DECENTRALIZING VENTURE CAPITAL: AN ANALYSIS OF THE CURRENT AND FUTURE STATE OF INVESTMENT DECENTRALIZED AUTONOMOUS ORGANIZATIONS

by

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For over half a century, venture capital (VC) has been a staple of the startup ecosystem as a source of funding. Venture capital firms have historically backed some of the most well-known companies today, including Meta, Google, Uber, and countless others. More recently, VC firms have started setting their sights on a new category of startups that are hoping to lead the way to a more decentralized world by leveraging blockchain technology. Among the many applications within this space includes an emerging and alternative model for traditional VC that is facilitated through Decentralized Autonomous Organizations (DAOs).

Historically, investing in venture capital funds has been limited to large institutions and high net worth individuals. However, the emergence of DAOs modeled as VC funds could potentially increase accessibility for a larger pool of investors to gain exposure to cryptocurrency and blockchain-focused startups and earn the astronomical returns that were a privilege previously limited to a select group. This thesis serves to examine the advantages and challenges of DAOs as venture capital investment vehicles and analyze the potential role that DAOs may eventually play the venture capital landscape.

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Chapter 1: Background

Chapter 1.1: Introduction

In recent years, the emergence of **blockchain technology** has disrupted countless industries. By leveraging distributed networks, blockchain aims to decentralize traditional business processes and structures by serving as distributed networks and computing infrastructure for a host of different applications. These rapidly popularizing and polarizing applications, such as NFTs and DeFi, have given rise to a new wave of **startup companies and projects** working to build the foundation for a decentralized online ecosystem and society. Due to the meteoric rise of cryptocurrencies such as bitcoin and ether to the forefront of the financial markets and the immense potential for this space to expand, **venture capital** firms are racing to deploy millions of dollars of capital into crypto and blockchain startups.

While venture capital has historically been an industry and asset class limited to the wealthy elites and large institutions, the ethos of blockchain calls for increased **democratization and accessibility** to fund crypto and blockchain startups and the technology has accomplished just that. A new organizational form, called **Decentralized Autonomous Organizations** (DAOs), has emerged as an alternative vehicle to coordinate and conduct business activities. DAOs have been formed for a variety of reasons, such as to govern DeFi platforms, collect NFTs, and even to purchase an original copy of the U.S. Constitution, but decentralizing **governance and control of capital** are two themes at the core of virtually every DAO's mission. For Investment DAOs, the concept of a decentralized VC fund has garnered the attention of

traditional VCs and noticeably disrupted what was a relatively systematic and established venture capital landscape. This decentralized organizational structure has created a potential avenue for the average individual to not only invest in, but also participate in the management of a venture capital-esque fund.

Pushing venture capital towards true democratization and increased accessibility is undoubtedly a tall order for those in the Investment DAO community, however, as venture capital is highly regulated and firms typically target employees that are some of the brightest minds in finance and tech. As a result, venture capital is naturally a challenging industry to navigate from an investor's and fund manager's perspective. This will objectively make it difficult for Investment DAOs to truly alter the fundamentals of the industry. There are a multitude of questions that must be answered about the effectiveness of the Investment DAO model, in addition to a number of inherent and potential challenges Investment DAOs must overcome to maintain the existing role they have carved out, let alone increase their prevalence in venture capital. However, despite these challenges and the uncertainty of the external environment impacting Investment DAOs, the model does possess several value-added characteristics that gives it the upper hand in some aspects of funding and supporting crypto and blockchain startups. For now, it is these advantages that are keeping Investment DAOs in the game and allowing them to settle into a role in the early stages of crypto and blockchain venture capital, which they are primed to thrive in.

As DAOs are native to the same technology (blockchain) as most of the projects, such as startups and NFTs, they invest in and therefore largely share the same broad values and ambitions, it only seems fitting that Investment DAOs be the ones to fund

and help scale these startups. However, this is obviously not how modern-day capitalism works and it is certain that traditional venture capital firms will not relinquish the opportunity to achieve exponential returns by withdrawing from the crypto and blockchain space. Therefore, regardless of any shifts in the external environment, Investment DAOs have much to prove about how they can effectively and sustainably add value to this niche area of the industry.

Entrepreneurship and ingenuity are just as important to the crypto and blockchain space as they have been to the entire history of mankind. For decades, venture capital firms have had the privilege of being the gatekeepers to capital in the startup world, but cryptocurrency and blockchain technology present a unique set of challenges that firms must navigate to effectively capture this opportunity. Meanwhile, the rise of Investment DAOs has brought a fresh perspective on this new wave of startups and an unorthodox structure (for venture capital) to the table that is in some ways better equipped and aligned to be the gatekeepers in this space. However, the future of Investment DAOs is without a doubt uncertain due to their nascency and the many moving pieces at this intersection of blockchain and venture capital. I hope that my research will provide clarity on where Investment DAOs currently stand and bring to light pertinent questions and issues that must be considered by their communities and relevant external entities.

Chapter 1.2: Research Question and Methodology

Through my research, my primary goal is to gain a deeper understanding of the Investment DAO ecosystem and identify characteristics and variables that will play an integral role in determining where Investment DAOs end up in the future. It is crucial to

understand that my research is more forward-looking and exploratory in nature as the intersection of DAOs and venture capital has gone largely unexplored in academia. Therefore, the purpose of my thesis is not to prove whether DAOs will become the standard vehicle for venture capital or fail outright, or even argue for how the space should be developed and regulated. Rather, my research will serve to highlight the most relevant characteristics of Investment DAOs and identify the most pressing issues facing their adoption, focused on the question of "what are the advantages and limitations of DAOs as a venture capital investment vehicle?" This information will also be synthesized to establish a more focused set of outcomes for the fundamental question of "what role will DAOs play in the future of venture capital?" While this question is impossible to answer definitively, I strongly believe that making this complex topic more palatable and increasing transparency is critical to ensuring that the development and regulation of this space is approached in an educated manner.

Due to the range of disciplines implicated my topic, my research focuses on a high-level and holistic overview of the most important concepts from each discipline as they relate to my research questions. Additionally, my research is predominantly qualitative in nature as there is very limited quantitative information on Investment DAOs that can be formally analyzed. Furthermore, a majority of the unknown, forward-looking variables involved are also qualitative and have a wide range of outcomes. In other words, these variables would not be definable by a categorical variable in a traditional regression model, which is an unfortunate limitation for the more predictive aspect of my analysis. Despite this limitation, I found this research process to be extremely unique and fascinating in that I ended up engaging with literature and

readings from a variety of different disciplines that also varied widely in their age. Venture capital DAOs have implications in disciplines including computer science and venture capital, which are relatively new compared to the fields of law and ethics that date back thousands of years. It was difficult to digest information from so many different subjects, but I believe it was crucial to consider each subject equally so that I could develop a more holistic and unbiased perspective through my research.

I primarily relied on objective articles published online providing conceptual information to develop a strong foundational knowledge encompassing all the requisite disciplines that would serve as the base for my analysis. I deemed this to be an appropriate approach as the intersection of all these disciplines becomes highly convoluted, so I wanted to focus my research on purely the most relevant facts and avoid overcomplicating my literature review with any highly technical or argumentative literature. However, in reviewing these more simplistic and straight forward literatures, I leveraged the most reputable sources from each discipline when possible to ensure the correctness and reliability of information being used. For some of the more technical sections of my thesis, I did want to engage with more formal academic literature that provided greater depth on the core underlying concepts to strengthen my understanding of the topic.

When it came to assessing Investment DAOs, defining the key factors in their external environment, and projecting a range of future outlooks for the ecosystem, I consulted sources that would offer the best inside perspective on this intersection. This included articles and reports published by individuals heavily involved in the crypto and blockchain space or journalists and media outlets focused on this area. I also had the

wonderful opportunity to have multiple conversations with Stephen McKeon, an Associate Professor of Finance at the University of Oregon (on leave) and a managing partner at a crypto-focused venture fund, Collab+Currency. I was able to gain a tremendous amount of valuable insight about Investment DAOs and crypto and blockchain in general from someone who is directly involved right at this intersection. These conversations proved to be critical towards answering my research questions as his anecdotal experience helped me bridge the gap between what I had synthesized, and the various perspectives being offered by other articles and reports. Surprisingly, these sources were also for the most part unbiased in their views Investment DAOs, which helped me maintain an unbiased perspective throughout this piece and critically think about their qualities and outlook.

Chapter 1.3: Preface on Literature Review

The current collection of literature focusing on the intersection of blockchain and venture capital, specifically Investment DAOs, is extremely sparse and limited primarily to broad articles and reports published by crypto and blockchain media outlets and entities in the industry. As a result, much of my literature review was centered around studying pertinent concepts from the underlying disciplines and synthesizing this information to fill the gaps in the narrative surrounding Investment DAOs. Additionally, most of these articles and reports failed to consider the implications of every major discipline impacting the Investment DAO ecosystem. This shortcoming is understandable though, as even formal academic research on other applications of cryptocurrency and blockchain typically must encompass multiple disciplines, some of which may not be the researchers' strong suit. Thus, virtually every piece of literature

covering this intersection is fragmented, which leaves individuals like me, who are not directly involved in the space, with an incomplete understanding of Investment DAOs and their broader implications.

My goal is to bridge this gap between industry and academia through a more formal discussion of Investment DAOs that provides a rough framework to surveil the Investment DAO ecosystem and understand the implications of shifts in its external environment. Moving forward, I believe it is crucial to increase the engagement of academia and more qualified experts in the relevant disciplines. This would provide a more well-rounded perspective on a topic that poses so much uncertainty to both professionals and the general public. It may also serve as a platform for positive change and progress in this space as regulators, developers, and other implicated groups may look to thoughtful academic research for appropriate mechanisms to cultivate trust and sustainable growth in the Investment DAO ecosystem.

