Legibility, Exit, and Retention

The Evolution of DeFi Governance and the Formation of Viscosity

About

Metanomia is a think tank focused on analyzing transformations in the cryptocurrency market and related technologies.

Researcher

Eunmi Kim

Corresponding Author

Taemin Oh

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Introduction

As James C. Scott argues in *Seeing Like a State*, states have historically reorganized the social world into a legible space in order to govern society and design long-term order. This process involves identifying, observing, and recording individuals and communities and transforming them into calculable units, thereby rendering society "readable" to the state. Such standardized systems of information were essential for taxation and conscription in the premodern era and, later, for implementing long-term projects such as state-building and industrialization. In other words, legibility was not merely a matter of administrative convenience; it was a fundamental precondition for state governance and administration itself. To this end, modern states settled populations in fixed locations, standardized surnames, weights and measures, and time, and administratively classified land and populations. The process of restructuring society into a form that could be read and governed by the state sometimes involved violence and coercion, but it also provided the foundation upon which states could build long-term order and pursue strategies for development.[1]

Yet there were also those who sought to avoid being "read" by the state. Those who rejected lives of identification, classification, and control moved beyond the reach of state authority. Indeed, some communities in Southeast Asia migrated to mountainous regions to evade taxation and conscription. Swidden agriculture and dispersed settlement patterns allowed them to relocate whenever necessary, making mobility itself a strategy of resistance to state capture. Some Southeast Asian dynasties even used tattoos or other bodily markings to control population movement and identify those subject to taxation.[2] However, as transportation, communication, and military technologies advanced, these spaces were gradually brought within the reach of state administrative power, making strategies of escape and mobility based on physical territory increasingly difficult.[3]

The development of cryptography and internet technologies gave rise to a new kind of space. Blockchain is a cryptographic network unconstrained by the limits of physical territory or national borders—a new digital space in which participants and capital can move in real time at extremely low switching costs. This is not a highly legible space constructed by the state for administrative purposes. Rather, it is a space in which technology itself has produced a high degree of legibility. On-chain data and open-source code enable anyone to verify the state of the network, while publicly available information—including fund flows and governance votes—can be continuously observed.

Yet this hyper-legibility[1)] produces an outcome that is in some respects the opposite of what states have historically experienced. Because on-chain data make it possible to observe system performance and detect signals of risk, participants can compare projects at any time and immediately move to those offering higher returns, more compelling narratives, or safer environments. Whereas state legibility made it easier for states to monitor and control their populations, blockchain's hyper-legibility makes it easier for participants to leave and move across protocols.[4] Moreover, while states could use territory, law, and violence to bind people to particular spaces, blockchains lack any mechanism for physically preventing participants from leaving.[2)] Thus, hyperlegibility ultimately gives rise to a condition of "exitability."

This exitability presents a new challenge for blockchain projects. Although blockchains must remain open to anyone who wishes to join or leave freely, a project requires a certain level of sustained participation and capital in order to continue operating. This tension is particularly evident in decentralized finance (DeFi). In DeFi, yields, risks, and capital flows can be compared in real time, and capital can move rapidly from one protocol to another. At the same time, a protocol can survive only if developers maintain the system, liquidity providers commit assets, and governance participants make the necessary decisions. The central challenge for DeFi projects, therefore, is to create reasons for participants and capital to remain and continue participating in an environment where they are always free to leave.[5]

To explain such continued participation, this study proposes the concept of "viscosity" as an analytical framework. In physics, viscosity refers to the degree to which a fluid resists flow, a property that arises from cohesion among molecules. More recently, social scientists have increasingly sought to understand society through the lenses of mobility and flow, employing metaphors such as "friction" and "stickiness" to describe forces that constrain or delay movement.[6] Whereas friction refers to resistance imposed from outside and stickiness to the tendency to remain attached to a particular place, viscosity is distinguished by the fact that it emerges endogenously from relationships and institutions among participants. Applying this perspective to blockchain, this study defines viscosity as a social and institutional property that delays immediate exit even when participants and capital are free to move. Viscosity is formed through trust, shared interests, community experiences, and governance institutions. Within a structured environment, it slows the immediate departure of participants and capital and thereby creates conditions that enable the continued operation of a project.

This study therefore examines, through case studies, how DeFi projects operating in an environment where hyper-legibility structurally generates exitability have developed institutional mechanisms and forms of governance to increase the viscosity of participants and capital. Viscosity is not a directly observable property. Rather, it is manifested through behaviors such as long-term holding, sustained liquidity provision, participation in governance, and remaining committed during periods of crisis. Accordingly, this study uses these behaviors as empirical indicators of viscosity to compare and analyze the cases and, in doing so, examine the process of institutional evolution in DeFi governance.

1) Applying Scott's concept of legibility to blockchain, this study conceptualizes blockchain as a space that achieves a higher degree of legibility than the state and proposes the concept of hyper-legibility. In the blockchain field, this characteristic is generally described in terms such as "transparency" or "public visibility." Indeed, according to an analysis by the U.S. Federal Reserve (Fed), transparency is a key distinguishing feature of public blockchains: the functionality of smart contracts executed on the network and their transaction histories are publicly visible.
However, this study conceptualizes this quality as hyper-legibility, rather than mere transparency, because it focuses not simply on the fact that information is publicly available, but on the fact that actions and states are recorded as data, allowing anyone to continuously query, compare, and calculate from that data and act accordingly. In other words, while transparency refers to a condition in which information is visible, hyper-legibility emphasizes that information is structured in a form that can be read, calculated, and used for judgment, and that this legibility is open to everyone rather than monopolized by the state or particular actors.

Cy Watsky et al., "Tokenized Assets on Public Blockchains: How Transparent Is the Blockchain?," *FEDS Notes* [Washington: Board of Governors of the Federal Reserve System, April 3, 2024], https://www.federalreserve.gov/econres/notes/feds-notes/tokenized-assets-on-public-blockchains-how-transparent-is-the-blockchain-20240403.html.

2) One of the core features of blockchain is the freedom of participants to enter and exit the network. In a permissionless network, anyone can participate without prior authorization and can leave or rejoin the network at any time. While traditional social orders are maintained through coercive mechanisms, the blockchain space—unlike the state—is characterized by very low exit costs and a high degree of mobility.

Eric Budish, "Trust at Scale: The Economic Limits of Cryptocurrencies and Blockchains," advance publication, *The Quarterly Journal of Economics* [September 2024]

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The Formation of Viscosity and Early Experiments

Attempts to Attract Capital and Participants

The financial institutions we take for granted today—such as deposits, loans, collateral, and exchanges—are the products of experience and trial and error accumulated over long periods of time. Blockchain, however, represents a new kind of space unlike anything humanity has experienced before. Because the early blockchain ecosystem had such a short history, it lacked the accumulated empirical knowledge and practical know-how needed to design and operate financial systems. Under such conditions of uncertainty, the most practical way to design new institutions is to draw on those that have already proven successful. Organizational sociologists Paul DiMaggio and Walter Powell explain that new organizations tend to imitate established and successful models when operating in uncertain environments, a phenomenon they call *mimetic isomorphism*.[7] In the face of uncertainty, imitation can be the cheapest and fastest strategy for survival.

Early DeFi's adoption of structures from traditional finance—including deposits, lending, collateral, and exchanges—can likewise be understood as a form of mimetic isomorphism. Rather than creating an entirely new financial system from scratch, blockchain developers chose to recreate on the blockchain institutions that had already been tested and proven in traditional finance. In 2017, MakerDAO established a collateralized lending system that issued stablecoins against crypto assets. In 2018, Compound introduced a decentralized money market that connected depositors and borrowers. Uniswap, which also emerged that year, presented a decentralized exchange model that allowed assets to be exchanged without centralized intermediaries. Although their technical implementations differed, the financial functions these protocols sought to perform were not fundamentally different from those found in traditional finance.

However, designing an institution and making it work are two different things. A financial system cannot function simply because the institution itself exists. Collateralized lending requires collateral, exchanges require traders, and money markets require deposited assets. For DeFi projects to function and survive, they needed both participants and capital. The first challenge facing early DeFi projects, therefore, was to attract participants and capital that were free to leave and secure sufficient liquidity. No matter how sophisticated a protocol may be, a market cannot form without participants. No matter how

innovative an exchange may be, trading cannot take place without assets available for exchange. And without trading, participants and capital will not gather.

The most direct tool early DeFi projects used to attract capital and participants was incentives. Just as banks attract deposits by offering high interest rates, DeFi protocols sought to attract participants by offering higher returns and greater yield opportunities. In practice, early DeFi projects grew rapidly by offering liquidity providers interest income as well as additional token rewards. The assumption that participants follow returns provided a simple yet effective way to attract capital and participation.

However, attracting participants is one thing; retaining them is another. High yields may be effective in securing initial liquidity, but participants and capital can move at any time when another project offers higher returns.

The problem of participant and capital exit was not unique to blockchain. Organizations operating in spaces beyond the reach of direct physical coercion by the state faced the same challenge in the past. In the seventeenth century, the Dutch East India Company (*Vereenigde Oostindische Compagnie*, VOC) had to sustain long-term operations in the maritime trading space, where the physical coercive power of the state was difficult to extend. At the time, most commercial investments were structured so that capital was withdrawn once a voyage had been completed. The VOC, however, gave investors shares in the company and allowed those shares to be freely traded. This arrangement allowed individuals to leave at any time by selling their shares while keeping the invested capital within the company. It was an institutional mechanism designed to encourage the long-term retention of capital without relying on physical coercion.[8]

Ultimately, the challenge facing early DeFi designers was not simply to attract participants and capital. It was to develop institutional mechanisms that could transform them into long-term stakeholders and thereby increase viscosity.

Compound and the Dawn of DeFi Summer: The Emergence of Stakeholders and an Early Experiment in Viscosity

Compound's developments in 2020 are widely regarded as a turning point that helped trigger the explosive growth of the DeFi ecosystem. At the time, Compound was a decentralized money market in which both deposits and loans were executed automatically through smart contracts. Although it began under centralized control, Compound ultimately aimed to transfer authority over the protocol entirely to its community and stakeholders, including a DAO.

The first problem Compound sought to solve was how to attract participants and capital. In most DeFi protocols at the time, once an asset was deposited as collateral, it could no longer be used for other purposes. Recognizing this inefficiency, founder Robert Leshner introduced cTokens for depositors. Participants could keep their original assets as collateral while using their

claims on the deposited assets in other financial activities, significantly improving capital efficiency. This structure later became the basis for the socalled “Money Lego” model, in which multiple protocols could be combined with one another, and provided a technical foundation for the rapid growth of DeFi.[9]

However, the more fundamental problem Leshner sought to solve was the long-term sustainability of the protocol. He believed that Compound should not be the property of a particular company but should instead become open financial infrastructure that no one could arbitrarily shut down.[10] He concluded that the protocol could not achieve long-term survival as long as the development team continued to control it. His ultimate goal was therefore to transfer operational authority over the protocol to the community and its stakeholders. He described this goal as removing the protocol’s “largest single point of failure”—his own team.

To put this philosophy into practice, Compound introduced its governance token, COMP. COMP holders could participate in key decisions, including changes to the interest-rate model, the addition of new assets, and protocol upgrades.[11] Leshner expected that giving governance rights to participants who deposited or borrowed assets would naturally give them a stake in the protocol’s long-term development. This philosophy was also reflected in the token distribution model. Through liquidity mining, which began in June 2020, 2,880 COMP were distributed each day to depositors and borrowers in proportion to their use of the protocol.[12]

The market, however, interpreted this experiment in a very different way. Participants were more interested in the market value of COMP than in its governance rights. Depositors received COMP in addition to interest, while borrowers could also receive COMP even as they paid interest on their loans. In some cases, this created a situation in which borrowing at a high interest rate could still generate greater overall returns.[13] The results were explosive. Once COMP rewards exceeded prevailing market interest rates, large amounts of capital flowed into Compound. Within just five days of the launch of COMP distribution, Compound became the largest DeFi protocol by total value locked (TVL). The price of COMP also rose sharply. After trading at approximately $101 shortly after liquidity mining began, COMP surged to around $380 within six days.[14]

The influx of capital and participants into Compound sent a powerful signal throughout the DeFi ecosystem. Within just a few weeks, numerous projects, including Balancer and Rarible, introduced governance tokens and liquidity-mining models, helping to usher in what became known as “DeFi Summer.” During the cryptocurrency bull market of 2021, Compound’s TVL eventually exceeded $12 billion.[15]

However, this explosive growth in TVL did not necessarily mean that viscosity had formed. On the contrary, as new projects offering higher yields emerged, participants and capital moved between protocols in search of greater rewards rather than remaining within a community. The designers had envisioned a community with long-term shared interests, but what actually emerged were “yield farmers” who followed returns.

