GDF GBBC DIGITAL FINANCE

2022 | GBBC Digital Finance Report

DeFi: Moving the Dialogue on Standards and Regulation Forward

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Foreword

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GBBC Digital Finance (GDF) began in 2017 prior to the initial coin offering (ICO) crash. In the absence of regulatory developments, responsible market leaders convened to publish the GDF Taxonomy and the GDF Code of Conduct, establishing a global standard for best practices for firms across the crypto and digital asset sector.

The current global market downturn is an opportunity to consider how to establish further standards across the decentralized finance (DeFi) ecosystem. These standards will further embed trust and predictability into the market —a benefit to investors, regulators, service providers, and consumers of DeFi products and services.

Having been a priority topic for both the industry and regulators for the past two years (according to GDF industry and regulator surveys), DeFi and risk mitigation is a complex area, whether considering top-down regulatory frameworks or self-regulation. At this stage, there are few comprehensive regulatory solutions.

The topic requires further industry engagement to maximize the great benefits and efficiencies of DeFi, which are manifest in this epoch of digital innovation in the financial services sector. The objective here is to harvest the opportunity and its benefits and mitigate the market and regulatory risks, similar to the proposed approach to setting sustainability standards by the newly created IISB.

As the first half of 2022 has shown, DeFi risks can be significant in declining markets, as it is in traditional financial markets when excessive leverage is extended and algorithmic finance deployed. These risks will continue to grow when perpetrated by bad actors, if not mitigated by effective policy and proportional regulations.

Concerns over regulatory approaches to DeFi form part of a wider conversation among policymakers regarding the increasingly pervasive role of technology in highly regulated industries, and the discussion to mitigate risks to the public by directly regulating technology providers. As part of this wider conversation, we continually return to the borderless nature of digital innovation, which is reflected, if not amplified, in the global crypto and digital assets sector.

With this in mind, GDF will continue to promote robust and positive engagement between industry, regulators, and policymakers by fulfilling its role as a stewardship platform for the development of standards and solutions, and fostering cross-border industry and agency collaboration on global frameworks, standards, and codes of conduct.

Following the 2018 crypto winter, industry and regulators were arguably not yet ready to undertake a more collaborative approach to identifying risks in the crypto and digital assets sector—though the industry recognizes the solid accomplishments across various jurisdictional regulatory sandbox intakes, the FATF industry Contact Group, and the GDF Regulator (Only) Forum.

Industry and agencies should now take this opportunity to work together on the innovative digital solutions that have the potential to define global regulatory approaches in this fast moving era of digitalization, to better ensure investor trust, fair, orderly, and transparent markets, and the prevention of illicit activity.

This report is the product of substantial work throughout 2021-2022, including the contributions of many industry leaders who took part in the GDF DeFi Knowledge Series, presented exclusively to the GDF Regulator (Only) Forum.

We are indebted to our co-chairs, Steven Becker, John Salmon, and Justin Wright, as well as all of our working group contributors, with a special thanks to Richard Crook, Nicolas Decouterre, and GDF board member and regulatory advisor Greg Medcraft.

An additional special thanks to Anastasia Kinsky, the GDF report editor.

Introduction & Executive Summary

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Decentralized finance (DeFi) has attracted much attention of late, with regulators outlining their concerns and industry keen to communicate the full benefits and opportunities. Digital innovation is becoming increasingly important to financial services, and regulation is vital to its development. There is a clear need to harmonize regulatory and policy approaches on a global scale.

As a financial market developing various services, the DeFi industry must be prepared and equipped to answer to agencies who have mandates to engender investor trust and confidence, ensure fair, orderly, and transparent markets, and prevent illicit activity. Working with the technology and developing appropriate solutions to these mandates will require commitment and engagement between both industry and regulators.

GDF supports the development of proportional regulation that fits the activity in question. Regulators need to balance achieving their regulatory mandates with the appropriateness of regulatory intervention. Embracing digital solutions will be central for agencies to ensure that innovation is developed responsibly.

The first section of the report provides an overview of the DeFi market, noting that:

1. **Exploring the constituents of the DeFi ecosystem helps us to understand where and why the activity is different to other financial sectors.** In particular, the report looks at the lifecycle of a DeFi project; the functions of decentralized autonomous organizations (DAO), smart contracts, and stablecoins; the mechanisms of liquidity development, lending, and trading; settlement processes, and data provenance.

2. **This innovation is currently mostly used by institutional and professional participants,** rather than retail. While there are opportunities presented by DeFi that may lead to impactful innovation, the current clear benefits are for small-medium enterprises (SME) and institutional finance.

3. **The unanswered questions relate to the degrees of decentralization**; legal identity of entities; the issuance and maintenance of stablecoins, smart contracts, and code auditing; and the provenance of data, among others. In all cases, we must consider the difference between the developer and the operator of the code, and ensure that the regulation developed for the DeFi ecosystem is fit for Web 3.

The second section summarizes the risks identified by regulatory and policy agencies, with the view that:

1. **Regulatory agencies are consistent in their concerns for the market, including:**
    - Investor trust and confidence, related to disclosures, the duty of care in outlining risks to the user, and inappropriate investor promotion,
    - Market integrity and stability concerns,

including price volatility, conflicts of interest, slippage and arbitrage risks, and the use of highly leveraged strategies,

- Illicit activity risks, related to the absence of Know Your Customer (KYC) processes.

2. **This discussion comes alongside pivotal developments of policy and legislation**: discussions in the United States (US) Treasury for a global cryptoassets framework; the consideration of the regulation of stablecoins in many global jurisdictions; the continuing implementation of the Financial Action Task Force's (FATF) Recommendation 16, along with jurisdictional implementations of money laundering directives; the European Union's (EU) implementation of the Markets in Crypto Assets (MiCA) Regulation following provisional agreement, and numerous other jurisdictional regulatory considerations for cryptoassets. Expected oncoming regulation relates mostly to components of the crypto assets industry — which may well impact the DeFi market — rather than DeFi per se.
3. **Many of the questions raised in this report are specific to finance. Others are part of a wider, ongoing conversation about the impact of digitalization** and algorithmically-led decision making on safety measures and market risks. This applies to financial services as it does for digitalization in automotive industries or healthcare. Many agencies have been considering the increasingly pervasive role of technology in critical industries and the need to mitigate risks to the public by directly regulating technology.

In the third section, GDF proposes the next steps in building risk mitigation processes into the DeFi ecosystem:

Track 1: Short-Term Industry Transition
Industry Standards

In the absence of regulation specific to DeFi, the industry must coordinate to establish governance and investor protection standards, as well as industry-led monitoring, to demonstrate that it can operate to high standards of trust and predictability.

This can be more rapidly expedited through analysis of standards for wholesale markets and adopting existing standards and principles to connect the dots to emerging policy and regulatory frameworks.

