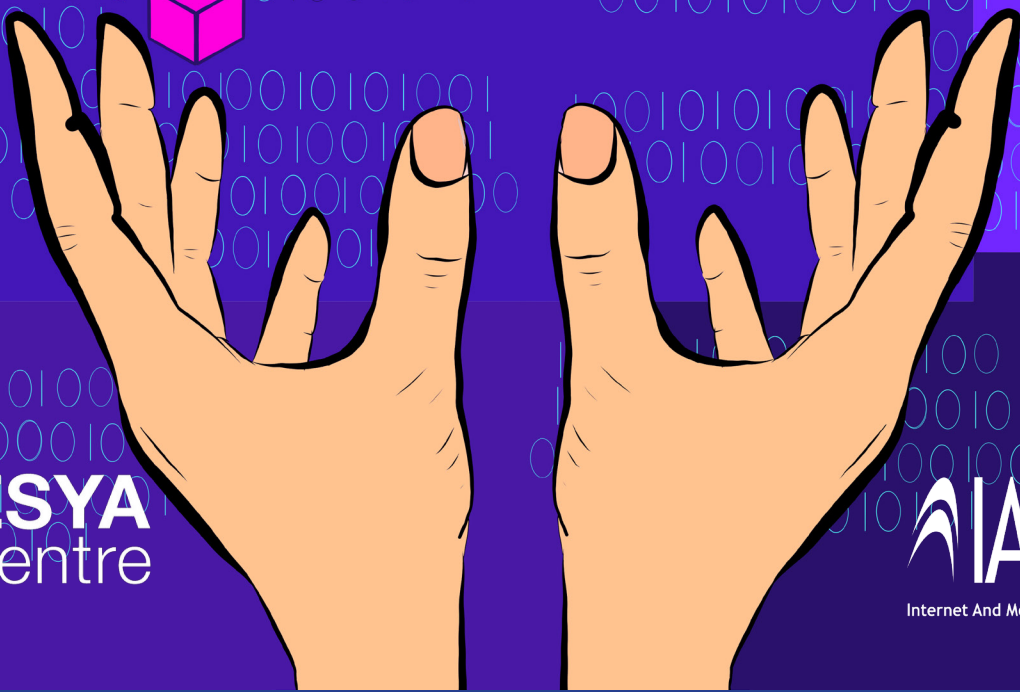
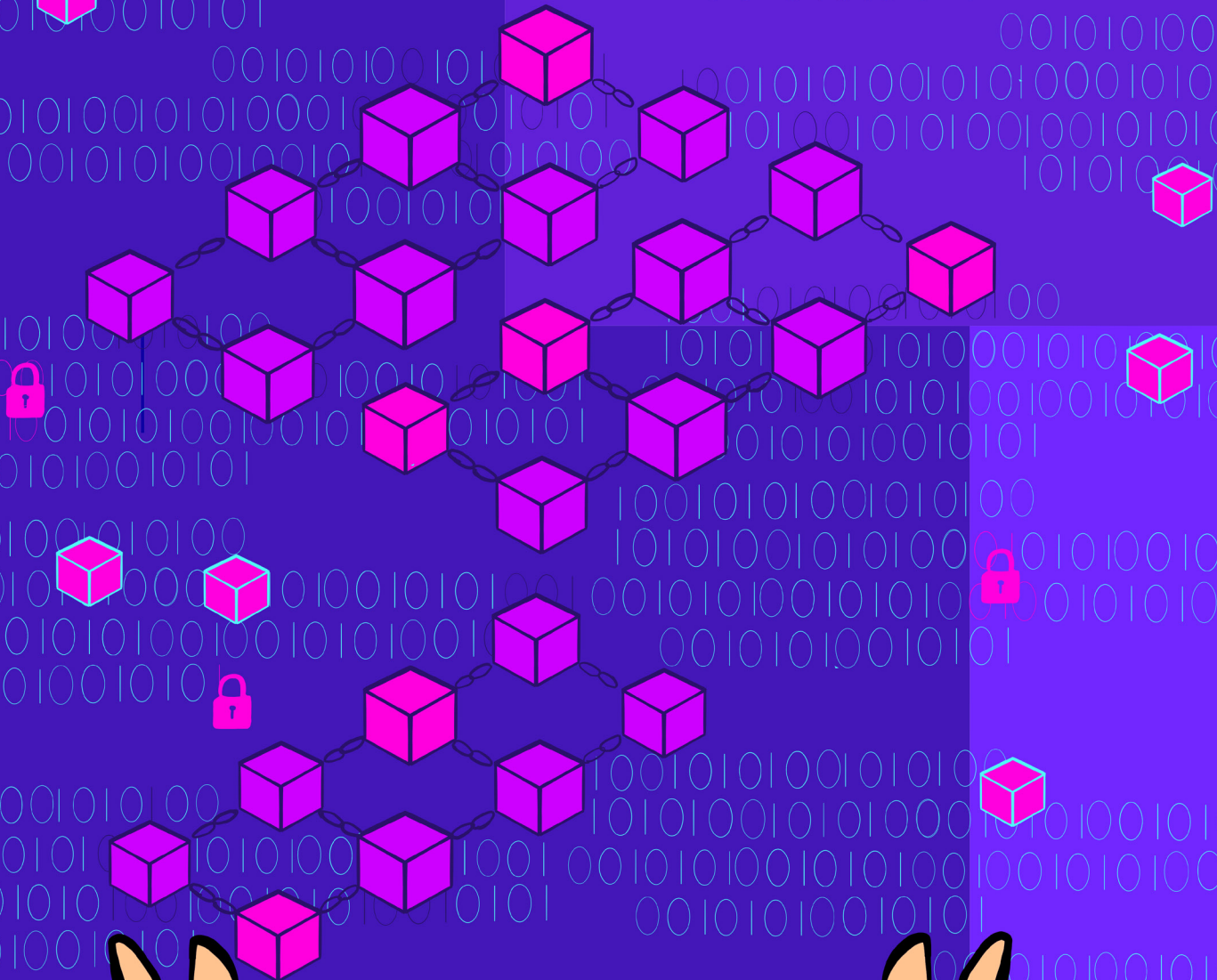


