Uluslararası İleri Doğa Bilimleri ve Mühendislik Araştırmaları Dergisi
Sayı 7, S. 158-162, 10, 2023

Araştırma Makalesi

IJANSER
https://alls-academy.com/index.php/ijanser
ISSN: 2980-0811

International Journal of Advanced Natural Sciences and Engineering Researches
Volume 7, pp. 158-162, 10, 2023

Research Article

Decentralized Finance

Albina Hysaj [*]

[1]*Department of Banking and Finance, Epoka University, Albania*

[*]*(albinahysaj@gmail.com)*

(Received: 30 October 2023, Accepted: 13 November 2023)

(2nd International Conference on Contemporary Academic Research ICCAR 2023, November 4-5, 2023)

ATIF/REFERENCE: Hysaj, A. (2023). Decentralized Finance. *International Journal of Advanced Natural Sciences and Engineering Researches*, 7(10), 158-162.

Abstract **–** Decentralized Finance is a segment of finance that enables financial transactions by the execution of smart contacts, without the intermediation of financial institutions and central authorities. It uses innovative technology to ensure the necessary transparency and autonomy of all the participants and potential investors. Even though DeFi is in its early stages, based on the increasing market size and high return yield of the assets, it is expected to contribute to a more innovative financial economy and the development of traditional finance as well.

Through theoretical analysis of the existing literature and information, this study investigates the importance of Decentralized Finance, its advantages, and disadvantages, the associated risks that arise from decentralization, and the lack of central authorities. Decentralized Finance has several advantages, including interoperability, borderless, openness, transparency, innovation, decentralization, efficiency, and so forth. Because of its nature, DeFi has several disadvantages and risks as well, such as high volatility, stablecoin run, unstoppability, irreversibility, lack of transparency, pseudonymity, and the risk of money laundering.

As the growth of DeFi is mainly related to innovative and information technology, it is expected that its fast-growing trend will continue in the future as well. Considering the limited research in Decentralized Finance, this study contributes to enriching the related literature.

Keywords – Decentralized Finance, Blockchain, Innovation, Volatility, Stablecoins

I. INTRODUCTION

Decentralized Finance (DeFi) is an emerging financial system based on blockchain technology, through which all the financial transactions happen peer to peer, without the intermediation of traditional financial system institutions. Blockchain is similar to a ledger of records of transactions by ensuring at the same time that the recorded data are safe and transparent. Decentralized Finance is a system that does not rely on central authorities to control or monitor transactions [1]. Even though decentralized finance, unlike traditional financial systems, is not monitored or controlled by central authorities, its transparency and control are attributed to the integrity-protected blockchain and the higher yield that traded financial assets offer compared to Centralized Finance assets [19].

Decentralized Finance has known significant growth in terms of revenue and market size since its inception. According to a report published by Research and Markets (2023) [20], the significant development of Decentralized finance is driven by fast technological developments and the innovation of the industry of cryptocurrency. Other factors that

can contribute to the significant growth of DeFi are digitalization and the rise of investment activity in the DeFi sector [14]. The Research and Markets report [20] estimates that the market size of DeFi is expected to move to USD 231.19 billion in 2030, and the compound annual rate will rise to 46% from the current year to 2030. This rise is expected to create new opportunities for traditional finance as well.

Figure 1 gives information regarding the daily number of DeFi users from December 2017 until January 2023. Based on De Best (2023) [7] the number of users in December 2017 was 189, while in January 2023 the number of users was about 6.7 million worldwide. The number of users increased by 1097% from January 2021 until January 2022, and 280% from January 2022 until January 2023. The number of DeFi users continues to increase at a steady rate.

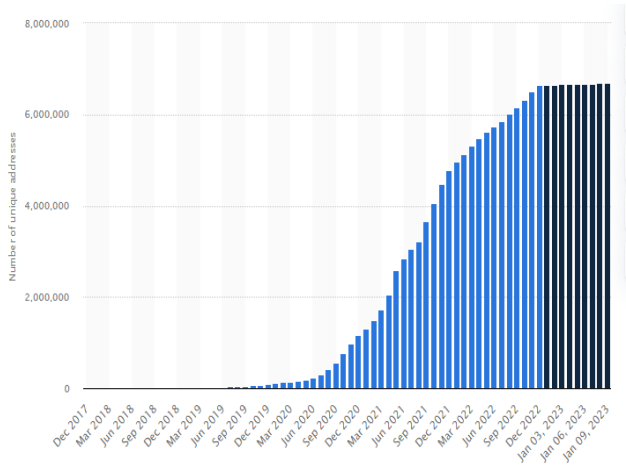

Fig 1. The number of unique active DeFi addresses from Dec. 2017 to Jan 9,2023
(Source: Statista 2023)

Based on the importance of DeFi and its impact on the financial economy, the aim of this paper is to conduct a theoretical analysis based on a literature review, regarding the role of Decentralized Finance, the advantages, disadvantages, challenges, and so forth. As the phenomenon is new and there are only a few, mostly non-empirical studies in this field, this study and its findings will make a modest contribution to future research in the field of DeFi.

