

THE RISE OF DECENTRALIZED FINANCE (DEFI): OPPORTUNITIES AND CHALLENGES

Dr. Virendra Singh Chauhan

Associate Professor, Head, Department of Agricultural Economics,

Narain PG College , Shikohabad, District - Firozabad (UP)

ABSTRACT

The term "decentralised finance," which is abbreviated as "DeFi," is a relatively new idea that is gaining acceptance in the financial industry. According to the DeFi philosophy, the provision of financial services should not be carried out by centralised intermediaries but rather by users for users alone. This is accomplished via the use of a decentralised peer-to-peer system that is structured on blockchain technology. This introductory chapter includes a discussion of the origins of decentralised finance as well as the characteristics that set it apart from traditional money. via the elimination of middlemen and the transfer of risk to technology, decentralised finance (DeFi) or "open finance" is able to automate the financial business sector via the use of exponential blockchain technologies. The total value of digital currency that is now under management is two trillion dollars. Additionally, the advent of new digital asset classes will result in an increase in earnings for insurance firms while simultaneously causing a change in the risk landscape. It will be necessary for regulators in a variety of nations to adjust their policies in order to accommodate this growing innovation. Additionally, there is a possibility that new rivals from industries other than insurance may join the market with a different perspective on embedded risk.

keywords : DeFi, Decentralized Finance , blockchain

INTRODUCTION

One definition of decentralised finance (DeFi) is "financial applications that automate the provision of financial services without the need for intermediaries" (i.e., those that operate on a permissionless blockchain)². Two key characteristics that differentiate DeFi from centralised blockchain systems are the use of smart contracts and the platform's decentralised operation and governance. Stored on a blockchain, smart contracts are programmes that execute themselves when certain criteria are fulfilled. They eliminate the need for a third party or governing body by automating the implementation of agreements and transactions between anonymous participants and by putting into motion pre-determined events like interest or dividend payments. In a well-coded and configured smart contract, the automated execution and public verifiability on a permissionless blockchain allow for a high degree of security. The subsequent transactions are also permanent and can be traced on the blockchain with ease. Second, the DeFi ecosystem is characterised by decentralisation.

This encompasses two concepts: first, the utilisation of smart contracts to eliminate a central institution or intermediary from the process of implementing financial services on a DeFi platform; and second, the implementation of voting schemes or other decentralised or community-based governance mechanisms to

determine platform protocols and operations. Interest rates, collateral requirements, platform services, dispute resolution, and operational concerns are all examples of areas where such judgements may be necessary. Platforms are expected to become more decentralised as they are deployed and their user bases grow, although developers initially centralise the design and implementation of DeFi systems by creating the platform's architecture and codes and making the main initial policy choices about the system's administration. There is a wide range of decentralisation levels across DeFi projects, which is mostly attributable to differences in platform maturity.

Users are granted governance tokens, which give them the power to vote on proposed changes to the DeFi protocols or applications. In a fully decentralised model, these changes are implemented directly into the protocols. In a partially decentralised model, a group of developers with admin keys⁵ implements the changes based on the instructions given by token holders. But according to some recent publications⁷ by regulators like the BIS, decentralisation is not possible for the majority of DeFi platforms due to the fact that decision-making is often dictated by centralised governance frameworks and that only a small number of people, who are also somewhat predefined, have control over the platform's administration and governance. Despite the fact that decentralisation is somewhat dependent on the platform's maturity, the BIS stresses that several variables cause decision concentration regardless of the platform's development status.

Incentives to grow platforms and the distribution of a large portion of the first coins to the project's creators and backers are two of these causes. Consequently, a small number of individuals—including, but not limited to, platform core developers¹⁰, key transaction validators, and early investors—tend to own the vast majority of coins and governance tokens. Furthermore, holders may often grow their stakes in governance tokens by trading them. There will always be a need for human choices, made centrally, according to the BIS, as smart contracts cannot account for all conditions and eventualities. In addition to decentralisation and smart contracts, a third characteristic of DeFi platforms is the significance of stablecoins, which are cryptoassets with a constant face value relative to fiat currencies like the US dollar, for the platform's functioning.¹¹ Stablecoins are crucial to the operation of DeFi marketplaces, which let users to move funds across platforms, since they are used as collateral or to pay interest in DeFi protocols. Stablecoins serve as a link between the cryptocurrency and conventional monetary systems, allowing DeFi market players to avoid making several currency changes.