Chapter 2: An Overview of Blockchain Technology

Blockchain is the core underlying technology that supports DAOs and is a key reason why many advocates for decentralization believe that DAOs will eventually become a standard for commercial organization. The ethos of DAOs, which promotes a more community-oriented and inclusive structure for business activities, remains consistent with the motivations for the first widely successful application of blockchain – Bitcoin. For this reason, exploring the intersection of DAOs and venture capital requires a fundamental understanding of blockchain itself and the broader concerns the technology addresses.

Chapter 2.1: What is Blockchain?

Chapter 2.1.1: The Ideologies of Blockchain

The Bitcoin Whitepaper, published in 2008 by anonymous source Satoshi Nakamoto, a pseudonym for the creator(s) of Bitcoin[1], laid the groundwork for the countless applications of blockchain technology that exist today. As Bitcoin was created as a peer-to-peer (p2p) electronic cash system, an alternative to traditional money, the motivation behind this innovation centers around Nakamoto's distaste for the legacy financial system. Nakamoto argues that commerce on the internet suffers from the problem of reliance on financial institutions and centralized entities as trusted third parties to process electronic payments. While this is the model we have all grown accustomed to, Nakamoto's concerns were valid considering the Bitcoin whitepaper

[1] The exact identity of the person(s) who published the Bitcoin Whitepaper is still unknown today and will likely never be purposefully revealed. Revealing this information would effectively defeat the purpose of a decentralized and distributed network that is not supposed have a central authority. While Nakamoto would not have complete power over the network, it is likely that the participants of the network and Bitcoin community would look towards Nakamoto for guidance in how the protocol should be developed, thus resembling a network with a single source of power and influence.

was published amid the late 2000s financial crisis, which casted doubt on the trust that was held in the institutions and governing bodies underpinning the nation's financial infrastructure.

During these turbulent times, the introduction of Bitcoin offered a novel method to make electronic payments that was anonymous, immutable, trustless, and decentralized. Among other implications, this means that the system does not rely on a single centralized party that in other cases could act as a single point of failure for the entire network. In essence, Nakamoto wanted to create a system that was free from governmental or institutional control that could instead be run democratically by the people through blockchain technology. This democratization of processes is at the core of every application of blockchain technology that seek to build a more decentralized world. As an ideology of social change, decentralized blockchain applications can be seen as expressions of technolibertarianism, related to anarcho-capitalism in economic theory. At its core, this philosophy favors individuals and stateless societies with financial and economic freedom from centralized governments.

Another core tenet of Bitcoin (and the many other blockchain applications that have followed) is the borderless nature of the system. Anyone with an internet connection anywhere in the world can interact with a blockchain network and the services it provides while bypassing traditional third-party intermediaries. Furthermore, blockchain is crucial for underdeveloped countries or regions that do not have the requisite resources and infrastructure to support robust financial systems and other services. This characteristic also serves to benefit countries with corrupt governments that severely restrict the financial freedom of their citizens, which is unfortunately still

the case in a handful of countries today. A popular mantra for financial blockchain applications (a segment called decentralized finance, or DeFi for short) is "banking the unbanked," demonstrating that blockchain is not just some controversial technology for political and economic reform, but also an avenue for positive social change.

Chapter 2.1.2: Blockchain Concepts and Characteristics

While the highly technical concepts behind blockchain are not requisite to an analysis of the intersection of DAOs and venture capital, it nonetheless important to understand what has allowed blockchain to be so disruptive. This section will briefly discuss some of the technology's core concepts and characteristics that have given it so much notoriety.

In its simplest form, blockchain is a distributed ledger or database technology that serves as a system of record for various types of transactions, similar to the ledgers that banks maintain to keep track of their clients' account balances. As the name suggests, a blockchain is a chain of blocks and each contains transactions that have been verified by the chain's network and executed by its underlying protocol. Each blockchain's protocol defines a set of rules that governs its network, including the incentives for network participants to process transactions and how information is shared between computers running the protocol.

The computers running a blockchain's protocol are called "nodes" that are essentially stakeholders of the blockchain's network and maintain the digital ledger by verifying valid transactions and confirming blocks to be added to the chain. Each node owns a copy of the ledger, and they must all agree on the current global state of the ledger. This implies that no single node has control over the network, thus making

blockchains distributed and decentralized. Blockchain's (that are public) are impossible to shut down for this same reason, as there is no central entity with the power to do so. There are several theoretical ways in which a blockchain could be compromised or attacked, but in general, the security of blockchain is highly robust and virtually impenetrable by malicious actors.

Malicious actors who do attempt such actions face the lofty hurdle that is the immutability of blockchains. In a blockchain, adjacent blocks are linked together cryptographically using extremely complex hash functions that create a unique identifier for each block. This unique identifier is called a block's "hash" and is contained within the block's header, which also stores the hash of the previous block; these hashes are generated by essentially running the block's contents (e.g., transaction and header data) through the hash function used by the protocol. Due to the immense amount of processing power necessary to re-solve the hashes of prior blocks, major blockchains with substantial hashpower are immutable and virtually immune to fraud because any change in a block's contents (even by just 1 character) would invalidate all following blocks as they would no longer store a valid hash matching the prior block's hash. Additionally, different blockchains will have different mechanisms in place to ensure that it is extremely difficult or at least unfavorable to dishonestly modify the chain's contents.

Another benefit of blockchain technology, which stems from the two qualities discussed already, is that it removes the need for trust among network participants. Blockchain supports what its proponents call "trustless" systems because participants do not need to trust in any one party to ensure that on-chain information is valid and

correct. While blockchains do not actually eliminate trust entirely, they are effectively minimizing the amount of trust that participants need to place in a single party by distributing that trust among the entire network to reach consensus on what is and isn't valid. Additionally, as identities in blockchain are anonymous (i.e., transactions cannot easily be tied to a real person's identity), participants do not have to know exactly who they are transacting with or trusting to maintain the blockchain's authenticity. In addition to supporting this idea of "trustless" networks, this anonymity offers a sense of confidentiality and privacy to users of blockchain.

Chapter 2.2: Ethereum

As of 2022, Ethereum, represented by its native cryptocurrency ether, is the second largest blockchain by market capitalization only behind Bitcoin. And while Bitcoin is the presumed origin of modern day blockchains and cryptocurrencies, Ethereum is arguably the more relevant and important blockchain today.

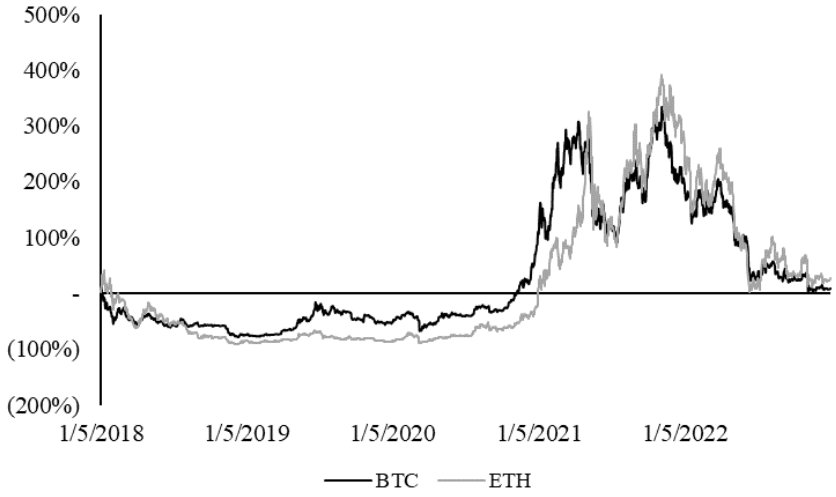


Figure 1: 5-year cumulative returns of Bitcoin (BTC) vs. Ether (ETH)

(Source: Yahoo Finance)

In its current state, Bitcoin purely functions as a peer-to-peer payments network. Ethereum on the other hand is much broader in its applications as it is programmable and provides a platform for blockchain developers to build towards their vision of a more decentralized online ecosystem. This includes, liquidity protocols, NFT marketplaces, decentralized games, and much more. Additionally, users can deploy DAOs, the majority of which are housed on the Ethereum blockchain and its compatible chains; as of June 2022, this is estimated to be over 70% of the approximately 6,000 DAOs in existence according to CoinTelegraph. As such, this section will emphasize the Ethereum blockchain and the tools it provides to cultivate the growing DAO community.

Ethereum was launched in July of 2015, proposed by Russian-born Canadian programmer Vitalik Buterin and developed by Buterin and his co-founders. Buterin became intrigued by blockchain technology and got involved in Bitcoin as a 17-year-old in 2011. However, he started to realize that those in the Bitcoin community weren't

approaching the challenge of building decentralized applications and were limiting the possibilities of what the Bitcoin network could be. In developing Bitcoin, Nakamoto purposely limited the protocol's scripting system for security reasons, which in effect put a restraint on what Bitcoin could do. The founders of Ethereum designed it to relieve these constraints on blockchain developers, who are now only limited by their own creativity. Ethereum was created with the intent to reach beyond the financial applications of Bitcoin and enable developers to build decentralized applications ("dApps" for short) with endless possibilities. According to Gemini, a cryptocurrency exchange, there are nearly 3,000 dApps deployed on Ethereum today, roughly half of all functioning dApps, with more than 600,00 actives users[2].

