in such conditions. In order to ensure the proper functioning and security of the network.

This point is very important in the Bitcoin system, because if miners were not paid, they would not have been incentivized to invest so much in such powers, in order to ensure the proper functioning and security of the network, the rate of creation of new Bitcoins was 1 bitcoin every 25 minutes. The creation of bitcoin will therefore stop when the 21 million bitcoins in 2140 this limit was set from the origin of bitcoin, by its creator, Satoshi Nakamoto, mining has a double purpose: to avoid fraud by securing transactions and to allow the creation of new bitcoins, anyone can become a miner. and everyone can see the

history of all previous transactions in the virtual ledger that constitutes the blockchain (LARUE Louis, September 2016, pp. 3-4).

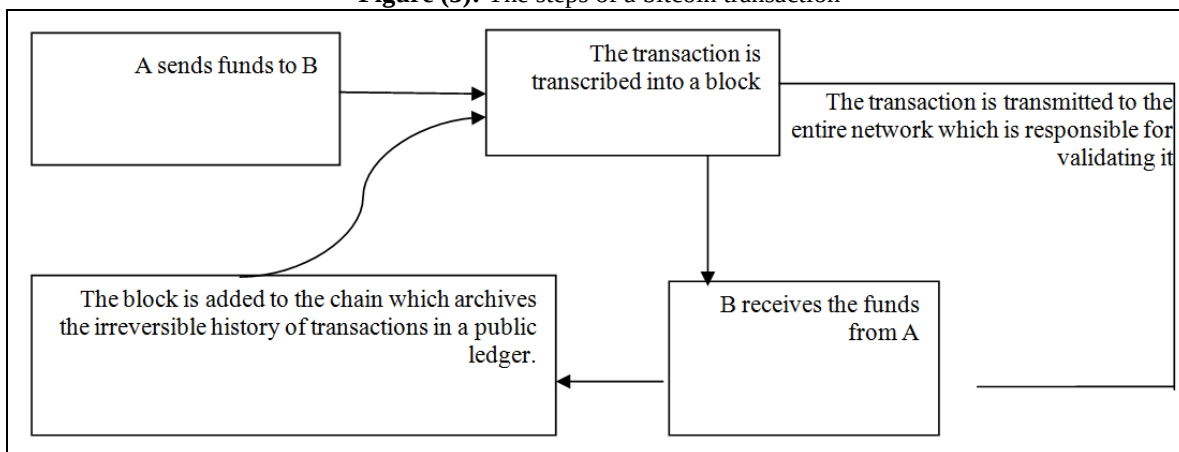
3. Blockchain technology and its applications in the financial field:

The applications of blockchain in finance are numerous, and the technology can be used to exchange virtual currencies, securities, register the voting rights associated with shares, and raise funds via ICOs (initial coin offerings) by creating equity securities linked to tokens exchangeable for cryptocurrencies, programming the execution of smart contracts. Other uses outside the financial system have developed. (Marianne VERDIER, 2018, p. 68)

3.1. Transferring money to the blockchain: from bitcoin to cryptocurrencies

The first developments of the so-called blockchain 1.0 technology concerning bitcoin and cryptocurrency exchanges. To send Bitcoin you need to post. transfer a certain amount, the verification nodes will ensure that you have the amount and that it has not been transferred to another person, once its information is confirmed the transaction will be included in a block, this block is added to the previous block, and the transactions cannot be changed, for example Jack (pseudonym) wants to transfer bitcoins to Daniel (pseudonym), and the whole network must be able to verify that they have not been spent before, then register the change of ownership, this exchange can be done in a simple way thanks to a key system encrypted by cryptographic algorithms with Jack's private key (he is the only one who knows it) and a public key that can be distributed throughout the network, and created from the private key and Bitcoin address (which was created from its public key). A private key gives the ability to grant, sell, or use the associated Bitcoin as collateral. Jack initiates the transaction. encrypted message with his private key to the network, it indicates the address of the recipient of the Bitcoins, and the amount of Bitcoin that will be transferred to his public key, the public key is used to decrypt Jack's message. It allows the entire network to verify that Jack has not already spent the units used to pay Daniel (double-spending problem), there is no need to verify Jack's identity (anonymity). Once the transaction has been verified, the network records the transfer of ownership (Mariane VERDIER, 2018, pp. 69-70).

Figure (3): The steps of a bitcoin transaction



Source : (FIGUET Jean Marc, p. 327).

3.2. Applications of blockchain technology in the banking sector:

Blockchain is an emerging technology that is adopted in an innovative way by various fields. We explain some of the use cases in the banking fields.