DeFi facilitates community-wide peer-to-peer transactions by virtue of its decentralisation and mutualization tenets. In a society, good conduct is encouraged and bad behaviour is punished when it is readily apparent. Because Islamic Takaful insurance is based on mutual insurance businesses and cooperatives, which are the original insurance models, this will significantly impact the way protection is provided in the future. Factors such as incentives, punishments, claims assessment voting, behavioural science, and game theory form the basis of community insurance. A large portion of the global population, known as the informal sector, lacks traditional banking services but has access to the internet and mobile phones; this is a problem that the IOV aims to address. In the DeFi sphere, regulation is still in its infancy. A number of parts, including stablecoins and liability scope, are likely to undergo intervention. There are several intriguing jurisdictional legal and regulatory issues with DeFi insurance and alternative risk coverage dApps due to their decentralised structure and their worldwide reach.

There are a number of digital exchanges that are currently being studied, and there's a chance that politicians will step in and make CBDCs look like DeFi instead of complementary. This could lead to digital currency

being controlled by a central authority and the current legacy financial system being around for far longer than what consumers want. As the globe struggles through a deflationary decade, fiscal stimulus, and a global pandemic, digital assets are being touted as the new money, but this is not a desirable consequence of technical advancement. The epidemic acceleration of digitization is driving a trend away from traditional, centralised financial institutions and towards decentralised, peer-to-peer financing, which is known as DeFi.

The expanding protocol landscape is shown in the Tokeny figure that follows. To fully grasp how DEX, AMM, lending/borrowing platforms, and stablecoins work, one must place them in the context of risk management and how they generate yield. With the elimination of need for redundant Know Your Customer (KYC) processes and the complete auditability of the blockchain, token custody shifts to individual wallets and security to smart contract technology. Commonalities across protocols include being free and open source, transparent, compatible with other protocols, programmable via plug points, and lacking authorization. Users retain ownership of their wallets and are solely responsible for their actions since the system is non-custodial and visible to everyone on a public blockchain for auditing and verification. Blockchain explorer apps make all transactions public, allowing for real-time clearing and reconciliation. Interest is accrued, paid, and computed in real time.

IMPLICATIONS OF DEFI ON POLICY

Authorities usually strive to regulate crypto assets and activities, including DeFi, adopting a strategy that is based on the principle of "same activities, same risks, same regulations." This is done with the goal of striking a balance between reducing risk and offering opportunities for innovation. On the other hand, the current wave of cryptoasset policy initiatives is mostly from a "centralised" or "entity-based" viewpoint, and it concentrates on anti-money-laundering and counter-financing-terrorism rules in addition to cryptoasset and cryptoasset service provider regulation. Consequently, it is still unclear how these criteria might ever account for the particulars of decentralised finance systems that would operate in a way that is completely decentralised with no central authority.

CFT and AML regulations

A review of anti-money laundering and countering the financing of terrorism (AML/CFT) regulations at the European Union (EU) and global levels is centred on the financial operations that include crypto-assets, as well as the service providers and users engaged. For the purpose of making it abundantly obvious that they include financial operations using cryptoassets and VASPs (virtual or crypto-asset service providers), the Financial Action Task Force (FATF) modified its worldwide anti-money laundering and countering the financing of terrorism (AML/CFT) guidelines in October 2018 and June 2019. In the month of October 2021, they produced risk-based recommendations that were more comprehensive. The legislation that the European Union has in place to combat money laundering and against the funding of terrorism are now undergoing revisions in order to include cryptoassets, their holders, and any service providers that are related to them²⁶. A tentative agreement was reached by the institutions of the European Union (EU) at the tail end of June 2022 over the proposal to extend the laws that regulate the information that must accompany monetary transfers (the so-called "travel rule") to include cryptoasset transfers (TFR regulation).

