Author: Subhojit Shome, Team Finserv
Email: finserv@vinodkothari.com
Date: July 11, 2024

Decentralised Finance: Emergence of New Investment Avenues

A Brief Guide to Crypto Markets and DeFi Services

Introduction

> *The first rule of an investment is don't lose money. And the second rule is don't forget the first rule.*
>
> *- Warren Buffet*

After the crypto-asset markets took a plunge in the wake of the FTX debacle, markets have once again revived with bitcoin trading at around $5.5 million during the end of May 2024, above its pre-FTX high. Indian investors have been returning to their trading apps and news agencies reported, mid-May, that SEBI has recommended to the Finance Ministry that a multi-regulator regime be followed to oversee investments in cryptocurrencies (virtual digital assets). Although in opposition to the stance taken by the RBI, this is the strongest indication that at least governmental agencies in India are open to bringing the crypto market into the mainstream.

In this article, we look at the emergence of decentralised finance (DeFi) as an avenue for trade and investment by examining the services that it provides and the use of coins or tokens that act as an incentive mechanism and are used to operate the DeFi platforms.

Market Overview

Globally, the total value of crypto-assets locked in the various DeFi applications ('TVL') peaked to over $230 billion early 2022. The IOSCO Report on DeFi identified capital formation, development and deployment of DeFi platforms, investment and settlement of trades to be the primary causes leading to the rise in the volume of crypto-assets.

Immediately post the FTX debacle, the TVL fell steeply both due to investors drawing money from the DeFi platforms as well as various platforms going bust. We can, however, observe from figure 1 that the TVL has made a healthy recovery from mid-2023 almost catching up with 2021-22 highs.

Figure 1: Total value of crypto-assets on DeFi platforms

(data source: Defilama)

Crypto Exchanges

For the run-of-the-mill investor or trader, crypto exchanges are the gateways to the crypto markets. Crypto exchanges are service providers who have emerged in the field of converting fiat currency to crypto-assets,

providing secondary market facilities to trade one's crypto-assets as well as providing custodial services in the form of electronic wallets to store them. Crypto Exchanges provide services akin to 'traditional' exchanges like maintaining an order book or providing market making services to facilitate secondary market transactions in crypto-assets and they also participate in new age DeFi services such lending and staking having access to large pools of crypto-assets.

A substantial portion of current volume of crypto trades occur on crypto exchanges owned and controlled by private parties and such exchanges are referred to as centralised exchanges (CEX). In the past few years, however, protocols have been developed that have led to the introduction of several decentralised exchanges (DEX) that provide a marketplace for peer-to-peer secondary market transactions in crypto-assets without the need for a central counterparty/ intermediary. Decentralised exchanges, however, unlike CEX, don't allow for exchanges between fiat and crypto — instead, they exclusively trade crypto-assets for other crypto-assets.

There are a number of crypto protocols/ services that make up the crypto-asset and DeFi ecosystem, we take a brief look at such services in the next section.

Application Protocols/ Solutions

The decentralised application (DAPP) ecosystem consists of a number of protocols or services (usually in the form of a smart contract or a collection of smart contracts) that either on their own or in combination with other services cater to a number of user requirements. There are decentralised protocols that are used for the purposes of decentralised exchanges, a number of financial products (like derivatives, indices and insurance), tokenization services that assist in representing real world assets in the digital world as well as miscellaneous utilities such as applications that assist in the launch of new crypto-projects and tokens.

Figure 2 provides a comparative view of the value locked in the various decentralised protocols (applications).