Track 2 Medium to Long-Term:
A Co-Regulatory Model

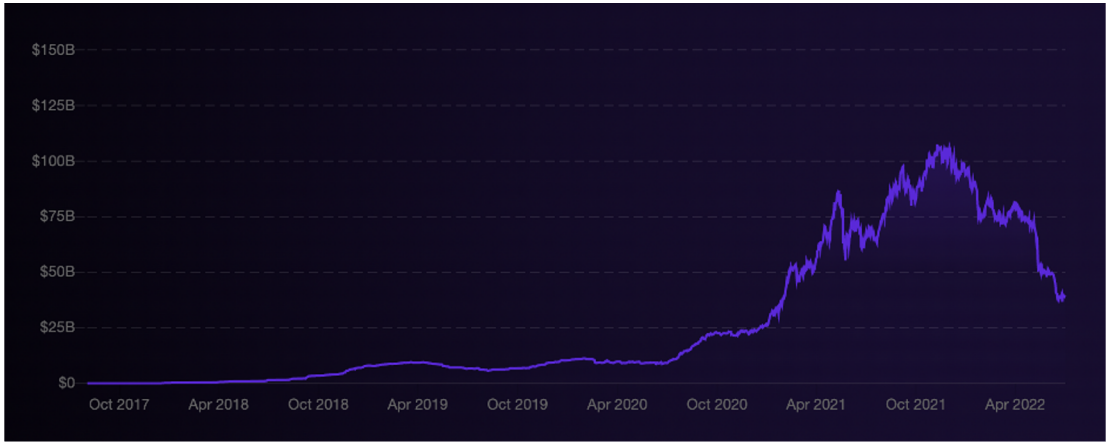
Industry and agencies must collaborate in a co-regulatory model to carry out the process of risk identification across the ecosystem in a shared engagement platform. This will accelerate the development of proportional and balanced regulation that is harmonized at a global level.

In doing so, regulators have the opportunity to explore the design and operation of regulator nodes in a DAO.

This report is a call to action for both industry and regulators to better collaborate on the next steps for moving forward responsible innovation in the DeFi space, We look forward to convening all stakeholders to further develop the Track 1 and Track 2 plans and objectives.

OVERVIEW OF DEFI

Market Context



Total value locked (TVL)[1] in USD from October 2017-June 2022. Source: DeFi Pulse

DeFi has seen significant development over the past few years, both from the perspective of market value and use of DAOs, the main structure under which DeFi projects are run. One of the earliest DAOs was set up in April 2016, called "The DAO". Having experienced a popular crowdfunding raising more than expected, The DAO experienced a hack which took Ether collected from the sale of its tokens.

Some attempted to split The DAO to prevent more Ether from being taken, but they were not able to get the votes needed from the 11,000 participants in the short amount of time available. The price of Ether dropped from USD $20 to under USD $13.

Among the many learnings from the hack was that although a decentralized structure in which the smart contract

1 Total value locked is the sum of all assets deposited in DeFi protocols earning rewards, interest, new coins and tokens, fixed income, etc. A drop in TVL is therefore not necessarily a reflection of assets being removed from DeFi markets, but rather a result of declining asset value.

is the only arbiter of the deal represented is an attractive idea, putting this into practice requires sound agreements around levels of code security, verification, and operational audits.

DAOs that have developed in the period since, particularly between 2018 up until now, may have included contingencies to limit risks such as hacks or code failure. However, there were questions raised by lawyers even before The DAO hack occurred that have not yet been settled today: did the tokens issued by The DAO violate securities laws? Would the creators be liable for any problems that developed, and were the token holders of The DAO accepting responsibilities they were not aware of? What consensus is needed surrounding code auditing and code security?

The total value locked (TVL) of the market saw steady growth until late 2020, rising to USD $86.638 billion in March 2021, and a high of USD $106.156 billion in December 2021. The TVL has broadly been in decline throughout 2022, with significant fallouts from April 2022. In line with other macroeconomic trends, as a risk asset, cryptoassets have lately experienced a sell-off. The drop in TVL comes at a time when there is a drop in collateral value and many players in the market are experiencing governance and stability issues. The interconnectedness of the DeFi ecosystem is exposed. ■

Constituents

DeFi is a set of composable financial tools that are trust-minimized, transparent, and accessible to anybody on the internet. In order to understand what the opportunities and implications are, we must first understand the constituents that bring us to the point of consumption.

The lifecycle of a DeFi protocol

At the beginning of a DeFi project's lifecycle, a centralized group or entity deploys a protocol. This protocol may have been developed by the team that deployed it, or it may have been developed by a separate software engineer. It is often deployed under an open-source software license. Once the protocol is launched, control and maintenance of the protocol source code can be handed over to a separate group, such as a foundation or a DAO.

As the management of a protocol moves from fully centralized towards decentralization, governance tokens are issued to participants of a DAO, giving them the ability to vote on proposals related to the management of the code. The administrative keys that control the smart contracts of the protocol can be fully handed over to the DAO participants. In other cases, creators, leaders, and builders may retain control of the keys and therefore a degree of control of the protocol. Likewise, governance tokens can also be issued so that a particular group retains a level of control through a larger number of governance tokens and therefore a larger percentage of the vote. These steps can be transitory, and ultimately lead toward handing over control and decentralizing the operation of the DeFi project.

DeFi projects may initially be funded by venture capital firms, who may either get equity or tokens in return, and/or access to buying governance tokens if they are issued. Maintenance and development of the code can also be funded through a 'treasury' (often in the protocol's own token), which acts as a reserve for the DAO.

Decentralized autonomous organizations

DAOs seek to automate operation of the protocol according to a decentralized ledger technology (DLT)-based form of governance. Participants vote on decisions relating to code application and maintenance. In theory, DAO decisions are decentralized because voting rights are allocated to the community of participants, and transparent because all operation of the protocol is recorded on a publicly accessible ledger.

In practice, the extent of transparency of information and voting structures vary across different projects. DAOs vary widely in terms of decentralized governance, from structures in which the community can propose topics and vote for those to more advanced structures in which the community can vote for protocol fees and protocol patches.

Governance frameworks change according to how voting proposals are put forward; how voting is carried out; the concentration of votes through governance token holders, and how a voting result is implemented. These procedures can include differing levels of centralization.

Some have argued that DAOs are not an entirely new concept, but rather reflect structures similar to cooperatives or unincorporated associations. Others have

shown that the activity appears to be similar to collective investment schemes. Some have offered overviews of what legal wrappers can be applied to DAOs. However, these have stopped short of analyzing fiduciary duty in the context of automation.

Strong governance is needed for DAOs to be successful. One example of strong governance for a distributed open source project for consideration is the Linux Foundation.