Leshner later acknowledged that the launch of COMP distribution had produced incentive effects that neither the team nor the community had fully anticipated. Simple incentives alone, however, could not turn participants into members of a long-term community. Eventually, as short-term speculative activity began to distort the protocol's incentive structure and market conditions, the community introduced Governance Proposal 011, which fundamentally changed the criteria for COMP distribution. Instead of allocating COMP across markets according to the amount of interest paid, the new system based each market's allocation on the total dollar value of assets borrowed in that market.[16]

COMP succeeded in creating economic interests, but it failed to generate the viscosity needed to transform participants into members of the community or responsible governance participants. The rapid increase in TVL demonstrated the initial conditions for viscosity by bringing participants and capital into the protocol. However, both could leave for another protocol whenever higher yields became available, while the inflow of short-term speculative capital also distorted the protocol's asset allocation and market conditions. Ultimately, turning short-term participation into long-term cooperation—and yield-seeking capital into a community committed to the protocol—required more sophisticated institutional design. Compound's governance token and liquidity-mining model were institutional experiments that revealed this fundamental challenge.

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Institutional Experiments to Increase Viscosity

The competition among governance tokens that began with Compound's COMP became a major turning point in the DeFi Summer. In an environment characterized by hyper-legibility and exitability, participants continually moved toward protocols offering better terms and greater returns rather than remaining within any particular community. This gave rise to "yield farming," in which participants moved across multiple projects in pursuit of higher returns. Projects issued tokens in an effort to slow the exit of capital and participants, but these tokens were often sold on the market immediately after distribution. Attracting participants was possible, but keeping them was more difficult. Compound's experience demonstrated that providing participants with economic interests alone was not enough to delay their immediate exit. Early DeFi projects subsequently sought to address this limitation in different ways.

This study examines three cases—MakerDAO, Uniswap, and Yearn Finance—that continue to function as core protocols within the DeFi ecosystem as of 2026. Each developed different approaches to delaying participant exit, and all three have continued operating to the present by modifying and refining their institutions while experiencing critical crises. However, selecting only surviving cases introduces a risk of selection bias, as it excludes projects that attempted similar institutional changes but ultimately disappeared. Accordingly, this study does not claim that institutional modification causes survival. Instead, it examines how viscosity is formed through institutional processes in protocols that have survived over the long term, and how that viscosity has been sustained through periods of crisis and institutional evolution. This chapter therefore treats viscosity not as a fixed state but as a dynamic process that can be strengthened or weakened through repeated cycles of crisis and institutional modification. It further examines later projects such as Morpho and Hyperliquid to explore how the lessons of these early experiments have been incorporated into protocol design.

Responsibility and Retention in Times of Crisis: MakerDAO

Compound's COMP holders could participate in major policy decisions concerning the protocol, but they did not directly bear the ultimate financial consequences when poor decisions resulted in losses to the system. The COMP distribution bug in 2021 was caused by an error in the reward distribution logic introduced through Governance Proposal 062, which resulted in COMP being distributed in excess of the amounts intended for depositors and borrowers. Even after the error was identified, there was no entity with the authority to immediately halt or correct the distribution, and resolving the problem through the governance process took more than a week. The price of COMP fell by more than 10 percent immediately after the incident, and a substantial amount of COMP was distributed during the period before the issue could be resolved. Although Leshner asked those who had received excess COMP to return it voluntarily, most declined. It was a moment that revealed a critical asymmetry: authority had been decentralized, but responsibility had not.[17]

MakerDAO approached this problem from a fundamentally different direction. Whereas Compound sought to broaden its stakeholder base by decentralizing authority, without successfully translating that arrangement into responsible governance participation, MakerDAO sought to connect participants' interests to the stability of the protocol by coupling authority with responsibility.

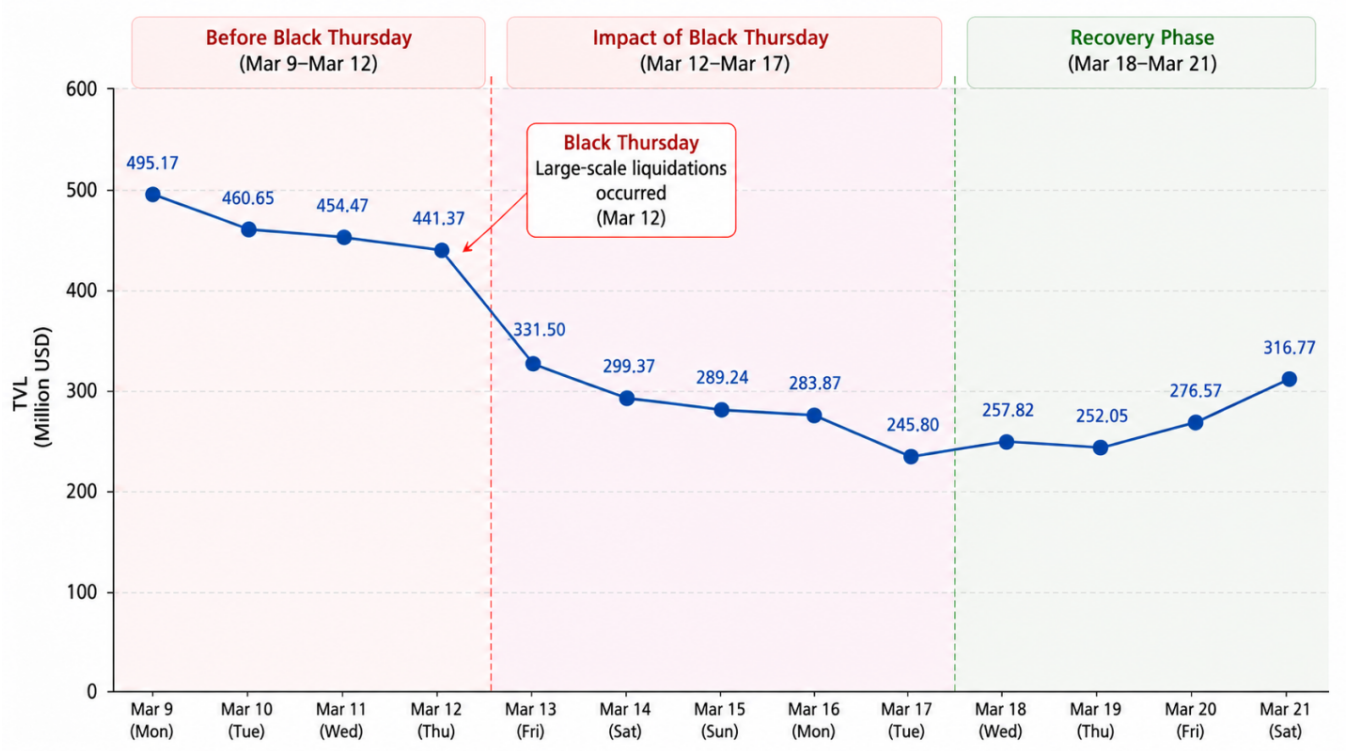
Founded in 2015, MakerDAO launched DAI in December 2017 as a crypto-collateralized stablecoin designed to maintain a peg to the U.S. dollar.[18] Operating on the Ethereum blockchain, MakerDAO initially relied primarily on ETH as collateral. Participants could deposit ETH and other crypto assets approved by the protocol into smart contracts and generate DAI within specified collateralization ratios. If the value of the collateral fell below the liquidation threshold, the system would automatically initiate a liquidation process to repay the outstanding debt.[19] This automated liquidation mechanism was a representative DeFi solution for maintaining system solvency without human intervention.

Founder Rune Christensen recognized early on that not every problem involved in creating a stable decentralized currency could be solved through code alone. What should the collateralization ratio be? When should liquidation thresholds be adjusted? By what criteria should new collateral assets be added? These questions have no permanently fixed answers because market conditions and participant behavior are constantly changing. Keeping rules permanently fixed while the market changes can, in fact, make a system more vulnerable. MakerDAO therefore incorporated human judgment into the system from the outset. While DAI issuance and liquidation were handled automatically by smart contracts, key parameters—including collateralization ratios, stability fees, liquidation rules, and the approval of new collateral assets—were determined by holders of MKR, MakerDAO's governance token.[20]

Moreover, MakerDAO gave MKR holders not only decision-making authority but also an economic stake in the consequences of those decisions. When the system operated profitably, the protocol could use its surplus to purchase and burn MKR, potentially increasing the scarcity and value of the remaining tokens. Conversely, if poor risk management or market shocks caused the system to incur losses, new MKR could be issued to cover the shortfall.[21] In such cases, existing MKR holders would see their ownership stakes diluted. This structure resembles Nassim Nicholas Taleb's concept of "Skin in the Game," in which decision-makers directly bear the consequences of their actions.[22] The arrangement was intended to encourage participants to consider not only short-term rewards but also the consequences their decisions could have for the system as a whole.[23] However, this structure of responsibility had little opportunity to be tested in practice for several years. From 2017 to 2019, MakerDAO operated relatively smoothly, and for most participants, governance was less a form of political responsibility that could determine the survival of the system than a maintenance function for adjusting key parameters. Whether this institutional design could actually create and sustain viscosity remained untested.

The design was put to a critical test during Black Thursday in March 2020. Amid the shock of the COVID-19 pandemic, the price of ETH fell sharply, while severe network congestion disrupted the normal operation of the liquidation system. Some participants exploited two vulnerabilities in the auction mechanism used to liquidate ETH collateral for DAI. One was that the auction allowed only a limited period—10 minutes—for subsequent higher bids after a bid had been accepted; the other was that competing bid transactions were not being processed in time because of network congestion. By paying extremely high gas fees, the attackers were able to get their near-zero DAI bids processed ahead of competing bids. When the auction timers expired without competing bids being processed, they acquired the collateral for almost no DAI, resulting in a large accumulation of bad debt in the system. This was not simply a technical error. It demonstrated the limits of the automated system when confronted with an extreme real-world shock. For MKR holders, it was also the first major test of their position as the parties ultimately responsible for absorbing the system's losses.[24] At the same time, the market witnessed another important aspect of governance: it was not merely a procedure for setting policy but also an institutional mechanism for restoring the system in a crisis. Although the automated liquidation mechanism had failed, MakerDAO did not abandon the system. Through governance, MakerDAO issued and auctioned new MKR and used the proceeds to cover the system's bad debt. The system was restored through governance decisions, and MakerDAO survived. This experience strengthened confidence within the community that the system could survive even under crisis conditions, helping to reinforce the viscosity that delayed immediate participant exit.

FIGURE 01 **MakerDAO (now Sky) TVL, March 9–21, 2020**



Following the large-scale liquidations on March 12, TVL declined from approximately $441 million to approximately $245 million by March 17, before beginning to recover after March 18, when the bad debt was addressed through debt auctions. However, because TVL represents the dollar-denominated value of collateral, changes in the price of ETH may have contributed substantially to both the decline and subsequent recovery. Although the graph alone cannot isolate the effect of the governance response, it does show that the system entered a recovery phase without collapsing.

Source: DefiLlama, *MakerDAO (now Sky) TVL (Daily)*; daily figures as of 23:59 UTC; reconstructed by the author with the assistance of generative AI.

Black Thursday demonstrated the importance of governance in responding to crises. MakerDAO subsequently began to restructure governance from a routine maintenance function into a core institution responsible for the survival of the system. Human judgment and responsibility were gradually institutionalized within the protocol through Risk Teams that assessed system risks, Core Units that carried out operational work, a Delegate System that provided access to specialized expertise, and Executive Votes that implemented final policy decisions. Crisis response began to evolve from one-off measures into repeatable institutional processes.

Through this process, Christensen came to recognize another problem: maintaining viscosity through responsibility also involved costs. As MakerDAO grew, governance increasingly became a complex form of risk management. Assessing the risks of collateral assets, adjusting liquidation mechanisms, and deciding whether to add new assets required substantial knowledge of finance, economics, and technology. Responding to exceptional events during crises was likewise difficult for ordinary participants.[25] In a *WIRED* interview, MakerDAO participants pointed to another problem: people were reluctant to vote on complex proposals, voter participation was only around 10–15 percent, and ordinary participants often found complex proposals difficult to understand, leading them to follow the decisions of founders or prominent figures.[26]

As a result, most participants chose simply to use DAI rather than directly participate in collateral-risk analysis or policy decisions, while actual decisionmaking gradually became concentrated among risk-management specialists, economic analysts, technical developers, and delegated representatives. Participants wanted governance to exist, but they did not necessarily want to participate in it themselves.[27] What they wanted was not continuous political participation, but institutional safeguards capable of defending the system and preserving the community during periods of crisis. MakerDAO therefore encountered another paradox. By coupling authority with responsibility, it had succeeded in creating viscosity within the community, but sustaining that viscosity required substantial expertise and ongoing participation. This was the opposite of the problem Compound had revealed: a structure in which the number of stakeholders had increased while responsibility remained limited. This realization became the starting point for Christensen's subsequent proposal of Endgame.