In order to be in compliance with this legislation, on both ends of the transfer, specifics about the origin of the asset and the receiver of the asset must be documented. There will be no minimum threshold or exclusions

for transfers of low-value crypto assets; nevertheless, a threshold of one thousand euros will be applied to transactions from un-hosted wallets. This refers to wallets that are managed directly by owners and do not make use of a cryptoasset service provider (CASP). In addition, the EU MiCA (Markets in Cryptoassets) regulation creates a public record for CASPs that do not comply with the law and mandates that CASPs verify that the provenance of the asset is not sanctioned or subject to restrictive measures. At some point in the future, these laws will be applicable to DeFi platforms; however, the question of whether or not they will be implemented remains unanswered due to the possibility that there will be no central authority to do so. However, according to the Financial Action Task Force (FATF), a legal entity may be considered a VASP (virtual asset service provider)²⁷ if it has a substantial influence on the operations of the protocol and the services that it provides. It is not apparent how this might be used in a decentralised infrastructure for decentralised finance.

Regulatory strategy for DeFi operations

IOSCO published a regulatory policy agenda on cryptoassets in July 2022 with the intention of addressing concerns over the integrity of the market, the protection of investors, and the potential systemic risks that are produced by activities related to cryptocurrencies. In terms of DeFi, the objective is to provide policy recommendations by the time the year 2023 comes to a close. Within the confines of this framework, the IOSCO DeFi working group will conduct an analysis of the dynamic relationship that exists between DeFi, stablecoins and cryptoasset trading, lending and borrowing platforms, and the wider financial markets. In addition to this, they will investigate the ways in which the concepts and standards of IOSCO may be used to DeFi. The European Union is on the verge of implementing the Markets in Crypto-Assets (MiCA) regulation²⁸, which will oversee the activities of cryptoassets. MiCA proposes a new legal framework for cryptoassets (including stablecoins) that would include the majority of tokens that are generated, traded, or used as collateral on DeFi platforms.

This is in contrast to the present regulation that is in place in the EU²⁹. Among the objectives of the MiCA are the promotion of innovation, the guarantee of financial stability, the enhancement of consumer protection, and the provision of legal certainty for cryptoasset issuers and providers. The MiCA should eventually be applicable to DeFi since it takes a technology-neutral posture (the same activities, the same dangers, and the same rules may be applied to both). Despite this, the precise manner in which the execution will take place is still unknown at this moment. MiCA³⁰ does not make any particular reference to DeFi platforms or services, which may make it challenging to apply MiCA's "entity-based" approach to DeFi activities that are really decentralised. A number of "entity-based" safeguards are imposed by MiCA. These safeguards include capital requirements, client asset segregation, oversight of cryptoasset issuers and service providers, and disclosure requirements. In addition, MiCA mandates that cryptoasset service providers must be authorised and physically present in the European Union. Some examples of controlling stakeholders that regulators have proposed as entry points for the regulation and supervision of these platforms include the on-and off-ramps that are used to access or exit DeFi systems when exchanging fiat currency for cryptocurrency, the holders of controlling shares of governance tokens, or organised governance structures. These are all examples of controlling stakeholders. The category of regulated financial activities might be expanded to include decentralised finance (DeFi), according to other recommendations; nevertheless, each of these ideas need further examination. It is possible that MiCA's Level 2 standards will also contain essential information about decentralised finance services for

platforms that are not entirely decentralised. It would therefore be possible to apply the restrictions that are now in place for the financial sector to services that are comparable to conventional finance, such as lending services. Furthermore, the revelation of sufficient information on the specific operational and governance arrangements used by DeFi platforms (such as the distribution of governance tokens, voting methods, the usage of administration keys, and so on) may be regulated in accordance with the transparency criteria established by the MiCA. The sharing of information about investor protection is yet another possible area in which policymakers might exert their influence.