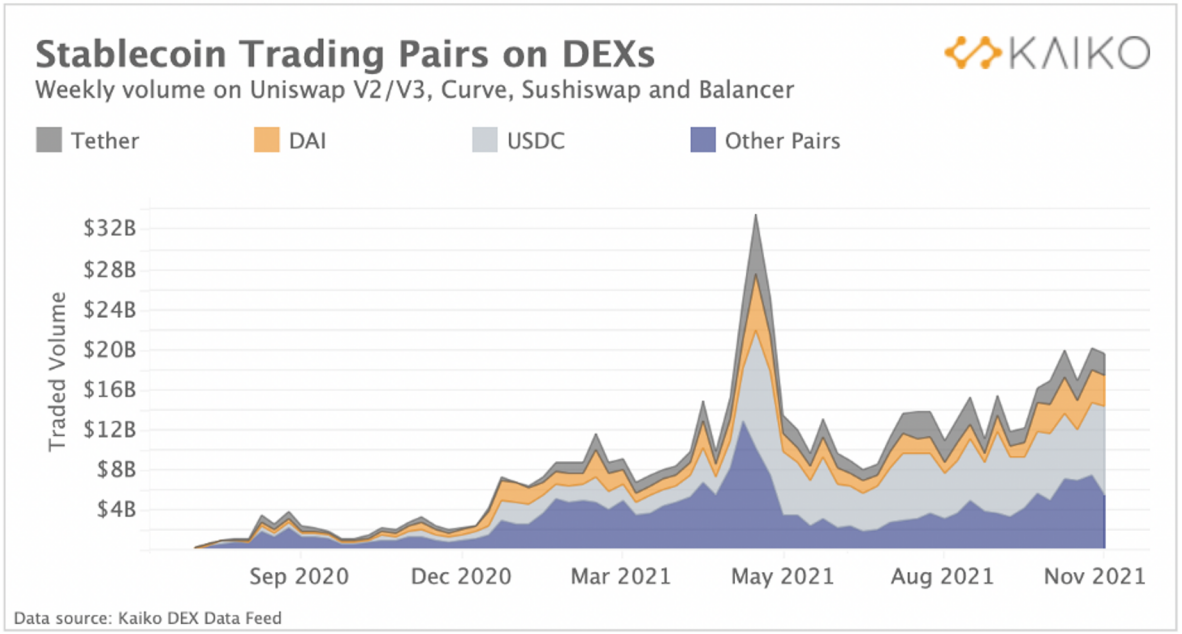
Smart Contracts

A smart contract is an immutable computer program that runs deterministically on a distributed ledger database. The smart contract provides the functionality of a DeFi protocol, whether lending, borrowing, or otherwise. The terms of agreement are outlined in the code itself. Projects often require multiple smart contracts to form a protocol.

A smart contract receives information or executes an action when its code is triggered, either by a person, a bot, or another smart contract. For example, a smart contract would execute a trade when a person provides the appropriate information and triggers its trading functionality, similar to the way that algorithmic or high frequency trading occurs today.

The contracts have a unique address on the blockchain that they are deployed on. All transactions involving that smart contract will reference this address. The smart contracts can be viewed and tested by anyone with the technical capabilities to inspect them on chain.

The open-source nature of smart contracts means that improvements to the system can be suggested in DAO forums, meaning that there are low barriers for participants with incentives to keep the protocol optimized.



The chart displays total traded volume on the top four Ethereum DEXs, broken apart by stablecoin. More than 50% of all trades involve USDC, a centralized stablecoin. Source: Kaiko

Stablecoins

Not all stablecoins are issued by decentralized entities, but stablecoins are structurally crucial to DeFi markets, which cannot support fiat currencies. They are therefore important to understanding the DeFi ecosystem.

Not only do stablecoins facilitate the transfer of value between centralized finance (CeFi) and DeFi, they are also used as deposits and collateral to facilitate activities such as borrowing, liquidity mining, or yield farming.

Stablecoins can be issued by centralized entities, or have a more decentralized structure. DAI, for example, is issued by MakerDAO, a decentralized entity, while USDC is issued by Circle, a centralized company. Stablecoins vary in their mechanisms for seeking to maintain stability either from the assets that back them (fiat, crypto, real-world assets etc.), an algorithm, or a hybrid of assets and algorithms.

Today, the top three stablecoins on decentralized exchanges are used to facilitate ~75% of total trade volume.

Liquidity Development

Collateralization

Cryptoassets can be used as collateral for a number of activities, but most importantly to generate stablecoins. Most decentralized stablecoin protocols require an over collateralization of assets against the stablecoin issued to keep the system solvent and protected with an extra buffer.

The collateral can be transferred to a pool of like-assets or to a specific ring-fenced vault depending on the risk management and utility of the protocol. The difference is important as the ring-fenced feature enables composability.

More traditionally, cryptoassets can be used as collateral against loans, which is covered extensively below.

Lending and Borrowing

Understanding the mechanisms of lending in DeFi is important because they explain how projects currently look to mitigate credit risk without the use of credit checks.

In DeFi lending, lenders deposit assets (such as stablecoins, ethereum and wrapped bitcoin) into a smart contract known as a lending pool. This is the next contributing factor in liquidity development for DeFi is the pooling of assets to be made available for borrowing. DeFi participants with longer term horizons will transfer their assets into pools to loan out their assets in order to generate extra yield. Those with generally shorter horizons will transfer collateral to a different pool in order to borrow a target asset.

In return for depositing assets, the depositor receives a liquidity provider token (LP token) which represents the depositor's pro rata interest in the lending pool and can be redeemed for the original deposit plus accrued interest.

Interest rates functions are set either by the protocol or by the protocol's project team and are programmed to rise and fall with changes in utilization rates in order to attract deposits and discourage borrowing when necessary.

Borrowers can use these pooled assets for loans when they have also deposited collateral. In the absence of knowing the customer, where traditional finance would use credit checks to secure a loan and reduce counterparty risk, DeFi loans rely on other cryptoassets being used as collateral. Most, if not all, DeFi lending projects are over-collateralized: for every dollar borrowed, there is more than one dollar held in the lending pool, similar to margin lending in traditional finance.

The risk of lending is then mitigated through **loan-to-value ratios**; **liquidation ratios**; **collateral ratios**; and **liquidation bonuses**.

The **loan-to-value** ratio defines the size of the loan obtained by a borrower based on the amount of deposited collateral. If the **liquidation ratio** reaches the maximum **loan-to-value ratio**, the liquidation process starts.

The **collateral-to-borrow** ratio is the inverse of the **loan-to-value**, and determines how much collateral is required to take out a loan. If this falls below the **liquidation ratio** (now in relation to the collateral ratio), the borrower is considered in default and the liquidation process is started.