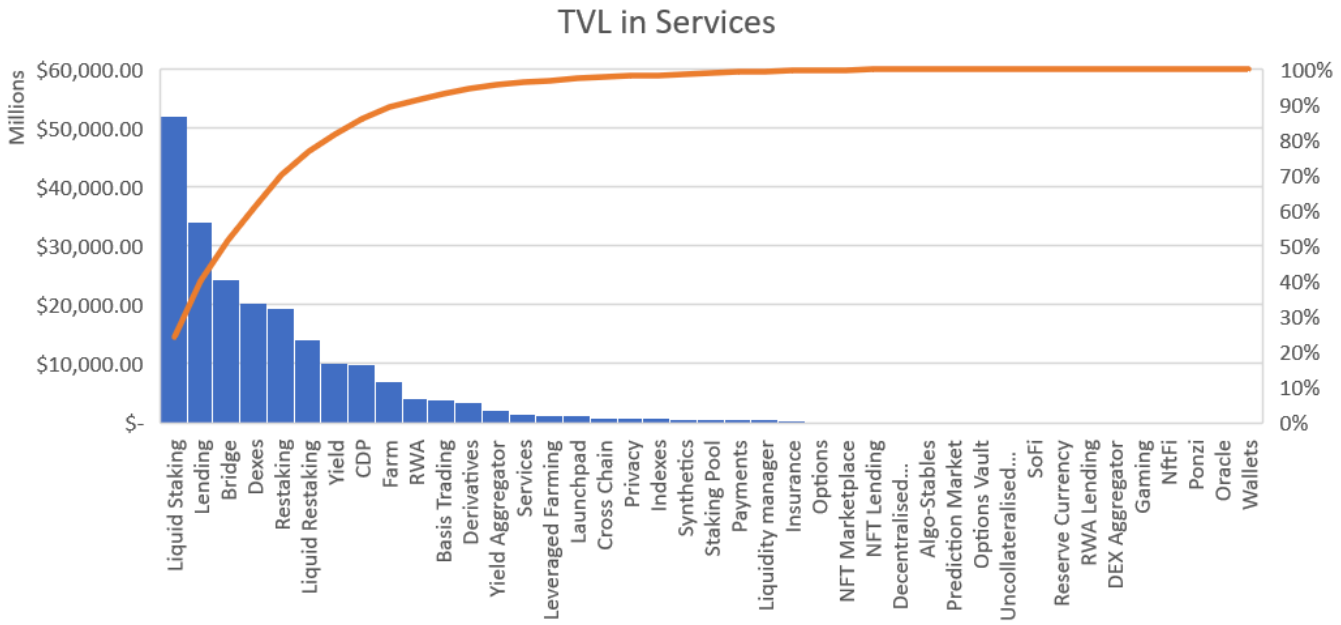


Figure 2: Total Value Locked (TVL) in DeFi Services/ Protocols

(data source: Defilama)

Category	Protocol/ Service	Description
Cryptoexchange services	Dexes, Liquidity Managers, NFT Marketplaces	Services that allow users to trade one cryptocurrency for another, manage liquidity positions in concentrated liquidity AMMs (automated market making services) and buy, sell or rent NFTs
Financial products	Derivatives, Indices, Insurance, Lending, NFT Lending, Options, Options Vaults	• Services for creating leveraged instruments, such as crypto futures, based on underlying crypto assets, • Indices provide a way to create, update or the performance of a group of related assets (generally crypto-assets); • DeFi-based insurance are designed to provide monetary protection generally to cover operational losses arising out of crypto transactions; • Lending protocols allow users to borrow and lend assets usually crypto-assets while NFT lending allow users to collateralise their NFTs for availing loans; • DeFi-based options, like options used in traditional finance, give one the right to buy an asset at a fixed price. Protocols are also available that allow the user to deposit collateral into an option strategy.
	Reserve Currency, RWA Lending, RWA Lending, Synthetics	These are protocols that use a reserve of valuable assets acquired through bonding and staking to issue and back its native token, bridge traditional finance and block chain ecosystems by tokenizing real-world assets for use as collateral or credit assessment, allowing decentralised lending and borrowing opportunities, create tokenized derivatives that mimic the value of another asset.
Misc. products	Gaming, Prediction Market	Protocols that have gaming components or allow one to wager/ bet/ buy in future results.
Pure decentralised finance practices	Farm, Leveraged Farming, Liquid Staking, Staking Pool, Yield, Yield Aggregator	• Protocols that allow user to lock money in exchange for protocol tokens • Protocols that allow the user to leverage yield farm with the use of borrowed money or cryptocurrencies • Services that allows one to earn staking rewards on token as well as providing a tradable and liquid receipt for the staked position • Platforms where users stake their assets on the native blockchain to help secure the network and earn rewards. Unlike liquidity staking, users don't receive a token representing their staked assets and their funds are locked up during the staking period limiting participation in other DeFi activities • Services that pay a reward for staking or providing liquidity positions on their platform • Services that aggregate yield from diverse protocols/ blockchain platforms
Stablecoin implementation	Algo-Stables, Collateralized Debt Position (CDP)	Protocols that provide algorithmic coins for stablecoin implementation Protocols that mint their own stablecoin using collateralised lending
Tokenization	RWA	Services that involve digital representation of real world assets like property tokenization

