

An abstract graphic featuring a large dashed circle. Inside this circle, there are several overlapping shapes: a large light blue circle, a medium light blue circle, and a small light blue circle. Each of these light blue shapes contains a smaller, solid teal circle. The teal circles are positioned at different points within the dashed circle, creating a sense of movement or a path. The overall design is clean and modern, using a teal and light blue color palette.

Bringing clarity to the DeFi sector

**A cross-sector proposal for
a unified DeFi definition**

IOTA Foundation

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1. Introduction

1.1. Introduction to this paper

The primary goal of this work is to set the groundwork for a comprehensive and universally recognized definition of DeFi. In light of the rapid growth and evolution of the Web3 industry, it becomes imperative to establish a shared understanding of DeFi as a way to foster collaboration, regulatory clarity, and innovations in this borderless financial ecosystem.

The purpose of this paper is to provide a comprehensive report of the process that led to the formulation of the consolidated definition of DeFi outlined above. Several stages were completed to achieve this definition, including the literature review that served as the basis, the open survey conducted to gather the opinions of various stakeholder groups, and the valuable feedback received from academia. Throughout this journey, we carefully considered the perspectives and priorities of the crypto community, industry professionals, investors, and founders to create a definition that captures the essence of DeFi as a decentralized financial system built on innovative technologies. We focused on shedding light on the complexities of defining DeFi and the significance of establishing a shared understanding that can pave the way for regulatory harmonization and foster the growth of this transformative financial ecosystem.

Our journey began with a literature review, analyzing various papers and reports that attempted to define DeFi. The outcome of this literature review led to the formulation of a preliminary DeFi definition, which portrays DeFi as a financial system that operates in a decentralized manner, leveraging innovative technologies like Distributed Ledger Technologies (DLT) and Smart Contracts to facilitate transparent transactions. This preliminary definition embodies the principle of absolute financial freedom, empowering users to be self-reliant in managing their financial activities, all while eliminating the need for intermediaries and central authorities. Trustless interactions form the core of DeFi, ensuring that transactions occur without relying on blind trust in any single entity. Furthermore, DeFi decentralizes the governance of financial services, transcending jurisdictional boundaries and enabling a global and borderless financial ecosystem.

With the preliminary definition at hand, we conducted an open survey to assess the perceptions of different stakeholders in the industry. The survey results unveiled three main definitions of DeFi based on the target audience - the crypto community, the industry professionals, and investors and founders. While each group had nuanced variations in their definitions, they collectively emphasized DeFi as a new financial system that operates in a decentralized manner, utilizing DLT and Smart Contracts to eliminate

intermediaries. These insights from the community, industry, and investors provided valuable perspectives that helped shape our understanding of DeFi.

Additionally, we recognized the significance of academic input in our pursuit of defining DeFi accurately. Incorporating feedback from our esteemed professors, we arrived at a more consolidated and comprehensive definition.

This comprehensive definition consolidates the collective insights from the literature review, the crypto community, industry professionals, investors, founders, and the valued input from academia, making it a culmination of groundbreaking work to comprehensively understand DeFi.

DeFi is based on blockchain technology and aims to create open-source financial building blocks. It operates as a paradigm that integrates various technologies with common characteristics, challenging the cohesive unit approach of traditional financial systems. DeFi's core principle revolves around providing absolute financial freedom through absolute user responsibility, extending beyond conventional financial systems and influencing economic activities across all domains. DeFi encompasses a wide range of activities managed without intermediaries, such as exchange, lending, and tokenization. However, to achieve a high level of DeFi, it requires a delicate balance between decentralization and security. DeFi is both globally accessible and transnationally operated, serving as a universal platform connecting individuals worldwide. It fosters collaboration and knowledge-sharing across jurisdictions, establishing a borderless and interconnected financial landscape that transcends traditional system limitations.

1.2. Introduction to the complexities behind decentralization

The Web3 industry is growing faster and faster, with new concepts constantly appearing on the horizon. Even when getting to grips with blockchain technology is not an easy task, regulators are expected to understand both the current state of the industry and the upcoming innovations in a way that enables them to set the rules of the game that is in constant change.

To understand an industry, it is crucial to be familiar with the core principles that guide it. Having a common definition of the concepts that surround and establish the core of the industry is key to align stakeholders to cooperate, achieve clarity, and push the industry forward.

Blockchain and crypto assets are evolving rapidly, bringing new applications and possibilities almost daily. This makes it difficult for regulators to have a thorough understanding of the blockchain ecosystem, which can generate uncertainty for players and innovators who develop solutions without knowing how future legislation could affect them. Common definitions provide the sector with lexicological standards for a collective understanding to govern the technology.

Understanding what DeFi is will also help decipher the potential of blockchain technology and expand the horizon of the actions of the blockchain ecosystem, so those within and outside of it can see and understand the potential of these technologies to achieve a greater good. Moreover, decentralization will play an important role in the years to come, and not only in the financial sector. Concepts like Decentralized Societies (DeSos) and Decentralized Autonomous Organizations (DAOs) have started to gain attention and will systematically impact our social rules and interactions.

In order to define DeFi, it is necessary to review the concept of decentralization and its levels. The [Cambridge dictionary](#) refers to decentralization as “*the act or process of decentralizing an organization or government (moving control from a single place to several smaller ones)*.” Interestingly enough, the first example is the “distribution of power.” It is important to notice that the Cambridge definition refers to the process (act) of becoming decentralized. However, the definition does not refer to how dispersed or distributed the functions and/or powers should be to consider them decentralized.

To measure the level of decentralization of a blockchain system, we can make use of the [Nakamoto coefficient](#), which proposes a metric system that divides a system into subsystems that are later enumerated in order to measure how many entities are needed to be combined to gather 51% of control over the network. The key point here is to find the minimum amount of subsystems that will be required to arrive at 51%; the higher the volume of the minimum, the higher the decentralization level of the blockchain system ([E. Glen Weyl, et al., 2022](#)).

However, this coefficient is not effective in measuring decentralization in a distributed ledger or blockchain system where an individual can control multiple wallets and control over 51% of the system with them. To address this, E. Glen Weyl et al. (2020) proposed a way in which the measurement of decentralization could be more accurate than with the Nakamoto coefficient by considering social dependencies, weak alienations, and strong solidarities in the equation. They propose to realize this measurement via soulbound tokens, which are non-transferable tokens that represent commitments, credentials, and applications ([E. Glen Weyl, et al., 2022](#)).

Soulbound tokens for KYC

A potential use case for non-transferable tokens beyond the ones presented in the Glen paper is their potential to enhance compliance with anti-money laundering (AML) on wallets. By supporting a system where a trusted party tokenizes an identification process done by an Identifier- ID provider. These tokens help Crypto Assets Service Providers (CASPs) gain confidence in this compliance process. The tokens can be used for on-chain processes, allowing web3 native interactions. In this case, the trusted party can reveal the identity information if requested by an authorized party (e.g. law enforcement) as well as revoke the token if, for example., an invalidation is needed (e.g., watchlist changes). In this case, those identity tokens should have the quality of being non-transferable (or being soulbound) - otherwise, the proof of identity on the owner and controller of the wallet will be insignificant.

The question here again is whether the soulbound or non-transferable tokens use cases actually represent a valid level of decentralization. The Glen paper argues that potentially soulbound tokens can solve the weak spots of the Nakamoto coefficient by adding additional considerations (social dependencies, weak affiliations, and strong solidarities) into the equation, which can be measured by analyzing the interactions among soulbound tokens, in a particular system. However, this proposal seems to understand that all soulbound tokens or systems will be able to understand interactions both outside and inside the system in which they interact. It also leaves without analysis or reference to the dependencies between the issuer of the soulbound tokens and the systems for which the soulbound tokens will be used, a consideration that becomes more relevant if one takes into account that the issuer may have revocation powers where collusion and manipulation issues can easily appear for the strong centralization of powers on the issuer. However, this entirely depends on the construction of the blockchain protocol and the terms of the smart contract that creates the soulbound token.

The example of the soulbound tokens utilized for DAO voting is a good example to understand the complexity behind defining the levels of decentralization. [Glen Weyl et al.](#) suggested in their paper that in a DAO, soulbound tokens could prevent [Sybil attacks](#) by limiting token voting by examining the correlations between soulbound tokens held by different wallets and discount votes by the wallet, therefore, making the process highly decentralized. This particular case presents an opportunity to consider the levels and moments that need to concur for a system to be decentralized. Here, it seems that the interactions in a particular subsystem (the DAO) in regard to the voting mechanism and decision-making happen in a decentralized way. However, for this to happen, we need the presence of a centralized entity which is the issuer of the soulbound tokens.

The [Decentralized Society: Finding Web3's Soul paper](#) is a great example of how blockchain technology is trying to address the challenges of decentralization. It proposed an innovative solution to decentralization in voting and participation processes in subsystems. Consider for example, the voting processes in a DAO where, in order to ensure enough decentralization, a decentralized identity solution can be deployed. With this approach, each voter would need to verify their unique individuality using their decentralized identity. The voting system would ensure that only one vote is allowed per decentralized identity, ensuring a fair and transparent process.

However, and considering the Cambridge definition, decentralization refers to the end result and the process of becoming decentralized. Therefore, it is necessary to determine the conditions of the processes and the levels (systems and subsystems) in which the processes occur to determine whether the final outcome is decentralized or whether the process as a whole is decentralized. Furthermore, defining the minimum levels of distribution of power is not an easy question, and this becomes even more complex when applied to the financial system, even more considering that there is not a perfect state of decentralization and that considerations on the interaction between centralized and decentralized systems need to be done when analyzing the level of decentralization in the processes and outcomes.

2. Efforts to define DeFi

Achieving a global definition of DeFi is crucial in order to establish a universal understanding of this borderless phenomenon. By its nature, DeFi operates across jurisdictions without geographical limitations, and it becomes essential to have a shared and consistent definition that transcends national boundaries. Without a globally recognized understanding of DeFi, there is a risk of fragmentation and divergent regulatory approaches, hindering innovation and creating uncertainty for industry participants and users alike. A universal definition of DeFi will provide clarity, promote regulatory harmonization, and facilitate international cooperation, fostering the growth and development of this transformative technology.

In the last two years, there have been different efforts by academia, regulators, and international associations to understand DeFi as well as its opportunities and risks. Reviewing their work is a key step in understanding the different positions. Moreover, it presents an opportunity to compare the different definitions and understandings of DeFi from different actors.

As we will present later, from the literature review, DeFi can be summarized as a decentralized financial system that operates without intermediaries, leveraging technologies like blockchain and smart contracts. It offers users absolute financial freedom, ensuring universal access and self-reliance. Trustless interactions form the foundation of DeFi, as it eliminates the need for reliance on centralized entities. Furthermore, DeFi decentralizes governance of financial services and transcends jurisdictional boundaries, allowing for a borderless and inclusive financial ecosystem.

2.1 The current DeFi scholars' definition

In 2022, Eva Andrea Meyer et al. published [Decentralized Finance – A Systematic Literature Review and Research Directions](#), a paper on a systematic literature review of DeFi in which 83 papers on the DeFi space produced during 2020 and 2021 were reviewed. The paper aimed to answer three questions:

1. How can DeFi literature to date be structurally framed, and which research methods and blockchain systems have scholars focused on?
2. Which results and insights can be synthesized from the current state of research?
3. Which research avenues can be derived?

In the paper, the authors established that based on several scholars' definitions, DeFi refers to a finance protocol built with smart contracts which are 'trustless' (i.e., functioning without intermediaries or third parties) and developed on permissionless, public blockchains. For the authors, the characteristics highlighted in the definition, such as "built with smart contracts," "trustless," and "functioning without intermediaries," even when relevant components of DeFi, should be considered separate from the definition itself. The paper strongly argues the need for building DeFi on a permissionless blockchain since restricting access goes against the principles of DeFi itself, especially those regarding inclusivity (anyone can access) and decentralization. The paper identified three different perspective levels from which DeFi is analyzed in the 83 papers:

1. **The 'micro-level':** With 35 papers allocated to this category, it is the major one among the studied papers. This category discusses three components of DeFi as subcategories: DeFi landscape with smart contracts, DeFi tokens, and Defi Dapps. The papers on financial smart contracts focus on how programming languages could replace traditional financial contracts effectively; however, this topic refers to pre-blockchain work that paved the road to replacing traditional financial agreements with formal contract languages (also referred to as domain-specific languages, DSLs). The papers on financial DeFi tokens examine token forms, characteristics, and standards for DeFi applications, including the vulnerabilities of

trustless stablecoins, such as volatility aspects, risks and disadvantages related to the type of collateral involved, and dependency on appropriate off-chain integration. Papers in this subcategory also suggest solutions focused on token standards, token models, and interpretation functions to tackle volatility issues. The papers on DeFi DApps discuss the potential of DeFi DApps in tackling risks associated with crypto-asset lending through peer-to-peer mechanisms focused on collateral management. Some papers suggest protocols as an alternative to peer-to-peer lending, such as Automated Market Makers (AMMs), which function as decentralized exchanges and provide incentives to maintain their swap rates in line with actual exchange rates. The papers also present several use cases, such as substitutes for stock exchanges and decentralized auctioning of invoices.