II. BACKGROUND AND LITERATURE REVIEW

A. The Beginnings

Decentralized Finance is a new paradigm in the financial world, however, there are numerous developments that would create the path for the birth of DeFi. Nakamoto (2008) [16] introduces a cash system that enables transactions without the intermediation of financial institutions by using electronic cash. The emergence of Bitcoin, the first digital currency, would be followed by the invention of other digital currencies traded through blockchain technology. The invention of Ethereum by Buterin (2014) [4] would serve as the leading event in the development of DeFi. Ethereum, apart from being the second-largest cryptocurrency, is a decentralized trading platform, that enables the self-execution of smart contracts by using its own currency called Ether. Ethereum is beyond a digital currency, and it also supports several improvements in the blockchain structure [22].

According to Arner, Barberis, & Buckley (2016) [2] the development of Fintech goes through some eras. The first era, Fintech 1.0 consists of establishing the basic infrastructure for the development of Fintech and the transfer of big flows of data. It started with the first transatlantic cable in 1886 and it was shaped during the Second World War, when the efforts were focused on coding and decoding the information, as a milestone for modern programming.

The second era of Fintech 2.0 is characterized by significant developments in the digitalization of finance. Starting from the invention of ATM-s, the foundation of NASDAQ, the first electronic stock exchange, the establishment of SWIFT for worldwide bank financial transactions, concluding with the beginning of banking digitalization during the 1990s, usage of PayPal, and the launch of the first iPhone in 2007.

The third era, Fintech 3.0 started after the last financial crisis. As banks and international monetary institutions were focused on the lack of the regulatory framework that might have caused the crisis, the professionals in the financial industry who were left unemployed because of the crisis started to look for new opportunities. Fintech 3.0 is the era of start-ups in fintech. The new developments in technology, combined with the lost trust in traditional financial institutions brought

more innovative financial services and products. The last era, Fintech 3.5 is characterized by significant development in developing countries, while the previous areas mostly took place in the US and Europe.

B. Decentralized Finance Applications

The first application of decentralized finance is stablecoins. Stablecoins are digital currencies that are pegged and aim to maintain a stable value toward a financial or real asset. Stablecoins hold characteristics of both cryptocurrencies and traditional currencies. Similar to cryptocurrencies, stablecoins are digital currencies traded online, through blockchain technology. However, their price is not volatile like other cryptocurrencies. According to a thematic report prepared by EU Blockchain Observatory and Forum Experts (2022) [8], stablecoins emerged because other cryptocurrencies fail to serve as a unit of account and as a medium of exchange due to their high volatility and decentralized issuance, while stablecoins fulfill all characteristics of money.

Another application of decentralized finance is decentralized exchanges. Decentralized exchanges (DEXs) are platforms that facilitate the peer-to-peer trading of cryptocurrencies between traders without the need for an intermediary or a centralized authority to oversee the transactions. In a DEX, users retain control over their funds and private keys, and trades occur directly between users through smart contracts on a blockchain. Blockchain also ensures that the transaction is transparent and visible.

Aspiris et al, (2021) [3] who empirically investigate decentralized exchanges suggest that the listing and trading characteristics of crypto assets traded in decentralized exchanges differ from the ones that are traded in centralized exchanges. The authors find that even though the trading volume in DEX-s has increased rapidly following an exponential function, the investors would migrate to a centralized exchange (CEX) for the convenience and liquidity offered by CEX. However, in case of security violations, the investors would prefer the DEX-s.

Decentralized lending and borrowing take place in lending and borrowing platforms through the automatic execution of smart contracts. Lenders deposit their cryptocurrencies in lending platforms or liquidity pools and they earn interest rates automatically determined by the supply and demand of the underlying asset [12]. On the other side, the borrowers have to deposit other cryptocurrencies as collateral to secure the loan. The value of the loan is determined by the value of the collateral, while the ratio loan to the value of the collateral is set by the platform. If the borrowers fail to pay back the loan and the agreed interest, the collateral will be liquidated to cover the loan.