Utilities	Cross Chain, Launchpad, Oracle, Payments, Privacy, etc.	These are services that provides interoperability between different blockchains, provide users the facility to launch new projects, offer the ability to pay/ send/ receive cryptocurrency Protocols that provide services of masking information about transactions (usually their origins and destinations)

Table 1: Decentralised Protocols and Services

DeFi implementations fundamentally involve the creation and issue of digital tokens that take the form of a variety of crypto-assets and we make use of the following section to identify the various types of crypto-assets prevalent in the market, especially the financial markets, today.

Types of Crypto-assets

Blockchain-based tokens can be described as digitally scarce units of value the characteristics and circulation of which are prescribed via computer code.[1] Tokens can almost represent any and everything, as determined by the issuer of the token and are created and distributed by firms and platforms with a variety of purposes -

- They can grant users access/ participation to online services (utility tokens)
- They can serve as a means of payment or assure the right to purchase products (exchange/ payment/ currency tokens) or
- They can represent a stake in the issuer's company/ revenues (security token). As part of DeFi, security tokens play a significant part with issuers utilising them to raise funding and investors investing in them to earn returns. Security tokens are issued via what is referred to as - security token offering (STO).
- They can provide users governance rights like the right to vote on the type of projects that the platform may undertake or the protocol underlying such platform (governance tokens). Such platforms whose management and administration are decentralised in such a manner are referred to as Decentralised Autonomous Organizations or DAO.

Native Tokens

These are tokens (E.g. Bitcoin (BTC), Ethereum (ETH/ Ξ) that are created and issued by the underlying blockchain platform itself and are fundamental to the operations of the platform. These tokens are used to record transactions on the blockchain and are used as incentives for miners/ validators who verify the transactions before they are committed to the blockchain.

Application/ Smart Contract Minted Tokens

These are token issued by decentralised applications, including DeFi applications, built on top of the fundamental blockchain platform. Such tokens act as the currency that users may use to transact with the decentralised or DeFi applications.

A specific form of application/ smart contract-minted tokens are stablecoins. Stablecoin implementation is critical for convertibility from fiat/ real world currencies to application tokens/ cryptocurrencies and we examine their nature and function further in the following section.

[1] Maastricht Journal of European and Comparative Law, Valeria Ferrari [2020] – https://journals.sagepub.com/doi/pdf/10.1177/1023263X20911538