Potential advancements in the future to fully benefit from DeFi technology

The intrinsic fragility and fragmentation of DeFi platforms, according to various reports from public authorities³², prohibits regulation and supervision from enabling the full advantage of DeFi technology, which includes programmability, composability, and tokenization. This is the case regardless of how desirable the regulation and supervision may be. There are many who have hypothesised that this could need growing the scale of DeFi platforms, which would then necessitate an increase in network effects and interoperability, all while maintaining a high degree of safety inside the DeFi system. In order to address concerns over the proliferation of stablecoins and to enhance the safety of settlements, the Bank for International Settlements (BIS) and the Organisation for Economic Cooperation and Development (OECD) have advocated the use of central bank digital currency (CBDC) in decentralised finance (DeFi) rather than private stablecoins in specific circumstances. Despite the fact that some individuals have pointed out that institutions are unwilling to deploy DeFi³³ on a broad scale due to worries about accountability, others have presented protocols that employ a permissioned pool of participants as a solution.

Some of these participants may be legally traceable and held accountable for their actions. Despite the fact that the DeFi system has emphasised the advantages of financial inclusion and "democratisation of finance," these objectives have not yet been accomplished at this point in time. Improvements in operational efficiency and innovations in the underlying infrastructure of decentralised finance might bring about these advantages. These improvements could include enhancements to throughput and transaction costs, for example.

Possibilities and advantages related to DeFi

Decentralised finance (DeFi) provides a number of opportunities that might potentially increase the efficiency, flexibility, transparency, and accessibility of the financial system, provided that it is able to achieve a particular level of scale and liquidity.

Effectiveness and adaptability - As a consequence of the implementation of smart contracts on decentralised finance platforms, it is likely that market infrastructures and financial intermediaries would become more outdated. It is possible that costs and intermediation risks may decrease as a consequence of this; however, capital efficiency may increase as a result of aspects of decentralised finance such as high collateralization levels, which may cancel out some of the benefits. Additionally, as compared to traditional domestic and international financial transactions, the process of transacting token transfers via DeFi may be much more expedient and less complicated. Additionally, Due to the fact that protocols and applications on DeFi systems are very composable, they provide a great lot of flexibility.

Openness and ease of access - A DeFi platform should allow all parties concerned to study and analyse the code of smart contracts and applications. This will contribute to the openness of these systems and should be a requirement for all parties involved. The token contract, on the other hand, can impose limits on the access to certain tokens if it is deemed appropriate, for instance, to ensure the safety of consumers. Despite the fact that they are using pseudonyms, the transactions that have been recorded may still be tracked and validated on the blockchain.

Trust - Because they are carried out via the use of smart contracts and conform to the logic of transparent DeFi protocols, automated execution and recording of DeFi services in accordance with preset criteria removes issues around intermediation and custody. In addition, all users who own governance tokens are often available to participate in transparent governance operations. These procedures include the implementation of updates to the protocols of the settlement layer or of DeFi applications.

Possible dangers that DeFi apps may provide

Due to the fact that both conventional finance and decentralised finance include the supply of equivalent services, the financial risks that are associated with decentralised finance activities, such as counterparty, leverage, and liquidity risks, are largely identical to those of conventional finance. On the other hand, the risks that are associated with operations, technology, and, to a lesser extent, unlawful activities are more architecture-specific and originate from the decentralised character of decentralised finance institutions. The fact that decentralised finance is mostly unregulated at the present, in contrast to traditional finance, has led to an increase in the number of concerns about consumer protection and regulatory arbitrage. On the other hand, it is anticipated that the European Union would address this issue by putting into effect MiCA and revising its anti-money laundering and countering the financing of terrorism legislation (see to section 3). In the process of contemplating the links between decentralised finance and the conventional financial system, it is essential to take into account the dangers of spillover and the corresponding concerns about financial stability. In particular, this is the case when using stablecoins that are backed by fiat collateral²¹ inside DeFi protocols, or when expecting a rise in the utilisation of tokenized assets as collateral. Currently, these risks are mitigated by low exposures on both the asset and liability sides of the business; but, as DeFi grows, these risks may become more prevalent.