Gramlich et al. (2022) [9] summarize the DeFi related services in two main groups Core DeFi services and other DeFi related services. The core DeFi services are stablecoins, decentralized exchanges, lending and borrowing, derivatives, insurances, and asset management, while other DeFi-related services are fair lotteries, prediction markets, and decentralized gaming.

C. Decentralized Finance advantages and disadvantages

Decentralized finance because of its characteristics has numerous advantages, opportunities, and benefits such as interoperability, borderless, openness, transparency, innovation, decentralization, efficiency, and so forth [5], [10], [15], [17], [18]. As Decentralized finance is easily accessible for all users, no matter if they have access to financial institutions, and the transactions take place through smart contracts, it ensures interoperability. Due to the sound interaction and integration of various blockchains and protocols, DeFi allows users to use the platforms to execute transactions, share information, enhance the liquidity of their assets, and so forth.

Transparency is a key feature of decentralized finance. As all the information, transactions, and smart contracts are verified and publicly available for everyone, this allows the users to manage risks related to the investment [10]. Moreover, smart contracts that are executed automatically, ensure efficiency. The cost of transactions is low because there is no need for a trustee institution among investors. Decentralized finance is not subject to

central authorities, controlling its functioning and it ensures the inclusion and access to lending, borrowing, and investing opportunities for everyone.

Decentralized finance is borderless and open. It exceeded the borders of countries, national and regional financial systems or financial markets. Financial flows among investors happen automatically through smart contracts avoiding commissions, different currency transactions, and so forth.

Apart from advantages and opportunities, decentralized finance has some disadvantages and risks as well. Schueffel (2021) [21] suggests that the main characteristics and strengths of DeFi will turn into disadvantages in case of malfunction. The authors point out that an incorrectly smart contract combined with automatically run and unstopability, would bring huge negative consequences for the system. Additionally, even though the sector is developing very fast, the number of users is still limited and this brings a lack of liquidity. Makarov & Schoar (2022) [13] explain that similar to centralized finance, decentralized finance can happen stablecoins runs as well. By the time the investors have doubts regarding the quality of their investment they start the exchange of stablecoins with cash.

According to Katona (2021) [10], decentralized finance risks can be blockchain-related or market risks, and DeFi-specific risks. Blockchain-related risks come due to the constraints in the volume of the trading blocks. This may result in interruptions of transactions and in high transaction costs. Market risks are related to high volatility in crypto asset prices, which not only affects the position of the holder but may result in the loss of collateral as well. DeFi-specific risks are related to the interdependence of the system and to the fact that the transactions are irreversible and are executed by smart contracts.

Crenshaw (2021) [6] addresses two challenges of DeFi. The first one is the lack of transparency and the second one is pseudonymity. The author raises concerns that even though the transactions are recorded in a public blockchain, the investment lacks transparency, exposing the retail less experienced investors to higher risk. The second challenge is the pseudonymity regarding the identity of the traders making it difficult to detect manipulative trading. As the transactions in DeFi are totally decentralized and there is no information regarding the identity of the trader, Kirimhan (2023) [11] emphasizes the importance of anti-money laundering regulations for a cyber-secure DeFi.

CONCLUSION

Decentralized Finance is a recent financial ecosystem based on blockchain technology where transactions take place through smart contracts without the need for financial intermediation and central authorities. Even though investments in informational technology have started since the 1880s, the invention of Ethereum created the infrastructure for the fast development of Decentralized Finance. Decentralized Finance offers all the roles and functions of centralized finance starting from the core services such as stablecoins, decentralized exchanges, lending and borrowing, derivatives, insurances, and asset management, and other DeFi-related services such as fair lotteries, prediction markets, and decentralized gaming.

Decentralized Finance has several advantages, including interoperability, borderless, openness, transparency, innovation, decentralization, efficiency, and so forth. Because of its nature, DeFi has several disadvantages and risks as well, such as high volatility, stablecoin run, unstoppability, irreversibility, lack of transparency, pseudonymity, the risk of money laundering, and so forth. Since its inception, in terms of market share and number of users Decentralized Finance has seen a very significant growth which is expected to continue in the future as well. The emergence and growth of DeFi is not a feature of US and European countries but there are significant developments in developing countries. As the growth of DeFi is mainly related to innovative and information technology, it is expected that its fast-growing trend will continue in the future as well.

