

SECTION FINANCE, BANKING, ACCOUNTING AND AUDIT

COMPARATIVE ANALYSIS OF CRYPTOCURRENCIES VERSUS FIAT MONEY

Georgiana Iulia LAZEA, Ovidiu Constantin BUNGET, Anca Diana SUMĂNARU

Accounting, Faculty of Economics and Business Administration, West University of Timisoara, Timisoara, Romania

georgiana.lazea87@e-uvv.ro; ovidiu.bunget@e-uvv.ro; anca.sumanaru94@e-uvv.ro

Abstract: *This article aims to provide a comparative analysis of cryptocurrencies and fiat money, in the context in which the former might be considered an alternative to the latter. Mainly, we perform a literature review and qualitative analysis of 64 articles from Web of Science Core Collection, published between 2017 and 2023, using as keywords “cryptocurrencies” and “fiat money”. The information processing methodology involved presenting the data and information concisely, in order to gain a point of view on how crypto assets can be perceived in comparison with other financial assets. The results present the authors' conclusions regarding the economic differences and similarities between cryptocurrencies and traditional money. It also includes the limitations of the research and offers future directions for study.*

Keywords: cryptocurrencies, fiat money, bitcoin, blockchain, crypto assets, banking

JEL Classification: G15, G32, M40, O39, Q55

1. Introduction

The development of contemporary economic and financial systems is based on monetary and payment systems, which, along with the development of technology, are in permanent evolution (Kourmpetis and Gazis, 2022). The classic model where the central bank maintains monetary and financial stability can be contrasted with the new decentralised model based on the blockchain technology that supports cryptocurrencies. In this context, Temperini and Corsi (2023) mention, in their paper, the concept of economic *democratisation* with reference to the access and use of all monetary forms. Moreover, others are of the opinion that virtual currencies could even replace fiat currencies and thus avoid central banks (Gunay, et al., 2021). The purpose of this paper is to highlight the correlations and characteristics that exist between cryptocurrencies and fiat money.

The findings of the analysis highlight the similarities and differences between cryptocurrencies and traditional currencies. In this way, the authors want the article to contribute to the development of the study in this field and facilitate the understanding of investors and economic professionals.

1.1. Research methodology

The article is based on the systematic literature review and qualitative analysis of the specialised literature in which the association between cryptocurrencies and fiat currencies was found. Were considered various specialised publications on the Internet, at international level, which address the concepts of interest on the proposed topic. In addition, Web of Science Core Collection database was accessed to consult the published papers between 2017 and 2023 in which the key-terms “cryptocurrencies” and “fiat money” were found. Moreover, the market capitalisation was reflected as found on CoinMarketCap trading platform, in the period 2022 and 2023. This platform is sometimes used to obtain statistical data and graphs regarding the cryptoassets phenomenon.

1.2. Information processing

In explaining the points of view, from a theoretical perspective, different electronic sources were analysed for the purpose of defining cryptocurrencies and fiat currencies, and the most important observations will be highlighted. The database downloaded from the Web of Science Core Collection platform was processed using VOS viewer program. The result was to generate the key-terms cluster based on co-occurrence association strength method (Figure 1). Furthermore, certain statistical data were presented, such as the market capitalisation of cryptocurrencies and stablecoins, as available on the CoinMarketCap platform.

2. Analysis of specialised literature

This paper follows the trend of discussing the extent in which cryptocurrencies can replace fiat currencies by comparing their characteristics, properties, and functions. Initially, from the analysis of the 64 existing scientific works on the Web of Science Core Collection platform, according to the number of occurrences resulted 15 relevant key-terms. Among them, the high impact terms are: *cryptocurrency* which appeared 33 times, *bitcoin* with 22 appearances, *blockchain* with 14 appearances and *fiat money* with 11 appearances. Then, using the term association method, it can be seen from Figure 1 that the strongest links appear between *cryptocurrency*, *blockchain*, *bitcoin*, *fiat money* and *digital currency*. The simultaneous appearance in several scientific works is shown by connection nodes; as the size increases, it means the term has been used more often.