Christensen's Endgame proposal in 2022 was not simply a plan to strengthen governance. Rather, it emerged from the conclusion, based on operational experience, that it was inefficient to leave every issue to community voting.[28] Endgame sought to decentralize MakerDAO into multiple autonomous operating organizations, or SubDAOs, in order to increase specialization. At the same time, repetitive and predictable policy decisions would be handled through predefined rules and automation, allowing humans to focus on strategic decisions and exceptional crisis responses. The goal was not to eliminate human judgment, but to reduce the cost of governance by limiting human intervention to areas where it was genuinely necessary and delegating the rest back to the system.[29]

This direction became more pronounced when MakerDAO rebranded as Sky in 2024. Under the Endgame framework, SubDAOs were reorganized as "Sky Stars." A new stablecoin, USDS, was introduced alongside the existing DAI, while MKR could be upgraded to SKY, restructuring the governance system around the SKY token.[30] This was not simply a change of name, but a continuation of the long-term experiment to transform MakerDAO from a single, large DAO into a modular ecosystem of interconnected, specialized organizations.

The conclusion MakerDAO reached through this process of trial and error was that human judgment is necessary—and that such judgment is never costless. The decisions participants made and their willingness to bear responsibility during crises became the starting point for a form of viscosity that helped prevent systemic collapse and delay the exit of participants and capital. Yet sustaining this viscosity beyond temporary crisis response required specialized expertise and an institutional division of labor. Only then could it translate into long-term holding, sustained liquidity provision, governance participation, and continued participation during crises. MakerDAO therefore sought to develop a governance structure capable of sustaining viscosity by delegating routine and predictable functions to rules and automation while entrusting strategic decisions and crisis response to specialized human actors with the necessary expertise and accountability.

The Limits of Automation and the Redesign of Viscosity: Uniswap

While Compound and MakerDAO engineered incentives and accountability to bind users and capital providers as governance stakeholders, early Uniswap assumed that automated market mechanisms alone could maintain participant viscosity.

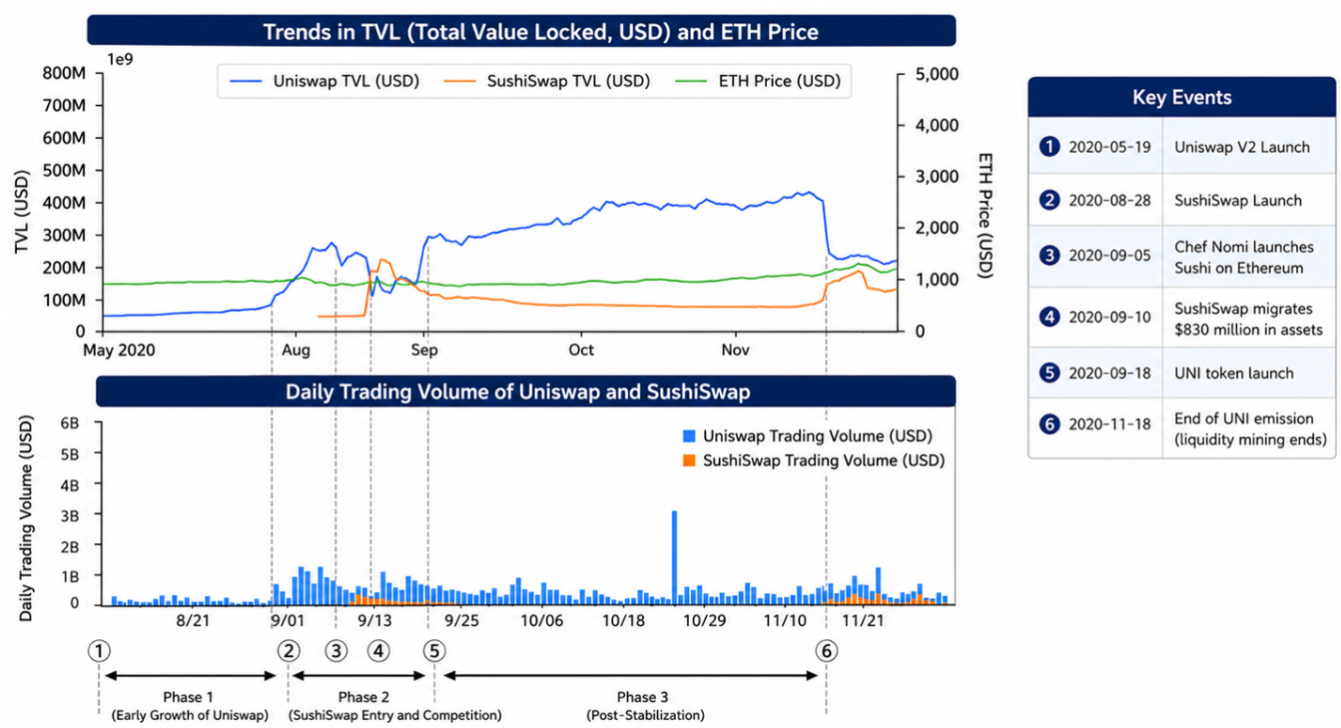
Whereas traditional exchanges relied on the discretionary judgment of market makers, exchange operators, and intermediary institutions, Uniswap replaced these with mathematical rules executed through an Automated Market Maker (AMM).[31] Traders executed transactions directly against liquidity pools without order books, while liquidity providers earned LP tokens and a share of transaction fees as rewards. The market was capable of operating continuously without intervention from distinct operators or intermediaries.

Indeed, following its 2018 launch, Uniswap operated without a governance token for nearly two years, maturing by 2020 into the largest decentralized exchange in DeFi. Uniswap was founded on the premise that efficient market mechanisms alone—without designing dedicated communities or governance frameworks—would naturally retain participants and foster continuous market expansion.

However, the 2020 "Vampire Attack" by SushiSwap revealed that automation and viscosity were not synonymous. Cloning Uniswap's codebase, SushiSwap lured Uniswap's liquidity providers by offering the SUSHI token along with supplementary fee revenues. Despite Uniswap's AMM architecture operating flawlessly, participants migrated their capital to stake Uniswap LP tokens on SushiSwap in pursuit of higher yields. Participants chose higher immediate returns over Uniswap's established market structure, enabling SushiSwap to utilize the pledged Uniswap LP tokens to siphon roughly $800 million in assets into its own protocol. This represented more than half of Uniswap's total assets at the time, instantly giving SushiSwap liquidity on the scale of a major exchange.[32] The event imparted a critical lesson: market automation succeeded, yet liquidity migrated the moment superior incentives materialized.

To reclaim fleeing liquidity, Uniswap issued the UNI token in September 2020. Sixty percent of the genesis supply was allocated to the community, including a retroactive distribution of 400 UNI to every wallet address that had interacted with Uniswap prior to September 1, 2020. This distribution encompassed approximately 12,000 addresses that had executed only failed transactions. Uniswap sought to subsume nearly every historical user into its community footprint.[33] In the short term, this served as an exceptionally effective defensive maneuver. While SushiSwap had offered users higher yields, Uniswap offered a form of protocol ownership and a voice in its future. Holding the governance token of what was then DeFi's premier exchange carried considerable symbolic weight, and the 400 UNI distributed per address represented substantial economic value. Consequently, liquidity flight rapidly decelerated, and Uniswap reclaimed market dominance.

FIGURE 02 **Trends in TVL and Trading Volume of Uniswap and SushiSwap (May–November 2020)**



Following the launch of the UNI token, Uniswap's TVL recovered rapidly, but its growth slowed after liquidity mining ended. This suggests that initial incentives alone may have been insufficient to sustain participation over the long term.

Source: Author's translation and reconstruction based on Figure 5 in Sizheng Fan et al., "Towards Understanding Governance Tokens in Liquidity Mining: A Case Study of Decentralized Exchanges," *World Wide Web* (2022) (with the assistance of generative AI).

Yet UNI—designed to counter SushiSwap's offensive—failed to provide an institutional mechanism capable of sustaining viscosity over the long term. By distributing UNI to nearly everyone who had previously used the protocol, Uniswap built a large community almost overnight. However, for many recipients, UNI was perceived not as a reason to remain aligned with the protocol over the long term, but rather as an instantly realizable monetary payout. Indeed, an exceptionally low percentage of airdrop recipients subsequently purchased additional UNI on the market, while a substantial majority liquidated their tokens immediately upon receipt.[34] Reclaiming liquidity and rebuilding viscosity proved to be distinct challenges.

Operationally, direct participation by token holders remained inadequate. UNI holders were granted rights to vote on protocol upgrade proposals, treasury management, governance rule amendments, and protocol resource allocation. Yet voting turnout averaged under 10% of total supply (under 15% of circulating supply), concentrating actual decision-making power among a small cadre of venture capital firms and large token holders, alongside delegates to whom these entities delegated their voting weight.[35] This underscored the practical limits of a direct-democracy model in which all token holders participate in day-to-day governance. More crucially, merely expanding operational access did not inherently heighten participant viscosity.

To address these limitations, Uniswap shifted away from expanding participation quantitatively and toward narrowing the scope of governance while increasing the role of domain expertise. Rather than deciding every

matter through community-wide votes, governance was limited to core principles, while specialized delegates handled operational matters. UNI holders could delegate their voting power to these representatives, who were responsible for reviewing policy proposals and conducting technical evaluations. Rather than serving as passive voters, delegates acted as specialized stewards, assessing the technical and economic implications of governance decisions. Furthermore, Uniswap introduced specialized entities such as the Uniswap Accountability Committee (UAC) to manage systemic risk and core operational functions, gradually moving toward a structure in which community-appointed representatives and experts assumed responsibility for day-to-day stewardship.[36]

Through this transition, Uniswap uncovered a key reality: users do not act on governance rights alone. While UNI holders possessed voting rights, the growth and revenue generated by the protocol did not translate directly into economic value for them.[3)] From the perspective of average participants, the time and effort required to review complex governance proposals and cast votes far outweighed any tangible return. To incentivize participants to care about the protocol's future and actively vote, it was necessary to link governance rights directly to economic value.

The institutional mechanism designed to address this disconnect was the "Fee Switch," debated extensively since 2022. The Fee Switch is a feature that diverts a fraction of Uniswap's trading fees away from liquidity providers (LPs) to the protocol treasury, converting fee revenue into capital reserves for protocol development and ecosystem expansion.[37] Although technically feasible early on, its deployment was repeatedly delayed. Directing fee revenue toward the economic value of UNI risked causing UNI to be characterized as more than a pure governance token, potentially exposing it to treatment as a yield-bearing security and introducing regulatory, tax, and legal liability risks. Thus, activating the Fee Switch was not merely a technical choice, but an institutional question of how to ground economic viscosity within a legally compliant framework.

Proposed in 2025, DUNI served as the institutional foundation for mitigating these constraints. Established under Wyoming's Decentralized Unincorporated Nonprofit Association (DUNA) statute, DUNI was designed to allow Uniswap governance to perform off-chain functions—such as tax filing, contract execution, and vendor hiring—while reducing the risk of direct personal liability for participants. The establishment of this legal entity provided an institutional basis for mitigating regulatory risks and establishing a legitimate framework for value distribution, creating the launchpad for the Fee Switch following the DUNI debates.[4)]

Building upon this institutional foundation, Uniswap Labs and the Uniswap Foundation introduced UNIfication in 2025—a proposal to activate protocol fees to buy back and burn UNI tokens. As protocol volume grows, higher fee revenues can translate into greater UNI buybacks and burns, forging a structural link between protocol growth and the economic interests of UNI holders.[38] The Fee Switch vote conducted in December 2025 passed with 125.34 million UNI in favor—exceeding 99.9% approval—while simultaneously

3) Despite generating $5.38 billion in cumulative trading fees during the five years following the launch of the UNI token in 2020, Uniswap distributed none of this revenue to UNI token holders. This was because Uniswap initially designed UNI as a "pure governance token," without revenue sharing, in an effort to avoid potential violations of securities laws.

Source: Andres, "Uniswap Tokenomics: From Governance to Value Accrual," Tokenomics.com, February 1, 2026,https://tokenomics.com/articles/uniswap-tokenomics.

4) In August 2025, a proposal was submitted to the Uniswap Governance Forum to establish a legal entity named "DUNI" based on Wyoming's Decentralized Unincorporated Nonprofit Association (DUNA) statute. This proposal aimed to allow governance to legally manage tax obligations and off-chain regulatory requirements while providing a "limited liability" shield to protect participants from personal legal liability or tax risks arising from collective decision-making. Holding UNI and participating in governance activities—including forum participation, delegation of voting power, proposal drafting, and voting—would automatically confer DUNI membership without requiring disclosure of one's identity.