DECENTRALIZED EXCHANGES REGULATORY PERSPECTIVES FOR INDIA

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Internet And Mobile Association Of India

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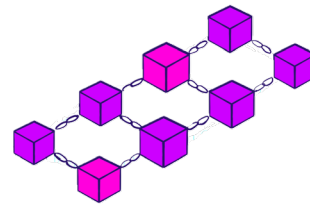
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A. BACKGROUND

Decentralized exchanges (DEXs) have emerged as an important component of a broader crypto-business segment known as decentralized finance (DeFi) – an ecosystem where financial activities are carried out through smart contracts rather than intermediaries. On a decentralized exchange, rather than a centralized intermediary a smart contract or a protocol executes trades on behalf of customers.

The regulation of decentralized exchanges is necessary from the standpoint of consumer welfare as well as anti-money laundering concerns. These issues are more easily resolved in centralized exchanges, where there is an identifiable or real-world entity dealing with users. Decentralized exchanges on the other hand are designed to offer peer-to-peer trading services, where a smart contract rather than an entity facilitates transactions.

This paper outlines possible approaches regulators in India may take to govern decentralized exchanges effectively.



IN RECENT MONTHS, AVENUES HAVE EMERGED TOWARDS THE “REGULABILITY” OF DECENTRALIZED EXCHANGES

Understanding how to regulate decentralized exchanges and other DeFi services is important for decision-makers globally. In recent months, avenues have emerged towards the “regulability” of decentralized exchanges.

B. OVERVIEW OF DECENTRALIZED EXCHANGE MARKET

Decentralized exchanges are characterized by three traits. First, they are disintermediated. Transactions are automated, executed by smart contract instead of a centralized intermediary. Second, they are self-custodial. While a centralized exchange generally has custody of a user’s private keys, decentralized exchanges give users control over their private keys. Third, unlike most centralized exchanges, decentralized exchanges are largely autonomous. Their protocols focus on trade efficiency and managing liquidity. Rather than consumer grievance redressal mechanisms, they rely

on transparency and incentive structures to check abuse. Changes to these platforms are made through a proposal process: where a group of governance-token holders vote to reject or approve any updates. Assets are not typically whitelisted.

Initially, decentralized exchanges could only facilitate the exchange of tokens supported by the blockchain ecosystem they had been built on. However, according to Werner et al. (2021), “wrapped tokens” and other similar solutions have helped solve for the interoperability constraints.²

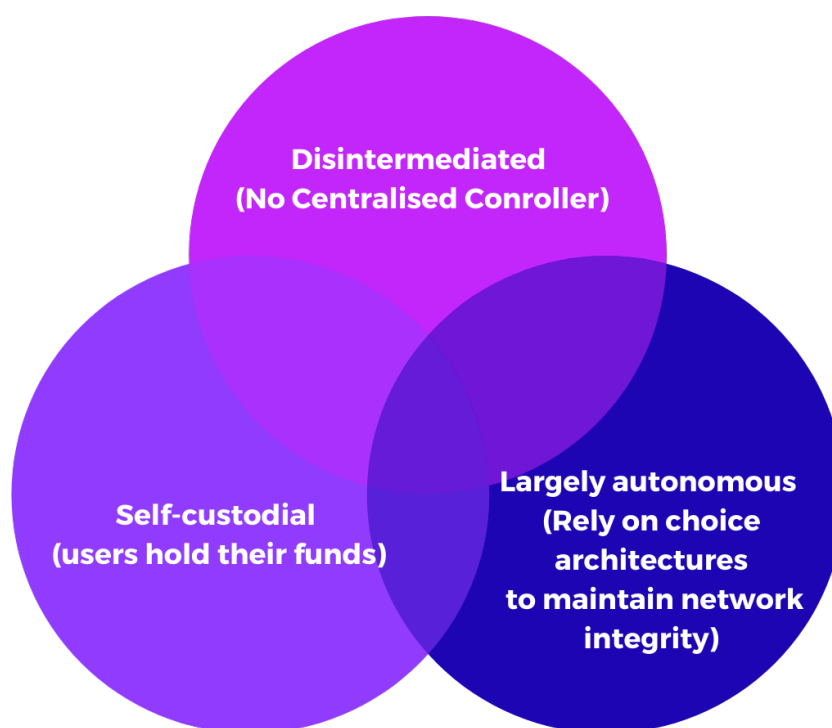
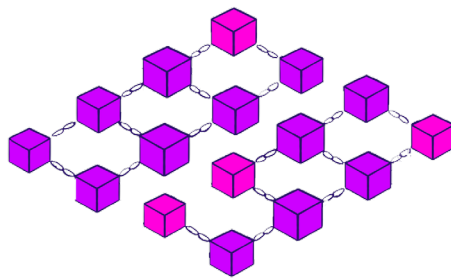


Figure 1: Characteristics of Decentralized Exchanges

Source: Author’s own diagram

Decentralized exchanges currently make up a small share of the crypto-asset exchange market, with only 140 DEXs operational, compared with 306 centralized spot exchanges.³ They account for a small share of global cryptoasset trading volume, standing at 2% of the absolute trading volume of CEXs.⁴

However, their popularity is rising. According to one report, DEX aggregators' trading volumes rose by 50% from November to December 2021.⁵



C. STATE OF DEFI IN INDIA⁶

A report by Chainalysis indicates widespread adoption of DeFi in India in 2021. The report ranked the country 6th in terms of DeFi adoption, and found that the share of activity taking place on DeFi platforms is much higher than on centralized exchanges – 59% of tracked activity was on DeFi platforms in India. Experts suggest that this may be because DeFi offers regulatory arbitrage

opportunities for users and has less friction for customer onboarding.

All centralized exchanges in India have rigorous KYC requirements, but most decentralized exchanges do not collect any KYC details. Given the high share of DeFi activity in India, it is advisable that regulators deliberate on modalities to regulate DeFi activity in the country.