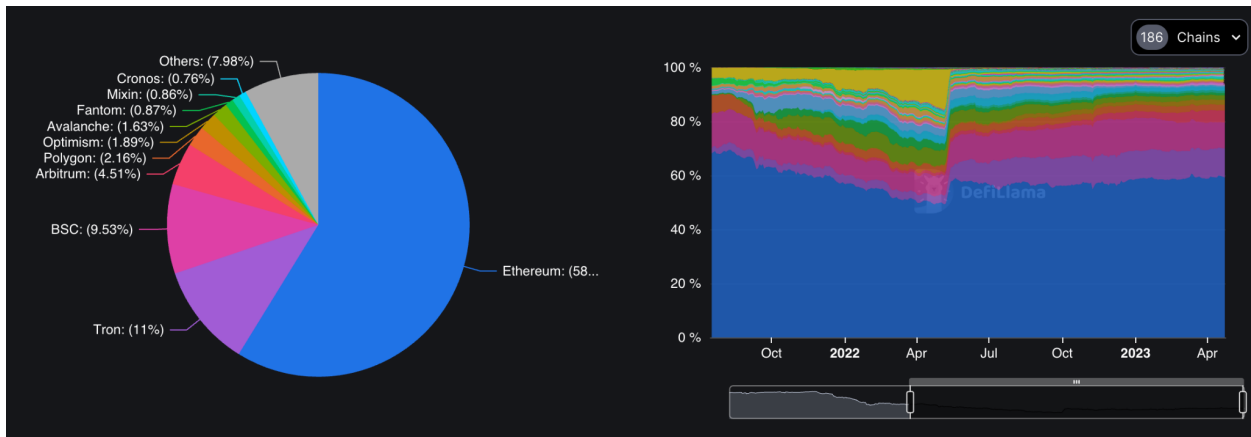
- 2. The 'meso-level':** Rather than focusing on specific components of DeFi, this category analyzes patterns within a single blockchain system or opportunities to scale DeFi beyond a single-chain system. This category includes 30 papers, of which most papers are focused on the DeFi single-chain ecosystem insights and empirical DeFi patterns, with Ethereum being the most analyzed blockchain. The papers discuss scams in DeFi, including Ponzi schemes and financial attacks, and suggest solutions such as detection tools and robust DApp design. The papers also point out that interdependency risks such as those found in traditional financial systems—for example, the failure of a single entity—also exist in DeFi. When an asset of one protocol serves as collateral or to earn interest in other DApps, a failure of that asset would affect all connected protocols and could cause a collapse.

Another subcategory of papers in the meso-level focuses on DeFi scaling opportunities beyond single-chain ecosystems. The papers highlight the complexity of operating across multiple blockchain systems for DApps, which makes centralized exchanges (CEXs) the preferred tool for cross-chain transfers. DeFi also suffers from fragmentation, and authors suggest prototypes for trustless cross-chain asset exchanges to address this issue. Moreover, some papers highlight the absence of an integrated mechanism for miners to verify real-world data generated outside the blockchain, emphasizing the importance of oracles to provide verified off-chain information to DeFi DApps.

- 3. The 'macro-level':** Papers that are categorized in the 'macro level' refer to papers focused on a more holistic analysis of DeFi, including impacts on society, the regulatory aspect of DeFi as well as advantages or use cases. Eighteen of the analyzed papers fall within this category. The first subcategory within the 'macro level' studies the DeFi ecosystem as a whole. Papers in this subcategory discuss the advantages of DeFi - most notably the lack of need for intermediaries, the ability of DeFi to operate across borders, as well as trust and innovation facilitated

by offering availability to anyone with access to a smartphone and internet connection, as well as the absence of censorship opportunities. However, the papers also express some advantages as risks or limitations: First, although the composability of DeFi primitives is considered to accelerate financial innovation, it can also be viewed as an interdependency and systemic risk due to the high degree of contagion in case of application failures. Second, while smart contract-based financial services increase efficiency, Ethereum gas costs and network congestion are also posed as key challenges in DeFi. Third, DeFi enhances privacy in the sense that ownership of wallet addresses is not disclosed; however, this may foster illicit activity. Moreover, privacy is also reduced as all transactions are stored on a public blockchain. That regulatory uncertainty of off-chain data integration, governance, and operational risks, as well as the sole reliance on code integrity/ security, pose challenges and risks for DeFi, is agreed upon by scholars in this field.

Overall, the paper highlights the advantages of DeFi, such as the lack of need for intermediaries, the ability to operate across borders, and the absence of censorship opportunities. However, the authors also point out the risks and limitations of DeFi, such as interdependency and systemic risk, Ethereum gas costs and network congestion, privacy concerns, regulatory uncertainty, governance and operational risks, and sole reliance on code integrity/security. However, the paper does not consider that Ethereum is not the only network on which DeFi applications can be built and how, lately, new opportunities have arisen for L2 solutions like Arbitrum and Optimism.



Source <https://defillama.com/chains>

2.2 DG FISMA: [Decentralized Finance: information frictions and public policies](#) and the European Blockchain Association: [Regulating Decentralized Finance- An approach for Europe.](#)

The European Commission's Directorate-General for Financial Stability, Financial Services, and Capital Markets Union - DG FISMA covered DeFi-related topics in its annual review titled the European Financial Stability and Integration Review. This year's review covers three main topics: macroeconomic developments, real estate in the aftermath of the pandemic, and the state-of-the-art and policy challenges related to Decentralized Finance (DeFi).

In regards to DeFi, the report highlights that DeFi has the potential to improve the security, efficiency, transparency, accessibility, openness, and interoperability of financial services compared to the traditional financial system. DG FISMA suggested that the DeFi ecosystem could provide substantial opportunities to foster cross-border financial integration, which is an important policy objective of the European Union. However, the report also indicates that the DeFi ecosystem is prone to numerous risks, and more effort should be committed to identifying operational risks. The lack of regulation, along with the pseudonymous culture of DeFi culture, constitutes the operational risks more vital. The report suggests that a new approach to the regulatory framework might be required, focusing on regulating DeFi actors based on their activity rather than their entity-based one.

DG FISMA also suggested that regulating smart contracts might be necessary, given that they are substituting regulated intermediaries. The report emphasizes the benefits of public blockchains regarding transparency and auditing, which constitutes an advantage for researchers and supervisors who can have access to the entire time series of historical and real-time trading data. This is expected to facilitate a better understanding of the risks that often remain obscure in traditional financial systems.

The report concludes that while DeFi is expected to contribute to digital transformation and competitiveness for the European economy, as well as introduce new forms of financing for small and medium-sized enterprises and European citizens, a clear and favorable regulatory framework is necessary to allow centralized and decentralized services (TradFi and DeFi) to coexist without hindering innovation growth for new types of services.

The report also points out that the global (borderless), trustless (disintermediated), and self-enforcing (automated) nature of DeFi services may present regulatory and policy challenges that should be addressed proactively so that innovation can flourish in Europe

and not move to other jurisdictions which may adopt more friendly or favorable approaches.

The [European Blockchain Association](#) (EBA) analyzed the DG FISMA report and published a [paper](#) in which they defined DeFi as *“the catch all term used to describe a range of on-chain activities and services such as borrowing, lending, derivatives, deposit taking, custody and exchanges that use distributed ledgers to connect buyer and seller directly without the need for intermediaries”*. In their report they concluded that DeFi risk can be broken down into 7 categories: 1) composability of tokens, which basically refers to the fact that tokens can exist at different levels of abstraction and be reused across different DeFi protocols, leading to spillover effects, 2) pseudonymity of users - as users can hide their identity through pseudonymous addresses, 3) excessive leverage and heavy reliance on leverage and collateral exacerbates procyclicality, causing sharp price adjustments with knock-on effects, 4) blockchain infrastructure dependencies, like consensus failure can lead to forced liquidations, and governance tokens and associated votes can be highly concentrated, 5) governance issues, 6) oracle risks stem from data feeds and human or input errors, which can cause forced liquidations and margin calls, and 7) cross-border operations, as DeFi protocols have no specific domicile, which creates coordination problems for regulators in different jurisdictions seeking to apply similar rules.

The paper of EBA discusses the lack of a regulatory perimeter for decentralized finance (DeFi) globally and the need to think about what a regulatory framework for DeFi in Europe could look like. It explains that DeFi refers to a range of on-chain activities and services that use distributed ledgers to connect buyers and sellers without intermediaries. It notes that DeFi is more complicated to regulate than centralized finance, and there are questions about which activities should be regulated and how to apply anti-money laundering provisions. The [EBA paper](#) concludes that some of the challenges in regard to DeFi can be addressed with a regulatory framework for DeFi that balances innovation, consumer protection, and privacy. These recommendations include legal recognition for Decentralized Autonomous Organizations (DAOs) within future European regulations, national API repositories integrated into EU oracle frameworks, SoulBound token recognition within the Markets in Crypto-asset Regulation- [MiCA](#) and the regulation on electronic identification and trust services - [eIDAS](#) frameworks for KYC purposes, a voluntary compliance/supervision mechanism over off/on-chain data flows, public observatories to ensure compliance, and the use of oracles as a nexus for both stability and supervisory requirements. These proposals aim to establish trust in the production and transmission of information by oracles, encourage voluntary compliance by DeFi service providers, and provide better quality data for DeFi protocols.

2.3. EUBOF: [Decentralized Finance \(DeFi\)](#)

In 2022, the European Blockchain Observatory and Forum (EUBOF) published a report titled [DeFi Report](#), in which they defined DeFi as “an umbrella term for a collection of financial products which rely on smart contracts and blockchains to enable open, peer-to-peer (P2P) financial services and automate specific procedures.”

The report provides insights with regards to the differences between DeFi and traditional or conventional finance, including DeFi intrinsic characteristics, such as topography and nature of the underlying systems or embedded protocols, functional differences with traditional or conventional finance, operational differences exploring user experience of the platform/interface, and legal and regulatory perspectives.

There is a presentation of the most prominent DeFi applications, including Stablecoins, Decentralised lending and borrowing, Decentralised exchanges (DEXs), as well as other notable DeFi concepts such as blockchain derivatives and decentralized insurance.

The report examines DeFi risks within the technical (blockchain risk, protocol risk, oracle manipulation, bridge disruption, etc.), financial (liquidity risk, slippage, front-running, impermanent loss, etc.), and procedural (loss of private key, admin key risk, governance risk, rug pulls, vampire attacks, etc.) spectrum.

Concluding, the report supports that *“DeFi represents a paradigmatic shift in financial services provisioning, and promises to be one of the most disruptive applications of blockchain-fuelled decentralization. The ability to transact P2P (i.e. without intermediaries) remotely and trustlessly (at least as far as trusting one’s counterparty is concerned) is a novel phenomenon, which is still maturing. The plethora of DeFi applications already in existence may be just the tip of the iceberg compared to the wave of innovation we expect in the near future.”*

2.4 [The Financial Stability Board:](#) [The Financial Stability Risks of Decentralised Finance](#)

The Financial Stability Board (FSB) published in February 2023 a [report](#) in which they defined DeFi as *“an umbrella term commonly used to describe a variety of services in cryptoasset markets that aim to replicate some functions of the traditional financial system (TradFi) while seemingly disintermediating their provision and decentralizing their governance”*. Moreover, five key risks for decentralized finance (DeFi) were identified: operational, liquidity, leverage, interconnectedness, and “other types of risk”. Operational risks arise from concentrated voting power, community disagreements, dependence on

blockchain infrastructure, and smart contract vulnerabilities. Liquidity risks stem from mismatches between assets and liabilities, which can cause run risks and spillovers to the broader financial system. Leverage risks arise from collateral use and can lead to procyclicality and sharp adjustments in prices. Interconnectedness risks arise from the composability of DeFi protocols and the concentration of total value locked in a few applications, exposing DeFi to the potential distress of centralized trading platforms. Other risks include DeFi's reliance on investor inflows, cross-border operations, and potential currency substitution in countries with macroeconomic instability.

The report also referred to DeFi as “an umbrella term commonly used to describe a variety of services in crypto-asset markets that aim to replicate some functions of the traditional financial system (TradFi) while seemingly disintermediating their provision and decentralizing their governance”

2.5. Overview of current definitions:

This section presents the definitions extracted from the below-mentioned documents. It also includes the definitions of the Bank for International Settlements and the ACPR Bank France.

Paper	DeFi Definition
Research Paper. Technical University of Munich & Frankfurt School of Finance and Management Decentralized Finance June 2022	DeFi refers to a finance protocol built with smart contracts which are ‘trustless’ (i.e., functioning without intermediaries or third parties) and developed on permissionless, public blockchains.
DG FISMA Report June 2022	Applications in Decentralized Finance (DeFi) rely on automated protocols to produce financial services including exchanges, credit, derivatives and portfolio management. In contrast with traditional venues, the specificity of DeFi is that protocols are (i) encoded in public digital contracts universally accessible and (ii) maintained by an open pool of pseudonymous agents rather than a unique legal entity.
European Blockchain Association Report	Decentralized finance is the catch-all term used to describe a range of on-chain activities and services such as

	<p>borrowing, lending, derivatives, deposit taking, custody and exchanges that use distributed ledgers to connect buyer and seller directly without the need for intermediaries. These services are performed by self-executing smart contracts, with no single source of truth, authority or point of failure is charged with changing the underlying data. Therefore, smart contracts shift counterparty risk away from intermediaries. The open source software that lies at the root of the DeFi ecosystem and the inherently contestable nature of DeFi as a result of smart contracts allows for composability across different platforms and the creation of entirely new ones. It's possible to buy a stablecoin on a decentralised exchange and then move it to a lending platform to earn interest while additionally leveraging these interest bearing instruments in an automated market maker (AMM). DeFi is also inherently cross border, existing as a digitally native and jurisdictionally agnostic ecosystem that is on 24/7 with users around the world.</p>
<p>EUBOF report</p>	<p>DeFi represents a paradigmatic shift in financial services provisioning, and promises to be one of the most disruptive applications of blockchain-fuelled decentralization. The ability to transact P2P (i.e. without intermediaries) remotely and trustlessly (at least as far as trusting one's counterparty is concerned) is a novel phenomenon, which is still maturing. The plethora of DeFi applications already in existence may be just the tip of the iceberg compared to the wave of innovation we expect in the near future.</p>
<p>BIS - Bank for International Settlements January 2023</p>	<p>Decentralized Finance (DeFi) is a new financial paradigm that leverages distributed ledger technologies to offer services such as lending, investing, or exchanging cryptoassets without relying on a traditional centralized intermediary. A range of DeFi protocols implements these services as a suite of smart contracts, i.e., software programs that encode the logic of conventional financial operations. Instead of transacting with a counterparty, DeFi users thus interact with software programs that pool the resources of other DeFi users to maintain control over their funds.</p>
<p>Financial Stability Board</p>	<p>DeFi is an umbrella term commonly used to describe a</p>