Source: kaereste, "[Governance Proposal]—Establish Uniswap Governance as 'DUNI,' a Wyoming DUNA," *Uniswap Governance Forum*, August 29, 2025, https://gov.uniswap.org/t/governance-proposal-establish-uniswap-governance-as-duni-a-wyoming-duna/25770.

authorizing the burn of 100 million UNI, valued at roughly $600 million at the time. Representing more than 20% of the circulating UNI supply, voter turnout marked one of the highest participation levels in Uniswap's history.[39]

Uniswap's evolution represents the iterative revision of its initial assumption that automated markets alone could preserve participant viscosity. SushiSwap's attack proved that while automation can sustain a market, it cannot anchor participants. Uniswap responded by issuing UNI, successfully recapturing liquidity and restoring market dominance. However, the UNI airdrop demonstrated that constructing a community does not automatically yield viscosity. Subsequently, Uniswap sought operational stability through delegation and specialization. Concurrently, through DUNI, the Fee Switch, and UNIfication, the protocol aligned its expansion more directly with the economic interests of token holders, encouraging long-term retention and governance participation.

Uniswap's journey demonstrates more than the simple truth that financial returns retain users. As shown in Table 1, Uniswap's governance proposals exhibited starkly contrasting participation levels based on proposal type. Operational proposals—such as deployments, parameter adjustments, and budget approvals—consistently hovered around the 40 million to 50 million UNI range, while grant execution proposals concentrating benefits on specific chains or liquidity providers repeatedly failed. Conversely, proposals tied directly to value accrual—such as fee redirection and UNI burns—elicited turnout far above baseline metrics, culminating in the 125.34 million UNI tally in 2025. This underscores that economic alignment tied to governance authority—rather than governance power alone—serves as a primary driver of participation.

However, binding governance authority with economic alignment did not heighten viscosity uniformly across all participant classes. The Fee Switch and UNIfication mechanism redirects a portion of protocol fees to accrete value to UNI, inherently diminishing the fee share previously captured by liquidity providers. While this aligns UNI holders with protocol expansion, it introduces the risk of dampening LP incentives. Competing DEXs—such as Aerodrome on Base—framed this shift as a "major strategic misstep" by Uniswap and aggressively pursued cross-chain expansion to recruit displaced liquidity providers.[40] Although a mass exodus of LPs did not materialize, this debate illustrates how a singular governance decision can create divergent incentive structures across distinct user groups. Uniswap's pivot should therefore be understood not as a total collapse of its community core, but as a deliberate restructuring that linked protocol earnings more directly to UNI holders.

TABLE 01 **Voting Size by Proposal Type in Uniswap Governance (2023–2026)**

Proposal Type	Primary Stakeholder	Representative Proposals (Votes For)	Voting Size
Deployment & Parameter Operations	Protocol Operations	Scroll v3 deployment (52.27M), Onboarding package bundle (44.06M), Cross-chain governance parameter update (51.52M)	41–52M
Treasury Execution & Incentives	Specific Chains & Liquidity Providers	Integrated liquidity incentives program (50.03M), Arbitrum LTIPP matching (44.98M), Forse Analytics outsourcing (rejected, 39.1M), Unichain joint incentives plan (23.29M), v4 expansion & Unichain support (Round 1 rejected 24.65M, Round 2 passed 41.28M)	23–50M
Delegate & Specialized Body Operations	Delegates, Foundation & Accountability Committee	Deployment Accountability Committee establishment (49.88M), Delegate compensation Round 1 (43.85M), Accountability Committee renewal Round 4 (43.67M), Foundation seed funding (60.8M)	43–61M
Legal Entity Establishment	All Governance Participants	DUNI establishment (52.97M)	53M
Fees & Burns	UNI Holders	UNIfication (2025.12, 125.34M), Protocol fee expansion Round 1 (2026.3, 62.84M) · Round 2 (2026.3, 77.83M) · Round 3 (2026.6, 72.98M), Robinhood Chain expansion (2026.7, 46.88M)	63–125M

Before 2022, the delegation structure had not yet become established, resulting in substantial volatility in voting participation; even operational proposals sometimes attracted votes totaling 70–80 million UNI. Accordingly, the analysis focuses on the period from 2023 onward, when the baseline had stabilized. The first through third rounds of protocol fee expansion and the Robinhood Chain expansion are follow-up proposals introduced after the December 2025 approval of UNIfication, progressively broadening the scope of the fee-accrual mechanism.

Source: Uniswap Agora, https://vote.uniswapfoundation.org

From Moral Legitimacy to Expertise: Yearn Finance

While the 2020 DeFi Summer triggered explosive growth across the blockchain ecosystem, it also led to widespread token dumping and participant flight as a result of yield farming. With a flood of emerging protocols—such as Compound, Aave, and Curve—unlocking novel financial opportunities, market participants constantly monitored yield rates. Users had to constantly assess which protocol offered the highest yield, when to move their assets, and which strategy was most efficient. These decisions still relied heavily on human experience and intuition.

South African developer Andre Cronje identified this structural reliance as the core problem. If algorithms could automatically locate optimal yields and reallocate assets, human involvement would become unnecessary. To optimize the management of his own assets, Cronje developed iEarn.finance in February 2020, one of the earliest automated yield aggregators, which subsequently evolved into Yearn Finance in July 2020. At the heart of this evolution was the introduction of the "Vault" system.[41] Vaults operated analogously to traditional financial safes, serving as on-chain accounts programmed to execute asset movements when predefined criteria were satisfied. When users deposited assets into a Vault, the protocol automatically moved capital across multiple DeFi protocols and reinvested the resulting yields to maximize compound returns. This automation, combined with the momentum of DeFi Summer, attracted immense amounts of capital and participation.

Yet the success of automation laid bare a new paradox. As the protocol expanded rapidly, the number of decisions that had to be made multiplied, encompassing strategy development, fee policy, vault management, and security responses. While Vaults could automatically execute predefined strategies, they could neither design new strategies nor exercise judgment in rapidly changing market conditions. What Yearn Finance automated was not judgment itself, but the execution of previously validated strategies. Ultimately, the discretionary judgment that automation failed to eliminate increasingly fell to Cronje. A project designed to eliminate reliance on human judgment thus became increasingly dependent on the judgment of a single founder.

Amid these dynamics, Yearn Finance rebranded in July 2020 and issued its governance token, YFI. While YFI's launch coincided with the broader governance-token boom sparked by Compound, it also reflected Cronje's pragmatic need to distribute operational authority and responsibility across the community. As Cronje later quipped in an interview, "I'm lazy," capturing the underlying reality that he could no longer bear sole responsibility for protocol operations.[42]

YFI was distributed through a pure Fair Launch model, with no tokens pre-allocated to Cronje or the development team. At the time of issuance, Cronje emphasized that YFI had "0 financial value" and that the development team held no tokens.[43] He reasoned that if a founder retained a substantial token allocation, the community could become dependent on that founder once again.[44] Consequently, unlike Compound or Uniswap, Yearn Finance distributed tokens exclusively to participants who provided liquidity to the protocol. Because there were no pre-allocations, presales, or listing reservations, YFI came to be framed as a token earned through contribution alone.

Market reception surpassed all expectations. Driven by the Fair Launch narrative, YFI's price surged from approximately $30 to $43,000 within two months of launch, briefly eclipsing Bitcoin on a per-unit price basis. As the 2021 crypto bull market progressed, YFI reached an all-time high of approximately $90,787 on May 12, 2021.[45] The fact that users rallied around a token explicitly declared to have no financial value was paradoxical in a highly fluid DeFi environment where capital moved freely in pursuit of short-term returns. However, price appreciation alone did not constitute evidence of viscosity. The true nature of this viscosity was revealed, paradoxically, when the founder announced his departure.

In March 2022, when Andre Cronje and Anton Nell announced their departure from the crypto space, YFI's price dropped approximately 13% within a single day. Crucially, Yearn Finance was already being actively maintained by a robust network of core contributors and developers, and its smart contracts continued to function normally without Cronje.[46] While the moral legitimacy generated by the Fair Launch provided a powerful source of community viscosity, that legitimacy remained embodied in the persona of the founder rather than institutionalized within the protocol itself. The effort to eliminate personal dependency by automating judgment and relinquishing privilege

ultimately transformed the founder into an irreplaceable symbol precisely through that act of renunciation.

FIGURE 03 **Short-Term Decline in YFI Price Following Cronje's Departure Announcement**

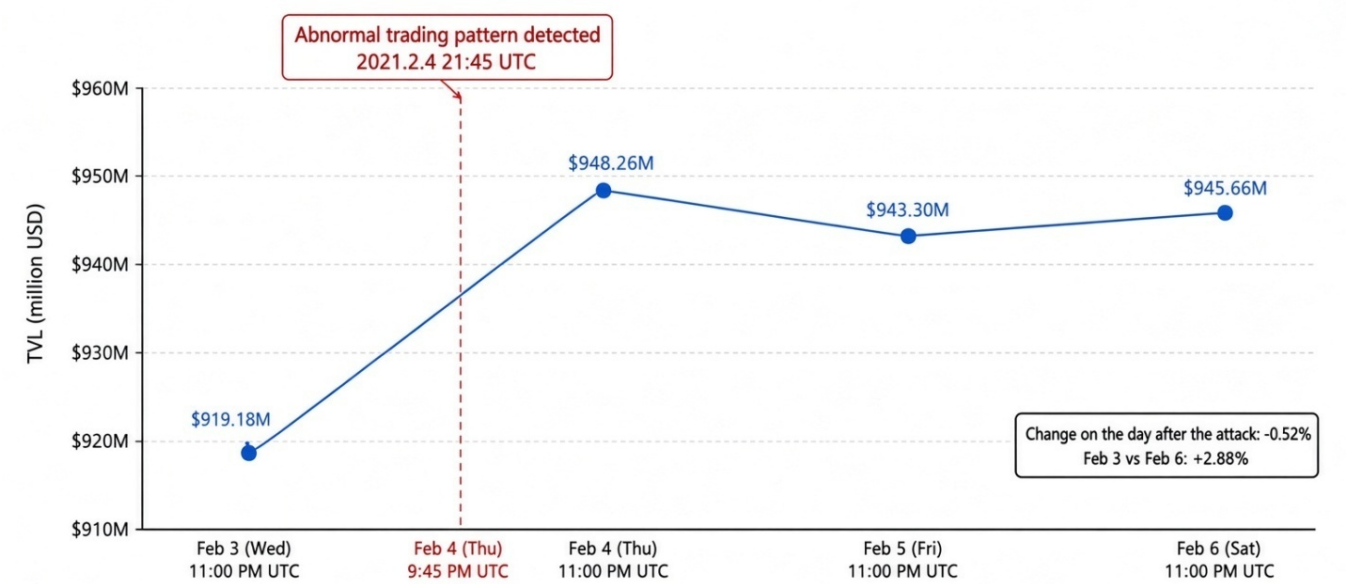
Source: CoinMarketCap https://coinmarketcap.com/currencies/yearn-finance/

While fair distribution and Cronje's symbolic authority succeeded in forming a community, moral legitimacy alone could not defend the protocol or sustain viscosity in real-time financial markets. Yearn Finance's original architecture envisioned a governance model in which the community exercised independent judgment and accountability. This structure was operationalized through the Yearn Improvement Proposal (YIP) framework—a governance system modeled after Bitcoin's BIP and Ethereum's EIP frameworks—enabling YFI holders to propose and debate new initiatives. The protocol emphasized the principle that critical decisions should emerge from the bottom up through proposals, discussion, and community consensus rather than through top-down mandates.[47] The expectation was that these rules would help sustain participant viscosity.

However, rapidly shifting financial conditions continuously tested these ideals. In February 2021, Yearn Finance's core DAI Vault suffered a flash-loan exploit resulting in an $11 million loss. Flash loans allow users to borrow large amounts of capital without collateral, provided that the funds are repaid within the same transaction. The exploiter leveraged this instant liquidity to manipulate market conditions and extract arbitrage profits. On the evening of February 4, 2021, Yearn's security team detected abnormal transaction patterns across contracts linked to the Vault. Core developers and security engineers mobilized immediately to mitigate the attack. Within 11 minutes of detecting the anomaly—while the attack itself continued for 38 minutes—the team disabled further deposits to the Vault, preserving $24 million out of the $35 million total pool.[48] Following the exploit, heavy sell-offs caused YFI's price to drop by approximately 10–15%. Yet the decline was short-lived; after several days of fluctuations, the price began to recover on February 8, eventually returning to its previous level and entering a new upward trajectory.[49] What prevented further participant exit was not the absolute scale of the loss, but the demonstrated competence and crisis-response

capacity of the core development team. This response fostered confidence that the community could defend the system during emergencies, thereby strengthening participant viscosity.

FIGURE 04 **Changes in Yearn Finance TVL Before and After the Flash Loan Attack**



Despite the approximately $11 million loss caused by the attack, TVL remained at around $920–950 million. This indicates that, unlike the short-term price volatility, no large-scale withdrawal of deposited capital was observed.

Source: DeFiLlama, *Yearn Finance TVL*; daily figures as of 11:00 p.m.; accessed August 1, 2026; reconstructed by the author based on the data (with generative AI assistance).