D. TYPES OF DECENTRALIZED EXCHANGES

Four kinds of decentralized exchanges are identified here. The primary basis of classification of these different models is the protocol through which they run.

1. Order Book⁷

DEXs that rely on order books for settlement are the oldest model of decentralized exchange. The order books put together a ledger of open buy and sell orders for different crypto assets. Information such as order book spread and market price is kept on chain, while assets remain in user custody, i.e. in their personal wallet.

2. Automated Market Makers/Swaps

Automated market makers enable peer-to-peer cryptoasset exchange.⁸ They rely on liquidity pools protocols to decide the pricing of the crypto assets being exchanged on their platforms. A liquidity pool is a crowdsourced collection of

crypto assets that have been locked in a smart contract. Users are incentivized to pool their crypto assets to provide liquidity through compensation, in the form of either transaction fees or “rewards”.

Liquidity providers are typically given tokens that represent the liquidity provided by them.⁹ One method of realizing such rewards is through a practice called yield farming, where liquidity providers loan or “stake” their tokens and receive interest.¹⁰

Automated Market Makers (AMM) protocols solve for the problem of liquidity on decentralized exchanges, typically by mathematically maintaining a “constant balance of assets”.¹¹ Prices are “deterministic” and are predicated on the comparative liquidity of crypto-asset pairs.¹² Illustratively, in a pool containing Token A and Token B, if some of Token B is purchased, its price increases marginally, and the pool is left with a lower tally of Token B than before the purchase was made.¹³

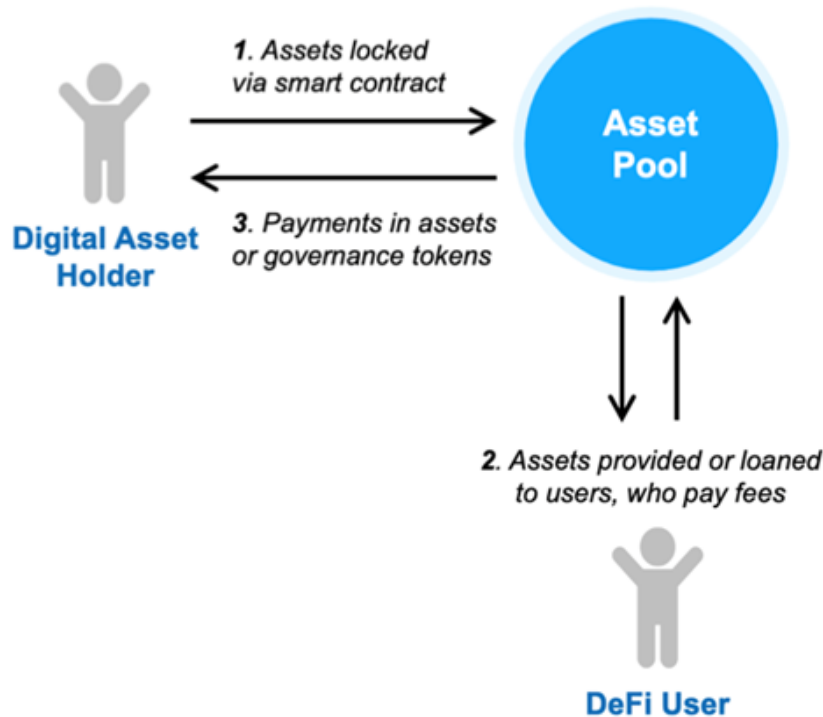


Figure 2: Mechanism of Liquidity Pool

Source: Sumedha Deshmukh, Sheila Warren, and Kevin Werbach, 'Decentralized Finance (DeFi) Policy-Maker Toolkit' (World Economic Forum, 8 June 2021), <https://www.weforum.org/whitepapers/decentralized-finance-defi-policy-maker-toolkit>

3. Decentralized Exchange Aggregators¹⁴

Decentralized exchange aggregators offer interoperability of liquidity pools across different exchanges, to overcome liquidity asymmetry and consequent constraints across multiple DEXs.

4. Batch Settlement Systems

In batch settlement systems such as Gnosis,¹⁵ algorithms are used to match trading activity “in periodic batches maintained by decentralized keepers”, who contend to solve complicated “matching” puzzles. Once they have solved a puzzle the solutions are

submitted on-chain, and the protocol relies on certain parameters to pick the optimal one. Keeper competitiveness is necessary to ensure price stability and fairness.

A Note on Self-Hosted Wallets

There are two primary types of self-hosted wallets, hot and cold. The table below outlines the key differences between them.

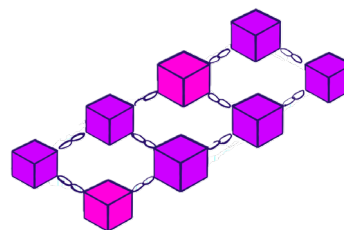
	HOT WALLETS	COLD WALLETS
Definition	Software on mobile phones, desktops, and the web that stores private keys online	Store private keys offline
Type of Custody	Can be custodial (third-party maintains control) or self-hosted (user maintains control)	Self-hosted. There are two types of cold wallets: paper and hardware
Security	Less secure because they are always online	Highly secure. Several reputed exchanges use cold wallets to store a significant proportion of users' private keys to keep them safe
Functionality	More convenient for users for fast transactions as they are always online	Less convenient for transactions as you need to connect hardware wallets to the internet for transactions. However, they are far more secure than hot wallets

Table 1: Types of Self-Hosted Wallets

Source: Adapted from [101 Blockchains](#) and [Cryptopedia](#)

E. POLICY CONCERNS RAISED BY DECENTRALIZED EXCHANGES

The lack of centralized control in DEXs makes it difficult to attribute liability to an entity or individual for illegal conduct on the platform. Decentralized exchanges do not have a specific legal identity or distinct human agents, making it difficult to establish a point of accountability for the enforcement of compliance norms or civil and criminal remedies. The platforms are loosely controlled and tend to focus more on efficiencies in trade execution and liquidity management. As mentioned above, they rely on enhanced transparency and complex incentive mechanisms to mitigate security risks and to check abuse. There is little focus on consumer protection, increasing the risk of scams and frauds if these structures break down. (According to one report, cyber-criminals defrauded users of USD 10 billion on decentralized finance platforms in 2021.⁶) Finally, the absence of legal identity means that decentralized platforms are not required to comply with KYC/AML requirements, making them ripe for illegal transactions.