Stablecoins

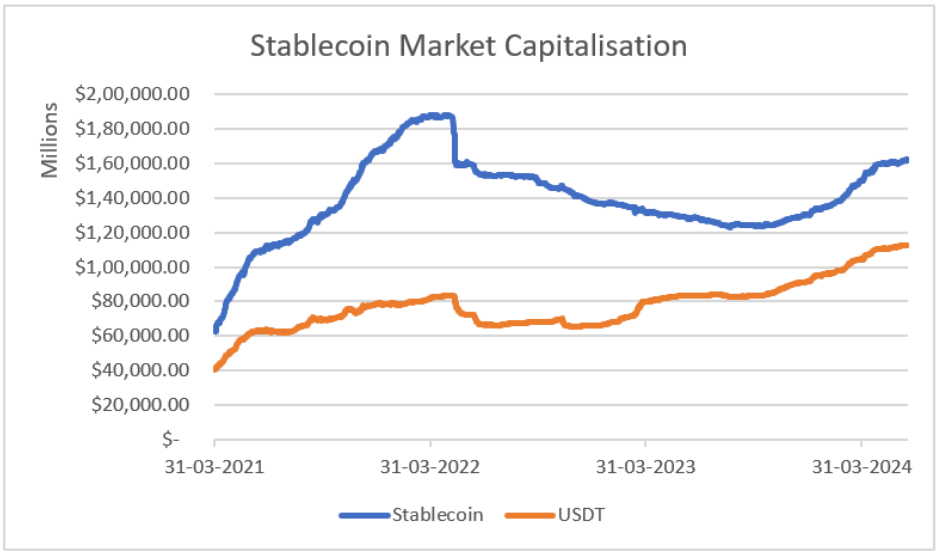
These tokens attempt to achieve price stability by being pegged to one or more of fiat currencies, other real-world assets, other crypto-assets or have their values being algorithmically maintained by adjusting token supply to fluctuations in demand. The fiat currencies or physical world assets may or may not be safeguarded in the physical-world by a custodian and the stablecoins value may merely be controlled by use of computer algorithms. Of course, algorithmically controlled stablecoins not backed by physical assets have run into issues in the market.

Also, one should note that although an essential part of DeFi, the stablecoin itself may reside and be managed on a centralised network under the control of a specific promoter instead of a public blockchain.

Stablecoins & Token Offerings

The total supply of stablecoins also witnessed a significant rise during 2021. As in the case of crypto-assets in general, the rise is seen to be fuelled by an increased need for liquidity for DeFi applications with USD pegged fiat-stablecoins accounting for a significant share of the liquidity.

Like we observed in the case of TVL, value locked in stablecoins have also seen a risk post the crash that followed FTX bankruptcy (ref. figure 3).



USDT Dominance ~70%

Market Cap as May 31, 2024
$61.845 billion

Figure 3: Major Stablecoins Market Capitalisation

(data source: Defilama)

During the pre-COVID-19 era, overall token issuances (security tokens and other coins) peaked during 2017-18 to flatten out and experienced a dip in 2019. Security tokens were the most significant blockchain-based funding instrument.[2] We can see from figure 4 that although fewer issuers are entering the DeFi space the total amount of funding being raised is back to the 2017-18 levels.

[2] 6th ICO/STO Report – Spring 2020 Edition, PWC [2020] - https://www.pwc.com/ee/et/publications/pub/Strategy&_ICO_STO_Study_Version_Spring_2020.pdf