Had Yearn Finance adhered strictly to its standard governance procedures, responding to such a crisis would have been impossible. Initiating a standard YIP required a minimum three-day forum discussion followed by a five-day off-chain Snapshot vote. In a scenario where a Vault was being drained by the minute, waiting days for a democratic vote represented a fatal inefficiency that could drive the protocol into insolvency.[50] Given the speed of capital movement in DeFi, financial emergencies demanded rapid, high-stakes decision-making. This experience led Yearn Finance to move away from direct community voting on operational decisions and to delegate substantial operational authority to specialized groups, including Strategists, Security Engineers, and Core Contributors. Crucially, these specialized groups were empowered to execute emergency measures and reallocate capital during crises without requiring prior on-chain votes. Consequently, the role of YFI governance was narrowed to higher-level oversight functions, such as appointing or removing specialized contributors and setting fee caps.

Concurrently, YIP-56 ("Buyback yEarn")—passed in January 2021 shortly before the exploit—introduced another important institutional dimension. YIP-56 directed protocol revenues toward repurchasing YFI tokens, with a portion retained in the protocol treasury.[51] Rather than simply distributing returns, this mechanism allocated capital to fund public goods such as development, security, and ecosystem maintenance. These treasury reserves provided a vital financial buffer that enabled the protocol to respond to future crises. Thus, YIP-56 marked Yearn Finance's transition from a system focused primarily on yield optimization toward an institution equipped with financial

buffers for long-term survival. The mechanism was subsequently implemented through actual YFI buybacks in 2021.[52]

Cronje initially posited that yield optimization could be solved through algorithmic automation. However, the DeFi market changed rapidly within a highly uncertain environment marked by the continuous emergence of new protocols and novel attack vectors. Yearn Finance sought to distribute judgment across the community, but in actual operation, the institutional legitimacy of its Fair Launch and the symbolic authority of Cronje functioned as the viscosity binding the community together. During crises, the visible expertise of core contributors instilled trust that the system could be defended, allowing participants to be retained. The community also institutionalized funding to sustain this kind of response.

Ultimately, what Yearn Finance automated was only yield calculation; financial judgment itself was never eliminated. Instead, governance participation was restructured around expertise recognized by the community, and trust in that expertise functioned as a new viscosity, giving participants a reason to remain with the project.

Converging Lessons and the Next Generation: Morpho and Hyperliquid

Starting with Compound and continuing through MakerDAO, Uniswap, and Yearn Finance, early DeFi projects emerged from fundamentally different concerns. MakerDAO focused on system stability and the attribution of accountability, while Uniswap emphasized stakeholder alignment and community formation. Yearn Finance, meanwhile, developed a model that combined automated Vault execution with the expertise of strategists and core contributors. Although their starting points differed, repeated crises and competitive pressures gradually pushed all three toward institutional mechanisms addressing common challenges: creating incentives for long-term holding, maintaining liquidity, encouraging governance participation, and retaining participants during crises.

TABLE 02 **Institutional Mechanisms of Early DeFi Protocols for Building Viscosity**

Category	MakerDAO (now Sky)	Uniswap	Yearn Finance
Long-Term Holding	MKR burn/dilution mechanism	Fee switch, UNI burn	Founder's symbolic authority, YFI buyback
Liquidity Provision	Sustained DAI collateral deposits	Recovery via UNI distribution	Inflow of massive capital during DeFi Summer through automated Vault strategies
Governance Participation	Delegation to expert groups (Risk Management units, Delegates)	Delegation to expert groups (Delegates, UAC)	Delegation to expert groups (Strategists, Core Contributors)
Retention During Crises	Recovered following Black Thursday	Restored dominance following vampire attack	Protocol persisted following flash-loan exploit

Despite following different paths, these early DeFi projects ultimately developed institutional mechanisms for sustaining viscosity in an

environment where participants and capital can exit at any time. In governance, in particular, all three moved away from simply expanding participation quantitatively and instead developed structures that delegated judgment and execution to specialized groups. Their institutional evolution is also reflected in their continued operation within the DeFi ecosystem as of 2026. MakerDAO (now Sky) and Uniswap remain among the top-ranked protocols.[53] Yearn Finance, by contrast, experienced a substantial contraction in capital as opportunities for high-yield farming declined after DeFi Summer, but its automated Vault infrastructure and strategist-centered operating model have remained in place. Viscosity is not a single, uniform attribute: capital viscosity can change rapidly with market conditions, whereas community viscosity accumulated through institutions tends to persist more gradually.

Morpho and Hyperliquid are not merely recently successful protocols. They represent a later generation of DeFi projects that incorporated, from the outset, lessons that early protocols learned through experience—particularly regarding accountability, stakeholder alignment, and specialization.

Morpho: Institutionalizing Alignment and Invariant Architecture

Morpho is a DeFi lending protocol that facilitates lending and borrowing against crypto assets. From its launch in June 2022, the protocol adopted a design that consciously reflected several problems encountered by early DeFi projects. One of its most distinctive features was its token design, which sought to establish long-term alignment among stakeholders.

To prevent the MORPHO token from becoming a vehicle for short-term speculation or being distorted by information asymmetries, Morpho initially distributed MORPHO in a non-transferable form. This restriction remained in place for approximately two and a half years after the protocol's launch. During this period, governance gradually distributed MORPHO to participants who contributed directly to the protocol's long-term success, including users, strategic partners, risk curators, and development contributors. Tokens allocated to founders and strategic partners were also subject to vesting and lockup periods of up to three to four years, and some participants voluntarily extended their lockups through relocking.[5)]

Once governance determined that the ecosystem had matured sufficiently and token ownership had become broadly distributed among key stakeholders, a vote on November 21, 2024, officially activated MORPHO's transferability. In other words, unlike the typical DeFi model of distributing freely tradable tokens first and building a community afterward, Morpho chose to establish its community and stakeholder structure before allowing unrestricted token trading. This sequence was intended to align the protocol's long-term success with the economic interests of its core participants and to position the governance token not merely as an investment asset, but as a mechanism conferring both authority and responsibility within the ecosystem.

5) Lockup refers to a mechanism that restricts the withdrawal and transfer of tokens for a specified period, whereas vesting refers to a distribution mechanism through which tokens are gradually unlocked over time. Morpho combined a non-transferability policy with participant-specific vesting and lockup schedules to curb short-term speculative demand while gradually distributing ownership to long-term ecosystem participants.

Source: Morpho, “The MORPHO Token,” *Morpho Docs*, https://docs.morpho.org/learn/governance/morpho-token/. Accessed August 1, 2026.

Morpho also took a different approach from early DeFi projects in its protocol architecture. Whereas major money-market protocols such as Compound relied on recurring governance votes to modify protocol rules and code, Morpho sought to keep its core functionality as simple and immutable as possible. Rather than incorporating every function into a single protocol, it separated the system into multiple components with distinct roles. Morpho Blue, introduced in 2023, provides variable-rate lending infrastructure, while Midnight, whose whitepaper was released in May 2026, provides a fixed-rate lending engine. Morpho Vaults (formerly MetaMorpho) operate as a separate layer for implementing asset-management strategies on top of this infrastructure.

The central principle of this architecture is the deliberate separation of lending infrastructure from asset-management strategies. The core smart contracts underlying Morpho Blue and Midnight are immutable: once deployed on the blockchain, they cannot be modified even by governance or the founding team.[54] By contrast, Morpho Vaults are designed to implement dynamic asset-management strategies on top of this immutable infrastructure in response to changing market conditions.[55] The core lending logic is therefore entrusted to code to ensure reliability and predictability, while strategic judgments that must adapt to changing market conditions are handled at a separate layer.

This was not an attempt to eliminate governance. Rather, Morpho drew a clear boundary between what should be handled by code and what should remain subject to human judgment. Governance cannot modify the protocol's core lending logic; instead, it exercises a limited set of economic and administrative powers required to operate the ecosystem. For example, MORPHO holders vote on the use of DAO treasury funds, whether to activate the Fee Switch[56] and at what rate, and whether to approve new Liquidation Loan-to-Value (LLTV) parameters and Interest Rate Models (IRMs). Governance also retains authority over the MORPHO token contract, protocol licensing, ENS domain management, and other functions necessary for maintaining the ecosystem. These matters are decided through votes by MORPHO holders, with approved proposals executed on-chain through a governance-designated 5-of-9 multisig wallet.

Separate from governance, development and ecosystem operations are handled by the Morpho Association, a French nonprofit entity. While the core functions of the protocol are executed by immutable smart contracts, the Association is responsible for research and development, security, frontend hosting, and management of open-source intellectual property. In addition, 35.4% of the total MORPHO supply was allocated to the DAO Treasury and 6.3% to the Association's ecosystem development fund, giving governance and the operational organization separate sources of funding.[57]

Morpho therefore represents a case in which accountability, specialized expertise, and long-term stakeholder alignment were not added reactively after a crisis. Instead, these principles were institutionalized at the protocol-design stage.

Hyperliquid: Public-Goods Infrastructure and Governance Minimization

Launched on mainnet in 2023, Hyperliquid is an on-chain derivatives exchange designed to provide the speed and usability of a centralized exchange (CEX). Hyperliquid likewise sought to reduce the political costs and decision-making delays that had emerged in early DeFi governance. It chose to delegate as many functions as possible to market mechanisms and automated systems while minimizing the role of governance.

Rather than merely reducing the scope of governance, however, Hyperliquid also designed several critical functions for maintaining system stability as public goods.

A prominent example is the Hyperliquidity Provider (HLP) Vault. Market-making strategies traditionally require substantial capital and technical expertise, making them the domain of specialized institutions and high-frequency trading firms. Hyperliquid co-founder Jeff Yan drew on algorithms and experience accumulated while operating a market-making firm and made them available through HLP, an on-chain Vault.[58] This allowed ordinary users to deposit USDC and share in the profits and losses generated by institutional-grade market-making strategies.

More importantly, HLP was designed not as a private yield-generating product, but as public infrastructure responsible for supporting liquidity and liquidations across the protocol.[59] Rather than treating its core algorithms as proprietary tools for extracting profit, Hyperliquid made them available as a public good intended to strengthen the stability of the ecosystem as a whole. This helped align protocol growth with participant interests and generated strong community support, turning users into active advocates for Hyperliquid's growth.[60]

The same philosophy appears in Hyperliquid's revenue structure. The protocol automatically converts a portion of its fees into HYPE tokens and accumulates them in the Assistance Fund.[61] This process occurs automatically at the protocol level and requires no human intervention. Unusually, the smart contract holding these funds was designed without a withdrawal function, requiring an extreme consensus event such as a hard fork to move the assets.

In a typical DAO, the allocation of accumulated treasury assets can become a source of political conflict and competing interests. Hyperliquid effectively removed the question of how to spend these assets from the scope of governance. Indeed, even after the fund had accumulated billions of dollars, validators moved toward treating the assets as permanently locked—effectively burned—rather than as funds available for discretionary use.[62] As a result, the Assistance Fund functions both as a deflationary mechanism that continuously absorbs HYPE as the protocol grows and as a long-term reserve supporting system stability.

Where Morpho constrained the scope of human discretion by hardcoding limits on fees, Hyperliquid went a step further by eliminating the possibility of political competition over a large pool of assets altogether.

This architecture did not, however, eliminate human judgment entirely. Unlike early DeFi projects that experienced decision-making delays while pursuing comprehensive decentralization, Hyperliquid deliberately maintained a degree of centralization during its early development.[63] The team was explicit about this trade-off. It consistently argued that, during the early stages of building a complex derivatives exchange, the ability to improve the product rapidly and respond immediately to major crises was more important than achieving full decentralization from the outset. Centralized validator groups were presented as a transitional mechanism for achieving these objectives.[64]

This philosophy became particularly evident during the JELLY incident in March 2025. An attacker exploited the low liquidity of the JELLY token to force the liquidation of short positions, leaving the HLP with approximately $13 million in unrealized losses. The validators determined that automated defenses alone were insufficient to contain the market disruption and intervened by ordering an emergency settlement and delisting the token.[6)] Some critics argued that the intervention established a precedent that undermined decentralization principles. Nevertheless, Hyperliquid retained its position as a leading on-chain derivatives exchange following the incident.[65]

Hyper-Readability as a Dual Condition: Exit and Viscosity

Morpho and Hyperliquid can therefore be understood as attempts to incorporate, at the design stage, lessons that early DeFi projects accumulated through years of trial and error. One particularly important lesson is that the hyper-readability of blockchain systems—identified earlier as a condition that can facilitate exit—can simultaneously serve as a condition for viscosity.

Publicly available smart-contract code, on-chain state changes, treasury movements, governance proposals, votes, and execution records allow participants to detect risk signals and monitor how a project operates. This visibility can accelerate exit when vulnerabilities become apparent. At the same time, however, it can provide a basis for trust by allowing participants to verify whether codified constraints and publicly approved decisions are actually being enforced.

This readability, however, is limited to what is recorded on-chain. Blockchain systems do not automatically reveal the real-world identities behind addresses, private negotiations, off-chain assets and operations, or the reasoning behind decisions made during a crisis. Historically, some of this gap has been filled not by technology but by disclosure practices. DeFi projects have conducted proposals and discussions in public forums, explained design rationales in whitepapers, and disclosed their responses after security incidents. Yet disclosure based on convention ultimately depends on the project's willingness to provide it and can therefore be reduced or withdrawn at any time.