The table below maps how the autonomous functioning of decentralized exchanges translates into different policy risks:

PECUNIARY ¹⁷		
Liquidity risks brought on by the peer-to-peer nature of trading.	Non-transparent or inaccurate pricing of assets. The external sources that the protocol relies on for pricing assets may be incorrect or manipulated. ¹⁸	The absence of a centralized control mechanism means there is no one to take the system offline in case of runs on the liquidity pool (mass cashing out). ¹⁹
SECURITY		
Vulnerabilities in smart contracts that can be used to repeatedly enter user accounts and drain funds from them; deficiencies in coding that can cause mathematical errors the system will not catch; and programming errors that can lead to millions in losses. ²⁰	Vulnerabilities in the underlying blockchain can be used to manipulate transactions. The current reliance on proof-of-work also creates risk: of transaction validators manipulating transactions to create arbitrage opportunities for some users. ²¹	Open-source decentralized exchanges can be derailed by “vampire attacks”, where the attacker creates a competing exchange with more robust incentive structures to drain the victim’s liquidity. ²²
REGULATORY ²³		
Rely on anonymity and autonomy to evade legal obligations.	Failure to comply with AML/ KYC requirements.	Used to scam and defraud users.

Table 2: Areas where Decentralized Exchanges Require Policy Guidance

Source: Adapted from Sumedha Deshmukh, Sheila Warren, and Kevin Werbach, ‘Decentralized Finance (DeFi) Policy-Maker Toolkit’ and Sam M. Werner et al., ‘SoK: Decentralized Finance (DeFi)’.

Recent developments show that it is possible to regulate decentralized exchanges effectively. International institutions have highlighted that complete decentralization is illusory, and points of centralization can be identified to pressure decentralized exchanges into complying with legal frameworks. These approaches are discussed in the next section.

F. INTERNATIONAL BEST PRACTICES

We emphasize approaches and not exact provisions because only the former can be transposed directly to the Indian context.

1. International Institutions

*a. Financial Action Task Force*²⁴

The FATF, the global financial crime watchdog, recently pointed out the necessity of centralization in decentralized finance applications for “creating and launching an asset, setting parameters, holding an administrative ‘key’ or collecting fees”.²⁵ In its updated guidance for Virtual Asset Service Providers (VASPs), the FATF clarifies that its standards do not apply to DeFi applications. It observes that a software developer may be treated as a VASP if their application or platform is used to engage in VASP functions, either “as a business or on behalf of others”.²⁶ Similarly, a party that creates or develops software to provide VASP services, either for themselves or for someone else, can also be classified as a VASP.²⁷

Countries must look for a transactional dynamic between the centralized controllers of decentralised exchanges and their users, even if the actual transacting mechanism is automatic. Additional considerations include profit points – such as the entity that collects the transaction fee charged by the platform or can introduce changes to platform operations, etc.²⁸ These VASPs would, in turn,

be required to comply with AML/CTF obligations.

The FATF acknowledges that in some cases it may be impossible to identify any underpinning entity that can exert control over a decentralized finance platform.²⁹ In such cases, countries may consider requiring the involvement of existing VASPs, such as centralized exchanges or custodial wallet service providers, in the DeFi value chain.³⁰

b. Bank of International Settlements

The BIS echoes the FATF’s position on the limitations in the purported extent of decentralization in DeFi. Citing the theoretical frame of “contractual incompleteness” established by Coase and Grossman and Hart, the BIS observes that it is impossible to programmatically account for all eventualities, implying a need for a centralized entity with the ability to exert control over a platform. All contingencies cannot be accounted for. Thus, there needs to be a developer in place to account for an unforeseen contingency.

2. Countries

a. United States

In July 2021, US Securities and Exchange Commission Chair Gary Gensler remarked that if any offering available on a centralized or decentralized exchange resembled a security, it would fall under the regulator’s jurisdiction and the platform would have to comply with securities law.³¹ The comment prompted

Uniswap Labs, the developer behind the Uniswap decentralized exchange, to restrict access to several tokens on its platform, including “synthetic tokens”, which are tokenized versions of real securities.³² Shortly thereafter the SEC launched an investigation into Uniswap Labs, perhaps to better understand the extent of control exerted by the developer over the decentralized exchange.

The SEC had earlier launched a similar investigation into the workings of a decentralized autonomous organization called TheDAO, which yielded some important insights on the governance of DeFi, and once again highlighted the degree of centralization on purportedly decentralized platforms. DAOs are virtual organizations “embodied in computer code and executed on a distributed ledger or blockchain.”³³

According to the World Economic Forum, TheDAO represented the “first viable DeFi service”. TheDAO’s technological architecture is similar to decentralized exchanges in that it seems to confound traditional notions of liability attribution, as its governance is ostensibly automated and heavily decentralized. However, the SEC uncovered a fair bit of centralisation in TheDAO’s operations.

Governance on decentralized platforms like TheDAO and decentralized exchanges is typically performed through proposals. It may include proposals to upgrade or change the protocol, or to introduce new technical or operational features. How this generally works is that a proposal for an upgrade or change is submitted and then reviewed and voted on by the holders of governance tokens.