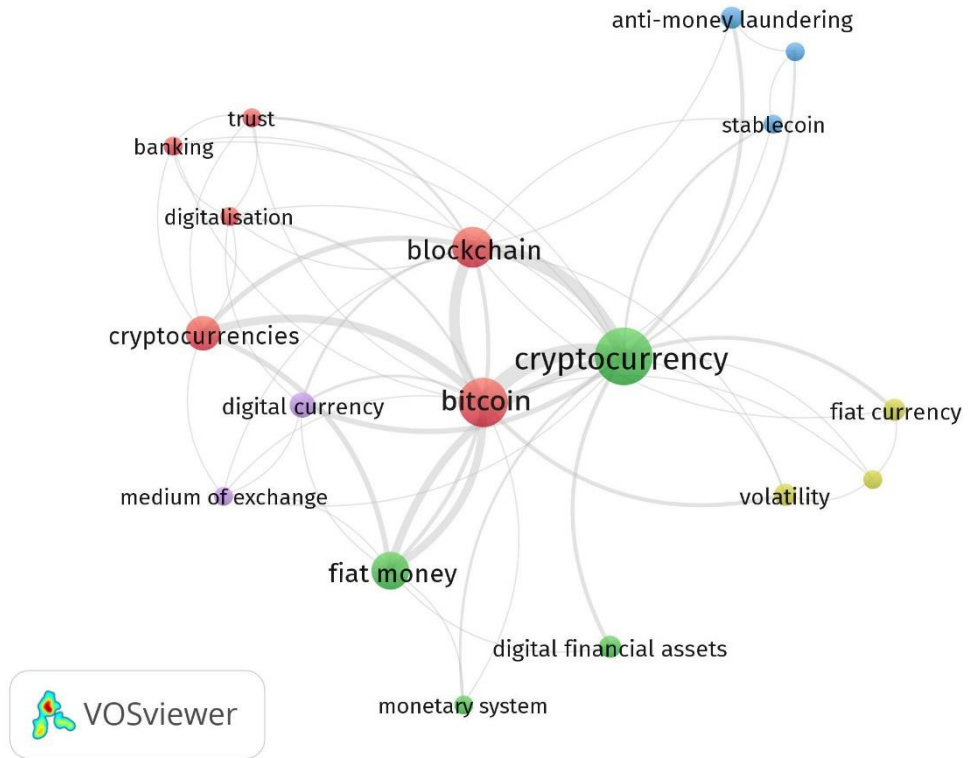


Figure 1: Key-terms cluster based on co-occurrence strength association method
Source: Authors' projection with VOS viewer from Web of Science database

2.1. Fiat currencies

Evolving from metal to paper or plastic, traditional money or coins represented a physical medium of exchange, transferable from one interested party to another. *The fiat currency* is a currency without intrinsic value, but whose declared value is recognised and validated by its users (Lukianchuk, 2022). In other words, fiat currencies represent cash that is used as a medium of exchange. Fiat currency is issued and controlled by central banks and governments, which provide oversight, prevent economic instability, and validate their value. Since the value of a coin is based on the trust of its users, when they lose trust, they tend to switch to another coin that they believe is more valuable (Jin, et al., 2021).

Going deeper, money is described by the English economist Jevons (1875) as having four functions: medium of exchange, unit of account, standard and store of value.

However, the current technological evolution that has led to the existence of mobile wallets and various payment applications such as Apple Pay or Google Pay, directs

society towards an economy devoid of liquid money, characterised by the term "cashless" (Lukianchuk, 2022).

2.2. Cryptocurrencies

According to the European Central Bank (2012), virtual currency does not have a legal physical equivalent, thus it is different from electronic money, respectively online bank accounts. The owner or issuer of the virtual currency is a non-financial private company and is not supervised in terms of monetary legislation.

Moreover, Venter (2018) warns, in the study about digital currencies, that the confusion between digital currencies and electronic currencies should be avoided. In terms of electronic currencies, the online bank account reflects the amount of money, in fiat currencies, existing in the account. In contrast, digital currencies are a medium of exchange that can only exist digitally, are not backed by any form of immobilisation, and do not exist in physical form. Their value fluctuates because it is influenced by the supply and demand relationship (Bunget and Trifa, 2023).