<p>(FSB) February 2023</p>	<p>variety of services in cryptoasset markets that aim to replicate some functions of the traditional financial system (TradFi) while seemingly disintermediating their provision and decentralizing their governance.</p>
<p>ACPR April 2023</p>	<p>“Decentralized finance” or DeFi refers to a set of crypto-asset services, which are similar to financial services and carried out without the intervention of an intermediary. It generalizes the principle of technical decentralization popularized by blockchain technologies and, in fact, it has developed in the wake of innovations linked to crypto-assets, in particular the generalization of smart contracts and the emergence of crypto-assets deemed stable, known as "stablecoins".</p>

Moreover, it is key to consider the different definitions analyzed in the papers reviewed in section 2. The table below presents the criteria considered under each definition as a core component of DeFi:

Paper / Extracted Concepts	Absolute financial freedom (autonomy)	A new decentralized financial system (industry, service)	New technologies (DLTs, smart contracts)	Reference to trustless ¹ in the text	Governance
<p>Research Paper Decentralized Finance June 2022 / finance protocol - smart contracts - trustless - without intermediaries - permissionless - blockchain</p>	<p><i>permissionless</i></p>	<p><i>finance protocol, without intermediaries</i></p>	<p><i>smart contracts, blockchain</i></p>	<p><i>trustless protocol</i></p>	<p>X</p>
<p>DG FISMA June 2022 / automated protocols - financial services - digital contracts -</p>	<p><i>universally accessible</i></p>	<p><i>financial services</i></p>	<p><i>automated protocols, digital contracts</i></p>	<p>X</p>	<p><i>maintained by an open pool of pseudonymous agents</i></p>

¹ Where “trustless” can refer to a protocol or to P2P transactions.

universally accessible - maintained by an open pool of pseudonymous agents					
EU Blockchain Association / on-chain (financial) activities and services - distributed ledgers - without intermediaries - smart contracts - open source software - jurisdictionally agnostic ecosystem - 24/7 service availability	X	<i>on-chain (financial) activities and services, without intermediaries</i>	<i>distributed ledgers, smart contracts, 24/7 service availability</i>	X	<i>open source software, jurisdictionally agnostic ecosystem</i>
EUBOF Report / financial services - blockchain - transact P2P (i.e. without intermediaries) - trustless	X	<i>financial services, transact P2P</i>	<i>blockchain</i>	<i>trustless P2P transaction</i>	X
BIS - Bank for International Settings January 2023 / financial paradigm - DLTs - services - without intermediary - smart contracts - users maintain control over their funds	<i>users maintain control over their funds</i>	<i>financial paradigm, services</i>	<i>DLTs, smart contracts</i>	X	X
Financial Stability Board (FSB) February 2023 / crypto-asset - financial system - disintermediating - decentralized governance	X	<i>crypto-asset, financial system, disintermediating</i>	X		<i>decentralized governance</i>
ACPR April 2023 / crypto-asset - financial	X	<i>crypto-asset, financial services, without</i>	<i>blockchain, smart contracts, stablecoins</i>	X	X

services - without intermediary - blockchain - smart contracts - stablecoins		<i>intermediary</i>			
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From the classification of the extracted concepts, it can be generalized that DeFi:

1. can be described as a new financial system that operates in a decentralized manner, without the need for intermediaries;
2. is based on the use of new technologies, specifically in the form of Distributed Ledger Technologies, including blockchain and Smart Contracts;
3. delivers absolute financial freedom, enabling universal access and self-reliance on the part of the user;
4. operates on the assumption of trustless interactions;
5. decentralizes financial services' governance and makes them jurisdictionally agnostic

Building upon the commonalities identified in the literature review, we have formulated the following comprehensive definition:

Literature Review Definition

“DeFi is a financial system that operates in a decentralized manner, eliminating the reliance on intermediaries. It leverages new technologies such as Distributed Ledger Technologies (DLT), and Smart Contracts to enable transparent transactions. DeFi offers absolute financial freedom, providing universal access and empowering users to be self-reliant in managing their financial activities. It operates on the principle of trustless interactions, ensuring that transactions are executed without the need for blind trust in centralized authorities. Additionally, DeFi decentralizes the governance of financial services, making them independent of any specific jurisdiction, and enabling a global and borderless financial ecosystem.”

3. IOTA Foundation contribution: the DeFi Survey

The IOTA Foundation, in cooperation with INATBA, is exploring the understanding of DeFi. To do so, we conducted a survey both within and outside INATBA to collect the point of view of different stakeholders. IOTA focused on the definition and consulted with community members, industry players, crypto enthusiasts, and the general DLT sector.

INATBA focused on its members and collected information about the definition and the regulatory/self-regulatory framework. For this report, only the IOTA questions related to the definition of DeFi were used.

In the following, the methodology used in this paper to pursue the investigation of DeFi's understanding is explained.

- **Data collection** - In the following, we are going to analyze data obtained from two surveys published online and with public access. Both surveys contained the same set of questions. The IOTA survey was published on the 10th of February 2023, while the INATBA one was published on the 13th. Both surveys remained open until the 28th of February. During this period, participants were given access to the survey through the Google Forms online platform. Participants were encouraged to complete the survey in their own time and at their own pace. Data were collected anonymously and stored securely to protect participants' confidentiality.
- **Participants** - The surveys were shared on social media and reached an undefined number of online users. A number of 141 participants from the general public who were interested in DeFi replied to the two surveys. The sampling method was a simple random sampling; however, we argue that the social media communities built around the IOTA and INATBA channels have a specific shared interest in decentralized technologies. Moreover, the different types of social media allowed us to easily reach different participant types (e.g., it is easier to find community members on Reddit or industry specialists on LinkedIn). The advertised main objective of the survey was to provide valuable insights into the public's knowledge and attitudes toward DeFi.
- **Procedure** - Participants were presented with an online survey containing 12 questions related to DeFi. The survey questions were designed to gather information on participants' familiarity with DeFi, their understanding of key DeFi concepts, their opinions on the potential benefits and risks of DeFi, and their past and potential future use of DeFi platforms. The questions were a combination of multiple-choice and open-ended questions.
- **Data analysis** - The survey responses were analyzed using descriptive statistics, such as frequencies and percentages, to summarize the sample's characteristics and responses to the survey questions. The analysis results are reported in the next section.
- **Limitations** - This study is subject to several limitations, including the use of a convenience sample that may not be representative of the broader population. Additionally, self-report bias may have influenced participants' responses to the

survey questions. Finally, the study's cross-sectional design limits our ability to make causal inferences.

In the following, we anticipate the three core concepts that have been extracted from the survey's replies. These are fundamental for the comprehension of all that was found in the survey results:

- **Absolute financial freedom (autonomy)** - Absolute financial freedom refers to a state of complete independence and control over one's financial resources and decisions, where an individual or entity has the ability to meet all their financial needs and desires without any constraints or limitations imposed by a third party. This concept includes references to law, the state, individuals' autonomy, and peer-to-peer interaction; often, terms such as "everyone" or "people" are used as opposed to "control" or "banks."
- **A new financial system (industry, product)** - A new financial system refers to a restructured or redesigned framework of financial processes, institutions, regulations, and technologies that deviate significantly from the existing or traditional financial systems. Some survey answers imply disintermediation from a centralized system, as in the "absolute financial freedom" concept, but with a tendency to embody this aspect into a new "decentralized" financial industry or product; the financial system concept includes references to a "new" system that is decentralized and opposed to a centralized financial system, i.e., with a "middleman."
- **New technologies (DLTs, smart contracts)** - This concept only focuses on the technologies that enable DeFi or that are born with it or in related terminology; some answers include references to smart contracts, DLTs, wallets, and protocols.

3.1. The Results of the Survey

Below, we present the result from the analysis of the questionnaire.

- **Question 1: What is your relationship with the DLT/ Blockchain industry?**

The first question posed to the survey participants was about their relationship with the DLT/blockchain industry. In this case, the answer was multiple-choice.

What is your relationship with the DLT/ Blockchain industry?

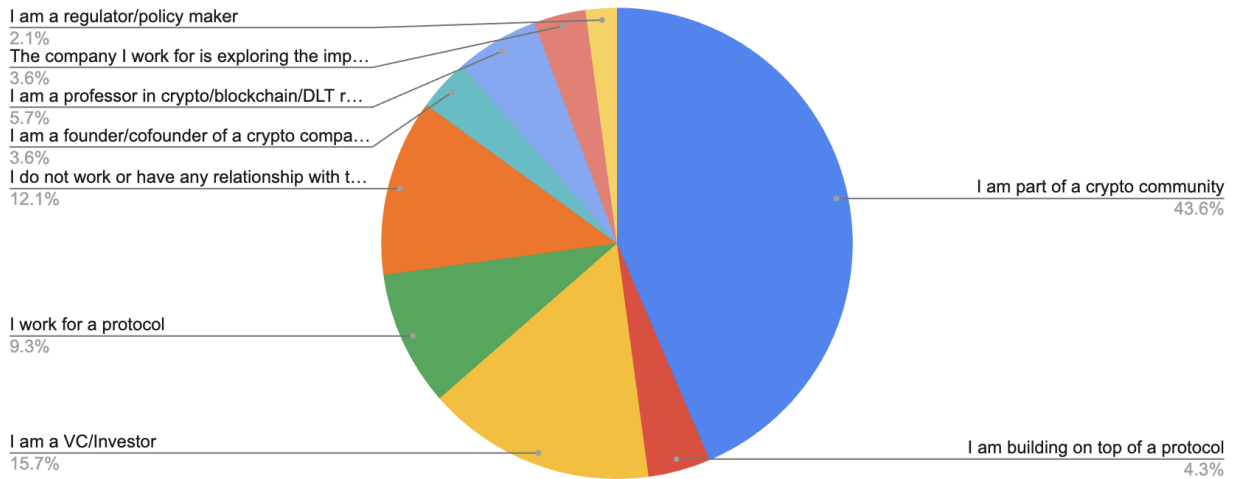


Figure 1 - Question 1 answers

Most participants came from the *crypto asset community* (43%). Fewer, but still relevant portions of participants, responded that they either belong to the groups of *VC/investors* (15%) and *DeFi protocols developers* (9%) or have *no relationship with the industry* (12%). Furthermore, some minorities were composed of *DLT-related-topics academics* (5%), developers of solutions that *exploit DeFi protocols* (4%), participants *working for companies exploring a DLT-based solution* (3%), *founders of crypto asset or DLT-based startups* (3%), and *regulators/policy makers* (2%).

- **Question 2: Do we need a globally harmonized definition of DeFi?**

The second question seeks to understand the participants' views on the DeFi definition. In particular, they were asked about the necessity of a harmonized definition of DeFi.

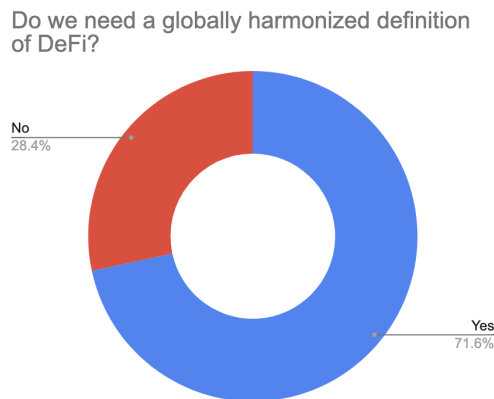


Figure 2 - Question 2 answers

The majority of participants replied *yes* (72%), and only less than one-third replied *no* (28%).

- **Question 3: How does your own definition of DeFi look like?**

The third question is an open question aimed at gathering the different shades of DeFi definition that participants can bring to the matter. Each participant's definition was almost unique but, at the same time, classifiable. Based on the answers obtained, we subdivided the participant's definitions into four classes:

- **Absolute financial freedom (autonomy)** - Answers falling into this class include references to law, the state, individuals' autonomy, and peer-to-peer interaction. An example might be: "*[DeFi] means there is no a regulator entity that manipulates the economic system as it wishes. Everything relies on the power of people and a totally free economy.*"
- **A new financial system (industry, product)** - Answers in this class include references to a financial system that is decentralized and opposed to a centralized financial system, i.e., with a "middleman." An example is "*[DeFi is] a system wherein data, with respect to financial products such as crypto assets, stocks, tokenized real assets, are stored and processed in a decentralized/serverless manner.*"
- **New technologies (DLTs, smart contracts)** - Answers falling into this class only focus on the technologies that enable DeFi or that are born with it or in related terminology. An example is "*Financial technology/instruments that are built on DLT, replacing intermediaries with smart contracts.*"
- **A critical definition opposed to the ideal DeFi** - A relevant part of answers falls into a class that categorizes critical points to the DeFi idea as a decentralized financial system or to DeFi implementations. An example might be "*In theory: direct interaction of users with financial instruments without having to go through middlemen. In practice: replication of TradFi under the guise of "decentralization," while not being decentralized and in addition lacking any consumer protection.*"

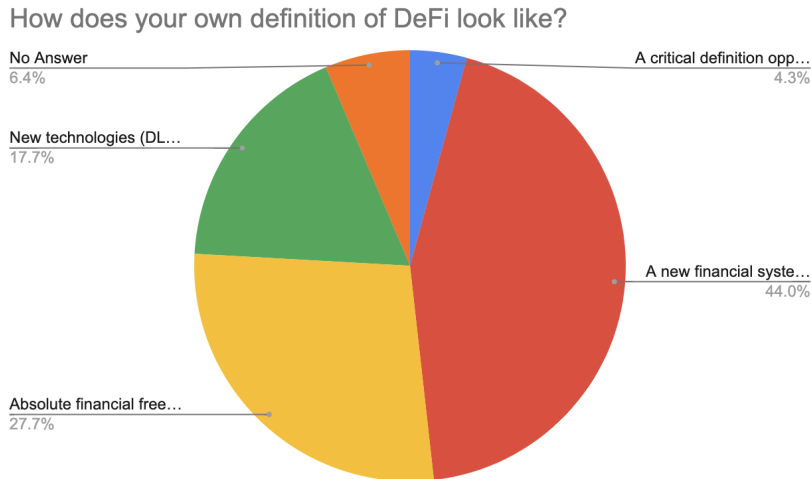


Figure 3 - Question 3 answers

Most participants define DeFi as a *new financial system* (44%) and often cite this system's ability to be opposed to centralization. Almost one-third of participants define DeFi as the ability to be *financially autonomous* (28%), followed by participants that focus on the involvement of *new technologies* (18%). Apart from the participants that did not answer this question (6%), we can find a few that provided a *critical definition of DeFi* (4%).