3.2.1. Simplification of the customer identification process (KYC and AML)

Financial institutions are obliged to create an identity file for each customer independently of other economic and financial agents in the markets, in this case the high cost of KYC and AML are major barriers to the growth of international trade (48.2% of international trade requires KYC, according to the international chamber report in 2016, 62% of banks have rejected transactions. due to KYC/AML restrictions. Blockchain can be used to set up a digital identity system, and this identification can be used by institutions that perform KYC when opening accounts for their customers. The identity on the blockchain contains the following information:

- _ Equal information such as: surname, first name, date and place of birth... etc.;
- _ Job information: salary, ... etc.
- _ Financial information: securities, debts;
- _ Certificates of diplomas obtained;
- _ Medical Information
- _ The house, the car.

This information is digitally certified, and this identity can be used to facilitate the procedure of. KYC but also to verify the identity of customers in the banking, financial markets and insurance sector (HMIMOU, 2017-2018, p. 48), the next time this customer seeks to open an account in a bank, the bank can use it again.

3.2.2. Remuneration and regulation:

The working principle to clear and organize payments and transactions is simple, firstly all assets are created and recorded on a blockchain consortium created in the form of crypto tokens, blockchain technology allows users to execute transactions and have them executed by information nodes on all assets, Securities, transaction history and account balance of each user.

3.2.3. International Trade Finance:

The process of international trade finance via blockchain technology begins with a sales contract between the importer and exporter and the editor. of a smart contract is shared with the importer's bank

- The importer's bank drafts the credit equivalent document via a smart contract and shares it with the exporter's bank for approval.
- The exporter's bank electronically signs the smart contract (documentary credit) so that the exporter can deliver the goods to the carrier.
- When the importer receives the goods, he electronically signs the smart contract to initiate payment.

3.3. Applications of blockchain in the financial market:

We present some applications

3.3.1. Financing a project via a blockchain ICO:

ICOs (initial coin off rings) which can be defined as a way to raise funds, work by issuing digital assets exchangeable for cryptocurrencies during the start-up phase of a project. These digital assets are issued upon fundraising, are called tokens, and can. be

exchanged on exchange platforms by their owners at any time for cryptocurrencies. But they can be kept by their owner throughout the creation phase of the company, their value, in fine, will depend on the success of the name of the company, thus tokens are not the equivalent of shares issued by a company during a capitalization fundraising but rather a future right to use the product or service, for example Storj which is a decentralized cloud storage solution has carried out an ICO by offering tokens (Storj coins) allowing to buy storage space on networkstorj. And conversely, to rent the storage space on the Storj network in exchange for Storjcoins. the interest received by the companies that are launch in ICOs is the speed with which its fundraising is carried out, last May, Brave the internet browser created by Brendan Eich the co-founder of Mozilla, had raised \$35 million in just 30 seconds, File coin, Tezos and EOS are the three largest ICOs made to date. As the table shows, the USA, Singapore and the United Kingdom generate the most ICOs indicate that China was in this top five before but that its name does not appear due to the too strict and hostile regulations towards cryptocurrencies.

Table (2): Top 5 countries according to the number of ICOs

Country	Number
USA	717
Singapore	587
UK	514
Russia	328
Estonia	301

Source: <https://icobench.com/stats#stats-contries>

3.3.2.Issuance of digital securities (crypto-securities):

According to a report by the European Central Bank (bank European central, September 2017), blockchain technology can be used in the financial market to replace traditional securities with crypto-securities, smart contracts are used to manage these securities and the properties of these securities are recorded on the blockchain and are similar to cryptocurrencies, With the difference that they are programmed and monitored by institutions and regulated. determine the legal characteristics of these securities, the trading of these securities can be executed on a marketplace platform and transactions are carried out regulated and recorded on the blockchain. The Nasdaq exchange has launched Project LINQ, a blockchain platform that enables the issuance and management of digital assets securely on a blockchain network. (Nasdaq, 2015)

Conclusion:

It should be clear that Bitcoin is an asset like no other. Its ecosystem tends to operate on four-year cycles, while its price can be defined by factors related to monetary policy, such as the. easing or quantitative tightening policy.

In just 14 years, Bitcoin's incredible growth has made it a new asset class that everyone has started paying attention to.

The applications of Blockchain technology vary from one sector to another even if it is not yet widely used in the financial sector. Banks need to have the infrastructure for blockchain technology in place and ensure that. that all employees comply with international standards for this blockchain technology, only when this happens can blockchain be used on a global scale. Moreover, once blockchain is accepted as a global standard, there are many advantages, for example it will lead to more transparent financial

systems, faster transaction processing, lower processing costs, and thus could give rise to new money creation applications. Overall, blockchain technology in the banking and financial sectors seems to have a very bright future.

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