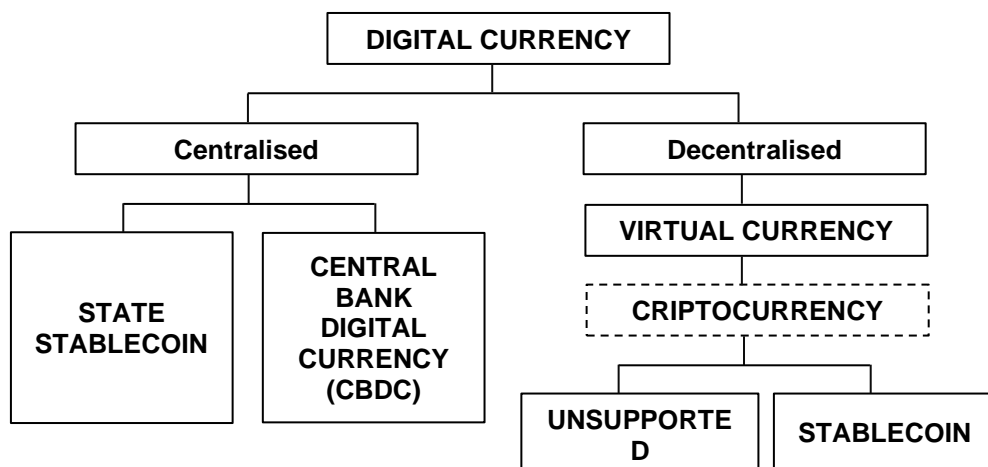


Figure 2: Structure of digital currency centralisation

Source: Authors' projection after European Central Bank (2012), Venter (2018) and Lukianchuk (2022)

The structure of digital currency centralisation is illustrated in Figure 2. Thus, digital currencies can be issued in a centralised or decentralised system. The centralised system involves state institutions, such as the central bank or a credit institution, that issue and hold digital currencies in a regulated framework.

Digital currency issued in a decentralised system, in a public, distributed ledger, is considered virtual currency. As a result, cryptocurrencies that are used as a means of payment, are a type of cryptographically based virtual currencies that are issued by private entities.

Cryptocurrencies or digital currencies represent a class of digital assets that were developed based on blockchain technology and appeared in 2009, when bitcoin

currency was launched on the market. They use cryptography as a method of ensuring security.

Cryptocurrencies can be divided into two main categories (Figure 2):

- *unsupported cryptocurrencies*, which derive their value from investors' expectations and usage, being characterised by volatility. They do not fulfil the fourth function of money mentioned by Jevons (1875), namely the element of storing value. The main cryptocurrency, *bitcoin*, and the alternative currencies on the market, *altcoins*, can be mentioned;
- *stablecoins* whose value is more stable because they are supported by financial assets that guarantee their value (Kourmpetis and Gazis, 2022). In their diversity, four categories are distinguished, depending on the factor that gives them the guarantee: stablecoins guaranteed by fiat currencies, stablecoins guaranteed by assets (gold), stablecoins guaranteed by other cryptocurrencies and algorithmic stablecoins (Temperini and Corsi, 2023).

Cryptocurrencies are based on the form of exchange that takes place strictly digitally. These digital currencies are characterised by limitations regarding their transformation into cash, respectively a high degree of risk regarding value fluctuations. Thus, cryptocurrencies are, in fact, a means of exchange in online transactions. However, since they are not fixed and determinable, they cannot represent a unit of account, a standard and a store of value.

Stablecoins were created to solve the problem of volatility and leverage blockchain technology. Stablecoins are cryptocurrencies that can be converted into fiat currencies. They can be managed in a centralised or decentralised system.

Starting from USD, it can be noted USDT centralised stablecoin issued by Tether, where 1 USDT is backed by 1 USD in the bank account of the issuer. Lukianchuk (2022) highlights in his article that there is a downside to centralised stablecoins, namely that the investor must trust the issuer regarding the unaltered holding of the physical monetary equivalent and the security of the stablecoins.