Liquidation bonuses and penalties refers to how the protocol either rewards a 'liquidator' when a borrower has defaulted or penalizes the borrower for defaulting, or possibly both.

There are other forms of loans, such as flash loans, or perpetual zero-interest loans. These will rely on features of blockchain transactions or structuring to compensate for the need for credit checks and therefore carry a different risk profile. Nevertheless, these protocols demonstrate the breadth of innovation developing in new mechanisms for lending.

Trading

Trading venues are another tool for liquidity development. Decentralized trading protocols are generally referred to as decentralized exchanges (DEXs). They are mostly constructed as an order-book exchange or as an automated market maker (AMM). AMMs are a derivation of constant function market makers (CFMM) that exist in the traditional financial world.

In AMMs, depositors (often known as liquidity providers, as they are in lending protocols) add their assets to a liquidity pool, and receive a LP Token in return. This can be redeemed at any point for their share of the pool plus accrued trading fees.

Liquidity pools in AMMs are generally made up of two assets, with the aggregate equivalent value for each asset. In an ETH-DAI pool, the value of all the ETH is equivalent to the value of all DAI in the pool. Consequently, If you take the number of DAI tokens in the pool and divide it by the number of ETH tokens, you get the price of ETH in DAI terms.

There are AMMs that do not require the transfer of two assets: you can transfer one token and the AMM will sell one part of the token for the other and deposit the two

tokens into the pool. There are also AMMs that allow the use of more than two assets in a liquidity pool.

Broadly speaking, in a two-asset liquidity pool, the exchange rate is determined automatically by a formula based on the ratio of assets held by the pool. The amount of the pool's liquidity taken determines the degree to which the asset price moves. However, a user that takes up the liquidity will pay a fee for that utility. A fee accrues to liquidity providers on a prorated basis using the liquidity provider tokens.

Importantly, as opposed to traditional finance and centralized crypto exchanges, the trading protocol does not hold or maintain control of the user's assets. Instead, it acts as an information relayer by setting the price and enabling peer-to-peer trading.

The development of AMMs has two significant impacts on the market: first, they offer continuous price discovery, moving away from bilateral and opaque processes and towards clarity and efficiency. In particular this is important for private markets largely reliant on over-the-counter (OTC) processing.

Secondly, AMMs move activities in trading away from distinct roles of buying and selling and accelerate the role of market makers, or 'liquidity providers'. This therefore changes how we look at market activities.

Settlement process

DeFi provides atomic settlement, in which all transactions

are processed instantaneously. This removes the role of a clearing agency. An instantaneous process is not necessarily the same as instantaneous finality – this relies on the counterparties in a transaction.

The settlement in DeFi usually occurs and is recorded on the relevant blockchain. Some popular blockchains, such as Ethereum, can become congested, which pushes up the fees for running the transactions. Scaling solutions have been developed to deal with these challenges, bringing the transaction off-chain but keeping the settlement on-chain, meaning that the security of the activity on blockchain is kept intact. The public blockchain then acts as the data store, ensuring transactions are effected appropriately and avoiding nefarious attacks.

Token Emission and Distribution

The function and utility of tokens in DeFi can be designed to incentivize particular behaviors, with the hopes of developing the desired sustainable community participation in the protocol. This is often referred to as token economics.

For example, the design of a token in a governance contract could be rewarded with more protocol tokens, but it requires the participant to hold the position of being able to contribute to the protocol for a specific length of time.

Yield farming looks to incentivize liquidity provision of the token. The LP tokens could be created by providing protocol token liquidity to a trading or lending pool. In turn, staking the LP token in the protocol would earn protocol tokens.

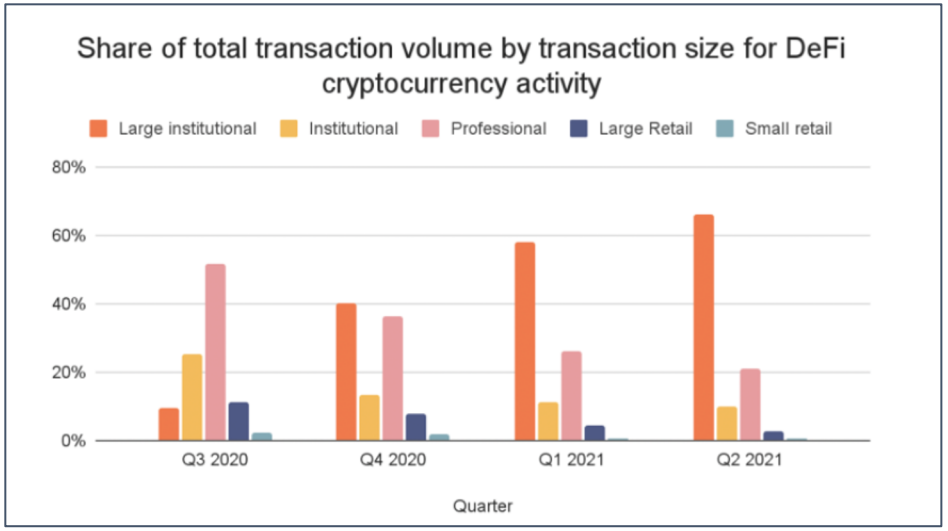
Given a reasonably fair launch of a DeFi protocol where the token allocation is decided, the continued distribution of tokens is used to focus the optimal amount of accretive value for the protocol.

Oracles and Data Provenance

For DeFi to function securely, protocols must have the correct information to initiate the appropriate smart contract activity. For most DeFi protocols, oracles are used to supply smart contracts with information. This information can come from on-chain activity as well as off-chain. This can include the current value of assets held as collateral. Not all protocols rely on oracles, some have other mechanisms for gathering price data. However, the role oracles play is not dissimilar to approved service providers to exchanges in traditional markets, many of whom are regulated.

The provenance of this data is crucial to DeFi protocols' functions. The provision of information by an oracle must be certain and timely to ensure that correct information on market conditions is delivered to the smart contract. Delays, malicious behavior by centralized oracle providers, coding errors, or attacks could trigger activity based on faulty information, whether intended or not. Consequently, the oracle's security is as important as the security of the protocol itself. It is vital to understand the level of decentralization and design of oracles together with how they source, filter, aggregate and deploy their data to smart contracts.

Opportunities and Barriers



Source: Chainalysis

The industry has outlined many opportunities of DeFi in various reports. This has come hand in hand with considerable growth in the market. There have been claims or predictions as to the full impact of decentralized algorithmic finance that may not yet have been realized.

Data gathered by market researchers firm Chainalysis shows that the majority of web traffic to DeFi protocols comes from North America, followed by western Europe.

Their research also showed that the average transaction size in DeFi implies that its current use is either with institutions or on a professional scale, as opposed to retail activity.