Risks to finances

Whenever financial activities are carried out on decentralised finance applications, the same market, leverage, liquidity, and counterparty difficulties that are experienced by traditional financial players also become apparent in these applications. Nevertheless, due to the fact that crypto-assets and transactions using crypto-assets are distinct, the nature and degree of these risks may differ. According to the theory, the counterparty and intermediation risks in decentralised finance should be smaller or nonexistent in comparison to conventional finance. This is because smart contracts, over-collateralization, and the absence of a separate settlement phase (transactions are completed via a transfer of the underlying value on the blockchain) should all contribute to this theory. Decentralised finance platforms, on the other hand, are subject to limitations (such as the quantities of loans that may be issued) and the potential for financial risks during times of crisis owing to the absence of a governmental guarantee and access to the balance sheets of traditional financial institutions.

Additionally, because to the significant volatility of the underlying digital assets, platforms may immediately liquidate loans that are not adequately collateralized. However, this may result in a reduction of the original amount of loan collateralization in some circumstances. There are just a few protocols that are responsible for the majority of the activity in the decentralised finance sector, and the majority of these protocols are based on the Ethereum blockchain²². The fact that a relatively small number of people or organisations, such as the core development team, have a disproportionate amount of authority is another factor that contributes to the danger of concentration. In spite of the fact that there are a number of restrictions concerning the creation of credit that do not now apply to decentralised finance, overcollateralization is a typical approach for decreasing worries around leverage. The exceptions that were mentioned above are included in this statement. For instance, in comparison to traditional exchanges, decentralised exchanges (DEXs) provide higher margins and leverage for derivative contracts. Furthermore, the money that is borrowed on a DeFi platform may be used as collateral for future transactions, which ultimately results in an increase in exposure.

Flash loans, which do not need collateral, have the potential to raise both leverage and credit difficulties as they proliferate. This is because they do not require collateral. It is possible that the difficulty in assessing the genuine value of cryptoassets, in addition to the challenges associated with liquidity and the market, may make these problems even more severe. This is particularly true during times of stress or when trust in a particular asset type decreases, which may lead to runs.

Risks associated with illicit activities

Crypto-asset transactions are often associated with a considerable risk of criminal behaviour, including fraud, market manipulation, and financial crimes. This is due to the features of crypto-asset transactions, which include the prospect of greater anonymity of transaction flows and counterparties, as well as the speed at which transactions may be completed. According to sources that were mentioned by the Basic Information System (BIS), around 1.1% of all bitcoin transactions in 2019 were illegal. Approximately eleven billion dollars was the value of these trades. On the other hand, more recent evidence indicates that illicit activity involving cryptoassets has dropped in comparison to the levels seen in 2019, when market growth is taken into consideration²⁵. In 2021, it achieved 0.15% of total transaction volumes, which is a 33.7 percent decrease from 2019's level. AML/CFT legislation have being examined at both the European Union and the global level to encompass transactions based on crypto-assets (see 3. Down below). This is being done in order to assist reduce these threats in the future. Because DeFi eliminates the need for financial intermediaries, it becomes more difficult to implement preventative measures against money laundering and counter-terrorist financing (AML/CFT²⁶). These measures include customer due diligence, record-keeping, and reporting suspicious transactions. All of these measures increase the risk of illegal activity involving cryptoassets. By virtue of the fact that DeFi is still relatively new, it paves the way for a wide variety of fraudulent activities and thefts, and hackers now have another target in the smart contracts that underpin it.