Morpho and Hyperliquid adopted a different approach. Both projects predetermined, in code, the boundaries of what their operators could and

6) In this incident, the attacker deliberately engineered the liquidation of their own position, shifting the resulting losses onto the exchange's liquidity system, HLP. The attacker simultaneously established a $4 million short position and two long positions totaling $3 million in Hyperliquid's perpetual futures market. The attacker then purchased large quantities of JELLY tokens on external exchanges to artificially inflate the token's price. Because JELLY had extremely thin market liquidity at the time, the concentrated buying drove its price up by more than 500% within a short period. As Hyperliquid's perpetual futures price rose in tandem through an oracle referencing external spot prices, the attacker's short position was liquidated.
At the time, Hyperliquid was designed so that the liquidity vaults comprising HLP would absorb liquidated positions when market liquidity was insufficient, thereby preventing trading from being halted. Consequently, when the attacker's short position was liquidated, the risk of loss was transferred to HLP. As the price of JELLY continued to rise, HLP's unrealized losses increased rapidly. If the situation had continued, these unrealized losses could have crystallized into actual losses for liquidity providers.
As this risk escalated, the validator set intervened urgently. The validators voted to delist JELLY perpetual futures and forcibly settle all open positions, thereby preventing further losses. This also neutralized the attacker's strategy of realizing profits from the two long positions by forcibly terminating the market. Subsequent on-chain analysis found evidence that wallets used in the attack had repeatedly conducted small transactions beginning approximately 10 days before the incident, apparently testing the attack strategy in advance. This evidence supports the possibility that the incident was a premeditated attack rather than spontaneous market manipulation.

Sources: Oliver Knight, "HyperLiquid Delists JELLY After Vault Squeezed in $13M Tussle," *CoinDesk*, March 26, 2025, https://www.coindesk.com/markets/2025/03/26/hyperliquid-delists-jellyjelly-after-vault-squeezed-in-usd13m-tussle. Accessed August 1, 2026; Kaiko, "DeFi Faces New Test as Low-Liquidity Token Gets Manipulated," *Kaiko*, March 31, 2025, https://www.kaiko.com/resources/defi-faces-new-test-as-low-liquidity-token-gets-manipulated. Accessed August 13, 2026.

could not do. Morpho explicitly defined which areas could be modified by governance and which could not, while Hyperliquid designed its Assistance Fund so that the team could not arbitrarily withdraw its assets. Participants may not be able to observe every internal deliberation or understand every consideration that led to a particular decision, but they can independently verify what the operators are technically capable of doing—and what they are not capable of doing.

This distinction is important. Because these constraints are embedded in code rather than resting solely on promises made by operators, hyper-readability should not be understood as synonymous with complete transparency. Rather, it is a condition that allows participants to continuously monitor and verify the enforcement of publicly observable rules and actions. In this sense, hyper-readability has a dual function: it exposes risks and thereby facilitates exit, but it also makes institutional constraints verifiable and can therefore reinforce viscosity.

These structures cannot, of course, yet be regarded as definitive solutions. The newer protocols have not undergone the same degree of long-term validation or extreme crises experienced by MakerDAO, Uniswap, and Yearn Finance, and the blockchain ecosystem itself continues to evolve rapidly. What matters, however, is that accountability, long-term stakeholder alignment, specialized expertise, public-goods provision, and crisis-response capacity are increasingly being embedded into protocol design from the outset rather than added later as corrective measures following a crisis.

03

Conclusion: The Institutionalization of Viscosity and the Emerging Order

In *Seeing Like a State*, the book discussed in the introduction, James C. Scott introduces two important concepts: *techne* and *metis*.[66] According to Scott, humans simplify complex realities in order to make them intelligible and manageable. Land is surveyed to calculate agricultural output, populations are classified for tax collection, and standardized maps are created to facilitate transportation. By reducing complex realities to rules, numbers, and procedures, the world becomes easier to read, calculate, and predict. In this sense, reality is endowed with *readability*. Scott refers to this design-oriented, rule-based form of knowledge as *techne*.

Reality, however, is always more complex than a blueprint. Even when the same rules are applied, local circumstances differ, unexpected events occur, and people behave in ways that designers could not anticipate. As a result, real-world situations continually generate problems that cannot be resolved through rules alone. What is required in such circumstances is practical wisdom—the experience, intuition, and situational judgment needed to respond to changing conditions—which Scott describes as *metis*.

Put simply, if *techne* is a blueprint prepared in advance, *metis* is the practical wisdom required when the blueprint proves insufficient. Scott's critique is not directed at *techne* itself. Rather, his concern is the tendency to oversimplify complex realities and mistake the resulting blueprint for reality itself.

Early DeFi projects likewise operated largely according to the logic of *techne*. MakerDAO assumed that an appropriate design of collateralization ratios, liquidation rules, and stability fees could establish a stable monetary order. Uniswap understood markets as systems that could be reduced to mathematical rules, while Yearn Finance assumed that even the judgment of asset managers could be optimized through algorithms. Although these projects addressed different problems, they shared the underlying belief that order could be deliberately engineered through rules, incentives, and algorithms. In this sense, all three were projects of *techne*.

Reality, however, proved considerably more complex than their designers had anticipated. Market participants' fear and herd behavior, network congestion, novel attack vectors, and sudden movements of liquidity were variables that could not be fully anticipated at the design stage. MakerDAO's Black Thursday, SushiSwap's Vampire Attack, and Yearn Finance's flash-loan exploit all revealed this complexity. The problem, therefore, was not simply that the rules were insufficiently sophisticated. There was a fundamental limit to the

ability of any designer to anticipate every possible contingency and encode it into the rules in advance.

It is at precisely this point that *metis* emerges. *Metis* is not merely human intuition or instinct, but the practical capacity to respond to situations that cannot be fully specified in advance and to preserve community cohesion under such conditions. This capacity corresponds closely to the empirical indicators of viscosity identified in this study: long-term holding, continued liquidity provision, governance participation, and retention during crises. Following Black Thursday, MakerDAO institutionalized crisis-response expertise by developing specialized risk-management organizations and delegated-representative structures. Uniswap, prompted by SushiSwap's Vampire Attack, recognized that market automation alone could not sustain a community. It subsequently introduced the UNI token, established a delegate system, and created a community treasury, thereby organizing stakeholders and enabling collective governance over important protocol decisions. In 2025, it further strengthened economic viscosity by activating the Fee Switch, linking token-holder interests to protocol revenues. Yearn Finance initially sought to automate human judgment, but built community trust through its Fair Launch and the symbolic authority of its founder, Andre Cronje, before subsequently institutionalizing expertise through specialized strategists and core contributors. Although their approaches differed, all three projects ultimately recognized that some areas could not be governed by rules alone and preserved an institutional role for human judgment in crisis response, community decision-making, and the exercise of specialized expertise. In other words, the evolution of DeFi was not a process of abandoning *techne*, but of recognizing its limits and institutionalizing *metis* in the domains that *techne* could not adequately govern.

This trajectory closely parallels the concerns raised by Vitalik Buterin in *"Moving Beyond Coin Voting Governance."* Buterin criticized attempts to resolve every problem through token voting, arguing that repetitive and predictable functions should be delegated to smart contracts and rules, while human intervention should be reserved for exceptional circumstances and strategic decisions requiring discretionary judgment.[67] This principle is consistent with the institutional direction ultimately taken by MakerDAO, Uniswap, and Yearn Finance through their respective experiences. Moreover, the *metis* acquired through these experiences was subsequently translated back into code and rules by later-generation projects and incorporated into their designs from the outset. The resulting process resembles a cycle in which *metis* emerges in areas that initial designs cannot adequately govern, becomes institutionalized through experience, and is then translated back into code as a new form of *techne*.

Historically, states were able to settle people and capital within defined spaces through territory, law, and coercive power. In blockchain environments, however, hyper-readability and exitability mean that no actor can physically compel participants or capital to remain. At the same time, hyper-readability can provide a foundation for viscosity by allowing anyone to verify whether a protocol is actually adhering to the rules and constraints it has publicly committed to. In this sense, it can contribute to the accumulation

of trust within a community. Ultimately, the projects that have survived in the DeFi ecosystem have been neither the most decentralized nor the most automated. Rather, they have been projects that maintained automated rules as a foundation while institutionalizing the *metis* necessary to protect the community during crises. These institutional mechanisms gave participants reasons not to exit immediately even amid repeated shocks.

Nevertheless, the significance of this study lies in reconstructing the common trajectory observed among surviving protocols and explaining how viscosity has been formed and maintained over time. The findings demonstrate that viscosity is not a fixed property of blockchain technology, but an ongoing process of institutional construction and adaptation. No design can anticipate every contingency that the future may bring.

Ultimately, the history of DeFi is not a history of technology designed to hold people in place permanently. It is a history of governance evolving to provide participants and capital with reasons to remain in an environment where they are always free to leave. Moreover, the fact that later-generation projects incorporate the institutional experiments and lessons of their predecessors into new protocol designs suggests that viscosity is not merely an achievement of individual projects. Rather, it is the product of institutional learning accumulated and transmitted across the broader DeFi ecosystem. As new technologies, crises, and participants emerge, this institutional learning will continue to be revised and accumulated, driving the further evolution of governance mechanisms designed to sustain viscosity.

Notes

1. James C. Scott, *Seeing Like a State: Why States Fail in Planning*, trans. Jeon Sang-in (Seoul: Ecolivre, 2010).

2. Scott, *Seeing Like a State*, 286.

3. Scott describes the concept of "Zomia" in *The Art of Not Being Governed*. Zomia is a mountainous region spanning parts of mainland Southeast Asia, including Myanmar, Laos, Vietnam, Thailand, southwestern China, and northeastern India. The term refers to highland areas that historically remained beyond the effective reach of states. According to Scott, before the twentieth century, states generally exercised administrative control over lowland regions, where populations could be more easily taxed and governed, while highland populations moved to areas that were difficult for state power and administrative authority to reach. They adopted subsistence strategies such as swidden agriculture and practiced complex cultural and linguistic forms that made them difficult to govern. Although twentieth-century road construction and the expansion of state power eventually reached many of these regions, significant portions of their physical spaces remained beyond effective state control.
James C. Scott, *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia* (New Haven: Yale University Press, 2009).

4. Albert O. Hirschman defined "exit" and "voice" as two ideal responses available to members of an organization when they perceive deterioration in the quality of a product, service, or institution. "Voice" refers to efforts to improve the situation through criticism or direct participation, whereas "exit" refers to withdrawing from the organization or choosing an alternative. Thus, while exit is relatively easy when switching costs are low, voice requires greater effort and engagement. Albert O. Hirschman, "Exit, Voice, and the Fate of the German Democratic Republic: An Essay in Conceptual History," *World Politics* 45, no. 2 (January 1993): 173–202.

5. The authors point out that governance participants may prioritize long-term stability over short-term gains, noting that governance participants who have held tokens for a longer period tend to vote more frequently. To align the interests of long-term participants with the "longevity and health of the platform," some protocols impose token lockups and vesting mechanisms. These mechanisms are designed to align the interests of participants and capital and to promote their continued retention within the ecosystem. Maya Dotan et al., "The Vulnerable Nature of Decentralized Governance in DeFi," arXiv, August 2023, arXiv:2308.04267. https://arxiv.org/pdf/2308.04267. Accessed July 31, 2026.

6. In the social sciences, concepts such as mobility, friction, and stickiness have been employed across different fields in analyzing movement and flows. Mimi Sheller and John Urry introduced the "new mobilities paradigm," analyzing social life through the movement of people, objects, and information and explaining how movement and friction are produced through networks of connections. Mimi Sheller and John Urry, "The New Mobilities Paradigm," *Environment and Planning A* 38, no. 2 (February 2006): 207–226. Anna Lowenhaupt Tsing analyzed how global connections and friction can produce particular forms of economic and social relationships. Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection* (Princeton, NJ: Princeton University Press, 2005). Markusen argued that even in spaces where production can move easily, certain regions can retain economic activity because of conditions that make them "sticky places." Ann Markusen, "Sticky Places in Slippery Space: A Typology of Industrial Districts," *Economic Geography* 72, no. 3 (July 1996): 293–313.

7. DiMaggio and Powell argue that organizations model themselves on institutions perceived as legitimate or successful under conditions of uncertainty. In particular, organizations tend to adopt models similar to those of external organizations regarded as "legitimate and reputable," because doing so allows them to gain legitimacy and reputational benefits in new markets. Paul J. DiMaggio and Walter W. Powell, "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review* 48, no. 2 (April 1983): 147–160.

8. Oscar Gelderblom et al., “The Formative Years of the Modern Corporation: The Dutch East India Company VOC, 1602–1623,” CGEH Working Paper Series, no. 36 (Center for Global Economic History, August 2012).