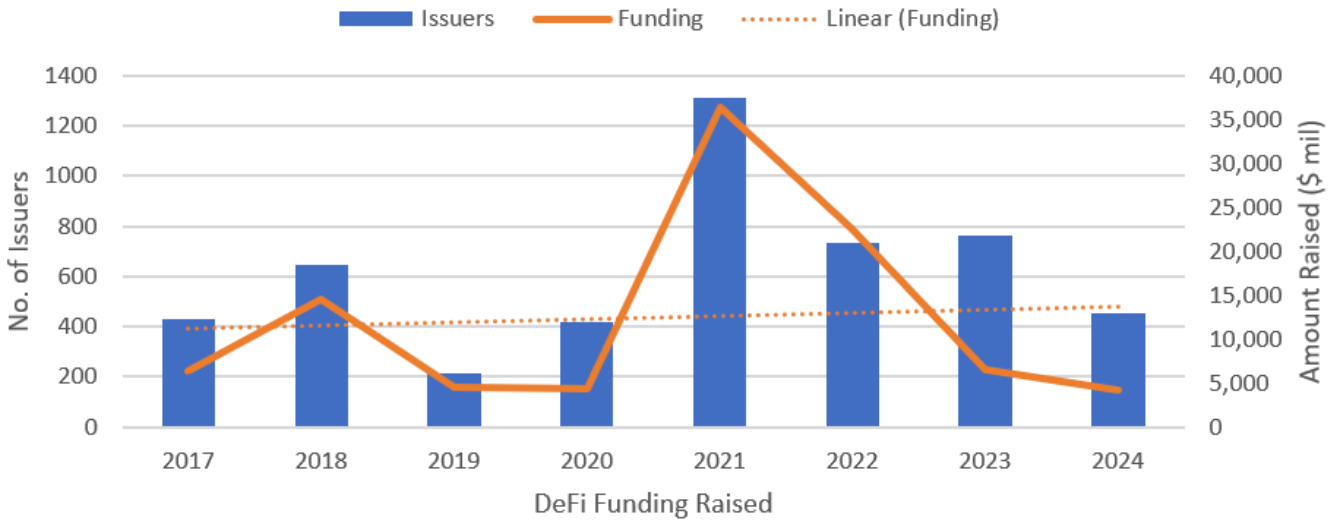


Figure 4: Funding Volumes using Coin Offerings (including Security Tokens)

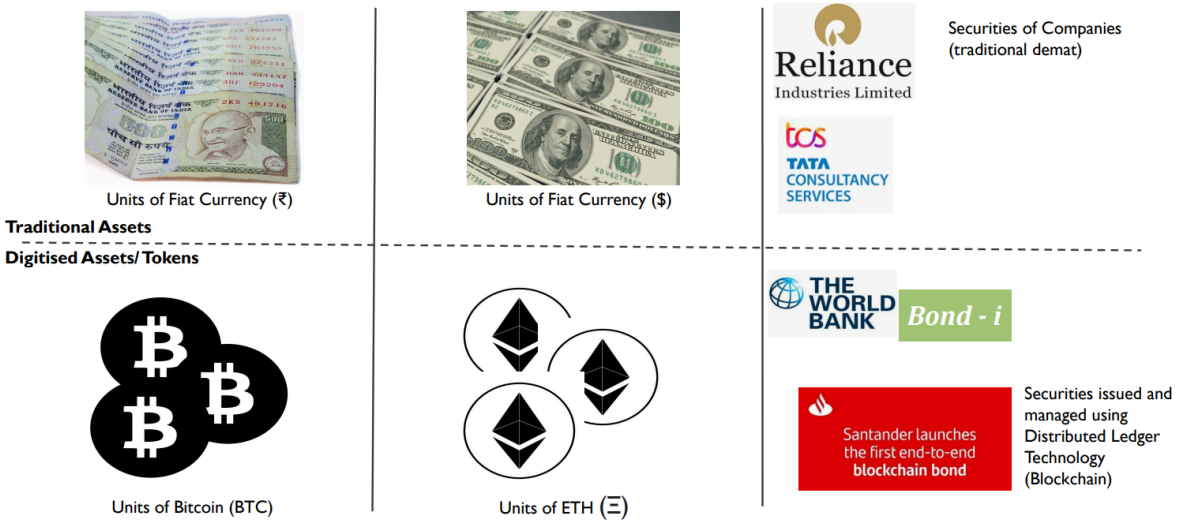
(data source: Defilama)

Non-fungible Tokens (NFT)

Much like fiat currencies or dematerialised securities, cryptocurrencies or security tokens are fungible among themselves. E.g. a unit of Bitcoin is no different from any other unit of Bitcoin or an unit of a tokenized bond (say the Bond-i issued by the Word Bank) is no different from any other unit of the said bond.

Tokens, however, may also be issued against digital rights, products and collectibles. Where tokens are backed by specifically identifiable assets or rights (usually identifiable intellectual property) and are not substitutable between one another, they are referred to as non-fungible tokens or NFTs.