- **Question 4: Based on your experience, where is the line drawn between DeFi and TradFi?**

The fourth question is the first open question that focuses on the comparison with TradFi. Also here, participants had their own ideas about where the line is drawn between DeFi and TradFi, and we classified them into three classes:

- **Presence of the "middleman"** - This class's answers include references to middlemen, centralization, and banks; often the decentralization aspect of DeFi is opposed to the presence of financial intermediaries. An example might be: "*The line between DeFi and TradFi can be drawn based on the centralization vs decentralization of financial services. In DeFi, financial services are provided in a decentralized manner, often on a blockchain network, without the need for intermediaries. In contrast, financial services in the traditional finance system are provided by centralized intermediaries, and often involve a high degree of trust in these intermediaries.*"

- **Permissionless and transparent mechanism, self custody** - Answers falling into this class include references to full control, openness, and self custody; these answers demonstrate a strict relation between the terms community, governance, and permissionless; some examples are *“DeFi is built upon open source smart contracts, which are verifiable. TradFi is closed source”* or *“[TradFi is when] the source of truth for account balances is in the hands of a third party.”*
- **New technologies (smart contracts, stablecoins, DAO)** - Answers falling into this class only focus on the technologies that differentiate DeFi from TradFi (similarly to the previous question); these answers include references to DAO, stablecoins, smart contracts, and DLT. An example is *“The line between DeFi and TradFi is the ability to hybridize the two systems by ensuring an expansion of available assets and the inclusion of smart-contract managed dynamics and logic.”*

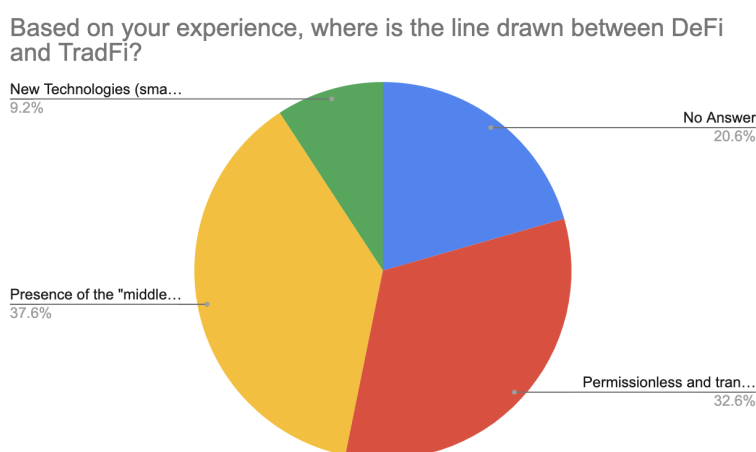


Figure 4 - Question 4 answers

Most participants draw the line between DeFi and TradFi in the *presence of a “middleman”* (37%). However, the ones that cite DeFi’s *permissionless and transparent mechanism* (32%) are just slightly less. In this case, more than 20% of participants did not reply to the question. Finally, a minority of participants differentiated DeFi and TradFi by their use of *different technologies* (9%).

- **Question 5: What are the main risks of DeFi that do not apply to TradFi?**

The fifth question follows the previous one for the comparison with TradFi. Here, participants were asked to answer the possible risks of DeFi that TradFi does not present. In this case, we used classes to represent concepts included by participants in their

answers. This means that a single answer can have concepts falling into more than one class.

- **Lack of fraud protection and accountability** - Some answers included concepts related to the lack of risk responsibility and governance when put in front of DeFi frauds. An example is *“TradFi has some capacity to disrupt the ability of bad actors to cause fraud through either protocol hacks or social manipulation. As a trusted third party they can undo transactions and blacklist bad actors, whereas DeFi has no mechanism to efficiently undo malicious transactions and must put all protections into the protocol design itself.”*
- **Manage your assets** - Answers with concepts falling into this class include references to full control and self-custody; some examples are *“in a decentralized system the price for more financial autonomy is that every player has a greater responsibility for their own acting”* or *“You have to fully manage your own keys.”*
- **Smart contract bugs** - Some concepts that can be found in answers are related to the merely technical aspect of the implementation of some DeFi technologies; in particular, some participants specifically refer to the immutability of smart contracts implementing DeFi protocols and thus to the possibility of unrecoverable code bugs; an example is *“Smart contract vulnerabilities: DeFi is built on smart contracts, which are self-executing code on the blockchain. If a vulnerability is discovered in a smart contract, it can be exploited, potentially leading to the loss of funds.”*
- **Lack of legal framework** - Some answers focus on the lack of a legal framework; this concept includes references to unregulated environment, responsibility, and taxes; an example is *“Traditional financial market law aims at intermediaries. This type of regulation does not work in a DeFi environment.”*
- **User experience** - The concept of user experience comes in different forms within the participants’ answers; in particular, these include references to the difficulties of approaching and using the new technologies that enable DeFi, whilst, in TradFi, the financial intermediaries usually provide an adequate user experience; some examples are *“Current web3 UI provides a high barrier for entry to many, which also opens up possibilities for technical scams”* or *“You can't afford to be incompetent.”*
- **Asset value volatility** - Some answers specifically refer to the concept of price volatility for crypto-assets; this is seen as a risk more relevant in DeFi rather than in TradFi.

- **No risks** - Some answers also include the concept of a DeFi with no risks or with fewer with respect to TradFi.

What are the main risks of DeFi that do not apply to TradFi?

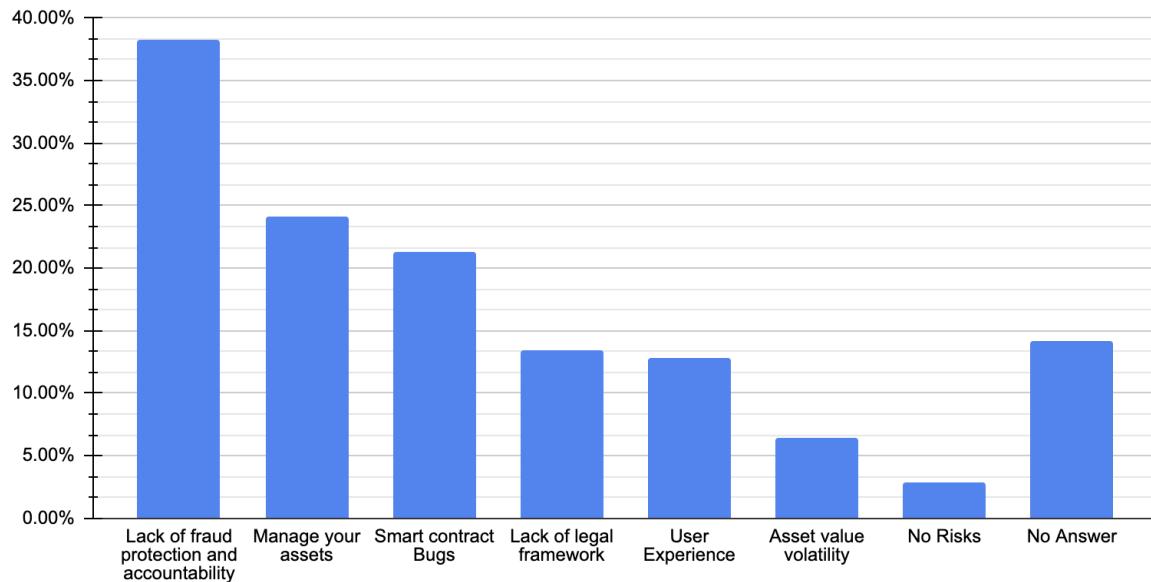


Figure 5 - Question 5 answers

More than a third of participants included the *lack of fraud protection and accountability* (38%) in their answers with regard to the main risks of DeFi. The concept of *managing your own assets* (24%) was included by almost one-fourth of participants, similar to the concept of *smart contract bugs threat* (21%). The concepts of *lack of legal framework* (13%) and *user experience* (12%) are also relevant. Less relevant are the references to *crypto-assets value volatility* (6%), while only 3% of participants replied “No risk” for DeFi. Finally, 14% of participants did not answer this question.

- **Question 6: What are the main risks of TradFi that do not apply to DeFi?**

The sixth question is the last one that puts TradFi in comparison with DeFi. Similarly to the previous question, but with the opposite scope, participants were asked to answer with the possible risks of TradFi. Here too, we used classes to represent concepts included by participants in their answers.

- **Centralization (corruption)** - The concept of centralization was included in some answers with a high correlation to the term “corruption”; these answers included references to monopoly, systemic fraud, and government intervention; some examples are “*Emergence of monopolistic structures posing a systemic threat*” or

“Centralized control: In traditional finance, financial services are provided by centralized intermediaries such as banks, which can have a significant degree of control over users' financial assets. This centralization can result in a lack of transparency and accountability and a single point of failure.”

- **Inaccessibility** - Concepts that fall into this class are inherent to the TradFi inaccessibility and lack of transparency; an example is *“Opacity and lack of transparency: Financial intermediaries in TradFi often operate with limited transparency, making it difficult for users to fully understand and monitor their financial transactions. Inequality of access: TradFi often serves a limited group of people, with many individuals and communities excluded from accessing financial services due to a lack of access to financial infrastructure or the requirement of minimum balances and other criteria.”*
- **Lack of control** - Some answers referred to the concept of lack of control over own assets, meaning that one's assets are in the hands of financial intermediaries; a related concept often found in this case is the presence of borders and national authority when acting on one's own assets; an example might be *“Surveillance. An individual cannot act independently. More within border given by authorities or so.”*
- **High transaction cost (time, fee)** - Concepts that fall into this class refer to an increased transaction cost in TradFi, in terms of time or fees. Some examples are *“Increased transaction cost. Particularly limiting in the case of microtransactions”* or *“Unexpected paperwork when you want to withdraw your funds.”*
- **Own assets value decrease** - Some answers include concepts that refer to a decrease in the value of one's assets, inflation, or loss of capital; an example might be *“[The main risks of TradFi are] inflation, government bailouts enabling bad behavior, fractional reserve banking, artificially low-interest rates.”*
- **Lack of privacy** - Concepts falling in this class focus on the lack of privacy due to the centralized management of assets; an example is *“Lack of privacy and censorship. Too centralized and controlled.”*
- **No risks** - Also in this case, some answers also include the concept of a TradFi with no risks or with fewer with respect to DeFi.

What are the main risks of TradFi that do not apply to DeFi?

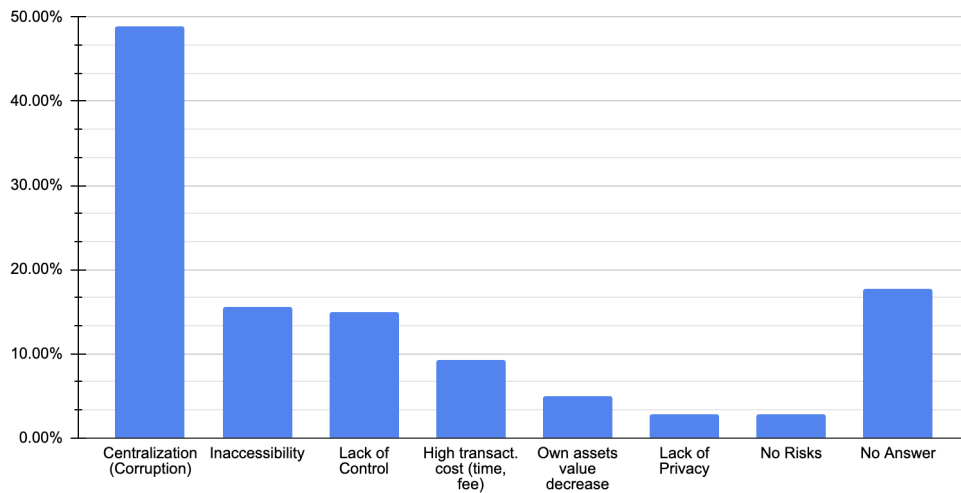


Figure 6 - Question 6 answers

Almost half of the participants include the risk of *centralization and corruption (49%)* of TradFi with respect to DeFi in their answers, making it the most perceived risk by the respondents by far. The second most common one, *inaccessibility and lack of transparency of TradFi* was reported by just 15% of the respondents. This is followed by a *lack of control (14%)*, *high transaction costs (9%)*, and a *decrease in the value of one's own assets (5%)*. Both *lack of privacy* and *no risk* were included by 3% of participants in their answers.

- **Question 7: Do you consider decentralized applications based on DAOs to be DeFi?**

The seventh question was presented with the possibility to reply yes, no, or in an open forum. The majority of answers fall into the first two cases. However, the open-form answers were easily classifiable into three different classes.

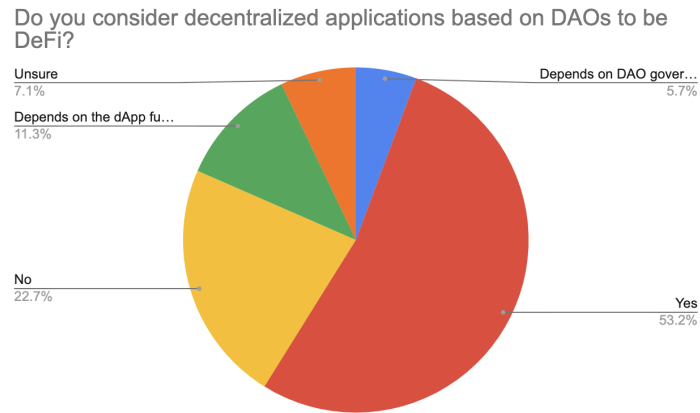


Figure 7 - Question 7 answers

More than half of the participants were convinced that *yes (53%), decentralized applications based on DAOs are DeFi*. Almost one-fourth, however, is in opposition to this view and replied *no (23%)*. Some participants did not give a definitive answer because they thought that it *depended on the decentralized application function (11%)*, while others thought that it *depended on the DAO governance (6%)*. Finally, 7% of participants remained *unsure* about the answer.