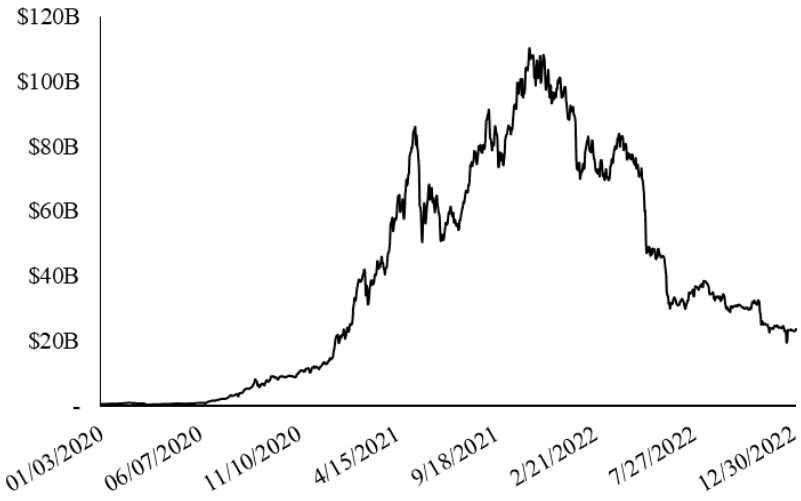


Figure 2: Total value locked (dollars) in dApps on the Ethereum blockchain

(Source: DeFiLlama)

With how it has disrupted the modern-day internet, Ethereum has been dubbed as "the world's computer" because it is essentially a public network infrastructure that

[2] *Ethereum Explained: A Guide to the World Supercomputer* (Gemini). https://www.gemini.com/cryptopedia/ethereum-blockchain-smart-contracts-dapps

supplies computational resources. To briefly explain the basis of this computational infrastructure, computations are performed via the Ethereum Virtual Machine (EVM). The EVM is a rule-based computer with an agreed upon state by network participants who keep a copy of the computer's state. Participants (nodes) are also able to broadcast requests for the EVM to perform a computation; when requests are broadcast, other network participants will verify, validate, and execute the computation. Execution of a computational request causes a state change in the EVM, which is propagated throughout the network so that nodes can update their copy of the state.

Chapter 2.2.1: Incentives, Accounts, and Transactions

Similar to Bitcoin, Ethereum creates a market for computation with **economic incentives** to reward participants for providing computational resources verifying and executing transaction requests. These rewards come in the form of Ether (ETH), which are offered by anyone who broadcasts a transaction request as a bounty, the amount of which is proportional to the time required to perform the computation. Bounties also act as a deterrent to malicious actors requesting abnormally large or infinite amounts of computation to intentionally congest the network. Additionally, ETH provides crypto-economic security to the network by 1) rewarding validators who propose new blocks (equivalent of mining a block in Bitcoin) or reporting dishonest behavior and 2) validators must stake ETH, which acts as collateral that can be destroyed if a validator acts dishonestly.

Accounts are another important element of Ethereum because they in part enable the more nuanced ecosystem that gives Ethereum an advantage over Bitcoin when it comes to being a versatile computing platform. In Bitcoin, there are no

"accounts," rather bitcoins are associated with an address that is controlled by whoever owns them. Ethereum still uses addresses, however they are tied to an Ethereum account, which is an entity with an ETH balance that can send transactions over the network. There are two different account types, both of which have the ability to receive, hold, and send ETH and other tokens, and interact with smart contracts deployed on the network. The first is an externally-owned account (EOA) – controlled by anyone with the account's private keys. The second is a contract account, which is a smart contract that is deployed to the network and controlled by its code. There are a couple of key differences that distinguish externally owned and contract accounts:

- Cost: EOA's are free to open while there is a cost associated with creating a contract since they use network storage.
- Interaction: Users can initiate transactions through EOA's; contract accounts can only send transactions in response to receiving a transaction (code is triggered when external accounts send a transaction).

Ethereum **transactions** are actions initiated by externally owned accounts. As mentioned previously, initiating a transaction requires a fee (referred to as "gas") in order to execute. In contrast to Bitcoin, transactions on Ethereum do not necessarily need to involve a transfer of value in a cryptocurrency. Additionally, as suggested by the presence of contract accounts, there are instances where users will "transact" with a non-human, code-controlled entity. These are the three major types of transactions in Ethereum:

- Regular transactions involve a transfer of ETH tokens from one account to another.

- Contract deployment transactions are used to deploy smart contracts to the blockchain and create contract accounts.
- Execution of a contract involves a transaction that interacts with a smart contract.

As we typically transact with other known entities directly or indirectly through standard mediums of exchange, contract and non-human controlled accounts are one of the less intuitive concepts for those unfamiliar with this space. However, this is a key reason for why Ethereum has been so successful in decentralizing a variety of industries as there can simply be code on the other side of a transaction that automatically executes when certain conditions defined by the account's code are met. This is the basis of all dApps because they function based on these predetermined rules that are defined by smart contracts, which will be discussed in more depth in the next chapter.

Chapter 3: Smart Contracts and DAOs

Chapter 3.1: Smart Contracts

Smart contracts are a crucial component of the DAO ecosystem because they define how DAOs operate and the mechanisms by which they are governed. As alluded to earlier, smart contracts give DAOs their decentralized and autonomous qualities because the "terms" of the contract can execute without having to be initiated by a contracted party. It is also important to understand that like traditional contracts, the foundation of a smart contract is just an agreement between two parties, human or not. The obvious difference in how they are formed is that smart contracts will codify the typical "if this – then that" terms of an agreement rather than there being extensive legally binding documentation drafted by a legal professional. However, despite the contrast between how they are formed, traditional contracts and their digital equivalents can be structured very similarly, content-wise.

This enables dApps to replicate the uses of traditional contracts and agreements, just on-chain, including decentralized lending and borrowing protocols or decentralized insurance. In these examples[3], dApps are programmed to act as the bank/lender or insurance broker that would typically sit between a borrower and a loan or underwrite an insurance policy for a person/business. A protocol's smart contracts would define the

[3] These are both examples of DeFi. Services such as lending and insurance typically require liquidity from the lender or insurance broker, so what decentralized lending or insurance services do is have a pool of liquidity providers that provide capital in the form of a cryptocurrency to the protocol. These liquidity providers are rewarded in a similar fashion to traditionally intermediaries; lenders can generate interest on the assets they have provided to the protocol and underwriters will receive a share of the premiums paid for insurance policies.

same elements seen in a loan agreement or insurance policy, such as the principal, interest rate, length of the loan, and any collateral (lending), or the monthly premium, policy limit, and coverage trigger[4] (insurance). DAOs do not necessarily use smart contracts in the same way as these types of decentralized services, but these examples are suggestive of the implied benefits, as well as challenges, of using smart contracts in a business context, which will be discussed in a later section.

While smart contracts may seem like a novel innovation due to their recent notability, the idea of smart contracts dates back to the 1990s when Nick Szabo, computer scientist and legal scholar, wrote an article titled "Smart contracts: Building Blocks for Digital Markets." In this article, Szabo suggests that we can embed contractual clauses in the hardware and software we use as a method to disincentivize breach of contract. He provides the analogy of a simple vending machine as a primitive ancestor to smart contracts that uses an automated mechanism to fulfill its purpose and protect its contents: accept coins, return change, and dispense a product. The smart contracts behind dApps are unquestionably more complex and nuanced than the implied contract of two decade-old vending machines. However, this analogy still demonstrates the inevitability that society would gradually adopt these mechanisms that automate fulfilment of contracts and improve contract security.

Chapter 3.1.1: Advantages of Smart Contracts

Smart contracts hold a distinct set of characteristics that gives them advantages over traditional contracts, while also posing risks and challenges to their adoption. In

[4] A coverage trigger is defined in an insurance policy as an event that triggers a payout to the insured party.

the same way that blockchain is touted to be "trustless," smart contracts can also remove the need for the trust that traditional contracts require between the contracting parties. As mentioned previously, smart contracts execute the terms that an entity has agreed to when contract conditions are met. For example, if you entered into an agreement through a smart contract to paint a neighbor's house for $100, the neighbor would have to deposit the $100 into an escrow account managed by the smart contract. Once you have painted the house and the smart contract is able to confirm that you have completed the job[5], the $100 will automatically be transferred to your wallet. In this case, you would not need to trust your neighbor to give you cash or write a check once the job is complete, nor feel the need to seek legal recourse if they refused to pay you. Oftentimes, a contractor may attempt to reduce risk of non-payment by requiring full or partial payment up front, however, this simply shifts the risk to the homeowner because the contractor may still fail to perform the service. Smart contracts escrow payments to mitigate the risks of non-compliance by both parties.

Another advantage of smart contracts is that they are always objective in how they interpret the terms of an agreement. The human factor of traditional contracts can be seen as one of the biggest points of failure. For example, two judges could interpret the language of the same contract in different ways, which may lead to different results in a breach of contract case. However, with smart contracts, the rigidity of the code removes the possibility for subjective interpretations and produces the same result (provided the same circumstances) every time without fail. This is one key

[5]Confirmation of real-world events and outcomes is provided by blockchain oracles. An oracles is a trusted 3rd party service that connects smart contracts with authenticated external data sources. This data will determine how a smart contract should execute if it requires the outcome of some real-world event. For example, a decentralized sports betting platform would connect to an oracle that covers sporting events and use the results of matches or player statistics to determine payouts to bettors.

characteristic of smart contracts that supports the narrative of "code is law" that proponents of blockchain advocate for. Code is law is a proposed form of regulation that is supported by other autonomous technologies, like machine learning, and insists that technology be used to enforce existing rules. While this paper will not make an argument for or against this belief that code should act as the final legal authority, it is nonetheless an important legal implication to explore.