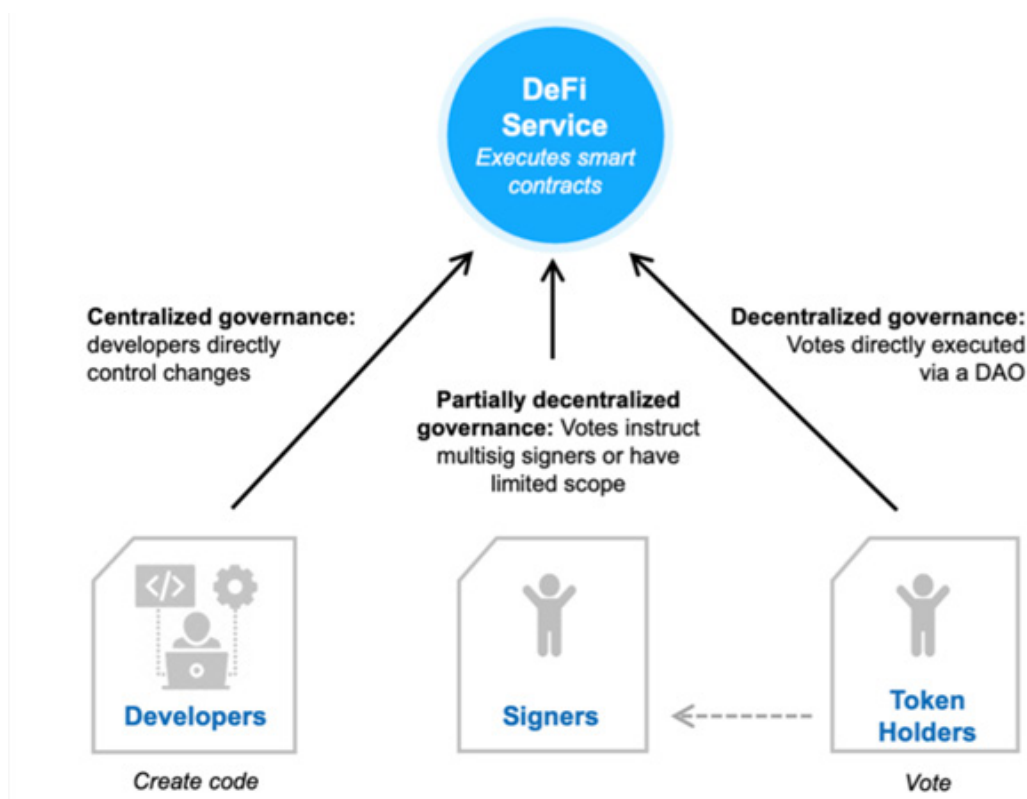


Figure 3: Types of Governance on DeFi Platforms

Source: Sumedha Deshmukh, Sheila Warren, and Kevin Werbach, ‘Decentralized Finance (DeFi) Policy-Maker Toolkit’

In TheDAO however, the SEC discovered a hierarchy in the governance structure. There was a subset of governance-token holders called “Curators” who reviewed governance proposals before they were put to vote.³⁴ According to the SEC these curators also performed integral “security functions”. They had been chosen by Slock.it UG, the company that launched TheDAO. So although TheDAO was decentralized, its governance was concentrated in the hands of Slock.it through the curators it appointed. This meant that non-curator governance-token holders had no meaningful say in the running of TheDAO, and its control over operations was in fact quite centralized.

i. Wyoming

In 2021 the US state of Wyoming passed the “Wyoming Decentralized Autonomous Organization Supplement”. The new law permits DAOs to register as limited liability companies in Wyoming provided they maintain a registered agent in the state. Algorithmically managed DAOs are also permitted to register, but only if the underlying smart contracts are capable of being “updated, modified or upgraded”. This means there must be a real-world entity responsible for the upkeep of the DAO.³⁵

b. Malaysia

The Securities Commission Malaysia requires all decentralized exchanges to register as “Recognized Market Operators”. It recently issued a cease-and-desist order to RimauSwap, a decentralized exchange, for operating without registration, clarifying further in a press

release that such unauthorized operations are an offence.³⁶

The Malaysian Capital Markets and Services Act, 2007 empowers the Securities Commission to register an electronic facility subject to conditions deemed appropriate by it. A recognized market operator is an entity registered pursuant to this provision.³⁷ Malaysia has brought digital currencies and tokens under the purview of its securities law through the Capital Markets and Services (Prescription of Securities) (Digital Currency and Digital Token) Order 2019.³⁸ Per the order, digital currencies have been deemed securities in Malaysia.

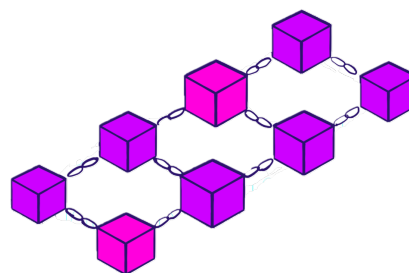
The registration requirements specific to Digital Asset Exchanges were specified in revisions to the Guidelines on Recognised Markets introduced on 31 January 2019. The guidelines clarify that digital asset exchanges are also recognized market operators and must meet all the requirements stipulated for these entities.³⁹ In addition, digital asset exchanges must be incorporated in Malaysia and have a minimum paid-up capital of RM 5 million.⁴⁰ Before making any digital asset available for trade, a digital asset exchange must submit an application to the Securities Commission detailing the nature of its project, its utility or use-case, asset liquidity, the level of distribution of a digital asset (number of addresses created and which of these are active, concentration of holdings and its transaction patterns), and a whitepaper detailing the digital asset, the security of the underlying ledger and how it plans to comply with Malaysian law.⁴¹

c. Thailand

The Thailand Securities and Exchange Commission recently granted a license to KULAP, a decentralized exchange. Crypto-asset exchanges were brought under the Commission's regulatory purview through the Emergency Decree on Digital Asset Businesses in 2018. Among other provisions the decree requires exchanges to comply with anti-money laundering laws.⁴² According to its website, KULAP follows rigorous KYC and know-your-transaction procedures when onboarding customers.⁴³ Overall, the Thai approach to crypto-governance seems to be in consonance with the Malaysian approach.

d. Germany

SWARM MARKETS USES 'COMPLIANCE LAYERS' TO STAY WITHIN THE AMBIT OF THE LAW. ACCORDING TO ONE REPORT, THESE COMPLIANCE LAYERS INCLUDE ON-CHAIN KYC AND AML PROTOCOLS THAT ALLOW VERIFICATION FOR ALL USERS.