The full future impact of DeFi is not within scope of this report. Whether or not DeFi delivers on its promises of accessible, democratized finance, there are some important use cases worth highlighting:

1. Benefits to SMEs

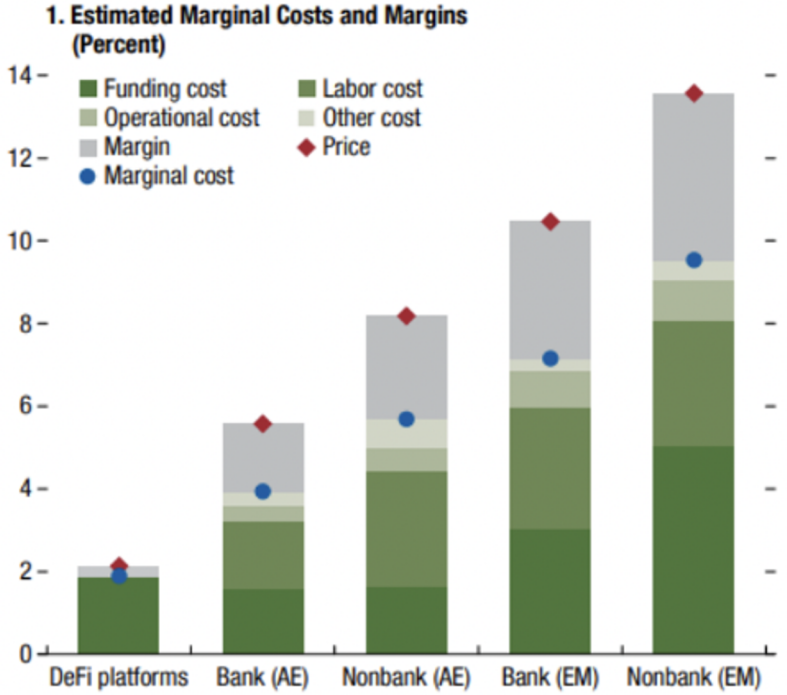
The liquidity enabled in the market is a benefit for funding SMEs. Where traditional banking approaches cannot meet the needs of SMEs, tokenization may be more suitable and efficient to implement. Through DeFi lending, SMEs can access the value of a global crypto market. Considering the current macro economic context, these new avenues of funding are potentially a great benefit to SMEs.

1. Institutional-Grade DeFi Solutions

Market players are developing institutional-grade DeFi products. The open-source code quality, atomic settlement, pooled capital, and a network of economic incentives for participation make DeFi attractive to traditional financial institutions, many of whom have shown increasing interest in decentralized financial market infrastructure and digital asset classes in the period between 2020-2022. The DeFi market has responded by developing solutions to meet their compliance requirements.

Figure 3.12. Efficiency and Risks of Decentralized Finance

DeFi has the lowest marginal costs due to the absence of labor and operational costs.



Source: IMF

The efficiencies of DeFi bring together a global network of capital providers. This makes it an impactful innovation in the development of digital value transfer and the future of banking.

That said, before the full opportunities of DeFi are realized, certain aspects of DeFi will require robust risk analysis and mitigation:

- The industry will need to address the regulatory touchpoints in DeFi projects in order to understand the responsible parties

- Decentralized algorithmic finance still requires code to be operated, and this will need to be undertaken by entities that can be held to account with the adequate resources to fulfill their obligations

- The code deployed will need to meet the required standards for security and stability

- Where stablecoins represent the foundations of most transactions, users will need reasonable assurance that their price is indeed stable

- The data provided to trigger these transactions must have verifiable provenance, integrity, and security

- Sustainable liquidity will require strong governance principles to avoid a liquidity squeeze

An overarching challenge which the industry will need to address is in defining the relevant DeFi activities which would benefit from regulatory oversight, and who to hold

accountable for such activities. This is difficult when the financial activity is often performed by software in the form of smart contracts rather than a legal entity, such as a traditional lender or an exchange intermediary.

Important questions therefore arise as to how governance mechanisms work in DeFi projects, and whether it is possible to impute responsibility to a set of individuals or a legal entity which has sufficient influence over the direction of the DeFi activity. In some cases, developers often have some form of control over the operation of the protocol. This may be through the use of administrative keys, or any ability to discontinue transactions (e.g., in case of a hack or malfunction).

Additionally, it may also be helpful to consider who the entities or individuals profiting from the provision of DeFi services are—for instance, via protocol fees or through the allocation of initial ownership of native tokens to insiders such as the core developer team, venture capitalists, or a corporate entity associated to the project.

Crucially, a balanced approach must be adopted. Industry will need to take care to distinguish between those who purely develop the relevant code underpinning a DeFi activity, and those who operate and/or profit from it.

DeFi is often developed under open-source software licenses, which distances the developer from the operator of code. This removes the responsibility of the activities carried out using the code from the developer. Ultimately, it is the operator of the developed code who must bear responsibility and provide for the adequate resources to indemnify investors when errors in the code result in material losses. Moving away from this principle to regulate the software developer would be a change in direction that would require careful consideration.

KEY RISKS IDENTIFIED BY AGENCIES

Summary of Risks Identified

Many regulatory and policy maker agencies have published extensive reports that outline the risks and considerations for approaches to mitigating risk in DeFi. The aim of the following section is to summarize and report the risks that the agencies highlighted, rather than to analyze, synthesize, or propose counterarguments. The proposed next steps forward for the industry and regulators will be the topic of Section 3: Considerations for Moving the DeFi Industry Regulatory Dialogue Forward.

Investor Trust and Confidence

Investor trust and confidence issues, as they relate to DeFi, are not dissimilar to the broader issues that are raised for stock trading and cryptocurrency platforms that offer leverage and derivative trading features, especially for retail consumers. Many issues stem around the provider's duty of care when it comes to clarifying the underlying risks a product or service pose to investors and consumers, including that they risk losing some or all their funds. The associated risks around inappropriate advertising and the gamification of finance are also on the agenda of policymakers and regulators.

Investor eligibility to trade or invest in DeFi is another key issue that often arises with regulators, especially in jurisdictions where regulation requires investors to be qualified or accredited to trade complex products or funds, or where prohibitions are in place preventing retail investors to trade bitcoin derivative products. Much of the focus here is on how well a platform knows its user, as well as the user's experience in the DeFi ecosystem, the nature of the technology as it relates to the role the customer is playing, and the means to trade and invest in the DeFi ecosystem.