Figure 3: Market capitalisation of cryptocurrencies during November 2022 – October 2023

Source: Capture from CoinMarketCap.com (2023)

Along with the stablecoins issued in the centralised system, the central bank can issue its own currency, called CBDC (Central Bank Digital Currency). This is a form of digital money accessible online that aims to simplify digital transactions.

In contrast, decentralised stablecoins are managed by autonomous entities and operate on decentralised ledgers, and reserves can be publicly verified, thus solving the problem of trust (Lukianchuk, 2022).

Analysing the existing data on CoinMarketCap.com platform between November 2022 and October 2023, stablecoins occupy a proportion of approximately 10% of the cryptocurrency market. Figures 3 and 4 show that the total capitalisation of stablecoins USDT and USDC is \$115 billion, while the total capitalisation of the entire cryptocurrency market is \$1.2 trillion.



Figure 4: Market capitalisation of stablecoins USDT and USDC during November 2022 – October 2023

Source: Capture from CoinMarketCap.com (2023)

2.3. Differences between cryptocurrencies and fiat currencies

Initially, the interest in the purchase of cryptocurrencies was low, but in the following stages the value of digital currencies recorded an upward trend considering their recognition as a payment method by large online retailers. Thus, although fiat currencies and cryptocurrencies exist in two different systems, they can practically be used as a medium of exchange. However, certain properties can be observed in parallel, between fiat currencies and cryptocurrencies, in Table 2:

Table 2: Differences between properties of cryptocurrencies and fiat currencies

Property	Fiat currencies	Cryptocurrencies
Control	Centralised to central banks and government.	Decentralised; not controlled by a central authority.
Supply	Available unlimited; central banks can issue as many currencies as	Some cryptocurrencies are controlled and limited (bitcoin

Property	Fiat currencies	Cryptocurrencies
	they want. Exposed to inflation risk.	currency is limited to 21 million coins). There are newly created cryptocurrencies, but their rate is decreasing. Low inflation risk.
Protection	Due to anti-money laundering legislation and regulations, the beneficiaries can be identified.	Poorly regulated. Secured by cryptography. Cryptocurrency transactions do not benefit of total anonymity (are pseudonymous).
Immutability	Transactions with fiat currencies can be reversed.	Reversal of cryptocurrency transactions is not possible.
Divisibility	Divisible into smaller units.	Allow micro-transactions. For example, in the case of bitcoin, the smallest unit, the satoshi, is equal to one hundredth millions of one bitcoin.
Volatility	Their market value is stable.	High volatility.
Technology	Traditional money printing technologies.	Blockchain technology.

Source: Adapted from Kourmpetis, S. and Gazis, A. (2022); Binance Academy (2022)

Starting from control, the decentralised existence of cryptocurrencies allows greater freedom and autonomy in transactions, as users have more control over their funds and can avoid potential government regulations or restrictions. On the other hand, fiat currencies, which are government-issued, offer stability and acceptance.

Transactions made with cryptocurrencies are pseudonymous, meaning that they are not directly tied to the identities of the individuals involved. This provides a level of privacy that is not possible with fiat currencies, where transactions are typically traceable and can be linked to personal information, can be monitored by central banks or financial institutions (Amarasinghe, et al., 2021).

Analysing further, the distinctions between cash and cryptocurrencies, according to their functions mentioned by the European Central Bank (2022), are highlighted in Table 3. According to the studies undertaken by Bunget and Trifa (2023), an advantage of money in the form of cash would be the fact that cash can be used directly in making payments.