Fungible Tokens



Non-fungible Tokens (NFT)

Figure 5: Fungible vs Non-fungible Tokens

Further fractionalisation may be possible depending on token implementation. Users may be able to exchange a fractional value of the token itself, similar to how a single unit of Bitcoin can be fractionalised (e.g. 0.001 BTC) -

Non-fungible but Fractional

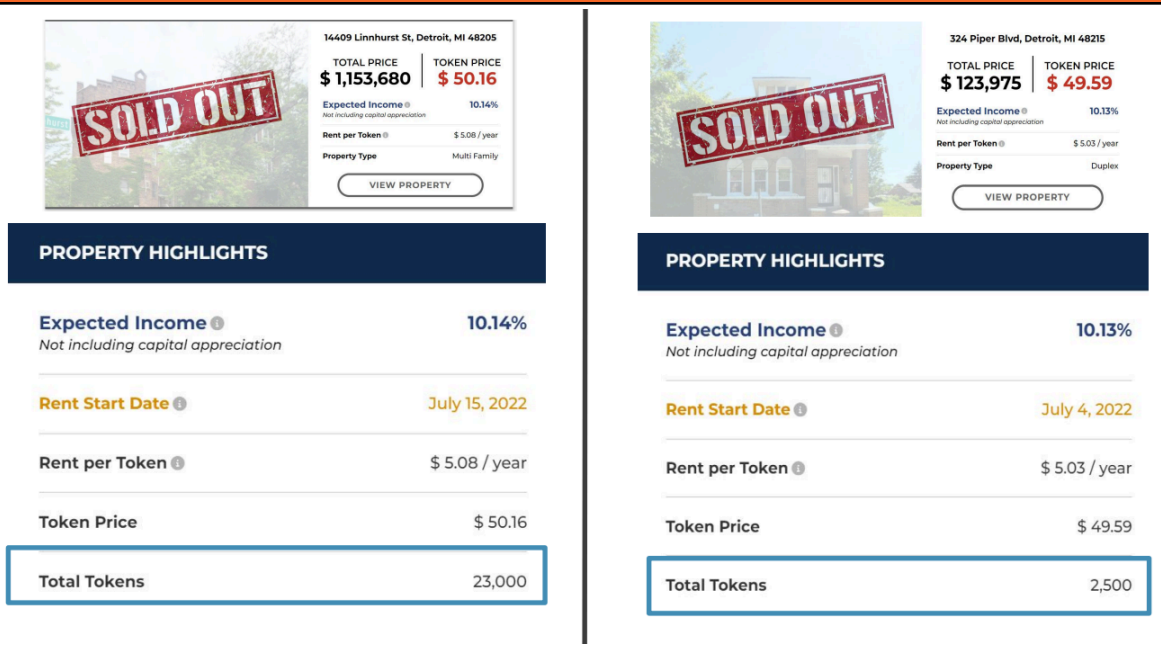


Figure 6: Token Fractionability

Audits

It is a commonly held notion that transactions recorded using the decentralised ledger technology (a blockchain) does not require to be audited as once transactions are 'hashed and chained' the technology implementation does not allow it to be altered without affecting the hash value (immutability). This position, however, does not take into account the vulnerabilities that the technological implementation itself may be exposed to, allowing

malicious actors to exploit these vulnerabilities and subvert the system. Hence, although audits in the traditional sense of an independent examination of financial records, transactions and documents have less meaning for Defi applications, information security audit of the protocols, smart contracts and code on which the application runs have become increasingly relevant especially with the amount of value locked in the system and a number of information security audit providers specialising in blockchain code and smart contract audit have emerged, although, there have not been any perceptible regulatory push to conduct such audits. Such audits provide users with assurance that not only third-party exploits are guarded against by the platform code but also that the promoters or developers of the platform do not subvert the system taking users for a ride.[3]

Risks

There are 3 types of risks that one must be primarily wary of when dealing with crypto assets - price/ volatility risk (idiosyncratic), reputation risk and regulatory risk and the risk flows among these categories as depicted in figure 7.