Chapter 3.1.2: Challenges with Smart Contracts

Those hesitant about smart contracts will cite their immutability and vulnerabilities as two major criticisms of the technology. The characteristic of immutability is a disadvantage of smart contracts from a software engineering perspective, which also exacerbates the harmful impacts of any vulnerabilities in the code. While the immutability of smart contracts can be viewed as a positive since the terms of a codified agreement cannot be altered once the smart contract is activated, there are inherent risks with this rigidity that can and have caused significant problems.

As with traditional software programs and applications, smart contracts are highly likely to have bugs when they are first deployed. However, as alluded to, the problem with smart contracts is that they are permanently written on the blockchain, meaning that any bugs in the original code cannot easily be fixed once they have been deployed[6]. This problem is compounded by the fact that smart contract writers are especially prone to making mistakes simply due to how unrefined the blockchain development space is and a general deficiency of standardized coding or code auditing

[6] There are ways to redeploy a "new" contract to the blockchain, however, this process involves other security risks that must be considered and can be costly because of the gas fees required to deploy a contract on Ethereum.

practices, although smart contract auditing is an expanding service. According to a thread on Hacker News [7] from 2016, Ethereum smart contracts averaged one hundred "obvious" bugs (detectable by a machine) per one thousand lines of code. In comparison, Microsoft code averages fifteen obvious bugs in the same number of lines, while NASA spacecraft code is virtually spotless at approximately 0 errors per 500,000 lines of code. This is not to say that smart contracts are not capable of ever being coded to a high standard, however, until they are, decentralized applications will continue to face heightened vulnerability to exploits.

While these vulnerabilities may often times be minor bugs that do not significantly compromise a smart contract's security, there are instances where the exploit of a point of vulnerability has led to catastrophic consequences. There are a variety of ways that vulnerabilities can appear in smart contract code and thus different methods in which a malicious actor can take advantage of the smart contract. By far the most infamous exploit of a smart contract was what is called "The DAO Hack." The DAO, launched in 2016 on the Ethereum blockchain, was the first true decentralized autonomous organization that serves as the inspiration for many DAOs today. The intent of this DAO was to act as an investor-led venture capital firm that invested within the cryptocurrency and decentralized space; it raised 12.7 million ETH in its initial token sale, equivalent to $150 million at the time and nearly $17 billion today. However, less than three months after its launch, a hacker stole $60 million worth of ETH from the DAO's wallet by calling a recursive function to repeatedly siphon out

[7] Hacker news is the public news forum of technology startup accelerator Y Combinator.

funds. Controversially, the Ethereum blockchain later underwent a hard fork[8] to restore the stolen funds in the hands of investors. This was a disastrous event for the blockchain community as it shed light on the potential dangers of relying on smart contracts to handle sensitive matters and large sums of money.

Chapter 3.2: Decentralized Autonomous Organizations (DAOs)

With these core underlying concepts of blockchain and smart contracts in mind, this notion of a decentralized organization form can now be formally introduced and discussed. The main ethos of the DAO ecosystem is to prioritize autonomy, ownership, and democratization of entities that conduct business. Over the years, it is fair to say that people have had their complaints and criticisms of traditional centralized corporations. This is primarily in how modern capitalism has fueled profit-chasing by large corporations and how existing corporate governance structures displace the average middle-class individual from any ability to take impactful ownership or make their voice heard in the actions of corporations. With the advent of DAOs, however, we are now seeing how these organizations based on code can disrupt the status quo and give the average individual a platform to spearhead business initiatives alongside others that share a collective vision. As DAOs are an extension of blockchain technology, this issue of democratizing governance of businesses is naturally an extension of the broader problem of decentralization that blockchain is addressing. However, it is difficult to say

[8] A hard fork occurs when a blockchain diverges into two separate chains with one undergoing radical changes to its code/protocol. In the case of the Ethereum 2016 hard fork, the blockchain was split into Ethereum and Ethereum Classic. People can still use and build on the Ethereum Classic chain, but most have moved on and adopted the "new" Ethereum chain. The decision to fork the blockchain was controversially because at its core, blockchain is intended to be an immutable database where actions and events cannot be reversed, regardless of how severe; many believed that this fork went against the core ideologies of blockchain.

whether DAOs will be more successful in achieving their vision than other blockchain applications like cryptocurrencies will be in decentralizing the financial system.

The origin story of DAOs comes from the realm of science fiction. Years before the first DAO was launched, there was the "Daemon" in a book written by Daniel Suarez in 2006 titled *Daemon.* In this science fiction novel, the Daemon is illustrated as a mass scale computer program that coordinates an underground society. While this cooperative engages in nefarious dealings, its underlying structure and operations are resemblant of what we see in DAOs today – disbursing funds, sharing information throughout a community, and managing a native currency through an autonomous computer program. Later, a more concrete idea for decentralized and computer-ran organizations would be envisioned by Vitalik Buterin, who defines a DAO in the Ethereum whitepaper as such: "a virtual entity that has a certain set of members or shareholders which, perhaps with a 67% majority, have the right to spend the entity's funds and modify its code. The members would collectively decide on how the organization should allocate its funds."

The smart contracts of a DAO remove the need for defined professional relationships between members and any hierarchical governance or management structures as the code acts as the enforcer of any rules. Additionally, the flat hierarchy in theory reduces bureaucracy because any decisions made by a DAOs members are instantly executed by the smart contracts instead of having to go through a multi-layer approval process seen in most organizations today. This heterarchical structure of DAOs is seen as one of their core benefits because it enables more efficient and

democratic collaboration that isn't subject to human interference at the governance and operational level.

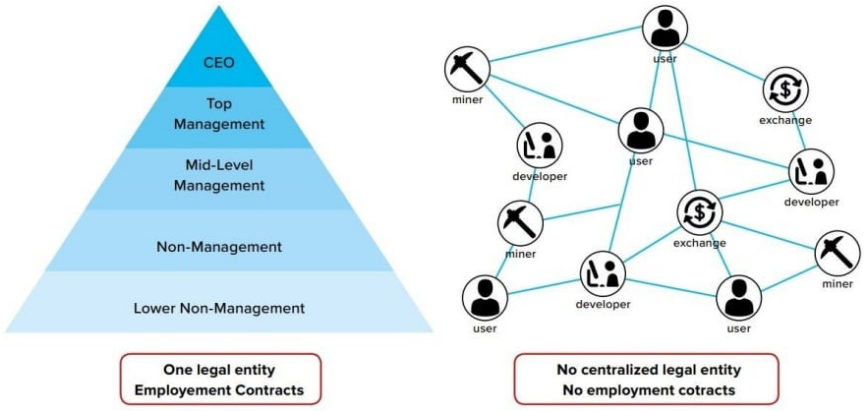


Figure 3: Traditional top-down vs decentralized organizational structure

(Source: Moralis Academy)

A crucial element of DAO governance is the management of its treasury, which is itself a smart contract account. When first joining a DAO, members must usually purchase a stake in the DAO's ownership by exchanging accepted crypto tokens, which are placed in the DAO's treasury, for the DAO's native governance token and/or a token representing an interest in the DAOs assets. DAO governance tokens give their holders voting rights in the DAO, similar to how the common stockholders of a public corporation have the right to vote on various matters related to the company. In DAOs, these voting rights can be exercised on proposals from members, including those to change rules in the DAO's smart contracts and deploy treasury capital.

This management structure differs from that of a traditional shareholder-owned corporation because the members of a DAO are the ones who are directly making decisions that impact the DAO. In contrast, investors in a corporation expect the company's executives to put their invested capital to good use but in the end, the

executives still have authority over the allocation of capital to certain projects. However, in a DAO, it is the members who are making decisions on where to deploy capital, meaning that they take a more active form of ownership in the organization, whereas public company shareholders are only passive owners (those who are not involved in day-to-day decision making). This effectively eliminates the agency problem that arises in business structures like corporations that involve a principal-agent relationship.

With DAOs being fully member-owned and run, this in theory increases the incentive for members to contribute meaningfully to the DAO and be responsible in their involvement as the DAO's health and progression are entirely in their hands. Incentives and motivation should be aligned from the very start however, as DAOs are typically launched with a defined goal and shared vision in mind between originating members. This leads to a great deal of intrinsic motivation for those in the DAO community as they are typically passionate about contributing to their DAOs mission and advancing the entire DAO ecosystem. DAOs can also have various forms of extrinsic motivation or monetary compensation depending on the type of DAO, including traditional base pay and bonus compensation structures using crypto tokens and a percentage of returns generated on any investments made by the DAO, similar to how many traditional asset managers work.

Chapter 3.2.1: Applications of DAOs

While the very first DAO was structured to be a decentralized venture capital fund, the DAO ecosystem has expanded far beyond that application as enthusiasts have used this organizational framework to build collaborative communities for other

purposes and causes. Today, the thousands of DAOs in existence can be segmented into four broader categories: Investment, Protocol, Social, and Media, and other DAOs falling outside these groups. To contextualize how large the DAO ecosystem has grown and the substantial treasuries they have accumulated, more than 10,000 DAOs tracked by DeepDAO[9], a DAO-focused analytics site, manage a combined $9 billion in their treasuries as of the end of 2022.