- **Question 8: Do you consider the level of network decentralization as an integral part of DeFi?**

The eighth question was presented again with the possibility to reply yes, no, or in an open form. The majority of answers fall into the first two cases, and just a few answers resulted in an “unsure”.

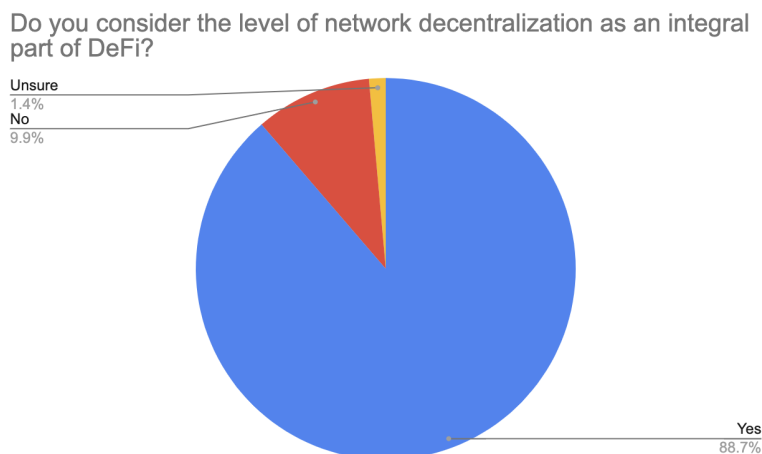


Figure 8 - Question 8 answers

The majority of participants replied *yes* (89%), and *no* (10%) answers were in the large minority this time. Unsure answers account for just 1% of participants.

- **Question 9: Is the underlying information structure of the protocol a determinant of DeFi?**

The ninth question was presented again with the possibility to reply *yes*, *no*, or in an open form. The majority of answers fall into the first two cases, and just a few answers resulted in an “unsure.”

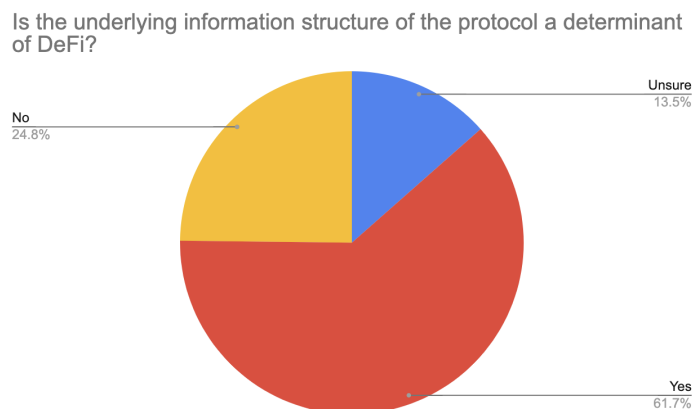


Figure 9 - Question 9 answers

The majority of participants replied *yes* (62%), and one-fourth replied *no* (25%). Unsure answers account for 13% this time.

- **Question 10: When talking about DeFi, do you usually mean a DeFi protocol or something else?**

The tenth question focuses again on a part of the definition of DeFi. Participants were asked to answer their meaning of DeFi with respect to the concept of DeFi protocol. These open-ended answers were classified on the basis of the following classes:

- **Conceptual** - Answers in this class represent the case in which participants do not usually mean a DeFi protocol when talking about DeFi, but they refer to the conceptual idea of decentralized finance; an example is “[I mean] *DeFi as a general term, regardless of protocols used.*”

- **New financial system or products** - Also in this case, answers falling into this class come from participants that do not intend DeFi protocol; their idea of DeFi is one of a new financial system or products (similar to the class in Question 3); an example is *“DeFi for usually means the broader crypto market which includes all lending, staking, borrowing & swapping protocols.”*
- **Set of techs and apps, including protocols** - this class of answers focused on the listing of some technologies enabling DeFi, such as smart contracts, or of protocols built on top, such as tokens, decentralized applications, and DAOs; some examples are *“[By DeFi I mean] the collection of all protocols and their interactions (defi is an emergent system)”* or *“[By DeFi I mean] the integration between token, protocol, and network. Also for now the ability for token traceability for useful money.”*
- **Yes, a protocol** - answers in this class responded affirmatively to the question and added more details to the participant's view.

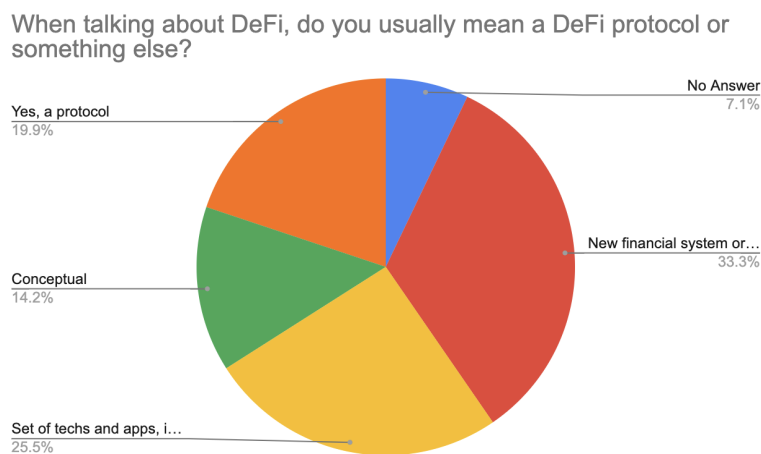


Figure 10 - Question 10 answers

Only one-fifth of participants replied *yes, a protocol* (20%) to the question. Exactly one-third replied that by DeFi, they mean a *new financial system or products* (33%), and one-fourth answered *a set of techs and apps, including protocols* (25%). A minority of participants answered that they refer to the *conceptual idea of DeFi* (14%) instead. 7% of participants did not reply.

- **Question 11: What is the core principle of DeFi for you?**

The eleventh question was presented with a multiple choice among three possibilities: *permissionless access for everyone, transparency through public ledgers, and execution through smart contracts*.

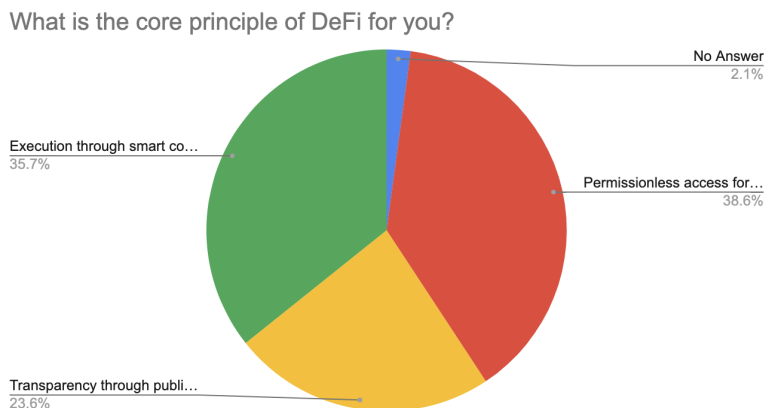


Figure 11 - Question 11 answers

The answers were almost uniformly distributed in the three possible choices, with *transparency through public ledgers (24%)* being the lesser chosen answer. *Permissionless access for everyone* was chosen by 38% of the participants, while *execution through smart contracts* was by 36%. The 2% of participants did not reply.

- **Question 12: Do you usually use a definition of DeFi that you have seen in the literature or the media?**

The twelfth and final question focuses on the source of the DeFi definition that participants made up. The open-ended answers can be classified as yes and no in general, but with different specifications for both.

- **Yes** - Answers in this class come from participants that use the DeFi definition seen in both media and literature.
- **Yes, media** - In this case, participants answered that they have only been influenced by the media.
- **Yes, literature** - In this case, participants answered that they have only been influenced by literature.
- **No** - Answers in this class represent participants that say that, in general, they have not been influenced by media or literature.

- **No, my own research** - In this case, participants answered that they had not been influenced by media or literature, but they built their definition based on their own research.

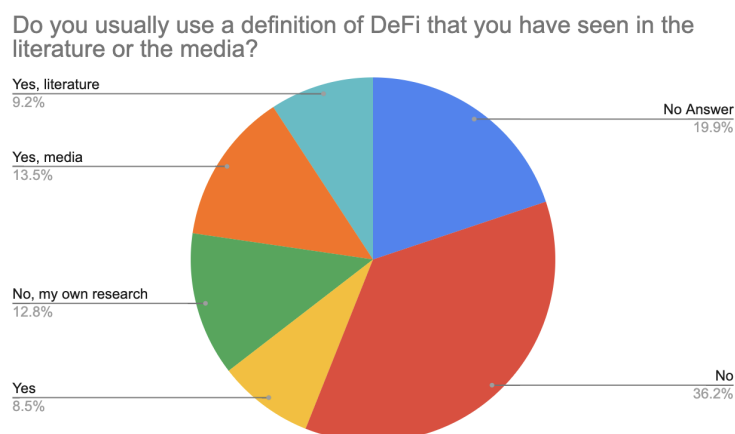


Figure 12 - Question 12 answers

The majority of participants answered with a general *no* (36%) to this question. Considering also the ones that replied *no, my own research* (13%), results show that half of the participants replied no. This becomes more relevant when considering that 20% of participants did not reply. Among the yes replies, we can find 8% *media and literature yes*, 13% *only media yes*, and 9% *only literature yes*.

3.2. Cross-sectional analysis

After we analyzed the answers from the individual questions on the survey, we wanted to run a cross-review between the different questions with the purpose of understanding how the participants perceived DeFi according to their relationship with the DLT space, as well as the key pain points between TradFi and DeFi and the main characteristics of DeFi.

- **DLT industry actors' view on a globally harmonized definition of DeFi**

The combined analysis of questions 1,2, and 12 enables the study of DLT/Blockchain industry actors' view on a globally harmonized definition of DeFi. Question 1 allows us to identify the role that participants play in the DLT/Blockchain industry, and when compared with other questions, we can appreciate the different points of view within the industry.

#1 What is your relationship with the DLT/ Blockchain industry? | #2 Do we need a globally harmonized definition of DeFi?

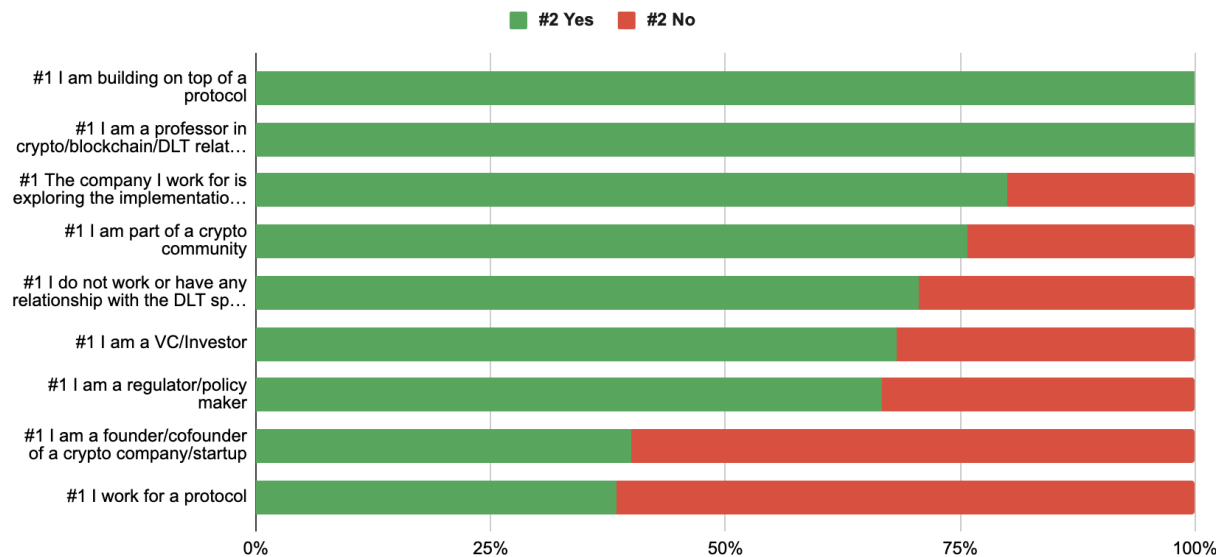


Figure 13 - Answers to question 2 compared to question 1's answers

Figure 13 shows a comparison between questions 1 and 2, with the aim of understanding what the different DLT/Blockchain industry actors think about a globally harmonized definition of DeFi. We can see a really strong opinion about the need for a globally harmonized definition by *developers of solutions that exploit DeFi protocols (100%, in favor)*, *DLT-related-topics academics (100%)*, *employees of companies exploring a DLT-based solution (80%)* and the *crypto community (76%)*.

The majority of participants being part of *DeFi protocols developers (40%)* and *founders of crypto or DLT-based startups (39%)*, seem to be opposed to a globally harmonized DeFi definition.

#1 What is your relationship with the DLT/ Blockchain industry? | #12 Do you usually use a definition of DeFi that you have seen in the literature or the media?

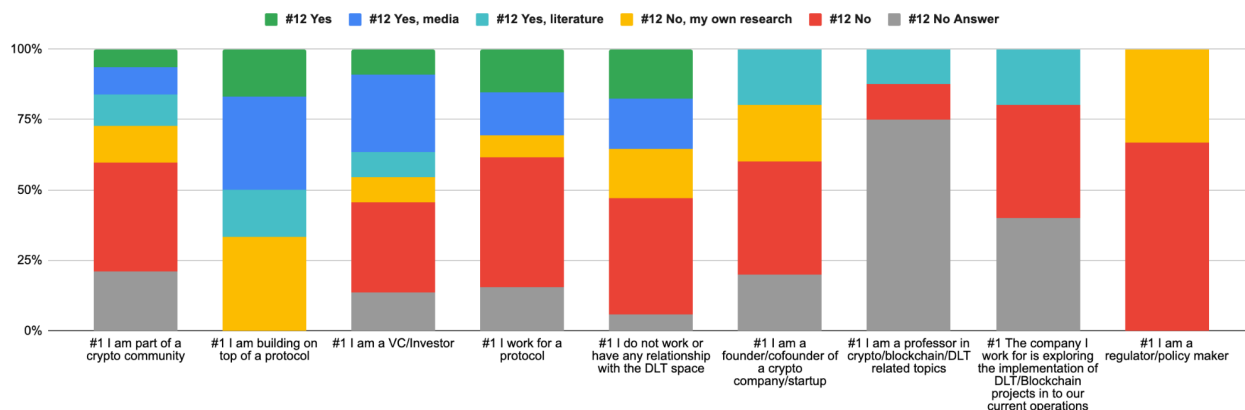


Figure 14 - Answers to question 12 compared to question 1's answers

Figure 14 shows a comparison between questions 1 and 12, with the aim of understanding the industry actors' dependency on media and literature for the definition of DeFi. We can see that the crypto community adopts a definition that, for the majority, does not come from media or literature (52%, yellow and red bars). Only 28% use a DeFi definition that comes from media or literature. Opposed to the crypto community are developers of solutions that exploit DeFi protocols that depend on media or literature for 66%. *Founders of crypto or DLT-based startups* (60%, no) and *regulators/policy makers* (100%, no) are the ones that depend the least on media and literature for their definition of DeFi.