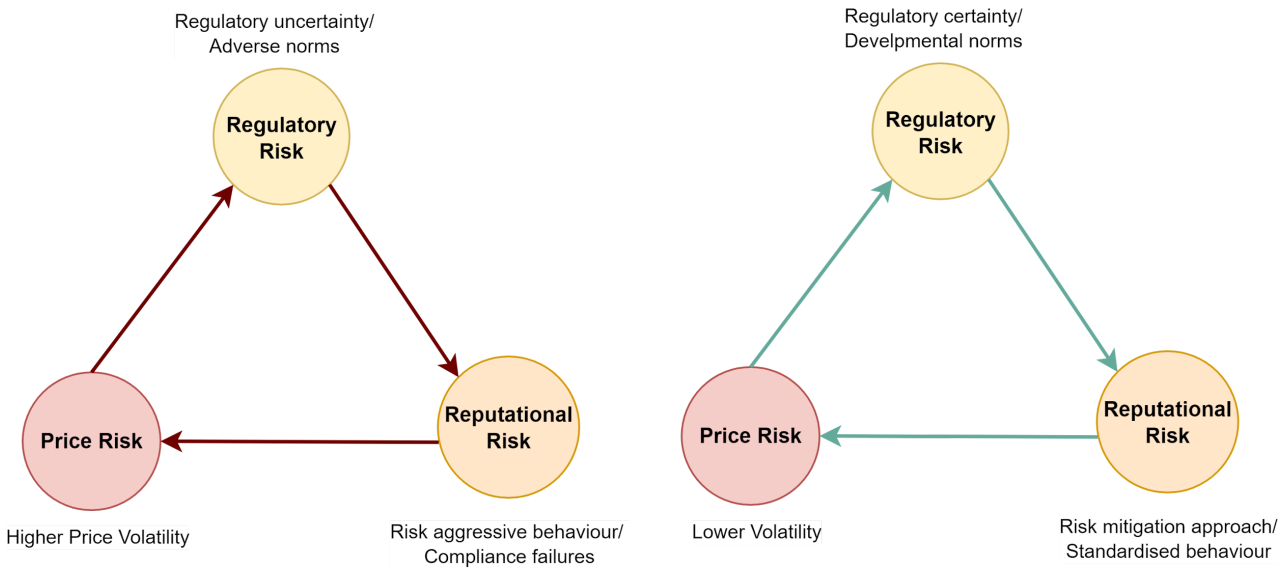


Figure 7: Risk Flows - Vicious and Virtuous Cycle

Fraud risk is another top risk when it comes to investing in crypto-assets and there is a need to assess the vintage, technology and business plan (whitepaper) of the Defi application/ token. Another risk mitigation measure is the insistence of an audit report from a reputed and independent third-party auditor.

Depending on the kind of service or investment strategy and the platform in question, market, credit, liquidity and counterparty risks are the other risks that should be taken into account.

Points of Note

- Complex strategies and applications - whereas the average person may believe that they may be making a straightforward investment in an asset, such asset may be deployed by the crypto intermediary into a number of strategies by use of the various services. Some of these strategies may be highly leveraged and are also prone to risks different from a straightforward investment and require deep pockets.
- One must decide whether the investment is for trading purposes, whether short or long term, or whether such investment is to make use of the services that the DeFi application provides (such as setting up start-up, getting discounts on a real world commodity or service, etc.)

[3] Ref. the case of Chai, a mobile payment app supported by the Terra blockchain. The recent SEC case against Terra alleges that payments were never processed on the blockchain and that Terra fabricated the transactions.

- One must also be discerning between a fad (remember 'pet rocks') and long term value creation especially when it comes to NFT collectibles.
- With investors and issuers coming back to the market and drawing in the average person in the street, given the experience with crypto, it is imperative that regulators put in place a well structured governance framework around these markets and services. To quote John Locke - *"where there is no law, there is no freedom...the end of law is not to abolish or restrain, but to preserve and enlarge freedom."*

To Get in Touch with Us