The German Federal Financial Supervisory Authority (BaFin) recently granted a licence⁴⁴ to Swarm Markets, a decentralized exchange that relies on an AMM powered by the Balancer protocol. Swarm Markets uses 'compliance layers' to stay within the ambit of the law. According to one report, these compliance layers include on-chain KYC and AML protocols that allow verification for all users.⁴⁵

G. FIRST PRINCIPLES TO REGULATE DECENTRALIZED EXCHANGES

The mode of law enforcement is a primary challenge presented by decentralized exchanges. Where do enforcement agencies begin with these entities? This is particularly true for India, whose citizens and residents do have access to decentralized exchanges, but whose authorities have few levers with which to hold these entities accountable, due to jurisdictional limitations.

Step 1: Identify Enforceability Threshold

AS THE PRESCRIPTIONS OF THE FATF AND BIS AND THE EXPERIENCE OF THE SEC INDICATE, THE FIRST POINT OF DEPARTURE IS TO IDENTIFY WHETHER A DECENTRALIZED EXCHANGE HAS ANY POINTS OF CENTRALIZED CONTROL, OR REAL-WORLD CONNECTIONS.

An enforceability threshold is a marker for what extent enforcement agencies can exert influence of a decentralized platform. The degree of centralization within a platform's operating structure is key to enforcement. As the prescriptions of the FATF and BIS and the experience of the SEC indicate, the first point of departure is to identify whether a decentralized exchange has any points of centralized control, or real-world connections. These include developers, the owners of governance tokens, and

entities which profit from the activities of decentralized exchanges, such as investors. If these are identifiable and have human agents, the agencies can contact them to understand the level of control and compliance that can be established on the platform. Agencies are also encouraged to engage with industry stakeholders to understand what measures can be taken to deploy DeFi regulation.

If on the other hand there are no identifiable controlling agents or entities, decision-makers may consider the following mitigation procedures:

- 1. Engage with the developers of the infrastructure products used to build these exchanges, such as Infura, or scalability solutions such as Polygon. Gather intelligence from them on the entities behind decentralized exchanges.*
- 2. Decentralized exchanges generally require users to connect their wallets to begin transacting on their networks. Several of these wallets are custodial solutions that belong to centralized exchanges which carry out KYC, such as Coinbase. One wallet provider, for instance, has included firewalls to verify decentralized finance protocols in accordance with certain parameters.⁴⁶ The firewall only allows users to engage with entities that have been whitelisted by it.⁴⁷ These entities can be leveraged to implement KYC/AML procedures, and to report separately on customers engaging with DeFi protocol.*

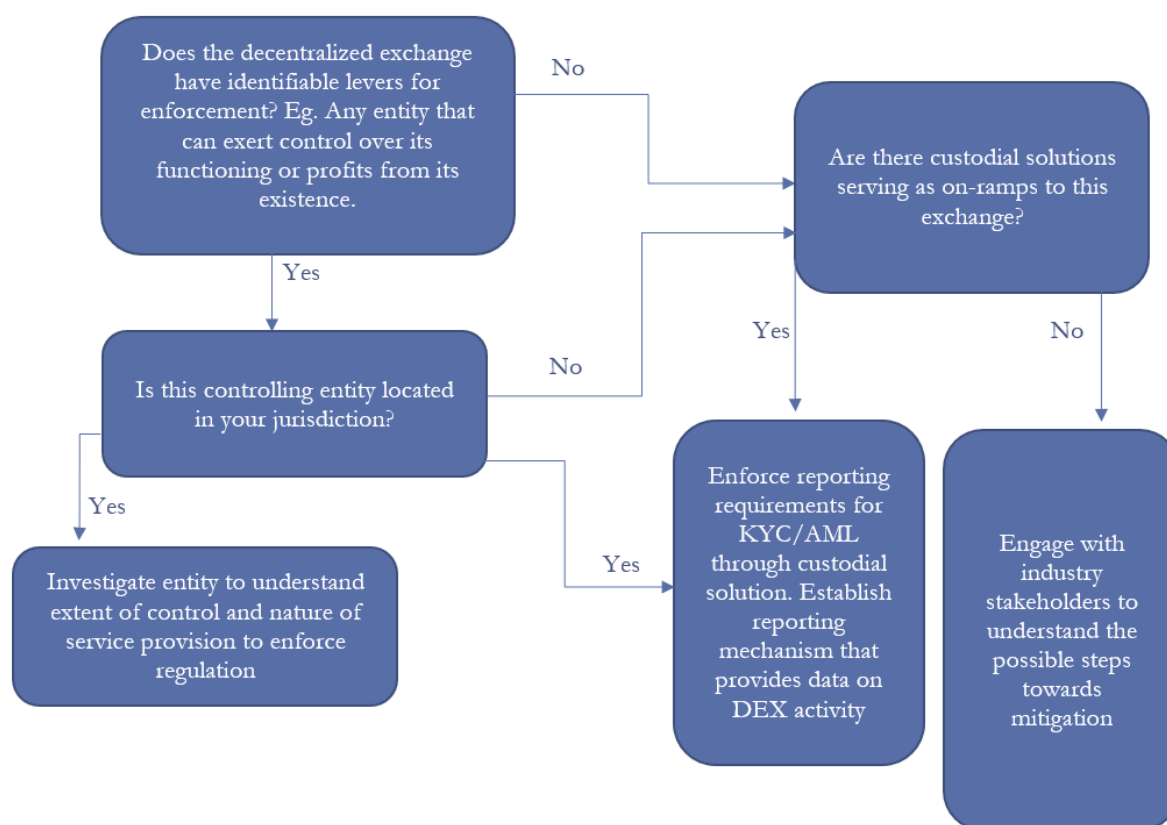


Figure 4: Roadmap to Enforcement for Decentralized Exchanges⁴⁸

Step 2: Establish Supervisory Parameters and Implement Regulation

a. International Decentralized Exchanges

International decentralized exchanges are platforms whose developers are based abroad or are unidentifiable. Enforcement is tricky in either case.