#12 Do you usually use a definition of DeFi that you have seen in the literature or the media? | #2 Do we need a globally harmonized definition of DeFi?

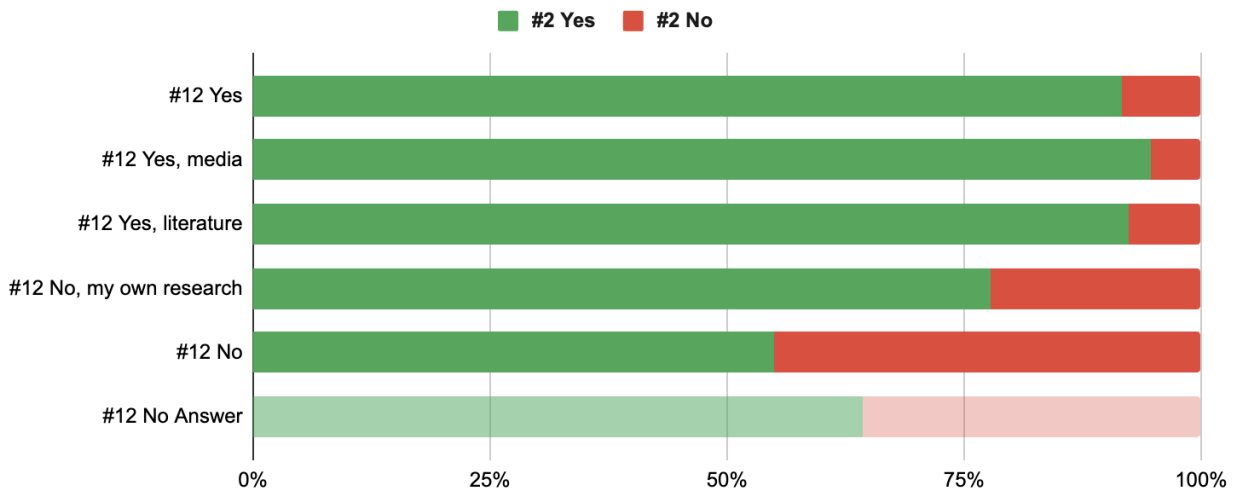


Figure 15 - Answers to question 2 compared to question 12's answers

Figure 14 shows a comparison between questions 2 and 12, with the aim of understanding how media and literature DeFi definition could influence participants' propensity towards the need for a harmonized definition of DeFi. We can easily see how participants that depend on media and literature for their definition of DeFi are in strong favor of the global harmonized definition (92% yes on average), while the others have a less strong opinion.

In conclusion, what can be assessed from this first cross-sectional analysis is that participants that get their DeFi definition from media or literature are more likely to support a globally harmonized definition of DeFi. Participants that have their own definition of DeFi, such as *DeFi protocols developers, founders of crypto or DLT-based startups, regulators/policy makers*, tend not to strongly support the need for a globally harmonized definition of DeFi.

- **DeFi Definition**

The combined analysis of questions 1,3,10, and 11 enables the study of the DeFi definition from the perspective of participants. Question 1 is used again to identify the role of participants, but this time with regards to their definition of DeFi. Question 3, i.e., the one that specifically asks for a DeFi definition, is discussed in light of the participants' core principles (question 11) and overall view (question 10) about DeFi.

#1 What is your relationship with the DLT/ Blockchain industry? | #10 When talking about DeFi, do you usually mean a DeFi protocol or something else?

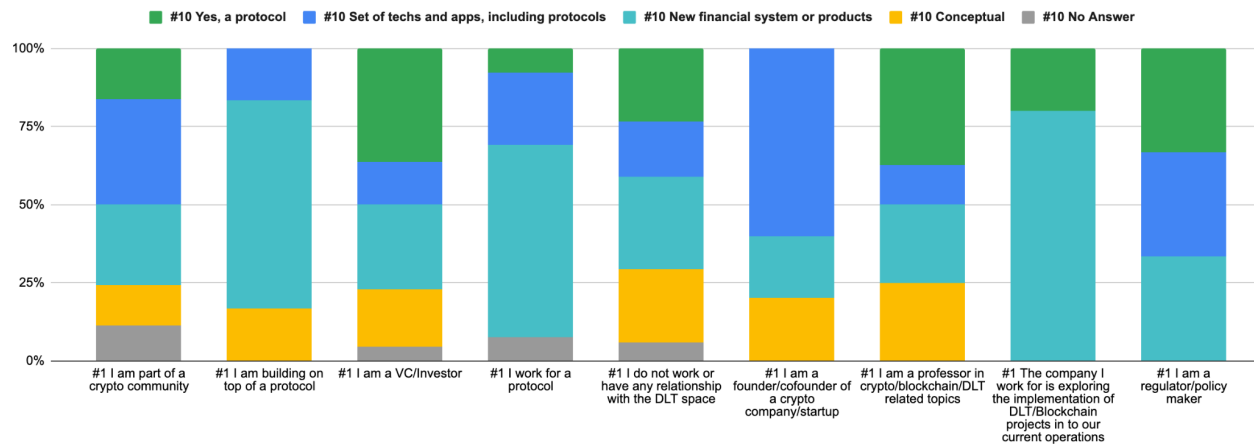


Figure 16 - Answers to question 10 compared to question 1's answers

Figure 16 shows a comparison between questions 1 and 10, with the aim of understanding the industry actors' overall view of DeFi. We can see that the *crypto community* has no view on DeFi standing out among the others but slightly prefers (34%) to use the word DeFi to identify a *set of new technologies and applications that also include DeFi protocols among others*.

On the other hand, with DeFi, *developers of solutions that exploit DeFi protocols* usually (67%) mean a *new financial system or set of products*. The same can be said for *DeFi protocols developers* (62%), *employees of companies exploring a DLT-based solution* (80%), and *participants who have no relationship with the industry* (30%).

The ones that, for the majority, intend a DeFi protocol when they talk about DeFi are *VC/investors* (36%) and *academics* (37%).

#1 What is your relationship with the DLT/ Blockchain industry? | #11 What is the core principle of DeFi for you?

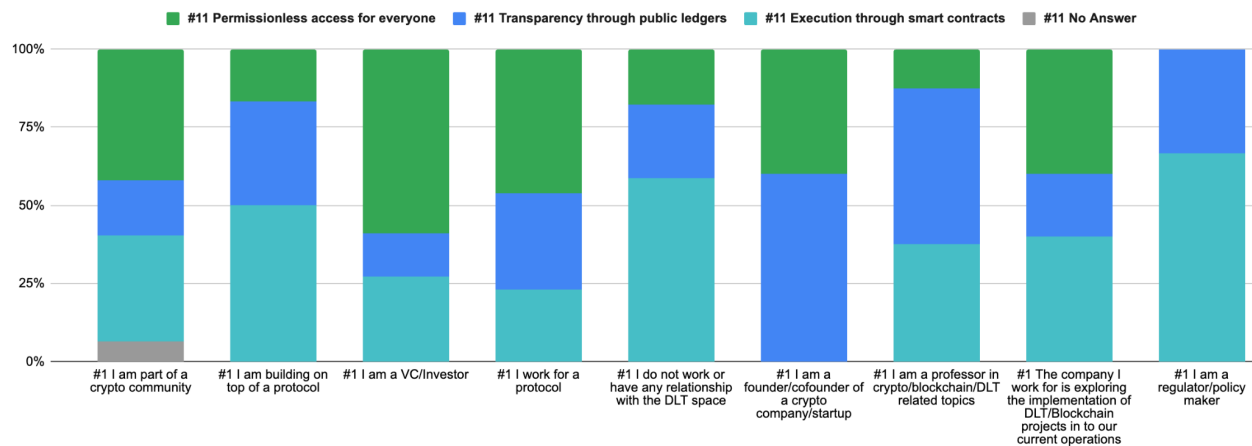


Figure 17 - Answers to question 11 compared to question 1's answers

Figure 17 shows a comparison between questions 1 and 11, with the aim of understanding the industry actors' core principle of DeFi. We can see that the ones that define *permissionless access for everyone* as their core principle are participants from the *crypto community* (42%), *VC/investors* (59%), *DeFi protocols developers* (46%), *employees of companies exploring a DLT-based solution* (40%, with *execution through smart contract being equivalently considered*). The core principle of DeFi for *DLT-related-topics academics* (50%) and *founders of crypto or DLT-based startups* (60%) is *transparency through public ledgers*, while *developers of solutions that exploit DeFi protocols* (50%), *regulators/policy makers* (59%) and *the ones that have no relationship with the industry* (67%) prefer *execution through smart contract*.

#1 What is your relationship with the DLT/ Blockchain industry? | #3 How does your own definition of DeFi look like?

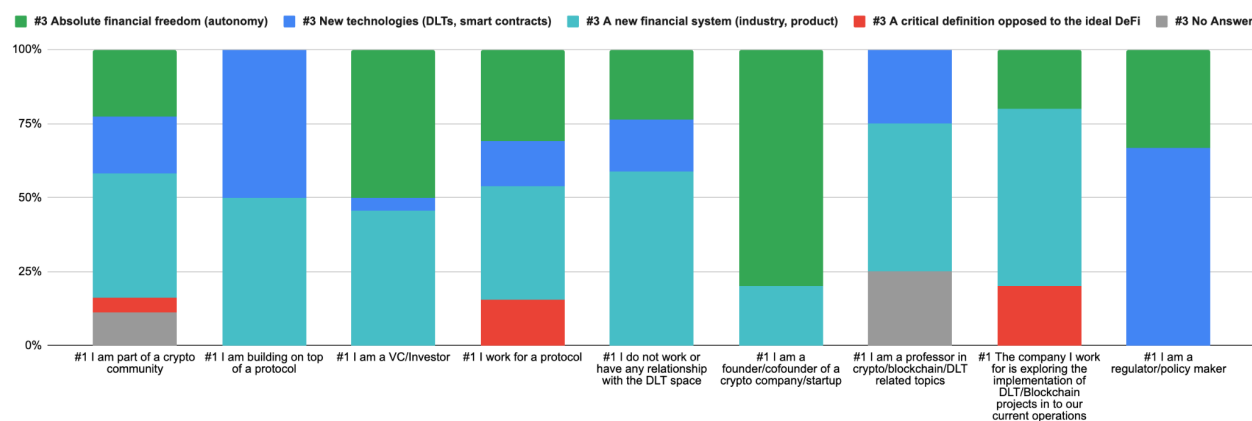


Figure 18 - Answers to question 3 compared to question 1's answers

Figure 18 shows a comparison between questions 1 and 3, with the aim of understanding the industry actors' definition of DeFi. We can see that:

- *crypto community* define DeFi mostly as a new financial system opposed to the centralized ones;
- *developers of solutions that exploit DeFi protocols* define DeFi as a new financial system built with new decentralized technologies;
- *VC/investors* define DeFi as having an absolute financial freedom, meaning individuals' autonomy and peer-to-peer interaction, but also see it as a new financial system;
- *DeFi protocols developers* define DeFi mostly as a new decentralized financial system, but a few present some criticisms;
- *participants that have no relationship with the industry* define DeFi mostly as a new financial system opposed to the centralized ones;
- *founders of crypto or DLT-based startups* define DeFi as having an absolute financial freedom;
- *DLT-related-topics academics* define DeFi mostly as a new financial system opposed to the centralized ones;
- *employees of companies exploring a DLT-based solution* define DeFi mostly as a new decentralized financial system, but a few present some criticisms;
- *regulators/policy makers* define DeFi mostly as a set of instruments built on top of new technologies such as DLTs.

#10 When talking about DeFi, do you usually mean a DeFi protocol or something else?
 #11 What is the core principle of DeFi for you?
 #3 How does your own definition of DeFi look like?

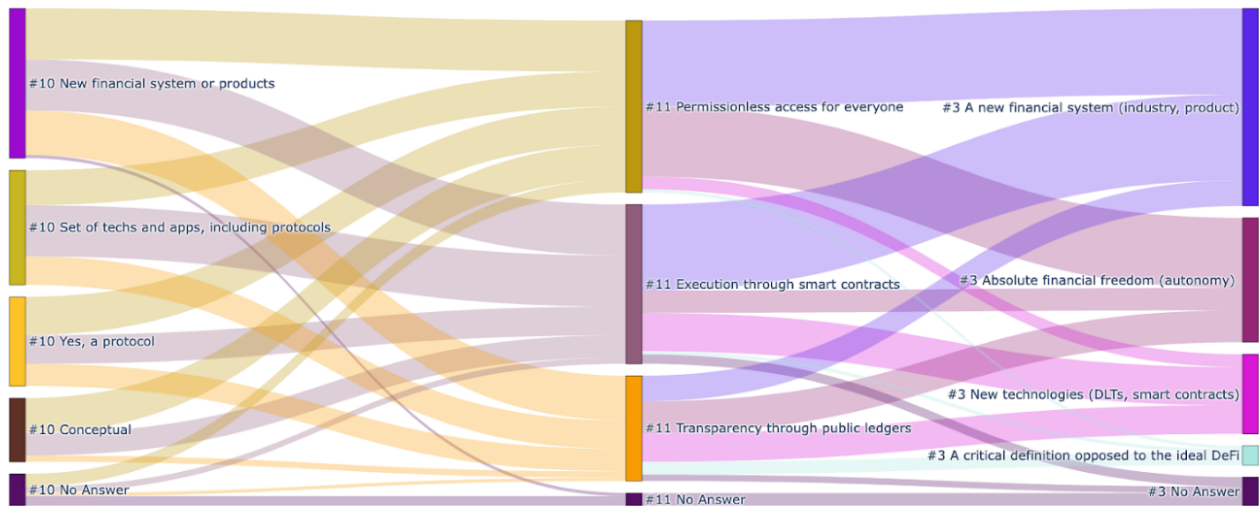


Figure 19 - Questions 10, 11, and 3 are compared using a Sankey diagram; this visualization is used to represent a flow from the answers of one question to the other, where the size of a link between two answers is determined by the number of participants who answered them both.