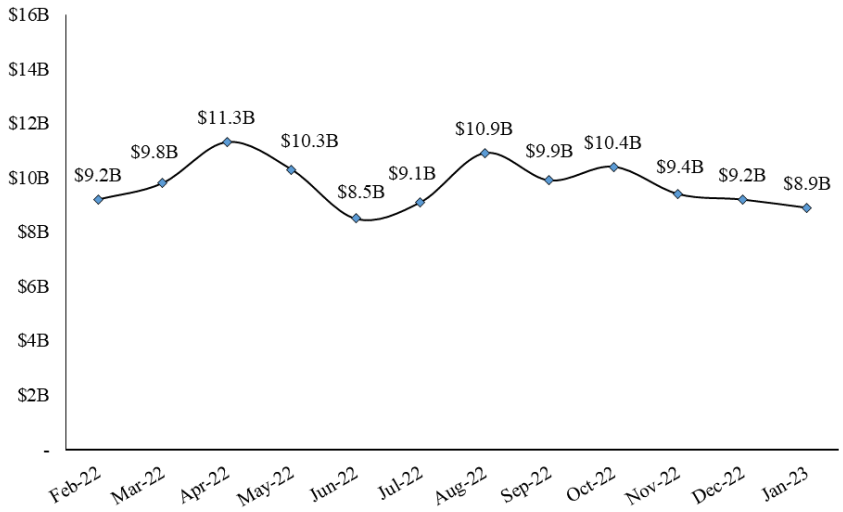


Figure 4: Total treasury value of over 10,000 DAO tracked on DeepDAO.

(Source: DeepDAO)

Investment DAOs will be discussed in greater depth later, but the main idea with this category of DAOs is that individuals can pool capital together and invest in digital assets and collectibles such as NFTs (non-fungible tokens) and fund early-stage crypto and blockchain (broadly referred to as the "crypto" space) startups in exchange for a share of the project's tokens or traditional equity. Speaking more broadly, investment DAOs act as decentralized investment clubs that make investment decisions through a

[9] https://deepdao.io/organizations

standardized proposal and voting process. Investment DAOs in particular hope to be the decentralized alternatives to traditional venture capital firms like Andreessen Horowitz, Sequoia Capital, and Accel. These firms raise funds from investors and fund startups in exchange for equity stakes that have the potential to increase exponentially in value if the startup is successful. While traditional venture capital firms can raise up to multi-billion dollar funds, their DAO equivalents do not have the same access to institutional capital that VC firms do. As such, most Investment DAOs typically operate with less than $1 million in capital, with very few boasting treasuries over $10 million. Some of the larger and more notable names among DAOs focused on venture capital include The LAO and MetaCartel Ventures that have each made a multitude of investments in a number of crypto startups and projects.

It is important to note that the lines are extremely blurry in defining Investment DAOs and separating DAOs that focus on venture capital investments. This is because virtually all Investment DAOs make venture capital-like investments in what we would call “startups”, but also extend into less traditional sectors such as NFT and digital asset projects that are not thought of as “traditional” venture capital investments. As such, Investment DAOs may also have different investment strategies and goals, such as Flamingo DAO, which is an NFT-focused DAO that aims to explore emerging investment opportunities for ownable, blockchain-based assets. Beyond the art and collectible aspect of NFTs, Flamingo expects NFTs to gain prevalence as the Web shifts to a more user-driven economy that emphasizes, monetizes, and incentivizes online digital content from individuals rather than mass-media companies and content distributors.

Similar to how financial services are provided through a parent company, protocol DAOs are the governing bodies of decentralized protocols, which are typically a consumer focused DeFi service. Examples include Aave (lending), Uniswap (cryptocurrency exchange), and InsurAce (insurance). These DAOs and their underlying protocols may one day replace traditional financial services companies like Bank of America (lending), Intercontinental Exchange (foreign currency exchange), and Aflac (insurance) that all rely on a centralized entity to facilitate the service and govern how it should be delivered.

Social and media DAOs may respectively be the new norm for how we interact and consume content online. Corporations like Facebook, Twitter, and large media publishers have long controlled the platforms we use to connect with one another and the circulation of news and media to which we are exposed. However, with issues like data privacy and censorship becoming major discussion topics regarding how these platforms are regulated, social and media DAOs can offer more open and inclusive platforms that allow people to share and discuss content. Social DAOs like the Friends with Benefits DAO primarily focus on fostering communities for members to build personal connections and share creative insights among one another. Media DAOs are created with the intent to curate, create, and publish compelling content, such as Bankless DAO, a community formed to disseminate media, culture, and education surrounding the decentralized movement.

Chapter 3.2.2: Forming and Tooling a DAO

The idea of creating an entire autonomous organization based on code may seem like a formidable task, however, there are a variety of tools that have been established to

help prospective DAO creators bring their decentralized communities to life. General tools such as Discord (communication), Collab.Land (coordination), Coordinape (compensation), Snapshot (voting), and Llama (treasury management) help facilitate the operations and management of a DAO once it is up and running. More importantly, especially for the investment DAO ecosystem, there are tools such as Syndicate, Tribute Labs, and Squads.io that provide frameworks for the formation of a legally compliant DAO. This is crucial to the success of investment DAOs because they need robust architecture and infrastructure to support the sensitive process of raising, coordinating, and deploying millions of dollars of capital.

The TributeDAO framework developed by Tribute Labs, founded in 2017, is currently the most widely used framework for investment DAOs. Prior to frameworks like TributeDAO being introduced, there were a variety of challenges and inconveniences involved in forming and running a DAO, including a lack of modularity, rigid voting and governance mechanisms, high costs, and a lack of NFT support. TributeDAO's goal is to provide an open-source framework to enable the creation of extensible and modular DAOs at a low cost. As with traditional businesses, there is no "one size fits all" framework for managing an organization. DAOs needed this modularity and flexibility to fit the needs of their organizations and membership, which Tribute Labs now offers. As of the beginning of 2022, Tribute Labs' technology had helped launch and support a highly curated group of nearly 10 DAOs, with that number quickly growing by 1-2 each month, including some of the most prominent investment DAOs such as The LAO and Flamingo DAO. One minor downside to the TributeDAO framework is that it limits these organizations to 99 members (in order to

remain legally compliant as an investment club[10]), however, they can still have very substantial investment portfolios.

Syndicate, founded in 2021, is another DAO-focused project focused on building the investing infrastructure for Web3, a blockchain-driven iteration of the Web. The organization's frameworks for decentralized investment clubs and collectives were built to "empower communities to raise, coordinate, and invest capital like never before". The Investment Club product offers a suite of DAO tools for communities to invest and allocate capital in Web3-native ways on the Ethereum or Polygon blockchain networks. Syndicate investment clubs can be created instantly and on-demand in unlimited numbers through a very straightforward process. Anyone interested in launching an investment club simply needs to 1) connect a crypto wallet and pay a gas fee to launch the club, 2) send a link to accept deposits from other interested members, and 3) leverage a dashboard built by Syndicate to manage all aspects of the DAO, including its investments and membership. For investment DAOs, utilizing Syndicate's framework provides a host of other benefits. First, investment club DAOs have the ability the invest in both on-chain and off-chain assets, including project tokens, NFTs, and traditional startup companies (via a legal entity). There are also legal compliance features, including legal document generation and signing, and creating legal entities for DAOs, which allows them to get EINs, open fiat bank accounts, submit state compliance filings and file tax forms. In February of 2022, Syndicate stated via Twitter

[10] Investment clubs are groups of people who pool their money to invest together. They are generally not regulated by the SEC, however, those that fall under certain categories do have registration requirements. This includes regulation of the offer and sale of membership interests if these interests are considered securities (under the Securities Act of 1933) or if the club meets the characteristics of an investment company (Investment Company Act of 1940), which are subject to SEC regulation. To qualify as a private investment company that may not need to register with the SEC, an investment club must, among other requirements, not have more than 100 members, which is why virtually Investment DAO frameworks are capped at 99 members.

that 10% of all DAOs in existence had been created using the Syndicate DAO framework, which had only been released 3 weeks prior. This suggests that Syndicate is extremely valuable to the DAO community and will likely be at the leading edge as investment and Investment DAOs continue to gain popularity.

Chapter 4: What is Venture Capital?

Venture capital DAOs are seeking to disrupt the traditional VC model by carving out a space in the industry to fund and support crypto startups, while striving to make the industry more accessible to the average person. Historically, only wealthy individuals and large institutions recognized as accredited investors[11] have been able to access venture capital investments, per Securities and Exchange Commission (SEC) regulations, due to the highly risky nature of these investments. According to a 2012 Wall Street Journal Article, it is standard for three or four out of every ten venture capital-backed startups to fail outright, with only one or two producing substantial returns for investors. Even with the tremendous amount of due diligence conducted by venture capital firms and the time and resources invested into portfolio companies, not all startups were born to succeed and be the next unicorn[12], so venture capitalists must distribute this risk among multiple investments and hope that at least one hits it big. These are opportunities that are not afforded to the average investor due to restricting, though sensible investor protection laws that the SEC enforces to preserve confidence in the integrity of the U.S. financial markets.

Today, venture capital firms are seeing exponential returns on their investments in crypto startups, with the crypto space experiencing unprecedented growth. Going back to the inception of Bitcoin, the ethos of blockchain would suggest that this decentralized movement was meant to be led by the people. However, with venture

[11] An accredited investor is defined by the SEC to be an individual or business entity that is allowed to trade securities not registered with financial authorities such as the SEC. The rationale is that these wealthy and capital-rich investors can bear more risk and require less protection in the form of regulatory disclosure filings, which are otherwise required for securities registered with financial authorities.