9. In practice, cTokens (Layer 1) were directly used as collateral in Curve (Layer 4), while cTokens and aTokens were also used as collateral throughout the broader DeFi ecosystem. Spencer Applebaum et al., “The DeFi Stack,” Multicoin Capital, November 24, 2020. https://multicoin.capital/2020/11/24/the-defi-stack/. Accessed July 31, 2026. The report also notes that, as protocols such as Compound become widely adopted as collateral, interconnected protocols may face systemic risks during periods of stress. Kazi Abrar Hossain, “Smart Contracts and Decentralized Finance,” Leonard N. Stern School of Business, New York University, April 2024. https://www.stern.nyu.edu/sites/default/files/2025-05/Glucksman_Hossein_Smart%20Contracts%20and%20Decentralized%20Finance.pdf. Accessed July 31, 2026.

10. Compound initially operated under centralized control but ultimately sought to transfer authority over the protocol to its community and stakeholders, including a DAO. Robert Leshner and Geoffrey Hayes, *Compound: The Money Market Protocol*, version 1.0, white paper (February 2019). https://compound.finance/documents/Compound.Whitepaper.pdf. Accessed July 31, 2026.

11. Robert Leshner, “Compound Governance: Steps towards Complete Decentralization,” Compound Labs, *Medium*, February 26, 2020. https://medium.com/compound-finance/compound-governance-5531f524cf68. Accessed July 31, 2026.

12. Adam Bavosa, “COMP Distribution, Key Delegates, New Asset Pages,” *Compound Digest*, June 17, 2020. https://compound.substack.com/p/comp-distribution-key-delegates-new. Accessed July 31, 2026.

13. Ferdi Kurt, “Coinmonks DeFi Weekly: Compound—The Protocol That Sparked DeFi Summer,” *Coinmonks*, *Medium*, August 21, 2025. https://medium.com/coinmonks/defi-weekly-compound-the-protocol-that-sparked-defi-summer-8871d6903a60. Accessed July 31, 2026.

14. CoinMarketCap, “Compound (COMP) Historical Data,” *CoinMarketCap*. https://coinmarketcap.com/currencies/compound/historical-data/. Accessed July 31, 2026.

15. Compound’s liquidity-mining success had a tremendous ripple effect throughout the DeFi ecosystem. Kurt, “Coinmonks DeFi Weekly.”

16. Brady Dale, “Compound Changes COMP Distribution Rules Following ‘Yield Farming’ Frenzy,” *CoinDesk*, June 30, 2020. https://www.coindesk.com/tech/2020/06/30/compound-changes-comp-distribution-rules-following-yield-farming-frenzy. Accessed July 31, 2026.

17. On September 30, 2021, shortly after the execution of the Proposal 62 upgrade, a bug occurred in the distribution of COMP rewards, enabling certain users to claim more COMP than authorized. Under the worst-case scenario, up to 280,000 COMP—worth approximately $82.8 million at the time—was at risk of being excessively distributed. Following news of the bug, the price of COMP plummeted from its 24-hour high of $334 to a low of $290. Compound founder Robert Leshner stated that there were no administrative controls or community tools to immediately halt COMP distribution, and that any protocol modifications required a seven-day governance process. Because Compound's core rules could not be arbitrarily altered by developer Compound Labs, fixing the issue necessitated a governance vote by COMP holders. Although a patch proposal was submitted on October 2, 2021, approval was not finalized until October 9; in the interim, approximately 200,000 COMP (worth roughly $68 million) was actually leaked. Some users claimed COMP without realizing it had been erroneously disbursed. Because distributed COMP could not be forcibly clawed back, the protocol struggled to persuade recipients to return the funds. Via Twitter, Leshner requested that recipients of the misallocated COMP keep 10% as a "white-hat" reward and return the remaining 90%, warning that unreturned funds would be reported to the IRS as taxable income and noting that most recipients' identities were already known ("most of you are doxxed"). This tweet met with fierce criticism, leading Leshner to acknowledge and clarify his remarks. Andrew Thurman, “Compound Founder Says $80M Bug Presents ‘Moral Dilemma’ for DeFi Users,” *CoinDesk*, October 1, 2021. https://www.coindesk.com/tech/2021/10/01/compound-founder-says-80m-bug-presents-moral-dilemma-for-defi-users. Accessed July 31, 2026. Sam Kessler, “DeFi Money Market Compound Overpays $15M in COMP Rewards in Possible Exploit,” *CoinDesk*, September 30, 2021. https://www.coindesk.com/tech/2021

/09/30/defi-money-market-compound-overpays-15m-in-comp-rewards-in-possible-exploit. Accessed July 31, 2026. Bhushan Akolkar, “Compound Finance Suffers Bug, Sends Millions of COMP Tokens to Users,” *NewsBTC*, October 1, 2021. https://www.newsbtc.com/news/compound-finance-suffers-bug/. Accessed July 31, 2026. Neptune Mutual, “Analysis of a Bug in the Compound Protocol,” *Medium*, October 2021. https://medium.com/neptune-mutual/analysis-of-a-bug-in-the-compound-protocol-8a16bc1cc25b. Accessed July 31, 2026.

18. MakerDAO, *The Maker Protocol: MakerDAO’s Multi-Collateral Dai (MCD) System*, white paper (February 2020).

19. MakerDAO, *The Maker Protocol*.

20. MakerDAO, *The Maker Protocol*.

21. When surplus DAI accumulated from stability fees and other charges exceeds a specified limit, the protocol buys back and burns MKR through a surplus auction; conversely, when system debt causes a DAI deficit, the protocol mints additional MKR through a debt auction to recapitalize the system. MakerDAO, *The Maker Protocol*.

22. Nassim Nicholas Taleb, *Skin in the Game: Hidden Asymmetries in Daily Life* (New York: Random House, 2018).

23. The white paper states: “This risk inclines MKR holders to align and responsibly govern the Maker ecosystem to avoid excessive risk-taking.” MakerDAO, *The Maker Protocol*.

24. On March 12, 2020, the price of Ethereum collapsed amid a broader market crash. Because the price oracle failed to update for a period of time, some transactions were processed at an abnormally low value of $0.01, while others were liquidated at prices significantly below market value. As a result, MakerDAO accumulated approximately $4.5 million in unsecured debt. According to contemporary analyses, MakerDAO issued approximately 4.5 million dollars’ worth of new MKR through debt auctions to cover the shortfall. The event prompted criticism that the protocol’s governance mechanisms had failed to prevent or adequately respond to the crisis, although the debt was subsequently resolved through governance measures. Liesl Eichholz, “What Really Happened to MakerDAO?” *Glassnode Insights*, March 17, 2020. https://research.glassnode.com/what-really-happened-to-makerdao/. Accessed July 31, 2026.

25. The paper argues that understanding and drafting governance proposals requires a high level of familiarity with the technical architecture of DeFi systems and programming skills, making specialized knowledge an important source of influence among developers and experts. Xiaotong Sun et al., “Decentralization Illusion in Decentralized Finance: Evidence from Tokenized Voting in MakerDAO Polls,” arXiv preprint arXiv:2203.16612 (April 2022). https://arxiv.org/pdf/2203.16612. Accessed July 31, 2026.

26. Joel Khalili, “This Billion-Dollar Crypto Collective Is Tearing Itself Apart,” *WIRED*, November 10, 2022. https://www.wired.com/story/makerdao-rune-christensen-decentralize/. Accessed July 31, 2026.

27. Sun et al., “Decentralization Illusion in Decentralized Finance,” 15.

28. Christensen criticized Maker's governance structure—where thousands of token holders must coordinate and decide on every complex operational detail and interpersonal dynamic—as a "problem of relationships" and a slow, clumsy single-thread process, and subsequently proposed the Endgame Plan. Rune Christensen, “The Endgame Plan Parts 1&2,” *Maker Forum* (MakerDAO), May 30, 2022. https://forum.skyeco.com/t/the-endgame-plan-parts-1-2/15456. Accessed July 31, 2026.

29. The core of the Endgame Plan is to delegate routine operational and governance responsibilities to SubDAOs while allowing Maker governance itself to focus on the final decisions that require the participation of the broader community. Rune Christensen, “The 5 Phases of Endgame,” *Sky Forum* (MakerDAO), May 30, 2022. https://forum.skyeco.com/t/the-5-phases-of-endgame/20830. Accessed July 31, 2026.

30. Samuel Haig, “Sky Completes Rebrand by Launching New DApp and Tokens,” *The Defiant*, September 18, 2024. https://thedefiant.io/news/defi/sky-completes-rebrand-by-launching-new-dapp-and-tokens. Accessed July 31, 2026.

31. An automated market maker (AMM) is a mechanism that replaces the traditional order book with a liquidity pool. The liquidity pool is a smart contract that holds reserves of two or more tokens, and users trade directly against the pool. AMMs use a constant-product formula, expressed as $x \times y = k$, as the basis for determining prices. Uniswap Labs, "What Is an Automated Market Maker?" *Uniswap Labs Blog*, May 1, 2025. https://blog.uniswap.org/what-is-an-automated-market-maker. Accessed July 31, 2026.

32. SushiSwap is a protocol created in August 2020 by a developer using the pseudonym Chef Nomi, who forked Uniswap's code. Nomi recognized that liquidity was essential to SushiSwap's success and judged that it would be difficult to persuade liquidity providers (LPs) on Uniswap, an established and proven protocol, to provide liquidity to a new platform. He therefore designed a strategy offering two types of rewards to SushiSwap liquidity providers: first, depositing tokens on SushiSwap earned SUSHI tokens; second, staking those SUSHI tokens allowed users to earn a share of the protocol's total fee revenue. Crucially, users could not earn SUSHI by depositing just any token; they had to deposit Uniswap LP tokens. Nomi used these LP tokens to migrate liquidity from Uniswap to SushiSwap. As a result, immediately before SushiSwap's launch, a massive inflow of funds into Uniswap drove its deposits from approximately $300 million to $1.8 billion. Once migration began, roughly $800 million, or about 55 percent of Uniswap's total liquidity, transferred to SushiSwap, reducing Uniswap's total deposits to around $400 million within just three days.
Gemini Cryptopedia. "SushiSwap and Vampire Attacks in Decentralized Finance (DeFi)." *Gemini Cryptopedia*. Updated October 6, 2023.
https://www.gemini.com/cryptopedia/sushiswap-uniswap-vampire-attack. Accessed July 31, 2026.

33. UNI's genesis supply was allocated as follows: 60 percent (600 million UNI) to community members, 21.266 percent (212.66 million UNI) to team members and future employees, 18.044 percent (180.44 million UNI) to investors, and 0.69 percent (6.9 million UNI) to advisors. The allocations for team members, future employees, investors, and advisors were subject to a four-year vesting schedule, while the 43 percent reserved for the governance treasury was also scheduled for distribution over four years. Breaking down the 60 percent community allocation, 15 percent (150 million UNI) was immediately claimable without vesting conditions. This figure comprised the 400 UNI user airdrop, approximately 49 million UNI allocated to historical liquidity providers (LPs), and allocations for SOCKS redeemers and holders. The remaining 43 percent held in the governance treasury was slated for ongoing distribution through contributor grants, community initiatives, liquidity mining, and other programs. An additional 2 percent (20 million UNI) was allocated without vesting conditions as part of an initial liquidity mining program, divided evenly among four pools—ETH/USDT, ETH/USDC, ETH/DAI, and ETH/WBTC—with 5 million UNI allocated to each.
Uniswap Labs. "Introducing UNI." *Uniswap Blog*, September 16, 2020. https://blog.uniswap.org/uni. Accessed July 31, 2026.

34. An estimated 93 percent of airdrop recipients sold their allocated UNI tokens, while approximately 98 percent of recipients never participated in governance, as most viewed UNI merely as a free reward.
Alsie L. "The Uniswap Airdrop—Lessons for the Industry." *Dune Blog*, November 23, 2022.
https://dune.com/blog/uni-airdrop-analysis. Accessed July 31, 2026.

35. Robin Fritsch et al. "Analyzing Voting Power in Decentralized Governance: Who Controls DAOs?" *Blockchain: Research and Applications* 5, no. 3 (June 2024): 100208.

36. According to official Uniswap documentation, regular UNI holders participate in governance by delegating their voting power to a specific address or delegate rather than voting directly. Holders can either delegate voting power to their own address (self-delegation) and vote directly or assign it to another party's address.
Uniswap Labs. "Governance Overview." *Uniswap Developers*.
https://developers.uniswap.org/docs/ecosystem/governance/overview. Accessed July 31, 2026.

The UAC, established in 2023, officially acknowledged in its revised August 2025 charter that DAOs inherently lack the operational efficiency of centralized corporations. To overcome this limitation, the UAC was structured around five domain experts elected directly by the DAO. Uniswap currently operates under a tripartite division of roles: Uniswap Labs handles core software development, the Uniswap Foundation manages long-term macro-ecosystem strategy, and the UAC oversees short- to medium-term

DAO operational affairs.
DonOfDAOS. “Uniswap Accountability Committee Charter.” *Uniswap Governance Forum*, August 20, 2025. https://gov.uniswap.org/t/uniswap-accountability-committee-charter/25807. Accessed July 31, 2026.