As a starting point, regulators can identify the custody services that link to international decentralized exchanges, centralized fiat-to-crypto exchanges, crypto-to-crypto exchanges, crypto-exchange aggregators, and even centrally controlled stablecoins, and impose KYC/AML requirements on these service providers for Indian citizens,

while establishing a separate reporting line specific to DeFi (see Table 2 below). Illustratively, the decentralized exchange Aave has created KYC liquidity pools where it gets custody services to carry out compliance for institutional investors.⁴⁹

Another solution recommended for the problem of identification on decentralized exchanges is a decentralized identifier or DID.⁵⁰ A DID is a type of identifier that can be ascribed to any object.⁵¹ It has the following characteristics:⁵²

- i. They are not issued by a central agency.
- ii. Their validity does not depend on the continued functioning of an underlying organization.

iii. *They can be used for cryptographic verification.*

iv. *They enable the collection of metadata.*

Decentralised identifiers use specific information parameters about the subject (such as Aadhaar number and public address) on the blockchain to create a unique cryptographic identifier which is globally accessible.⁵³ As such, they are an important means of enabling identification in decentralized finance and help mitigate some of the issues surrounding centralized identity structures.

intermediaries will accompany such measures. We do not consider how such an arrangement intersects with FEMA as there are complex dimensions to this problem that are beyond the scope of this paper.

DECENTRALISED IDENTIFIERS USE SPECIFIC INFORMATION PARAMETERS ABOUT THE SUBJECT (SUCH AS AADHAAR NUMBER AND PUBLIC ADDRESS) ON THE BLOCKCHAIN TO CREATE A UNIQUE CRYPTOGRAPHIC IDENTIFIER WHICH IS GLOBALLY ACCESSIBLE

There are still questions on how they can be effectively built into DeFi systems. There is also a high likelihood of friction between DIDs and the frameworks underpinning identity in India, such as the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016.

Regulators may also consider global travel-rule solutions such as those introduced by the company Coinbase, in tandem with blockchain analysis tools that can geolocate addresses to identify India-specific engagement with international decentralized exchanges.

This paper assumes that a general regulation instituting a registration/licensing mechanism for centralized crypto-asset

DECENTRALIZED EXCHANGE	TYPE	BLOCKCHAIN/ NETWORK	WALLETS	FOUNDER/ GOVERNANCE	LINKAGE TO CEX	INVESTORS	PRESSURE POINT USED BY REGULATOR
Uniswap	Swap/ AMM	Ethereum	Metamask, Wallet-Connect, Coinbase, Fortmatic, Portic	Uniswap Labs	Coinbase wallet	Union Square Ventures, Andreessen Horowitz, SV Angel, Version One, A Capital, Paradigm, Variant, ParaFi Capital, Coinbase, Blockchain Fund Chelyabinsk, Blockchain Capital, Maven 11 Capital	Developer - Uniswap Labs
dydx	Order Book	Ethereum	Metamask, imToken, Coinbase, Trust, Rainbow, Token-Pocket, WalletConnect	dydx/ Antonio Juliano	Coinbase wallet	Andreessen Horowitz, Hashcare, Starkware Industries, Delphi Digital, Menai Financial Group, CMS Holdings, Kronos Research, QCP Capital, FinLink Capital	NA
rinch Network	Decentralized Exchange Aggregator	Ethereum, Binance Smart Chain, Polygon, Arbitrum, Optimism	Wallet-Connect, Coinbase, Portis, Ledger, Trezor, KeepKey, MEW, FortMatic, Authereum, Torus, Bitsky, Binance Chain Wallet, FunFair Wallet	Anton Bukov, Sergej Kunz	Coinbase wallet	Amber Group, Jane Street Capital, Celsius Network, Nexo, Fenbushi Capital, VanEck, Gemini Frontier Fund, Alameda Research, Tribe Capital, Fabric Ventures	NA
Gnosis	Batch Settlement System	Ethereum	MetaMask, WalletConnect	Martin Koppelman, Stefan George,	NA	Kenetic, G2H2 Capital	NA

Table 3: Points of Centralization on Different Decentralized Exchange Platforms

Source: Author's own table

b. Domestic Decentralized Exchanges

Domestic decentralized exchanges are developed and deployed by Indian entities or residents. They can be regulated throughout their lifecycle, from the time of inception to deployment.⁵⁴ One way to do this is by creating a mandatory regulatory sandbox for decentralized exchanges, taking cues from regulatory “triggers” and bringing in measures as and when required.⁵⁵ The developers of decentralized protocols can apply to join the sandbox. It may be easier to implement regulation during protocol development, as regulators can exert the greatest amount of influence at this stage.⁵⁶

Another means of regulating these exchanges is similar to the paths taken by Thailand and Malaysia, which is to bring the entity launching the decentralized exchange (whether to operate it as a business or directly profit from it) under the same regime that governs centralized exchanges.

However, regulation generally has a direct bearing on innovation, and regulators must be mindful of a middle ground between the two. Regulators are encouraged to engage with industry stakeholders for a deeper dive into the regulatory considerations outlined here.

c. Consumer Protection

The most important component of decentralized exchange regulation is safeguarding consumer interest. It is the users of decentralized exchanges who currently undertake all the risk inherent in the platform, with no mechanism of redress.