The role the investor plays in the ecosystem — whether as a node operator or governance token holder; a lender; or borrower — would require that the DeFi platform conducts the Know Your Customer (KYC) processes, ensures that investor education resources are made available, and that the investor targeting is appropriate. Disclosures are the investors' guide to the risks of participation associated with the role undertaken, and ultimately, which party is responsible and financially underwrites the cost of failure concerning:

- **Governance**: token asset type (e.g. utility, security, other); administration keys; collateral and liquidation; cost of borrowing/earnings,
- **Lenders**: material and beneficial asset ownership; material disclosures; and custody,
- **Borrowers**: investor segment; knowledge and experience; financial means; material disclosures.

Fair, Orderly, and Transparent Markets

From a macro perspective, the strengths and benefits of DeFi and its associated ecosystem components such as "decentralized" participation in a networked mutual governance model; the use of algorithms in governance; AMMs; smart contracts; and oracles are a true innovation. The composability of interchangeable and interoperable components in the DeFi technology ecosystem help to lay the foundations for the future of finance across traditional financial services, and especially in capital markets.

From the policymaker's and regulator's perspective, however, this raft of innovative technology begs many questions, particularly from a market integrity and stability perspective, as do the benefits claimed by users of the DeFi ecosystem.

A number of agency reports have raised issues about the extent to which the market is driven by a fear of missing out and cite issues of conflicts of interest and the alignment of incentives for participants that may relate to failures in the protocol. This is especially evident when the price of the underlying cryptocurrency asset is in volatile decline, as in the current market downturn, and ultimate issues around solvency arise.

Policymakers and regulators are especially attuned to declining market conditions, high market volatility and the impact on prices, and over and under-collateralization following the Great Financial Crisis in 2008, as well as the need to identify the lender of last resort is.

Whilst products like flash loans are not well understood in the regulatory community, arbitrage opportunities and slippage place an additional layer of expectations on the scrutiny of the performance of protocols, especially in the circumstances of highly volatile and declining markets.

Issues around leverage, highly leveraged strategies, and the use of derivatives in leveraged strategies are consistent in agency reports on DeFi risks. The use of stablecoins in DeFi, beyond fiat on- and off-ramps, is often related to issues raised around leverage. These issues have been amplified following the Terra Luna algorithmic stablecoin crash and Celsius bankruptcy.

Putting issues of procyclicality and the concentration risks aside, policymakers and regulators are consistent in the issues they raise around the nature of trading and pricing misinformation as it relates to market front-running, collateralization, mispricing, and arbitrage. The role of information providers and oracles are often cited as key stakeholders in the DeFi ecosystem, and the level and

nature of the information timeliness, accuracy, and standards is frequently raised.

Prevention of Illicit Activities

The elimination of "bearer" instruments in transactions through KYC practices is seen to greatly aide the identification of entities and transaction flows that contribute to money laundering, terrorism finance, and sanction evasion. The lack of KYC practices throughout DeFi have raised concerns with regulators over the prevention of illicit activity. In particular, agencies highlight unhosted wallets, which allow users to be the sole custodians of their assets. Agencies also note that malicious actors are creative and use various functions to hide their identity.

Industry has communicated the known risks of illicit activity in DeFi and noted that the risks are greater in the traditional financial system. That said, this portrays the known activity today, rather than the potential risks as the ecosystem grows.

Expected Regulation for Crypto and Digital Assets

In this era of rising inflation, falling stock markets, and record energy prices, pause for consideration needs to be at the top of the agenda for industry leaders and policy makers alike. Much needs to be done in traditional finance to ensure that markets remain stable, threats to greater inflation are controlled, and purchasing power for staples such as food, energy, transport, and accommodation are protected. These factors will influence the priorities of policymakers and regulators at an increasing pace.

In late 2021, the Bank of International Settlements (BIS) called for greater collaboration on a global regulatory framework for cryptoassets, a call which GDF supports. To a large extent, GDF was created to help convene and execute this same goal. Digital is borderless and global, as are many of the crypto and digital assets market players require a coordinated global approach to avoid regulatory arbitrage.

2022 has seen a sharp rise in policymakers' and regulators' interest in cryptocurrency, digital assets, and stablecoins. As part of the US President's Executive Order on Ensuring the Responsible Development of Digital Assets, Treasury announced in July 2022 the development of a Framework for International Engagement on Digital Assets. The framework intends to promote US values as they relate to investor trust and confidence while appreciating the cross border nature of financial services, and the importance of managing uneven regulation that leads to arbitrage and threatens the financial system.

The FATF Recommendation 16 (also known as the Travel Rule) is in the process of being implemented across global jurisdictions at varying speeds. The Travel Rule requires virtual asset service providers (VASP) to conduct KYC or anti-money laundering (AML) checks and share data

between all VASP transactions above the USD $1,000 threshold. The requirements for DeFi ecosystems are less clear as by most current agency definitions, DeFi protocols and their developers are not considered to be the entities carrying out the financial activity, and therefore are not classified as VASPs. Nevertheless, the latest FATF guidance implies that developers may be considered to be so.

In the EU, the development of MiCA Regulation started in 2020. On 30th June 2022, The European Commission, Council, and Parliament reached a political agreement on MiCA, which is expected to enter into force in its entirety mid 2024. The agreement outlines the requirements for issuers and service providers of cryptoassets.

DeFi is not explicitly addressed in MiCA. However, this comprehensive framework sets out the "direction of travel" for native and non-native crypto and digital assets. It will set a global precedent in relation to the treatment of issuers (including stablecoins) and service providers. Crucially, as an EU Regulation, MiCA establishes a harmonized cross-border framework for crypto and digital assets which will apply to all 27 EU Member States and will enable firms to passport between them.

Priority in the US appears to favor the regulation of stablecoins. Indications are that we will see regulation in 2022 in the US with many pundits signaling to the industry to expect regulation to focus on treating centralized stablecoin issuers as Federal Deposit Insurance Corporation (FDIC) regulated banks, as opposed to money service businesses (MSBs), though this remains to be seen and is currently the subject of great discussion amongst agencies.

Another focus of the US President's Executive Order on the Responsible Development of Digital Assets is on agency

oversight of the crypto spot and derivative markets. The Commodity Futures Trading Commission (CFTC) has been identified as the likely candidate for this mandate, though it has recently been critical of the energy consumption of public blockchains using a proof-of-work consensus mechanism. The increasing focus of the Securities Exchange Commission (SEC) on what constitutes a security and the nature of DeFi projects, how these are initiated, and the role of governance tokens is an area that will be continued to be closely monitored by industry. A taxonomy along with policy and regulatory framework would go some way to bringing greater regulatory clarity to the markets, driving greater assurance and participation.

The Australian Government Treasury has put forth a proposal to legalize DAOs, recognizing that they are an important innovation and are self-regulating and transparent and have in-built systems for governance and voting. In March 2022, Treasury issued its consultation on licensing and custody requirements for cryptoasset secondary service providers (CASSP). An important point of note is that the consultation is seeking input on whether CASSPs should be regulated under the current financial services regime, or self-regulated, referencing the GDF Custody Code of Conduct.