Table 3: Differences between cash and cryptocurrencies by functions

Functions	Cash	Cryptocurrencies
Autonomy	Cash is the only way for citizens to hold money without needing access to equipment, internet, or electrical power.	Cryptocurrencies can be kept in a private e-wallet. These transactions require access to equipment, internet, and electricity.
Legality	Creditors and suppliers cannot refuse cash collections unless they have agreed with their	Virtual currencies are not a form of exchange in the true sense of the term, as there are very few

Functions	Cash	Cryptocurrencies
	customers on another payment method.	merchants willing to work with such payments.
Integration	Using cash, opportunities are offered regarding payment instruments, respectively the possibilities to make savings.	The use of cryptocurrencies is possible only for people who have access to the internet and who have educated themselves for the purpose of using these trading tools.
Rapidity	Banknotes and coins allow immediate or scheduled payments.	Virtual currencies facilitate the automatic exchange of cryptocurrencies between accounts.
Safety	Cash is almost immune to fraud, counterfeiting and cybercrime.	Virtual currencies are unsupervised. The main risks associated with their volatility relate to suspected fraud or cybercrime.

Source: Authors' projection from the European Central Bank (2022); Bunget and Trifa (2023)

Figure 5 illustrates how traditional currencies are traded compared to cryptocurrencies. According to Islam, et al. (2018), the authors state that in a centralised system, traditional currencies are issued by the government or central banks, and transactions between individuals are controlled. In contrast, cryptocurrency transactions operate in decentralised structures that allow the existence outside of central banks or governments. Each transaction must be validated by users in the network to avoid defrauding the system (Bunget and Trifa, 2023).

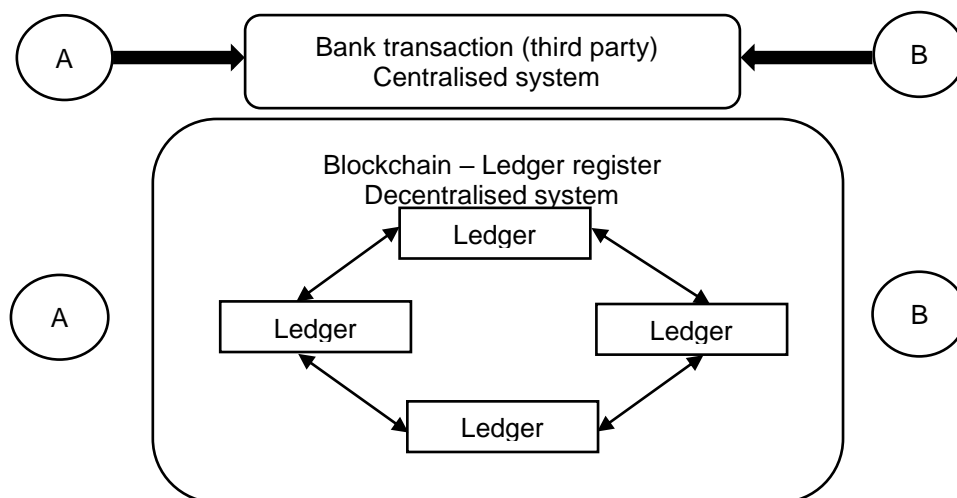


Figure 5: Comparison between cryptocurrency transactions and bank transactions
Source: Adapted from Islam, et al. (2018)

Satoshi Nakamoto (2008) supports in his work the idea that the distributed ledger system could eliminate the need for intermediate financial institutions to mediate transactions for a fee. As a result, Table 4 highlights the entities involved in transactions with fiat currencies, respectively with cryptocurrencies, processed according to Vaz and Brown (2020).

Table 4: Institutional penetration levels of fiat currencies and cryptocurrencies

Level	Fiat currencies	Cryptocurrencies
1	Transactions between individuals	Transactions between individuals
2	Transactions between legal entities	Transactions between legal entities
3	Transfer and payment system (regulated by central bank)	The blockchain platform (consensus based)
4	Banks and financial institutions	
5	Central banks	
6	Government	
7	International institutions: IMF (International Monetary Fund), BIS (Bank for International Settlements)	

Source: Adapted from Vaz and Brown (2020)

Regarding the first two levels, both fiat money and cryptocurrency transactions can involve individuals and legal entities. The first change comes from the third level, where fiat currencies are traded within specific systems regulated by the central bank, and cryptocurrencies are traded on blockchain platforms. The following levels are only addressed to institutions that, since they are under the regulatory umbrella, benefit from trust; here only fiat currencies are traded (Vaz and Brown, 2020).