Figure 19 shows a comparison between questions 3, 10, and 11, with the aim of understanding participants' definitions of DeFi with respect to their overall view and core principle of DeFi. We can see that:

- participants who mainly see DeFi as a *new decentralized financial system (from question #10)* are less than the ones that define DeFi *in this way (#3)*; but the ones that defines DeFi as a *new decentralized financial system*, then value their DeFi core principle more as a *permissionless access for everyone enabled by smart contracts (#11)*;
- participants who mainly see DeFi as a *set of instruments based on the use of new technologies (#10)*, appreciate more the *execution through smart contract* as core principle (#11); in line with this is the given definition of *DeFi based on new decentralized technologies (#3)*; in fact, this DeFi definition entails the *use of smart contracts as core principle* too, together with the *use of transparent public ledgers (#11)*;
- participants who define DeFi as *absolute financial freedom (#3)*, prefer as core principle the *permissionless access for everyone (#11)*;
- participants who attribute to DeFi mainly a *conceptual (#10)* view of the matter, prefer as core principle the *permissionless access for everyone enabled by smart contracts (#11)*;

In conclusion, what can be assessed from this first cross-sectional analysis is:

- There is no clear consensus on the definition of DeFi within the crypto community, with some using it to describe a set of new technologies and applications that includes DeFi protocols. DeFi is generally seen by developers and DeFi protocol developers as a new financial system or set of products. VC/investors and academics tend to use the term DeFi to specifically refer to DeFi protocols, while transparency through public ledgers is emphasized by academics and startup founders.
- As a DeFi core principle, permissionless access is prioritized by the crypto community, DeFi protocol developers, VC/investors, and employees of companies exploring DLT-based solutions. On the other hand, developers of solutions exploiting DeFi protocols, regulators/policymakers, and those with no industry relationship prefer execution through smart contracts.
- DeFi is seen as an alternative to centralized systems by the crypto community and those with no industry relationship, while developers and academics focus on new

technologies. VC/investors and startup founders emphasize financial freedom, while regulators view DeFi as a set of instruments built on new technologies.

- Those who see DeFi primarily as a new decentralized financial system (44% of participants) are more likely to value permissionless access for everyone enabled by smart contracts as their core principle; they often refer to the law, the state, individuals' autonomy, and peer-to-peer interaction. Those who use the definition of DeFi based on new decentralized technologies (18% of participants) also emphasize smart contracts and transparent public ledgers as core principles. Those who define DeFi as absolute financial freedom (28% of participants) tend to prioritize permissionless access for everyone as their core principle. Participants who view DeFi in a more conceptual way tend to prioritize permissionless access for everyone enabled by smart contracts as their core principle.

Overall, these findings suggest that participants' definitions of DeFi shape their understanding of its core principles and highlight the importance of clarity and consistency in defining and communicating the concept of DeFi.

• Comparison between DeFi and TradFi

The combined analysis of questions 4, 5, and 6 enables the study of the comparison between DeFi and TradFi from the perspective of participants. In this case, questions 5 and 6 allow us to identify the participants' thoughts on risks related to both DeFi and TradFi, and question 4 helps to draw the line between the two.

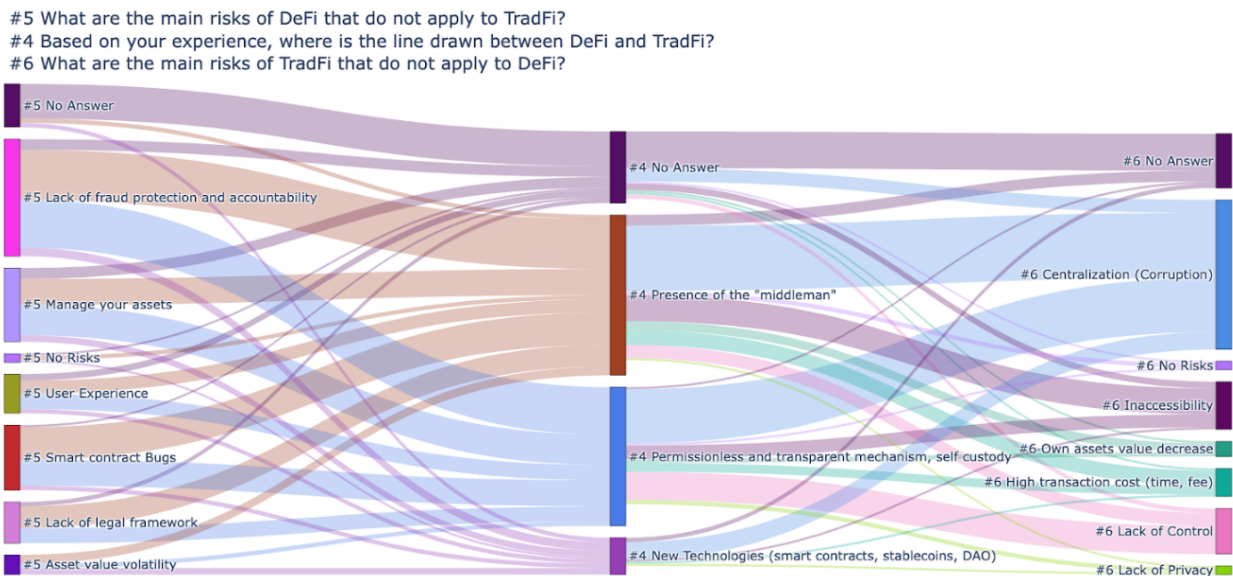


Figure 20 - Questions 4, 5, and 6 are compared using a Sankey diagram; this visualization is used to represent a flow from the answers of one question to the other, where the size

of a link between two answers is determined by the number of participants who answered them both.

Figure 20 shows a comparison between questions 4, 5, and 6, with the aim of understanding participants' ideas on DeFi and TradFi risks and their differences. We can see that:

- for participants indicating the *presence of the “middleman” (#4)* as the main difference between DeFi and TradFi, the issue of *centralization and corruption (#6)* is widely regarded as the most significant concern confronting TradFi; with regards to DeFi, they value more the risk of *lacking fraud protection and accountability (#5)*;
- participants who highlight the existence of *transparent and permissionless mechanisms (#4)* as the primary distinguishing factor between DeFi and TradFi are primarily worried about the potential for *corruption (#6)*; however, they also acknowledge the possibility of a *lack of control (#6)* within TradFi;
- participants indicating the risks of *directly managing their own assets and user experience (#5)* for DeFi, mainly differentiate DeFi from TradFi by the existence of *transparent and permissionless mechanisms (#4)*.

In conclusion, different participants have different views on the main differences between DeFi and TradFi. Some are more concerned about centralization and corruption in TradFi. Those who value transparent and permissionless mechanisms in DeFi are worried about corruption and lack of control in TradFi. Participants who identify the risks of managing their own assets and user experience in DeFi see transparent and permissionless mechanisms as the main difference.

- **Characteristics of DeFi**

The combined analysis of questions 1, 7, 8, and 9 enables the study of the characteristics of DeFi from the perspective of participants. Question 7 focuses on the specific aspect of DAOs, while questions 8 and 9 allow us to determine the participants' views on the underlying information structures and levels of network decentralization of DeFi.

#1 What is your relationship with the DLT/ Blockchain industry? | #7 Do you consider decentralized applications based on DAOs to be DeFi?

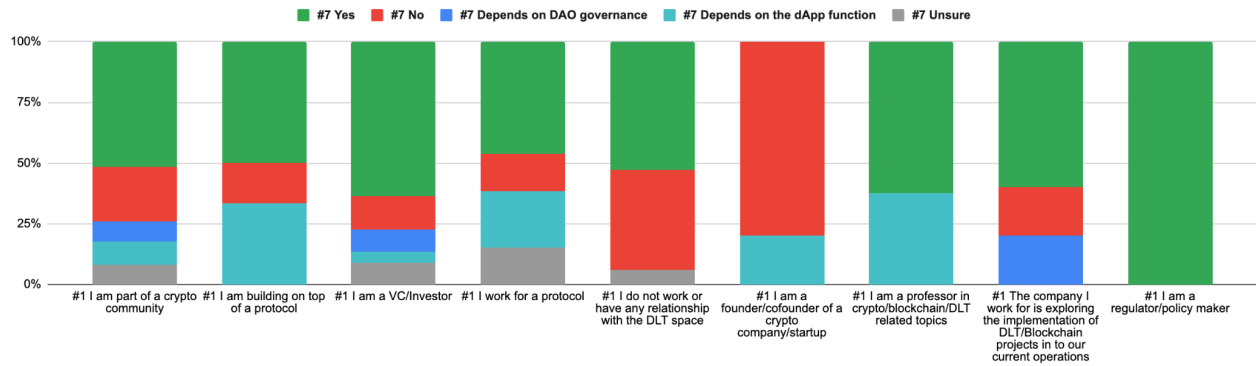


Figure 21 - Answers to question 7 compared to question 1's answers

Figure 21 shows a comparison between questions 1 and 7, with the aim of understanding the industry actors' views on DAOs and DeFi. We can see that most actors in the industry mainly think that decentralized applications based on DAOs are DeFi. Only *founders* and, in part, *participants that have no relationship with the industry* are opposed to that vision.

#1 What is your relationship with the DLT/ Blockchain industry?
 #9 Is the underlying information structure of the protocol a determinant of DeFi?
 #8 Do you consider the level of network decentralization as an integral part of DeFi?

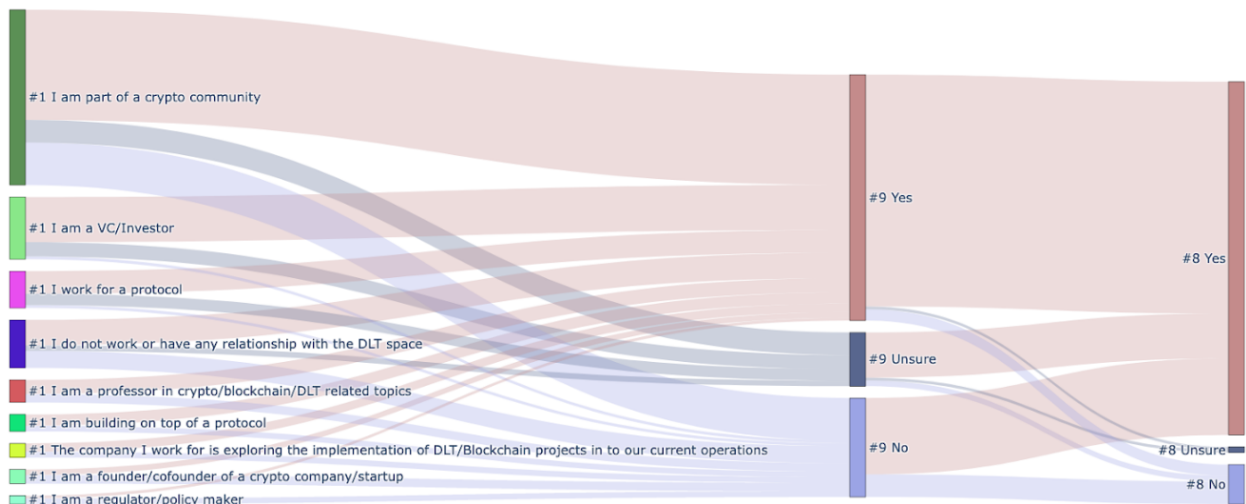


Figure 22 - Questions 1, 8, and 9 are compared using a Sankey diagram; this visualization is used to represent a flow from the answers of one question to the other, where the size of a link between two answers is determined by the number of participants who answered them both.

Figure 22 shows a comparison between questions 1, 8, and 9, with the aim of understanding participants' views of DeFi's underlying information structures and levels of network decentralization. We can see that the *crypto community*, *VC/investors*, *DeFi protocols developers*, and *developers of solutions that exploit DeFi protocols* have a strong opinion on the fact that the underlying information structure of the protocol is a determinant of DeFi. The rest has mixed options or tends toward not sharing this view. In

the latter case, however, the majority of participants think that the level of network decentralization is an integral part of DeFi.

In conclusion, industry actors see DAO-based decentralized applications as DeFi, except for VC/investors and some non-industry participants. The underlying information structure of DeFi protocols is seen as a determinant by the crypto community, VC/investors, DeFi protocol developers, and developers of DeFi solutions, while some have a mixed view or disagree. The majority of participants believe that network decentralization is integral to DeFi.

4. Main findings from the literature review and the survey

The above analysis finds that there needs to be a clear consensus on the definition of DeFi within the DLT/blockchain industry actors. Generally speaking, survey participants that got their DeFi definition from media or the literature mentioned under 2.5 are more likely to support a globally harmonized definition of DeFi; however, from the survey results, there is no global consensus on a unique definition. DeFi is generally seen by developers and DeFi protocol developers as a new financial system or set of products. At the same time, VC/investors and academics tend to use the term DeFi to refer to DeFi protocols and transparency through public ledgers specifically. DeFi is seen as an alternative to centralized systems by the crypto community, while developers and academics focus on new technologies that enable it. VC/investors and startup founders emphasize financial freedom, while regulators view DeFi as a set of instruments built on top of new technologies. At this point, the focus of a common definition is either on a DLT-technology, creating a new financial system, or on a new financial system being enabled by this new technology.