Equally, there are existing standards and principles that may be applied to components of DeFi. Most agencies have policies and regulations on product design, promotion, and distribution as it relates to financial products. In the area of, for example, token emissions, crypto firms falling foul of these rules and regulations will likely be held to account for their behavior. In the case of MiCA, this is a subsidiary piece of legislation which only

applies when existing EU financial services legislation does not apply.

In summary, the regulatory attention for crypto and digital assets remain strong. However, there is a growing industry consensus that in the short to medium-term, DeFi itself will not be regulated per se. Instead, we can expect components of the DeFi ecosystem, such as KYC / AML on-off ramps and centralized stablecoins, to be the subject of regulation. The regulation of these elements will have an impact on the DeFi space, and the industry is already assessing what this would mean.

The fall in TVL locked in the DeFi market reflects the current underlying volatility and sell off in the cryptocurrency and token markets today. Given the DeFi industry is currently a predominantly wholesale market, rather than for retail investors and consumers, consideration needs to be given to the priority of policy, especially one that is excessively focused on consumer and investor protections, as this is not the primary market being served.

It is worth considering which of these risks are unique to DeFi, and which are relevant to the wider discussion on the digitalization of finance, and indeed other industries. For example, although the use of social media to promote DeFi projects is an important consideration, it should be part of a wider conversation on promotional activities through social media. Personalities of considerable influence are able to have an impact on the market and promote risky assets to retail consumers using social media platforms. This is not limited to cryptoassets, and where DeFi activity pertains mostly to wholesale markets segments, this area is likely to be a lesser issue.

It is important to view these issues in the broader context of the regulation of technology. For example, legislation such as the European Commission's proposed Artificial Intelligence Act (COM/2021/206) (AI Act) places obligations on developers of AI systems to ensure that such systems are designed in line with specified requirements (relating, without limitation, to data governance, technical documentation, human oversight, security and robustness etc.), as well as to actively monitor such AI systems after being placed on the market.

Similarly, the Digital Operational Resilience Act (COM/2020/595) (DORA) primarily imposes requirements on financial entities around ICT risk management, but also brings ICT service providers which are of systemic importance to financial entities in the EU directly within the regulatory perimeter of the European supervisory authorities.

Under DORA, such providers would be subject to substantial fines for non-compliance with information requests, as well as recommendations by regulators on ICT security and quality requirements (e.g. in relation to the roll-out of patches, updates, encryption and other security measures), among others.

With this in mind, the question of decentralized governance and operation of code is part of a wider discussion on digitalization and algorithmically-led decision-making, and not solely a question for the DeFi sector to answer alone.

The International Organization of Securities Commissions' (IOSCO) report on Mechanisms Used By Trading Venues To Manage Extreme Volatility And Preserve Orderly Trading is a sound reference point for algorithmic finance. The Organisation for Economic Co-operation and Development's (OECD) Artificial Intelligence Principles lay

out a value-based set of principles that could form a foundation for any sophisticated model deploying algorithmically-led network governance, voting, and decision making.

Many of the larger global agencies are currently analyzing DeFi to better understand how to approach it. Getting the right balance between regulation and investor trust in very fast moving, cross-border, and well funded digital markets will be critical to supporting the delivery of the significant benefits digital innovation brings to all participants in the DeFi ecosystem and the wider economy.

CONSIDERATIONS FOR MOVING THE REGULATORY DIALOGUE FORWARD

Developing Appropriate Solutions: A Two Track Approach

With a greater focus on the right-sizing of policy and regulation implementation for the DeFi industry, the industry is calling for an immediate and new constructive engagement with policymakers and regulators in a process to identify and quantify the risks of the major component domains of the DeFi ecosystem that have been cited in recent agency reports:

DAOs

Legal identification of participants

Smart contracts

Automated market making

Oracles

GDF members support proportional and balanced regulation of the crypto and digital assets sector that underpins investor trust, confidence in the sector and fair, orderly and transparent markets. To help to achieve this, GDF proposes to deploy a co-regulation model, engaging regulators in the onset of a full discovery phase of policy and regulator development of the different domains of the crypto, digital assets, and blockchain sector. This would include:

- Bilateral and multilateral engagement
- Knowledge sessions and knowledge transfer
- Industry and regulator roundtables
- Regulatory sprints
- Piloting through regulator and digital sandboxes
- Whitepapers, standards, and codes of conduct
- Open public forums and consultations

To move the DeFi industry and regulatory dialogue forward, GDF proposes a two-track approach for consideration, to be immediately acted upon to collectively address benefits, risks, and issues of the DeFi ecosystem, especially as identified by recognized agencies:

Track 1 –Short-Term Transition Strategy for Industry: Industry standards and monitoring implementation.

Track 2 – Medium to Long-Term Co-Regulatory Development: DeFi policy and regulation implementation

As a next step, GDF will convene the DeFi working group, Advisory Council, and Regulator Only Forum to further review and input to the development of Track 1 and and Track 2 plans and objectives, followed by a wider industry engagement.

Track 1 – Short-Term Transition for Industry:

Industry Standards and Monitoring Implementation

The probability of regulation of DeFi in the short-term appears to be low, notwithstanding the focus of global agencies and regulators on KYC/AML/counter financing of terrorism (CFT), sanctions, and stablecoins.

This creates a short-term opportunity for industry to further demonstrate that it can convene to create standards, codes of conduct, and other self-initiated monitored outcomes, in order to demonstrate to users, investors, employees, shareholders, policymakers, and regulators that it can operate to high levels of trust and predictability. Most GDF codes and standards are developed over a period of weeks and months, and put into force in realistic timeframes that make them relevant to and usable by the industry in short durations.

The inter-VASP messaging standard (IVMS101) for the FATF Travel Rule was developed by the global crypto industry in an open forum. It was produced over 17 weeks and adopted by the industry participants all within a nine month period. This use case demonstrates how effectively the crypto and digital assets sector can come together with member-led associations to respond rapidly to emerging regulatory requirements.

Although DeFi is a new, evolving, and complex sector, the industry does not need to start at ground zero. It can use existing standards to build frameworks for DeFi, adapting where appropriate to meet the ecosystem's needs. Using the body of standards in the wholesale markets as a priority, we can better "connect the dots" to the emerging

cryptoassets regulatory landscape, and rapidly construct new standards for the DeFi industry to deliver greater support and a healthy foundation to users of the ecosystem. The objective here is to harvest the opportunities and mitigate the market and regulatory risks, similar to the proposed approach of IISB in setting new sustainability standards.