Risks related to operations and technology

Threats to the blockchain network or miner risks are intrinsic to blockchain-based systems and have the potential to harm the settlement layer of decentralised finance systems. These risks are produced by the malicious behaviours of miners or manipulations, such as the order in which transactions are executed. Due to the manner in which they are constructed and the technical qualities they possess, DeFi systems are exposed

to extra risks. The first issue is that there is a chance of vulnerabilities in smart contracts that are created by programming flaws. These faults might result in the code not running as planned or could leave the system vulnerable to attack. Despite the fact that similar coding hazards are also present in centralised systems, they are far more prevalent in decentralised finance owing to the automated nature of smart contracts and the difficulty in correcting such errors (which is often accomplished via a distributed arbitration procedure). In the event that manipulations or attacks are carried out, data feeds or protocols that are dependent on Oracle DeFi might be affected.

The protocols and applications that are used by DeFi are susceptible to internal operational security risks, such as hacking, corrupted admin keys (in the absence of secure storage), or malicious activities by core developers. These vulnerabilities are in addition to the external threats that are presented by the environment. One example of a risk that is mentioned by the BIS is the possibility that transaction validators who keep a significant portion of the coins they earn during the validation process could potentially manipulate the blockchain for their own financial gain, artificially flood the chain with transactions in order to increase fees, or even front-run large orders. Nevertheless, there are a number of approaches that may be used to lessen the probability of these unfavourable results. These approaches include the utilisation of timelocks, which establish a limit period of time before a transaction can be validated, and the need of multiple signatures, often known as multisig.

OBJECTIVES

1. Researching decentralised financing is the first step.
2. Investigating developments in blockchain technology

CONCLUSION

In light of the fact that DeFi is certain to provide a multitude of innovations to the sector of financial services, this tendency will be further strengthened by it. Five significant trends in the field of finance are now taking form, and they have the potential to reshape the sector as well as other areas. A proof-of-work validation technique is being replaced with a proof-of-stake validation approach, which is causing the Ethereum network to become more efficient and cost-effective for DeFi applications. This is one of the improvements that has occurred. The use of cross-chain technology will help to reduce network congestions and, therefore, the scaling difficulties that are now being faced by DeFi. This is due to the fact that it offers a greater number of protocols to choose from. Last but not least, stablecoins will continue to play an important part in the ecosystem of decentralised finance since they serve as a bridge to the more traditional domain of money. Because of this, it is fair to assume that the volume of these tokens will increase, in addition to the tokenization and deployment of further national currencies into the sphere of decentralised finance. A further aspect to consider is that DeFi intends to broaden the scope of its product offerings.

In a short amount of time, players will be able to use non-fungible tokens as collateral in a DeFi environment. Additionally, the platform will enable players to construct economies and markets inside their video games. Both inside games and across games, DeFi has the ability to foster the creation of digital content and the sharing of that material with other players. Lastly, the fifth and last reason is that it is quite probable that these changes will result in the increased popularity of DeFi. More ambitiously, it is likely that DeFi would result in the rebirth of prior financial concepts that were dropped because to dishonest actors failing to satisfy their

contractual commitments. This would be an even more ambitious outcome. The operation of tontine life insurances, which are a combination of annuities and the lottery, is as follows: An investment portfolio is created by a group of individuals who save money for it.

In the event that one or more of the individuals in the group pass away, the remaining individuals get their money back in addition to whatever holdings they had in the portfolio (Forman & Sabin, 2014). Weinert and Grundl (2016) discovered that such tontines might be extremely advantageous to policyholders for a number of reasons, including the current low-interest environment and the fact that the population as a whole is increasingly becoming older. It is possible that in the future, a DeFi environment will be able to safeguard the interests of all participating parties in a pension plan of this kind (Soland & Schueffel, 2021). Among the various topics that are now trending in the bitcoin market, DeFi stands out as one of the most prominent examples. The traditional financial services industry will eventually take notice of it, and not only because it will reduce the revenues and income of the established players in the market. This is not the only reason why it will catch their attention. Therefore, DeFi places a focus on the results that were discovered by Diaz-Rainey et al. (2015). In spite of the fact that it plays a significant part, technology is not the only thing that has an impact on the financial industry. Consequently, this indicates that DeFi is permissionless, which ensures a steady stream of new users; it is autonomous, adaptable, and secure as a result of its entirely decentralised organisational structure; and it is deregulated as a result of its anonymous identity.

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