THE MOST IMPORTANT COMPONENT OF DECENTRALIZED EXCHANGE REGULATION IS SAFEGUARDING CONSUMER INTEREST

The most important component of decentralized exchange regulation is safeguarding consumer interest. It is the users of decentralized exchanges who currently undertake all the risk inherent in the platform, with no mechanism of redress. The recommendations below come with the caveat that there is no legislative silver bullet for investor protection – which has multiple moving parts.

i. Require decentralized exchanges to build investor capacity through awareness and education campaigns and conscientious advertising. This can resemble the investor education and protection fund set up by the Ministry of Corporate Affairs, which relies on unclaimed funds to support the effort. Decentralized exchanges could carve out a section of their earnings for the purpose.

ii. Focus on disclosure and transparency requirements. These can include publishing a whitepaper for each new asset made available in the liquidity pool, and information on the functioning of governance tokens. This would resemble the requirement in the proposed Markets in Crypto Assets regulation in the European Union where crypto-asset issuers must publish their whitepapers and notify the authorities when they have done so.

iii. Policymakers/Regulators should work with decentralized exchanges. They must aim to establish how to

create consumer grievance redressal mechanisms.

iv. Insurance: Besides traditional investor-protection principles of investment law, as indicated above, the authorities must consider framing robust provisions for customer insurance to insulate consumers from the myriad financial risks accompanying engagement with

decentralized exchanges. While some argue that DeFi insurance is an effective mitigant in such scenarios, experts contend that decentralized platforms are inadequately able at present to account for risk. Regulators should consult with industry on more optimal avenues for insurance protections for users on decentralized exchanges.

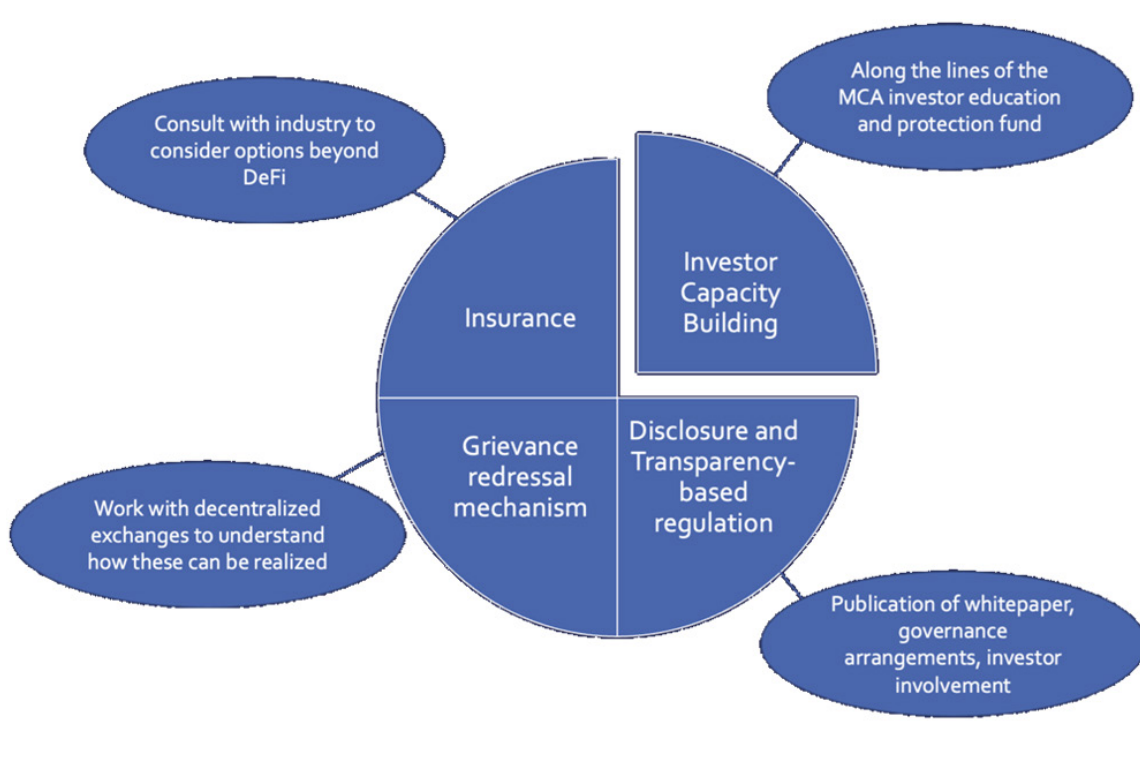


Figure 5: Regulatory Considerations for Consumer Protection in DeFi

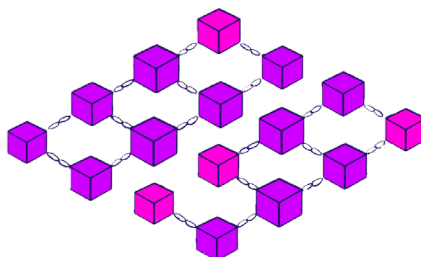
Source: Author's own diagram

H. CONCLUSION

This paper seeks to highlight considerations that Indian decision-makers must take into account when looking at how to regulate decentralized exchanges and other forms of DeFi. It is likely that 2022 will bring concrete developments in legislative action in other jurisdictions in this area. Industry also indicates that the recent scrutiny and pressure from regulators will prompt decentralized exchanges to take active measures for greater regulatory compliance. An added incentive for these platforms to begin complying with legal frameworks is institutional investment – which is unlikely to happen unless basic regulatory requirements are met.

India must move to regulate centralized crypto-asset intermediaries, so there are levers in place to begin regulating decentralized exchanges. In terms of a starting point for regulating decentralized exchanges, the Wyoming incorporation model is a good way to ensure that these businesses have real-world accountability. For concerns that go beyond what has been addressed in this paper, India must actively consult with the proprietors of decentralized exchanges to identify pathways to regulation in such areas.

IN TERMS OF A STARTING POINT FOR REGULATING DECENTRALIZED EXCHANGES, THE WYOMING INCORPORATION MODEL IS A GOOD WAY TO ENSURE THAT THESE BUSINESSES HAVE REAL-WORLD ACCOUNTABILITY



ENDNOTES

- 1 Regulability is a term coined by Lessig in the context of the ability of governments to regulate activity in cyberspace, or put another way, how amenable an element of cyberspace is to regulation. See https://cyber.harvard.edu/works/lessig/laws_cyberspace.pdf
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