[12] In the venture capital industry, the term "unicorn" is used to describe a privately held startup company with a value of over $1 billion.

capital firms and wealthy investors now reaping the returns from crypto startups, the "rich get richer" narrative is still apparent. This has become the driving force behind the emergence of investment and Investment DAOs. With how community-driven the cryptocurrency and blockchain space is, supporters of this space not only want a piece of the lucrative financial pie, but also want to be directly involved in the next wave of these startups to see out their success. The remainder of this chapter will discuss various aspects of venture capital, including its history, current structure, and the funding process that provide context for the emergence of Investment DAOs and where they potentially fit into the industry.

Chapter 4.1: The History of Venture Capital

While most may be aware of venture capital's recent history due to its association with household names such as Meta and Uber that started as fledgling technology startups and the industry's role in the dot-com bubble of the late 1990s, the roots of venture capital can be traced back to as early as the 15th century. The following examples provide the early blueprints for modern-day venture capital (Chapter 4.1.1) and exhibit its growth since it became a standardized industry (4.1.2).

Chapter 4.1.1: Early Days of Venture Capital

In the 1400s, Christopher Columbus saw an opportunity to sail west and discover the treasures of the Far East. Columbus was an entrepreneur and this potential voyage his venture. This voyage would be extremely risky, and many thought it would be impossible and far too costly for Columbus to fund alone. Nevertheless, Columbus sought out an investment from top European courts undeterred and spent eight years

trying to convince them until finally, he received an investment from Queen Isabella of Spain in 1492. Queen Isabella (the venture capitalist), desperate to reach the Indies, funded Columbus' high-risk voyage in return for what turned out to be an extraordinary return on her investment. While accidental, Columbus' discovery of the West Indies during his voyage set the Golden Age of Spain in motion, where the country became a powerhouse in exploration and the Spanish Empire solidified itself as a powerful global force for over 160 years. And as the investor in Columbus' venture, Queen Isabella received 90% of all profits from the voyage.

Some 300 years later, we can start to see how the modern-day structure of venture capital began to form with the whaling industry. Since the Neolithic era, whaling has been used to extract valuable resources, including blubber, oils, and keratin, from these creatures. Without modern equipment and resources, whaling was extremely dangerous in the 1800s, if not one of the most dangerous industries in the world. However, the unassuming town of New Bedford, Massachusetts had become arguably the most successful whaling hub in the United States. This was achieved through a venture capital-like model that helped agents maximize opportunities to profit from whaling. These agents (the venture capitalists) would raise capital from corporations and wealthy individuals (equivalent of limited partners in modern venture capital) to fund captains of whaling expeditions (the entrepreneurs), which encouraged and incentivized whaling despite the significant risks involved. As implied by New Bedford's success in whaling, this model turned out to be highly lucrative, with some agents generating annual returns over 50%.

Towards the end of the 19th century, a closer resemblance to modern venture capital appeared with the War of Currents, a fierce battle between entrepreneurs Thomas Edison and George Westinghouse over which form of current would be used to power lights. John Pierpont Morgan, the namesake of the largest bank in the United States today (J.P. Morgan), invested solely in Edison's direct current technology. In the following years, Edison and Westinghouse (who endorsed alternate current electricity) battled for the viability and prominence of their respective inventions. The later would manage to outbid Morgan for the contract to light up the 1893 Chicago World Fair, a spectacle that ended up being an overwhelming success for Westinghouse. In retaliation, Morgan led aggressive and successful takeover attempts and legal battles against Westinghouse. This enabled him to capitalize on his significant investment in Edison's project with General Electric (Edison's company) going on to be one of the original twelve publicly traded companies in the Dow Jones Industrial Average stock market index.

This series of events sets the precedent for more traditional venture capital that is seen today with investments in individual founders and companies developing new technologies and innovative products or services.

Chapter 4.1.2: Modern-Day Venture Capital

In the early days of modern private equity and venture capital, these industries that invested in small businesses were headlined by solely well-known and wealthy families, including the Morgans, Vanderbilts, and Rockefellers. However, funding for small business dried up when the Great Depression hit, and President Franklin D. Roosevelt enacted various financial reforms as a part of the New Deal. After World

War 2, a group of educated individuals, including the "Father of Venture Capital", Georges Doriot, realized that entrepreneurship was vital for the growth and resurgence of the U.S. economy. In 1946, they formed the first official venture capital firm – American Research and Development Corporation. This firm used money invested from sources other than wealthy families and operated with the belief that research and development could be a key driver of economic growth.

This soon transcended into an entire industry, one that most now associate with the term "Silicon Valley". Prominent venture capital firms like Sequoia Capital and Kleiner Perkins emerged in the heart of the California Bay Area on Palo Alto's Sand Hill Road throughout the 1960s and 70s. In 1974, the Prudent Person Rule[13] was passed as a part of the Employee Retirement Income Security Act (ERISA), which allowed pension funds to invest in venture capital funds and paved the way for other institutions to begin investing in VC at scale. As a result, capital began funneling into the industry in immense quantities, with institutional investors eager to capitalize on the surge in innovation. The next few decades saw the venture capital industry continue to thrive, with highly successful VC-backed companies going public, including Apple and Genentech.

While these success stories added more legitimacy to the industry, what really caused venture capital to explode was the internet boom of the 1990s. There was huge potential in startups pioneering this space, with many prominent internet names, including Netscape, eBay, AOL, and Amazon, emerging from this period. With early investors enjoying unprecedented returns in the hundreds of percent within a few short

[13] In legal terms, the Prudent-Person Rule restricts the choices of financial managers and fiduciaries to the types of investments that a person pursuing reasonable returns and capital preservation would buy for their own portfolio.

years, others jumped in and flooded the industry with capital fearing that they would miss out on the dot com frenzy. In just a decade, the amount of money invested in venture capital had increased 60-fold from $3.4 billion in 1991[14] to over $100 billion in 2000[15]. Unfortunately, the speculation eventually broke down, causing the dot com bubble to burst in early 2000. Valuations of startups crashed, leading to agonizing loses for VC firms and their investors. Nevertheless, the outlook on technologies such as software, mobile, and social media remained promising, keeping the industry relevant even after the market crash.

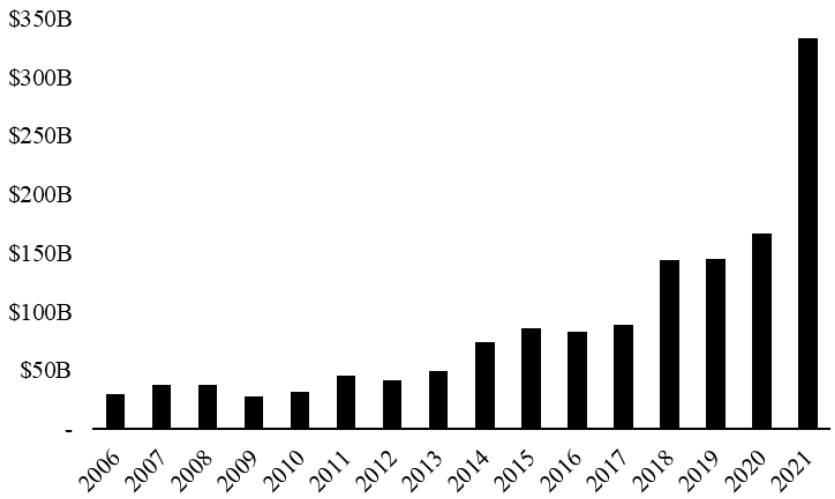


Figure 5: Total value of U.S. venture capital investments

(Source: Statista)

These are the types of companies associated with VCs today, with corporations like Google, Airbnb, and Twitter being proof of the continued success and lucrative returns of the VC model. At its peak during the COVID-19 pandemic, the global

[14] *Trends in Venture Capital Funding in the 1990s* (U.S. Small Business Administration). https://www.ceoplaybook.co/wp-content/uploads/2019/12/trends_vc-1.pdf
[15] *Venture-Capital Investments Exceeded $100 Billion in 2000* (Wall Street Journal). https://www.wsj.com/articles/SB977496982685663482

venture capital industry was worth a staggering $330 billion[16]. Activity may decline in the near-term due to turbulent economic conditions following the pandemic, however, the venture capital industry will undoubtedly remain as a staple of the global capital markets given its role in furthering innovation and creating economic opportunity[17].

Chapter 4.2: The Venture Capital Model and Process

Chapter 4.2.1: The Model

A complete explanation of the legal structure of venture capital firms and funds will be provided in chapter 5, but to briefly introduce the structure, venture capital funds, like other forms of private equity, are structured as limited partnerships. General partners, employed by the VC firm, are responsible for managing the fund and serving as advisors to the fund's portfolio companies, while limited partners are the investors and provide capital to the fund (e.g., wealthy individuals, institutions). The capital raised from limited partners will then be invested in various private startup companies with the number and dollar value of the investments being dependent on the size of the given fund, which can be in the tens to hundreds of millions or even billions of dollars. Regarding the venture capital compensation structure used to incentivize the firm and its general partners, the most typical is a 2/20 fee structure, which consists of a 2% management fee of total assets under management (AUM) in the fund and a 20% performance fee of all profits earned on investments.

[16] *Value of venture capital investment in the United States from 2006 to 2021* (Statista). https://www-statista-com.libproxy.uoregon.edu/statistics/277501/venture-capital-amount-invested-in-the-united-states-since-1995/

[17] According to a 2015 study by Ilya Strebulaev (Stanford University) and Will Gornall (University of British Columbia), venture backed companies have collectively spent $115 billion in research and development (R&D) since 1974, accounting for 85 percent of all R&D spending during this period. Young startups, most venture backed, have also been responsible for almost all 25 million jobs created from 1977 to 2010 per a study conducted by the Kauffman Foundation in 2010.