REFERENCES

[1] Anoop, V., & Goldston, J. (2022). Decentralized finance to hybrid finance through blockchain: a case-study of acala and current. *Journal of Banking and Financial Technology, 6*, 109-115.

[2] Arner, D., Barberis, J., & Buckley, R. (2016). The Evolution of Fintech: A New Post-Crisis Paradigm?

SSRN Electronic Journal ·, 47(4), 1271-1319. doi:10.2139/ssrn.2676553

[3] Aspiris, A., Foley, S., Svec, J., & Wang, L. (2021). Decentralized exchanges: The "wild west" of cryptocurrency trading. *International Review of Financial Analysis, 77*. doi:https://doi.org/10.1016/j.irfa.2021.101845.

[4] Buterin, V. (2014). *Ethereum.* Retrieved from Ethereum: https://ethereum.org/669c9e2e2027310b6b3cdce6e1c52962/Ethereum_Whitepaper_-_Buterin_2014.pdf

[5] Chen, Y., & Bellavitis, C. (2020). Blockchain disruption and decentralized finance: The rise of decentralized business models. *Journal of Business Venturing Insights, 13*. doi:https://doi.org/10.1016/j.jbvi.2019.e00151

[6] Crenshaw, C. (2021). DeFi Risks, Regulations, and Opportunities. *The International Journal of Blockchain Law, 1*, 4-11. doi:https://gbbcouncil.org/wp-content/uploads/2021/11/IJBL-1.pdf

[7] De Best, R. (2023). *Statista*. Retrieved from Statista: https://www.statista.com/statistics/1297745/defi-user-number/

[8] EU Blockchain Observatory and Forum Experts. (2022). *Decentralized Finance (DeFi).* European Union.

[9] Gramlich, V. P. (2022). Decentralized Finance (DeFi) – Foundations, Applications, Potentials, and Challenges. *Decentralized Finance (DeFi) – Foundations, Applications, Potentials, and Challenges*. Branch Business & Information Systems Engineering of Fraunhofer FIT.

[10] Katona, T. (2021). Decentralized Finance - The Possibilities of a Blockchain "Money Lego" System. *Financial and Economic Review, 20*(1), 74-102. doi:http://doi.org/10.33893/FER.20.1.74102

[11] Kirimhan, D. (2023). Importance of anti-money laundering regulations among prosumers for a cybersecure decentralized finance. *Journal of Business Research, 157*. doi:https://doi.org/10.1016/j.jbusres.2022.113558.

[12] Leshner, R., & Hayes, G. (2019, February). *Compound Finance.* Retrieved from https://compound.finance/documents/Compound.Whitepaper.pdf

[13] Makarov, I., & Schoar, A. (2022). Cryptocurrencies And Decentralized Finance (DEFI). *NBER Working Paper Series.* National Bureau of Economic Research.

[14] Market Research Reports. (2023). Global Decentralized Finance (DeFi) Market: Trends, Global Scenario, Innovations & Market. BCC Research.

[15] Michalikova, K. F., & Poliakova, A. (n.d.) (2021) . Decentralized finance. *Globalization and its Socio-Economic Consequences. 129.* SHS Web of Conferences. doi:https://doi.org/10.1051/shsconf/202112903008

[16] Nakamoto, S. (2008). *Satoshi Nakamoto Institute.* Retrieved from Satoshi Nakamoto Institute: https://nakamotoinstitute.org/static/docs/bitcoin.pdf

[17] OECD. (2022). *OECD.*

[18] Ozili, P. (2022). Decentralized finance research and developments around the world. *Journal of Banking and Financial Technology*, 117-133. doi:https://doi.org/10.1007/s42786-022-00044-x

[19] Qin, K., Zhou, L., Afonin, Y., Lazzaretti, L., & Gervais, A. (2021, June). *CeFi vs. DeFi -- Comparing Centralized to Decentralized Finance.* Retrieved from https://ideas.repec.org/p/arx/papers/2106.08157.html

[20] Research and Markets. (2023). Decentralized Finance Market Size, Share & Trends Analysis Report By Component (Blockchain Technology, Smart Contracts), By Application (Payments, Stablecoins), By Region, And Segment Forecasts, 2023 - 2030". Research and Markets.

[21] Schueffel, P. (2021). DeFi: Decentralized Finance - An Introduction and Overview. *Letter from Academia, 9*(3), I-XI.

[22] Vujičić, D., Jagodic, D., & Ranđić, S. (2018). Blockchain Technology, Bitcoin, and Ethereum: A Brief Overview. *17th International Symposium INFOTEH-JAHORINA (INFOTEH).*