37. Erin Koen. “Turning On the Uniswap Protocol Fee Switch.” *Medium*, October 8, 2022. https://erin-koen.medium.com/turning-on-the-uniswap-protocol-fee-switch-3642a042d1ba. Accessed July 31, 2026.

38. Uniswap Labs. “UNIfication.” *Uniswap Blog*, November 10, 2025. https://blog.uniswap.org/unification. Accessed July 31, 2026.

39. Yana Khlebnikova. “Uniswap Approves 100M UNI Burn, Activates Fee Switch.” *Coinspeaker*, December 26, 2025. https://www.coinspeaker.com/uniswap-approves-100m-uni-burn-activates-fee-switch/. Accessed July 31, 2026.

40. With Uniswap activating its Fee Switch, a portion of the trading fees previously directed entirely to LPs—0.05 percent for v2 and 16.7–25 percent of LP fees for v3—is redirected to the protocol for UNI token burns. Consequently, competing DEXs such as Aerodrome are actively attempting to attract LPs whose yields have been reduced by offering higher liquidity incentives and more favorable reward structures in new ecosystem pools.
“Aerodrome CEO Criticizes Uniswap’s Fee Switch Decision as Strategic Error.” *Phemex News*, November 11, 2025. https://phemex.com/news/article/aerodrome-ceo-criticizes-uniswaps-fee-switch-decision-as-strategic-error-34684. Accessed July 31, 2026.

41. “Yearn Finance.” *IQ.wiki*, August 13, 2023. https://iq.wiki/kr/wiki/yearn. Accessed July 31, 2026.

42. Cronje stated that he wanted to hand over system administration rather than manage everything himself, but doing so required entities capable of understanding the broader system and executing decisions as he did.
Laura Shin. “Andre Cronje of Yearn Finance on YFI and the Fair Launch: ‘I’m Lazy.’” *Unchained Podcast*, September 15, 2020. YouTube video, 24:02. https://youtu.be/SZvDoEJ6wdU. Accessed July 31, 2026.

43. Upon issuing the token, Cronje stated: “In an effort to further relinquish control (mostly because we are lazy and don’t want to manage it), we released YFI, an entirely valueless token with a 0 supply. To emphasize again, this token has 0 financial value. There is no pre-mine, no sale, and you cannot buy it. It will not be listed on Uniswap, nor will there be an auction. We, the developers, hold zero tokens.”
Andre Cronje. “YFI.” *iEarn Finance*, *Medium*, July 17, 2020. Archived July 20, 2020. https://web.archive.org/web/20200720233858/https://medium.com/iearn/yfi-df84573db81. Accessed July 31, 2026.

44. Explaining why he did not allocate YFI tokens to himself, Cronje stated that the personal funds he had invested during development had already been sufficiently recouped through protocol fee revenue and that he believed he should be subject to the same rules as all other participants. He reasoned that if a founder retained a substantial token allocation, the community would naturally demand founder accountability and rely on the founder for decision-making. Thus, preventing special privileges for the founder was essential to fostering an autonomous community.
Shin, “Andre Cronje of Yearn Finance on YFI and the Fair Launch.”

45. “Yearn Finance Price Prediction for 2026, 2030, 2040, 2050.” *Giottus*, January 8, 2026. https://www.giottus.com/prediction-price/yearnfinance. Accessed July 31, 2026.

46. At the time, core developer banteg tweeted: “People burying YFI, you do realize Andre hasn’t worked on it for over a year? And even if he did, there are 50 full-time people and 140 part-time contributors to back things up.” Cronje had indeed stepped away from day-to-day operations more than a year earlier, leaving system maintenance to dozens of full-time and part-time contributors. What Cronje actually shut down was his personal hosting of the *yearn.fi* web interface, not the underlying smart contracts. Nevertheless, the market interpreted his departure as a major existential risk. This demonstrates that Yearn’s legitimacy and community trust remained closely anchored to Cronje’s symbolic authority, even though the protocol was

not technically dependent on him.
Ekin Genç. “YFI, FTM Tank After Andre Cronje, Anton Nell Claim They’re Leaving Crypto.” *Decrypt*, March 6, 2022. https://decrypt.co/94483/yfi-ftm-tank-after-andre-cronje-anton-nell-claim-theyre-leaving-crypto. Accessed July 31, 2026.

47. Yearn Finance formalizes a bottom-up consensus process through which anyone can submit protocol and governance proposals via Yearn Improvement Proposals (YIPs). These proposals undergo forum discussion and community governance calls before final approval.
Yearn Contributors. “yearn/YIPS: The Yearn Improvement Proposal Repository.” *GitHub*. https://github.com/yearn/YIPS. Accessed July 31, 2026.

48. Yearn Security Team. “Vulnerability Disclosure 2021-02-04.” *yearn-security*, GitHub, February 5, 2021. https://github.com/yearn/yearn-security/blob/master/disclosures/2021-02-04.md. Accessed July 31, 2026.

49. CoinMarketCap. “Yearn (YFI).” *CoinMarketCap*. https://coinmarketcap.com/currencies/yearn-finance/. Accessed August 3, 2026.

50. “Proposal Process.” *Yearn Docs*, April 7, 2026.
https://docs.yearn.fi/contributing/governance/proposal-process. Accessed July 31, 2026.

51. Proposal YIP-56 (“Buyback and Build”) sought to discontinue protocol revenue distributions to stakers and instead use protocol revenues to buy back YFI on the open market and fund contributor rewards and broader Yearn initiatives. The proposal passed governance voting.
banteg et al. “YIP-56: Buyback and Build.” *Yearn Governance Forum*, January 13, 2021.
https://gov.yearn.fi/t/yip-56-buyback-and-build/8929. Accessed July 31, 2026.

52. Following the passage of YIP-56 (“Buyback and Build”) in January 2021, the Yearn Treasury deployed $1.02 million to purchase 21.35 YFI at an average price of $47,976 per token. The Treasury stated that it would conduct periodic open-market YFI buybacks using protocol revenues until a future governance vote determined otherwise.
Yearn Finance. “Yearn Finance Newsletter #34.” *Yearn Finance Substack*, April 20, 2021.
https://yearn.substack.com/p/yearn-finance-newsletter-34. Accessed July 31, 2026.

53. MakerDAO (now Sky) maintains a Top 5 ranking by total value locked (TVL), while Uniswap remains a flagship DEX in the Top 14. Yearn Finance has experienced a decline in TVL relative to its peak.
DeFiLlama. “Protocols.” https://defillama.com/protocols. Accessed August 3, 2026.

54. Mathis Gontier Delaunay et al. *Morpho Blue Whitepaper*. Morpho Association, October 2023.
https://github.com/morpho-org/morpho-blue/blob/main/morpho-blue-whitepaper.pdf. Accessed August 1, 2026.

Bhargav Nagaraja Bhatt et al. *Morpho Midnight Whitepaper*. Morpho Association, May 2026.
https://morpho.org/whitepapers/midnight-whitepaper.pdf. Accessed August 1, 2026.

55. Morpho. “Morpho Vault V2.” *Morpho Docs*. https://docs.morpho.org/learn/concepts/vault-v2/. Accessed August 3, 2026.

56. Morpho’s Fee Switch derives revenue from borrower interest rather than trading fees, reflecting the broader DeFi trend toward protocol revenue generation. When implementing this mechanism in lending markets, Morpho hardcoded an immutable ceiling into the smart-contract design, capping protocol fees at a maximum of 25 percent of interest paid, in order to guard against future governance overreach or error.
Morpho. “Morpho Governance.” *Morpho Docs*.
https://docs.morpho.org/learn/governance/organization#morpho-dao-governance. Accessed August 1, 2026.

57. Morpho. “The MORPHO Token.” *Morpho Docs*. https://docs.morpho.org/learn/governance/morpho-token/. Accessed August 1, 2026.

58. Cosmo Jiang and Cody Poh. “Housing All of Finance: The Rise of Perps and Hyperliquid.” *Pantera*, June 2, 2026. https://panteracapital.com/rise-of-perps-and-hyperliquid/. Accessed August 1, 2026.

59. Unlike standard user vaults, where vault managers charge performance fees of approximately 10 percent, HLP is classified as a Protocol Vault that charges no management fees and operates under full community ownership.
“What Is Hyperliquid (HLP), and How Does It Work?” *Cointelegraph*, February 21, 2025. Republished by *TradingView*. https://www.tradingview.com/news/cointelegraph:beef14d21094b:0-what-is-hyperliquid-hlp-and-how-does-it-work/. Accessed August 1, 2026.

60. Jiang and Poh, “Housing All of Finance.”

61. In addition to protocol fees, Hyperliquid utilizes yield generated from USDH reserves. USDH reserve yield refers to the operational income generated by the collateral backing USDH, a stablecoin issued by Native Markets for the Hyperliquid ecosystem. Under a dual revenue-sharing model designed to deepen ecosystem liquidity, 50 percent of reserve yield is automatically routed to the Assistance Fund, where it is converted into HYPE tokens locked in a keyless system address. Following a validator vote confirming these funds as permanently burned, the fund functions as a core deflationary mechanism. The remaining 50 percent is reinvested to promote USDH adoption and ecosystem expansion.
Jason Nelson and Ryan S. Gladwin. “What Is Hyperliquid? The Decentralized Exchange With Its Own Blockchain.” *Decrypt*, June 17, 2026.
https://decrypt.co/resources/what-hyperliquid-decentralized-exchange-blockchain. Accessed August 1, 2026.

Ezra Reguerra. “Hyperliquid Governance Vote Aims to Permanently Sideline $1B Assistance Fund.” *Cointelegraph*, December 17, 2025. Republished by *TradingView News*. https://www.tradingview.com/news/cointelegraph:f9f2d66e1094b:0-hyperliquid-governance-vote-aims-to-permanently-sideline-1b-assistance-fund/. Accessed August 1, 2026.

62. Analysis by Cantor Fitzgerald indicates that Hyperliquid routes 99 percent of its revenue into automated HYPE buybacks. The Foundation explicitly clarified that “the balance in this fund was never intended to be spendable or recoverable.” Ezra Reguerra, “Hyperliquid Governance Vote Aims to Permanently Sideline $1B Assistance Fund.”

63. Approximately 81 percent of staked HYPE tokens were concentrated among entities affiliated with Hyperliquid, prompting criticism over excessive centralization.
Hannah Collymore. “Hyperliquid Makes Validator Changes After Jelly Delisting Criticism.” *Cryptopolitan*, March 29, 2025. https://www.cryptopolitan.com/hyperliquid-makes-validator-changes-jelly/. Accessed August 1, 2026.

64. Lilian Aliaga. “Hyperliquid and the JELLY Attack: Context, Vulnerability and Team Solution.” *OAK Research*, March 28, 2025. https://oakresearch.io/en/analyses/investigations/hyperliquid-jelly-attack-context-vulnerability-team-solution. Accessed August 1, 2026.

65. Industry reactions to the JELLY incident were divided: some viewed validator intervention as an unavoidable decision that prevented a worst-case outcome, while critics—including Bitget CEO Gracy Chen—condemned it as a dangerous precedent that could become “FTX 2.0,” arguing that it undermined the principles of decentralization. Collymore, “Hyperliquid Makes Validator Changes.” The JELLY incident demonstrated that expert judgment, too, cannot completely eliminate the possibility of error and controversy, while underscoring that DeFi’s central challenge is not to achieve perfect decision-making, but to develop the capacity to sustain the system amid unpredictable crises. Despite these events, Hyperliquid remains the largest perpetual-futures DEX by trading volume. As of April 2026, its trading volume stood at $190.28 billion, accounting for approximately 3.9% of total perpetual-futures volume across both CEXs and DEXs and ranking ninth overall. CoinGecko, “State of Crypto Perpetuals Report 2026.”*CoinGecko*, May 21, 2026.
https://www.coingecko.com/research/publications/state-of-crypto-perpetuals-report-2026. Accessed August 3, 2026.

66. James C. Scott. *Seeing Like a State*. Part 4.

67. Buterin demonstrated that coin-voting governance structures are inherently vulnerable to whale plutocracy, voter apathy among retail holders, and bribery attacks. He advocated combining automated rules enforced through smart contracts with tightly constrained governance mechanisms.
Vitalik Buterin. "Moving Beyond Coin Voting Governance." *Vitalik Buterin's Blog*, August 16, 2021. https://vitalik.eth.limo/general/2021/08/16/voting3.html. Accessed August 1, 2026.

Legibility, Exit, and Retention

The Evolution of DeFi Governance and the Formation of Viscosity

Researcher

Eunmi Kim kimem1level@gmail.com

Corresponding Author

Taemin Oh

Editor

Sunghoon Jin