The startups and founders that VC firms invest in are chosen through a highly selective process the allows the general partners to evaluate a project's prospects and its viability as an investment. As alluded to previously, it is common for many of a fund's portfolio companies to fail and yield a negative return on investment (ROI), which is why VC funds will invest in anywhere from 15-20 individual startups (Vernon, 2020), potentially more, for a single fund. This is done to distribute the elevated risk and maximize the chances of hitting a homerun on one of their investments, which is sometimes all a fund needs to generate positive returns before it is liquidated[18]. There is also the added element of high liquidity risk as there is not an active market for private startups, so the potential returns offered on VC investments must be exceedingly high to compensate.

In contrast to investing in the stock market where investors take small positions in a company's equity and therefore have minimal control over the company's governance decisions, venture capitalists will take large stakes in the startups they invest in and demand seats on the company's board of directors to have a more active role in the governance of the company. They do this 1) to protect their interests and ensure that the startup is being managed properly, and 2) to be directly involved with founders and CEOs to provide resources that can significantly improve a startup's chances of success. These resources include financing (raising capital), technical support, HR management, and general managerial expertise. The managerial and subject-matter expertise that venture capital firms can offer to startups is crucial and

[18] As with any other investment, investors in VC funds expect firms to generate a positive ROI and return capital to them. The typical investment horizon for VC funds is generally 7-10 years, however, there is evidence that it can take up to 12-14 years to fully liquidate a fund due to differing exit timelines for individual startups (Kupor, 2019).

invaluable[19], as most startup founders generally lacks the skills and expertise required to cultivate a rapidly growing company.

Chapter 4.2.2: Startup Funding Stages

As a startup gains traction and starts experiencing growth, various funding rounds are made available to support the startup through the different growth phases it will go through if it remains on the right track. Due to the pace at which startup companies scale, each subsequent funding round is traditionally larger than the last in terms of dollars invested to provide a sufficient influx of capital that will sustain the startup's growth efforts until the next round of funding or a potential exit. Subsequent funding rounds also provide an opportunity for other VCs and investors who were not initial investors in the startup to purchase a stake in the company and gain a spot on its cap table[20].

Additionally, each time a startup raises capital through equity investments, its implied valuation will change based on the amount of equity purchased in the most recent round and how much investors paid for that share of equity. To understand how a startup's valuation is determined in the simplest of scenarios, take the popular reality TV show Shark Tank for example. At the end of an entrepreneur's pitch, one of the sharks may offer up an investment, stating how much they are willing to invest and what percentage of the company they would like in return for that investment. If Mark

[19] See appendix A for data showing the educational experience of venture capitalists.
[20] A cap, or capitalization table, is a detailed breakdown of a startup's ownership. Capitalization refers to the ways in which a company has been financed, including debt, common equity, and preferred equity. Through the startup process, cap tables are a critical due diligence element because they help founders and investors make informed decisions about the company and understanding its ownership structure. As a startup progresses through the various funding rounds of the venture capital process, its cap table will become increasingly complex as more investors take a stake in the company each time it raises capital. By breaking down ownership in the cap tables, existing investors can understand how their ownership and the value of their stake are impacted by each round of fundraising.

Cuban offers a $100,000 investment for a 10% stake, that implies a $1 million valuation of the company; since 10% of the company can be bought with $100,000, it would take ten times that $100,000 ($1 million) to purchase the entire company outright. How this implied valuation changes after each funding round is a crucial indicator of how investors perceive the progress of the startup and its future potential.

The first stage of funding a startup will go through is called pre-seed. In pre-seed, entrepreneurs will typically have an idea for an innovative product or service but need funding to help them develop and flesh out the details of the idea. The pre-seed stage is also a fitting time for startups to handle partnership agreements, copyrights, and other pertinent legal issues. At this stage, it is unlikely that traditional VCs will provide funding as there is no functioning business and no concrete product or service for the firm to build on. Thus, entrepreneurs typically must rely on personal resources and connections for financing, including their own personal funds, friends and family, or potentially early-stage investment funds that specialize in pre-seed startups. Many entrepreneurs will also enter business incubators or accelerators, which provide valuable resources to entrepreneurs and connect them with VC firms and networks that can help them develop the idea.

Once an entrepreneur has established a company around their idea and can demonstrate the company's potential for growth, they typically advance to the seed round. This will be a startup's first round of official institutional financing and as such, founders will need a detailed pitch deck to convince experienced investors that their project is a viable investment opportunity. Should a startup receive capital at this stage, funds raised are intended for activities such as market research, business plan

development, building a management team, and product development that can help startups build a stronger foundation. Seed rounds typically present the most risk to investors and are therefore the most expensive to founders in terms of the equity they must give up in the company. Friends and family, and angel investors will still be involved in seed rounds, but this is where VC firms typically make their first appearance on a startup's cap table.

Early-stage venture capital loosely comprises of the series A and series B rounds. At series A, a company should have a completed business plan and a pitch deck that emphasizes the product-market fit of the product or service it provides. The company should also be making strides to establish its customer base, in part by increasing marketing and advertising efforts to generate interest and more consistent revenue flow. Additionally, the business plan should demonstrate how the project will eventually become profitable and generate positive cash flows. Investors at series A include accelerators, VC funds, corporate VCs[21], and family offices[22]. Series B typically represents a much larger investment compared to prior rounds, as companies should be primed to scale their operations at this stage, which requires a significant amount of capital to do successfully. Scaling a company's product manufacturing, marketing, and sales operations are key to its ability to generate long-term growth and proving that it has a commercially viable product or service. In general, investors

[21] Corporate VCs are the venture capital wings of large and usually technology-focused corporations, including Google Ventures, Intel Capital, and M12 (Microsoft). Instead of raising capital from outside investors, corporate VCs directly invest company funds into startup companies. These investments can be made for a variety of reasons, but the most corporate-specific reason is to gain access to emerging, innovative companies that may eventually become competitors to one of the corporations' products or services.
[22] Family offices refer to private wealth management advisory firms that offer various financial services to ultra-high-net-worth individuals including financial planning, investment management, insurance, and tax services.

involved in series B rounds are almost entirely of the institutional variety – VC funds (late-stage VCs will start to get involved), corporate VCs, and family offices.

When a startup enters late-stage venture capital territory, this consists of any round beyond series C until the mezzanine or bridge stage. In this range, a company is on a clear growth trajectory and is well-established, indicated by factors such as exponential growth, consistent profitability, and a strong customer base that will only be supplemented by additional funding rounds. Incremental funding can help a later-stage company build new products, reach new markets, and even pursue acquisitions of other companies. Due to the proven early-stage success and strong VC backing of startup companies that are beyond series B, a larger range of investors are more willing to participate at this stage in addition to the earlier-stage investors, including private equity firms, hedge funds, and even banks as lenders. The mezzanine stage is the "pre-public" stage and typically the final phase of VC markets where companies look ahead to a major liquidity event, including M&A (merging with or getting acquired by another company) or IPO (listing of shares on public equity markets). At this point, companies have supposedly reached "maturity" (in startup terms) and simply need financing to support major growth and expansion activities. Many original investors in the startup choose to exit their positions (partially or entirely) to earn a return at this stage, while other later-stage investors can invest before the company gets acquired or goes public.

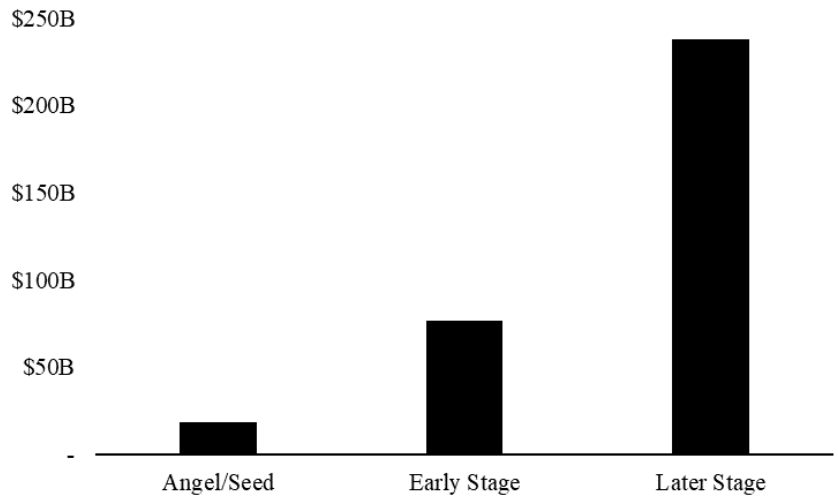


Figure 6: Value of venture capital investments in the U.S. in 2021 by stage

(Source: Statista)

At first glance, due to the sheer dominance of established and well-heeled venture capital firms at essentially every stage of the process, it appears unlikely that Investment DAOs will be able to carve out a role in funding crypto startups. However, in this space, the initial rounds are still wide-open to competition due to a more fragmented micro venture capital and angel investor market and the general unreliability of securing family/friends funding and personal investments. Additionally, DAOs are almost naturally limited but potentially better suited to disrupt the crypto VC space at these initial stages, which has made itself apparent with existing Investment DAOs. This is a scenario that will be discussed later in the paper.