The analysis finds that participants' definitions of DeFi shape their own understanding of its core principles. Participants who define DeFi mainly as a new decentralized financial system are more likely to value permissionless access for everyone enabled by smart contracts. The group of participants who view DeFi more conceptually tend to prioritize mainly permissionless access and not the DeFi underlying technology. This group comprises the majority of the crypto community, as well as DeFi protocol developers, VC/investors, and employees of companies exploring DLT-based solutions. On the other hand, developers of solutions exploiting DeFi protocols, regulators/policymakers, and those with no industry link/connection would rather consider smart contract execution as their core principle.

The analysis also finds different points of view on the main differences between DeFi and TradFi. The majority of participants are more concerned with centralization and corruption in TradFi. The same participants that are worried about the lack of control in TradFi also value transparent and permissionless mechanisms in DeFi. However, at the same time, they identify the risks of managing their own assets and user experience as being fundamentally critical in the context of DeFi.

Industry actors see DAO-based decentralized applications as DeFi, except for VC/investors and some non-industry participants. The underlying information structure of DeFi protocols is seen as a determinant by the crypto community, VC/investors, DeFi protocol developers, and developers of DeFi solutions, while some have a mixed view or disagree. The majority of participants believe that network decentralization is integral to DeFi. Overall, these findings suggest that clarity and consistency in defining and communicating the concept of DeFi are crucial.

4.1. Consolidated definition of DeFi from the literature review and the survey

Based on the analysis of the information collected, we found different definitions according to the nature of the participants:

Crypto community

(members of communities but not necessarily building on protocols)

Crypto communities define DeFi mostly as a **new financial system** opposed to the centralized ones, i.e., with a “middleman”; the crypto community adopts a definition that, for the majority, does not come from media or literature as they prefer to “do their own research”; finally the crypto community mainly thinks that decentralized applications based on **DAOs are DeFi** and that the **underlying information structure of DeFi protocols and the network decentralization are determinant and integral to DeFi**.

Industry

(i.e., developers of solutions that exploit DeFi protocols, DeFi protocols developers, and employees of companies exploring a DLT-based solution)

The Industry defines DeFi as a **new financial system** built with **decentralized technologies** that enable DeFi or that is born with it. The industry definition depends more on media or literature as compared to the crypto community. Finally, the industry mainly thinks that **decentralized applications based on DAOs are DeFi** and that the **underlying information structure of DeFi protocols and network decentralization are determinant and integral to DeFi**.

Investors and founders

(i.e., *VC/investors, founders of crypto or DLT-based startups*)

Investors and founders have a definition of DeFi mainly in line with having **absolute financial freedom**, with references to law, the state, individuals' autonomy, and peer-to-peer interaction but also see it as a **new financial system**.

Investors and founders are the ones that depend the least on media and literature for their individual definitions of DeFi.

Finally, investors and founders are in part opposed to the argument that decentralized applications based on DAOs are DeFi, but they also think that the **underlying information structure of DeFi protocols and network decentralization are determinant and integral to DeFi**.

To sum up, the definition of communities and builders (industry) are almost identical. The primary difference is the reference of the industry to DLT as an enabler of DeFi. For the rest, both mentioned a new financial system and considered the underlying information structure of DeFi protocols and the network decentralization, as well as the presence of a DAO as a DeFi key component. The VC group was not far from that definition; however, it added the concept of absolute financial freedom.

Moreover, it is also important to consider the common definition produced from our literature review:

Literature Review Definition

DeFi is a financial system that operates in a decentralized manner, eliminating the reliance on intermediaries. It leverages new technologies such as Distributed Ledger Technologies (DLT) and Smart Contracts to enable transparent transactions. DeFi offers absolute financial freedom, providing universal access and empowering users to be self-reliant in managing their financial activities. It operates on the principle of trustless interactions, ensuring that transactions are executed without the need for blind trust in centralized authorities. Additionally, DeFi decentralizes the governance of financial services, making them independent of any specific jurisdiction and enabling a global and borderless financial ecosystem.

When reviewing the four definitions, we can find two areas that are common 1) DeFi is defined as a new financial system that operates in a decentralized manner, without the need for intermediaries, and 2) DeFi utilizes new technologies such as Distributed Ledger Technologies (DLT) and Smart Contracts to facilitate secure and transparent transactions.

Moreover, as a reflection of the various perspectives and priorities within the different stakeholder groups, highlighting the nuances in their understanding and interpretation of DeFi, we can also consider that:

- The crypto community places a strong emphasis on decentralized applications as integral to DeFi, considering the underlying information structure and network decentralization as crucial factors.
- The industry definition of DeFi is influenced more by media or literature compared to the crypto community but still aligns with the concept of a new financial system built with decentralized technologies.
- Investors and founders see DeFi as synonymous with absolute financial freedom and highlight references to law, the state, individual autonomy, and peer-to-peer interaction. They have some differences of opinion regarding DAOs as DeFi.
- The literature definition presents a comprehensive overview of DeFi, encompassing the key characteristics identified in the other definitions while providing a broader understanding of the concept.

Hence the following definition encapsulates the common points mentioned across all four definitions while also providing a comprehensive understanding of DeFi that aligns with the perspectives expressed by the crypto community, industry professionals, investors, and founders, as well as literature. The proposed definition is aligned with what was found in the literature review.

Consolidated definition 1.

(Literature review + Crypto community + Industry + Investors and founders)

“DeFi refers to a new financial system and a set of new technologies that operate in a decentralized manner, eliminating the need for intermediaries. It leverages technologies like Distributed Ledger Technologies (DLT) and Smart Contracts to enable secure and transparent transactions. DeFi aims to provide absolute financial freedom, offering universal access and empowering users to be self-reliant in managing their financial activities. It operates on the principle of trustless interactions, allowing transactions to be executed without relying on blind trust in centralized authorities. Additionally, DeFi decentralizes the governance of financial services, making them independent of specific jurisdictions, enabling a global and borderless financial ecosystem.”

5. Input from the Academia to the consolidated definition 1.

The main objective of this paper is to develop a comprehensive definition of DeFi by incorporating insights from various stakeholders, including industry players. After thoroughly analyzing existing literature on DeFi (chapter 2) and gathering additional information through an open survey with the input of the industry, investors, and builders (chapter 3), we sought feedback from professors of different universities, both on the overall content of the chapters 2 and 3 and specifically on the proposed definition of DeFi. Their valuable insights have contributed to the refinement of the definition.

A total of 9 professors, members of the Academic Advisory Board of INATBA with relevant experience around blockchain and DeFi and with affiliations around the world, including Dr. Francesco Paolo Patti from Bocconi University, Dr. Gustavo Prieto from Ghent University, Dr.-Ing. Katarina Adam from HTW Berlin, Dr. Joyce O'Connor from National College of Ireland, Dr. Stefan Brunnhuber from Club of Rome, Dr. Lisa Short from Tshwane University of Technology, and Dr. Merav Ozair from Cornell University, contributed to this paper.

We presented the following definition to them and asked them for feedback:

Consolidated definition 1.

"DeFi refers to a new financial system that operates in a decentralized manner, eliminating the need for intermediaries. It leverages technologies like Distributed Ledger Technologies (DLT) and Smart Contracts to enable secure and transparent transactions. DeFi aims to provide absolute financial freedom, offering universal access and empowering users to be self-reliant in managing their financial activities. It operates on the principle of trustless interactions, allowing transactions to be executed without relying on blind trust in centralized authorities. Additionally, DeFi decentralizes the governance of financial services, making them independent of specific jurisdictions, enabling a global and borderless financial ecosystem."

The process consisted of the professors reviewing the results obtained from the survey and assessing the definition presented above. They were asked a straight yes/no question on their agreement with the definition. Out of nine participants, four replied with a yes (Figure 23). It is worth noting that those who responded with a "no" did not necessarily disagree entirely with the definition but rather provided comments and suggestions for improvement.

Will you agree with the final definition of DeFi proposed in the report?

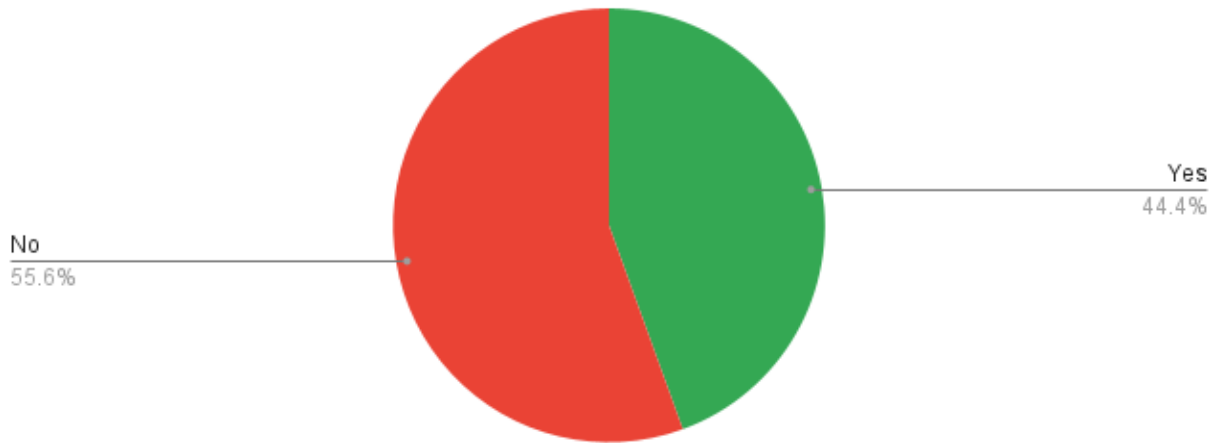


Figure 23 - First question asked to academics after the survey review.

The second and main question asked them about the changes they would make to the definition. Below we summarize the main topics that the professors highlighted when reviewing the definition:

- Absolute financial freedom implies absolute responsibility.
- DeFi is less cohesive than a financial system; rather, it can be seen as just different technologies with shared features operating together.
- DeFi implementations are boundless, as they go beyond the scope of a financial system by reaching every economic activity in our lives.
- DeFi seeks to build open-source financial blocks using blockchain technology.
- DeFi can be seen from two different perspectives: genuinely global, i.e., universal to mankind, or transnational, i.e., operated by a community of knowledge across some jurisdictions.
- The level of DeFi achieved in many cases requires a trade-off between the level of decentralization and security.
- DeFi's financial activities include exchange, lending, and tokenization.

We carefully considered the feedback and key points provided by the professors and integrated them into our previous definitions. Based on their valuable input, we have refined the definition as follows:

Consolidated definition 2.

(Consolidated definition 1. + Feedback from Academic Advisory Board Professors)

“Decentralized Finance (DeFi) is based on blockchain technology and aims to create open-source financial building blocks. It refers to a paradigm that operates through the integration of various technologies with common characteristics, as opposed to operating as a cohesive unit like traditional financial systems. At its core, DeFi embodies the principle of absolute financial freedom arising from absolute responsibility on the part of users. This causes it to extend beyond the boundaries of conventional financial systems, encompassing and influencing every economic activity in our lives. DeFi encompasses various activities managed without intermediaries, including but not limited to exchange, lending, and tokenization. However, achieving a high level of DeFi often requires a balance between decentralization and security. DeFi can be viewed as both globally accessible and transnationally operated. It serves as a universal platform that transcends geographical boundaries, providing financial services to individuals worldwide. Simultaneously, it fosters collaboration and knowledge-sharing across different jurisdictions, enabling a decentralized financial ecosystem that connects participants from various countries. This dual perspective highlights DeFi's aim to establish a borderless and interconnected financial landscape, unrestricted by traditional system limitations.”

The consolidated definition 2 was successfully undergone a second round of review with the members of the academia that participated in the first review before it was considered final.

6. Conclusions and final remarks

Having a clear and universally accepted definition of DeFi is of utmost importance in navigating the complexities of the rapidly evolving Web3 industry. As innovative applications and possibilities for blockchain and crypto assets continue to spread, regulators face the challenge of understanding the dynamic landscape and its potential impact on the financial system. A common definition of DeFi not only aligns stakeholders, fostering cooperation and clarity within the industry, but also aids regulators in setting appropriate measures to govern this transformative technology effectively.

The work we have undertaken in defining DeFi represents groundbreaking efforts to address the multifaceted nature of decentralization and its significance in the financial sector. By engaging with the crypto community and academia, we have gathered diverse perspectives to craft a more comprehensive and industry-driven definition. The

collaboration with esteemed members of academia, in particular, has enriched the definition, ensuring it reflects the latest insights and innovations.

It is essential to emphasize that defining DeFi goes beyond regulatory topics alone. Understanding the intricacies of this decentralized financial system will have far-reaching implications not only in the financial sector but also in various social rules and interactions as concepts like Decentralized Societies and Decentralized Autonomous Organizations emerge. Our project's multidimensional approach, including the survey with the community and engagement with academia, has enabled us to comprehensively explore and comprehend DeFi's potential impact.

DeFi is a collaborative and multidimensional effort that will continue to shape the industry's future. This collaborative effort has significant relevance for a future unified definition, more robust and reflective of the diverse perspectives within the industry. The comprehensive insights gathered from various stakeholders have not only strengthened the clarity and accuracy of our understanding of DeFi but also set the groundwork for a future legal definition.

7. About the Authors

This paper has been led and written by [Mariana de la Roche](#) and [Dr. Mirko Zichichi](#) from the [IOTA Foundation](#), with the support of [Asa Dalhborn](#) (IOTA Foundation) and [Tonia Damvakeraki](#) (EUBOF), and with contributions and feedback from [INATBA](#) Academic Advisory Board: [Dr. Francesco Paolo Patti](#) (Bocconi University), [Dr. Gustavo Prieto](#) (Ghent University), [Dr.-Ing. Katarina Adam](#) (HTW Berlin), [Dr. Ioannis Karamitsos](#) (Rochester Institute of Technology of Dubai); [Dr. Joyce O'Connor](#) (National College of Ireland), [Dr. Stefan Brunnhuber](#) (Club of Rome), [Dr. Lisa Short](#) (Tshwane University of Technology), and [Dr. Merav Ozair](#) (Cornell University) and the review of [Dr. Anja Raden](#) and [Tom Jansson](#) (IOTA Foundation).