This includes further engaging industry associations, as GDF does in the case of its Financial Institutions Crypto Standards Working Group, such as the ACI Financial Market Association (ACI FMA), International Swaps and Derivatives Association (ISDA), Global Financial Markets Association (GFMA), Securities Industry and Financial Markets Association (SIFMA), Asia Securities Industry and Financial Markets Association (ASIFMA), Institute of International Finance (IFF), International Organization for Standardization (ISO), Institute of Electrical and Electronics Engineers (IEEE), etc.

In surveying and selecting the utility of the wide body of standards available the DeFi ecosystem would be doing what many sectors before it have done in the midst of innovation cycles and industry-wide change.

A sample of proposed areas that the DeFi industry should address include:

Industry Association: Standards and Codes of Conduct

- Investor trust and confidence
    - Investor education
    - Investor promotion and distribution
- Retail segment treatment: self-certification / opting in processes
- Standards for project financing and development
- DAO governance, voting, and self regulation
- Smart contracts, margin lending, collective investments
- Stablecoins and tokens
- KYC / AML / CFT
- Oracles, pricing data, and approved service providers

Industry Association: Monitoring

- Industry red flags reporting
- No fault / blame incident reporting
- KYC / AML reporting
- *RegDAO* observation and engagement
- *ComplianceDAO* piloting

As with all GDF standards and codes, the development process includes an open working group platform with rigorous peer review and a public consultation.

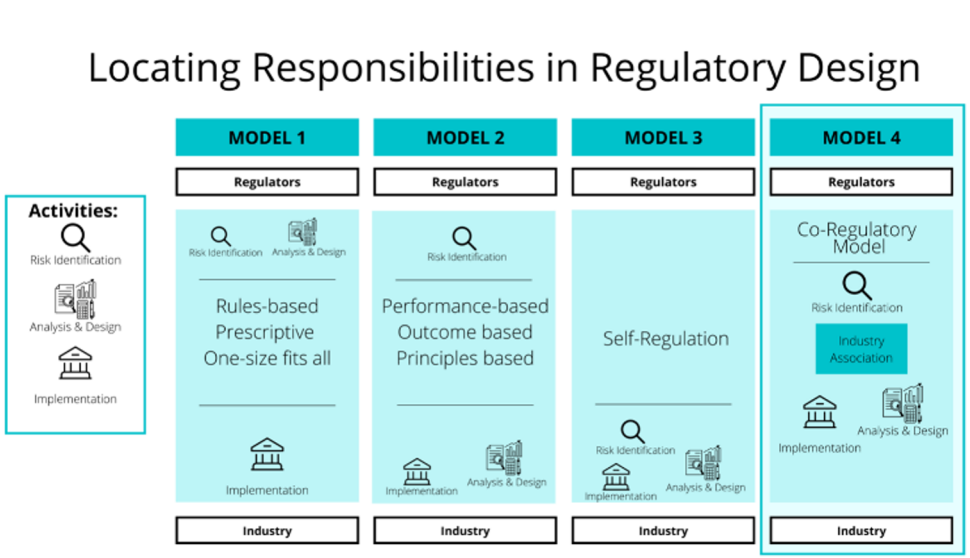
Regulatory purview is conducted by the *GDF Regulator (Only) Forum*, a quarterly engagement platform with discretionary invites going out to over 60 agencies and a regular quorum of G7+ agencies in attendance. This can be extended to a more efficient engagement, for example with IOSCO, to align to its 2022-2023 Crypto-Asset Roadmap and the DeFi workstream.

This short to medium-term work must be underpinned by a comprehensive and expedient research initiative to uncover the users and usage of DeFi:

- The size and typology of DeFi ecosystems
- The key jurisdictions that DeFi ecosystems currently operate in
- The users segments of DeFi
- The current and proposed standards in use

As a next step, GDF will propose the development of the next generation and configuration of the DeFi Working Group to outline the terms of reference and deliverables for the group and issue an industry call to action for participation to engage in this transition phase to develop global industry standards.

Track 2 – Medium to Long-Term Co-Regulatory Development: DeFi Policy and Regulation Implementation



Adapted from Malcolm Sparrow, *Fundamentals of Regulatory Design, 2020*

In Track 2, GDF will seek to engage members and the wider global community of DeFi firms in a medium to long-term engagement platform with regulatory agencies to set out and agree a structured agenda of risk identification.

As outlined in the GDF Co-Regulation Model (adopted from Malcolm Sparrow's *Fundamentals of Regulatory Design*, 2020) the discovery process of risk identification across DeFi could be conducted in a shared across industry and regulators.

A mutual discovery process of risk identification and assessment should go some way to removing the "cat and mouse" guessing game that is often employed through

regulatory consultation with industry. It seeks to deliver a more fair, orderly and transparent process for the identification and assessment of risk.

RegDAO

As well as identifying the risks, regulators and industry have a unique opportunity to take advantage of and consider algorithmic consensus models, and explore the design and operation of regulator nodes, and ultimately compliance nodes and tokens in a DAO.

This cluster of frameworks and activities is known in GDF as RegDAO, and would include legal frameworks, policies, standards, regulations, licensing, and enforcement. RegDAO would look at how these might exist as part of a DAO consensus mechanism.

GDF would seek to engage IOSCO in the first instance, as the association working across global jurisdictional securities regulators. IOSCO has done significant work to date on reporting on the identification of risk across DeFi and works closely with jurisdictional regulators on such programs. The inclusion of other organizations who have contributed significantly to the topic, such as the OECD and BIS, to engage in further input and or observation of the Track 2 engagement must be considered.

Given the nature of DeFi and the DeFi ecosystem, it would be incumbent on industry to lead with the provision of technical resources, software engineers, DAO governance specialists, and algorithmic finance specialists to ensure premium resources are available for the appropriate level of knowledge transfer to agencies. Where possible, industry must also commit resources to the development of a prototype RegDAO in the Track 2 engagement.

Track 2 would seek to cover DeFi knowledge domains such as:

- The nature of human and financial capital deployment at the inception of a DeFi project as it relates to non-native asset class definition and current jurisdictional regulations
- The convergence of open-source software licenses and financial services
- Understanding the reasonable consumer, the investor, or the wholesale counterparty using DeFi products and services
- The design and role of regulatory nodes and compliance notes for supervision, enforcement and reporting
- The role of AML/KYC/CFT regulation and the development of appropriate solutions for the prevention of illicit activity
- ·The role of smart contracts, code-based rule execution, code-based principles execution, and the governance of algorithmic finance in the context of governance oversight, quality assurance, and liability
- The role of AMMs, order pooling, liquidity pooling, credit, leverage, and settlement
- ·The role of stablecoins and other tokens and determining which stablecoins and tokens can be used in the ecosystem
- The role of oracles and the nature and quality of external data provision used in pricing, settlement and other market mechanisms

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