3. Conclusion

In this article, the characteristics of cryptocurrencies have been exposed in parallel with traditional currencies, after consulting various specialised sources in the field.

As a result, money in the modern context can include cryptocurrencies which, although not monetary instruments, can be used as an additional option in transactions. Similar to Lukianchuk (2022), the authors believe that in the case of payment with cryptocurrencies, they will be converted into the main means of payment, i.e., the currency of the central bank, at the exchange rate valid on the date of the transaction. Arguably, in some transactions, the most viable substitute for traditional currencies are stablecoins.

The authors draw attention to the fact that unlike banking transactions with traditional currencies, which according to Kameir (2019), have a longer transfer time, transactions based on blockchain technology are final and irreversible, and the recipient can use the funds immediately.

Regarding the limitations when researching cryptocurrencies, the authors found out that there is limited data availability. The cryptocurrency market is fragmented, with multiple exchanges and currencies that lack standardised reporting and

transparency. This makes it challenging to obtain reliable and comparable data for research purposes.

In terms of suggesting directions for further research, these may consist of analyses of the correlation between cryptocurrencies and other assets that may be of interest to economics professionals and investors.

References

- Amarasinghe, N., Boyen, X. & McKague, M., 2021. The Cryptographic Complexity of Anonymous Coins: A Systematic Exploration. *Cryptography*, 5(1).
- Binance Academy (2022) *What is fiat currency?*, sl: Binance.
- Bunget, OC. and Trifa, GI. (2023) Cryptoassets - Perspectives of Accountancy Recognition in the Technological Era. *Financial Audit*, XXI(3(171)/2023), pp. 526-551.
- CoinMarketCap.com (2023) *coinmarketcap.com*. [Online] Available at: <https://coinmarketcap.com/charts/#market-cap>
- Czapliński, T. and Nazmutdinova, E. (2019) Using FIAT currencies to arbitrage on cryptocurrency exchanges. *Journal of International Studies*, Issue 12(1), pp. 184-192.
- European Central Bank, 2012. *Virtual currency schemes*, Frankfurt am Main: s.n.
- European Central Bank (2022) *The role of cash*, sl: snc
- Gunay, S.; Kaskaloglu, K.; Muhammed, S. Bitcoin and Fiat Currency Interactions: Surprising Results from Asian Giants. *Mathematics*. Issue 9 (1395). DOI: <https://doi.org/10.3390/math9121395>
- Islam, MR, Al-Shaikhli, IF, Nor, RM and Mohammad, KS (2018) *Cryptocurrency vs Fiat Currency: Architecture, Algorithm, Cashflow & Ledger Technology on Emerging Economy*. sl, sn
- Jevons, WS (1875) *Money and the Mechanism of Exchange*. sl:D Appleton and Company.
- Jin, X., Zhu, K., Yang, X. & Wang, S., 2021. Estimating the reaction of Bitcoin prices to the uncertainty of fiat currency. *Elsevier*, Volume 58.
- Kameir, C. (2019) Beyond Fiat Money and Cryptocurrencies: Money over IP. *Forbes*.
- Kourmpetis, S. and Gazis, A. (2022) *Cryptocurrencies and fiat money: The end of a public good?*. sl, sn
- Lukianchuk, DY (2022) The Evolutionary Development of Money: From Minted Coins to Cryptocurrencies. *Economics*, Issue 339.72.
- Qureshi, H. (2019) *A Brief History of Money*, sl: sn
- Satoshi Nakamoto, 2008. *Bitcoin: A Peer-to-Peer Electronic Cash System*, s.l.: s.n.
- Temperini, J. and Corsi, M. (2023) Democratizing money? The role of cryptocurrencies. Democratizing money? The role of cryptocurrencies. *PSL Quarterly Review*. Issue 76 (304), pp. 51-66.
- Vaz, J. and Brown, K. (2020) *Money Without Institutions, How Can Cryptocurrencies be Trusted?*, sl: sn
- Venter, H. (2018) *Digital currency - A case for standard setting activity*, sl: sn