Chapter 4.3: Shifts in Venture Capital in the Age of Crypto

Chapter 4.3.1: Crypto in Traditional Venture Capital

While the volatility and risks of investing in the crypto and blockchain space are exacerbated in the context of venture capital, startups in this emerging market also

present a tremendous amount of opportunity to venture capitalists who are willing to take a chances on these startups. Similar to the dot-com boom of the late 1990s, this revolutionary technology movement along has venture capital firms scrambling to stake their claim in the space, causing investments in this space to skyrocket in recent years. According to a report by Blockworks[23], a digital assets media site, 49 new crypto and blockchain-focused funds were raised in 2021 with an average size of $300 million. Additionally, the total amount invested in this space by VCs in 2021 was $33 billion, which accounted for approximately 5% of all money invested by VCs across all sectors globally. This dollar figure was invested across over 2,000 funding deals, which was nearly double the quantity in the prior year. Prior to the crypto market plunge that started in late 2021, increasing adoption, expanding use cases, as well as rising digital asset prices drove up VC interest and funding in crypto startups. Furthermore, venture capitalists have also had extremely high hopes and expectations due to the exponential growth potential of these startups, which has led to premium valuations being put on crypto and blockchain companies. Blockworks reported that in 2021, the median pre-money valuation[24] for startups in this space was $70 million – 141% higher than the median across all VC deals of $29 million.

[23] *Report: VCs Invested $33B in Crypto and Blockchain Startups in 2021* (Blockworks). https://blockworks.co/news/report-vcs-invested-33b-in-crypto-and-blockchain-startups-in-2021

[24] The pre-money valuation of a startup is its implied valuation prior to receiving an investment.

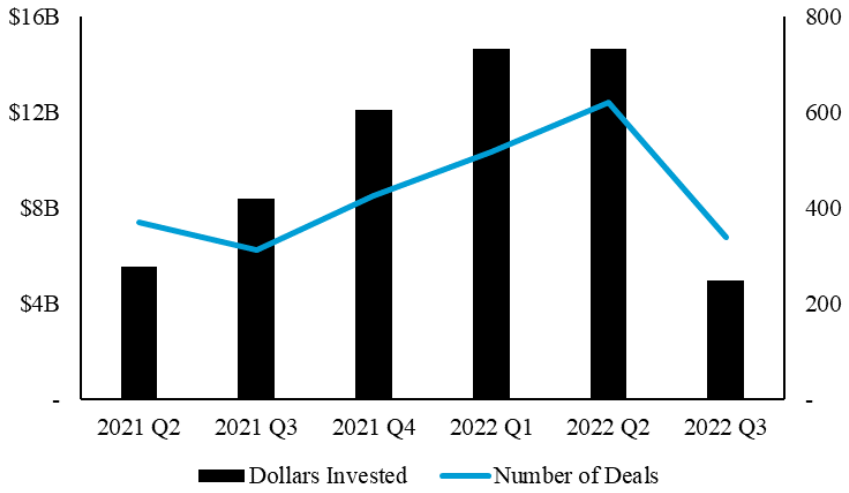


Figure 7: VC investment in startups in crypto, blockchain, and related fields

(Source: CoinTelegraph)

Despite the nascency of crypto and blockchain and its sudden impact on the venture capital landscape, enthusiasts and followers of this intersection have already begun to observe the advantages and disadvantages of VC involvement in the funding of crypto startups. One of the key advantages of VC funding in this space is the value of credibility and legitimacy that VCs can bring to these startups. Historically, many crypto projects and investment opportunities, most notably initial coin offerings (ICOs), have simply been unviable or turned out to be scams, which has made many highly skeptical of anything that involves this technology. However, VC funds 1) must perform an immense amount of due diligence to vet potential startup investments and 2) are highly prestigious and have reputations for being extremely successful in grooming startups. Both factors should in theory relieve at least a portion of the uncertainty among investors and the general public who may have concerns regarding a crypto or blockchain startup's viability and own reputation. The resources that a VC firm can provide to crypto startups are also extremely valuable from a founder's perspective, as

these types of projects typically scale very rapidly and thus require greater support and guidance from the outset.

In general, the process to acquire VC funding is time consuming and tedious for startups, an issue that can be exacerbated with crypto startups given the pace at which they tend to scale. This in effect compresses the runway[25] for these types of startups that may exhaust funds at a quicker rate in order to support their growth and must therefore be more responsible with the funds they are given. The overall timeline for crypto venture capital does move "faster", however, compared to traditional venture capital. Most crypto projects that pan out naturally do not grow to be substantial in size and as such, most projects do not advance past the pre-seed and seed phases. According to Crunchbase, there are only 40 cryptocurrency startups with unicorn status as of November 2022, making up only 4% of the 1,000 total unicorns across all of VC currently. Additionally, there have been very few crypto startups to obtain series A, B, or C funding thus far. Due to this accelerated timeline to exit and earlier liquidity for crypto startups, venture capitalists who invest in them must therefore be able to achieve desired returns within the same timeframe. This can put crypto startups at a disadvantage, as VCs may demand higher amounts of equity in the company than normal to create the possibility of generating substantial and sufficient returns before the startup's liquidity event.

Based on this initial discussion some of the advantages and disadvantages of traditional VC funding for crypto startups, there is some indication of the potential

[25] Runway refers to the amount of time, typically measured in months, that a startup can continue operating before it runs out of money. It is crucial for a startup to be cognizant of its runway in order to properly budget, strategize, forecast, and plan for fundraising throughout its lifecycle.

benefits or challenges Investment DAOs might to introduce themselves and the potential role that they may be able to carve out in this space. There are also relevant regulatory issues that create challenges for Investment DAOs, which will be discussed in the next chapter.

Chapter 4.3.2: DAOs in Venture Capital

From the birth of DAOs with the creation of The DAO in 2016, there was already evidence that blockchain-based organizations would play a role in disrupting venture capital. The DAO set out to be a decentralized venture capital fund and while it ultimately collapsed, this demonstrated interest from the crypto community in making investments into crypto startups and projects in a more structured manner. Previously, startups, both on- and off-chain, could quickly raise capital without facing regulatory hurdles through crowd sales of a token, called Initial Coin Offerings (ICOs), representing their project on the blockchain. Like other trends under the umbrella of cryptocurrency and blockchain, ICOs earned major interest and publicity at their peak in 2017, causing a frenzy among investors who rushed to put their money into these projects that advertised the potential for exponential returns. While some ICO-funded projects have gone on the be successful, the vast majority of them fell flat or turned out to be scams as there was no regulation around ICOs, which has since been tightened to protect investors. This has in part given rise to or created more opportunity for DAOs to provide capital to venture capital and specifically the crypto startup ecosystem and bring more diligence and expertise to the crypto startup funding process.

Investment DAOs are the digital equivalent to Investment Clubs, which is an official term created by the Securities and Exchange Commission (SEC) used to

describe a group of individuals who come together to pool capital and make investments in various financial assets. As noted previously, Investment Clubs are typically limited to 99 members because this is the maximum numbers of members they can accommodate to remain exempt from regulation by the SEC, which applies to larger investment advisors, including traditional venture capital firms. Investment DAOs also tend to adhere to this rule to avoid regulation and typically require that any member be an accredited investor since these DAOs are investing in crypto startups and projects, which are considered unregistered securities that have a different set of regulatory requirements in order to be an investor. Additionally, Investment DAOs typically ask that members have at least some prior experience with or knowledge of startups in the crypto space[26]. In being legally compliant and following these regulatory requirements as an investment fund, Investment DAOs are able to make investments in startups just as any other venture capital fund and guide their portfolio companies through the startup process to what they hope is long-term financial success. However, Investment DAOs are still unfamiliar territory for regulatory authorities, so while they have not received much scrutiny in recent memory, uncertainty lies ahead in how shifts in the regulatory environment will impact the viability and appeal of Investment DAOs, an issue to be discussed in Chapter 7.

Instead of raising capital from outside investors like traditional venture capital funds, DAOs will directly raise capital from their members, who must purchase membership interests in the DAO in order to join and receive voting rights. After accumulating these funds, the process by which VC-focused DAOs source and make

[26] For example, The "Investments" section of The LAO's docs state that, "As a member, you should have some experience in evaluating and investing in startups relying on digital assets." (https://docs.thelao.io/Investments.html)

investments is very similar to how traditional venture capital firms work, with the primary difference being the distribution of voting power in the final investment decision process. Venture capital funds will receive applications or requests from startups to pitch their company in front of the fund's partners and other employees to initiate the process to potentially receive funding. If the fund believes that the startup has good prospects and is a good fit for the fund, which is oftentimes only a sliver of the startups that even receive the opportunity to pitch, they will move forward in discussions. Should the VC firm decide to make an investment, they will draft up a term sheet defining the investment terms and rights of both parties and ultimately supply the agreed upon amount of capital.

Similarly, The LAO, one of the most prominent Investment DAOs today, for example, receives proposals from projects seeking capital that individual members can nominate for funding. Once a proposal has been nominated, members executive their right to vote on whether the DAO should invest in a project. Finally, if quorum is met within the DAO's defined voting period and consensus is reached, members will authorize (or deny) the investment. Based on this comparison, it is evident that the goal of Investment DAOs in this regard is to democratize the investment process by not only giving investors in a fund a more active role in actually investing those funds, but also democratizing investment decision making to all members of the fund, rather than just a few high-ranking individuals (partners in a VC fund). Once investments have been made, Investment DAOs will also engage in arguably the most vital part of the VC process, which is nurturing and guiding the startups they have invested in to increase the chances of the startup becoming a successful company. In contrast to a venture

capital fund, however, that only has few partners available to support 15-20 different startups, Investment DAOs can have up to 99 members, with a variety of skillsets, to support startups in almost any capacity, a key advantage of Investment DAOs that will be discussed in more depth in Chapter 6 along with other advantages (and challenges) of this model.

Chapter 5: Legal and Regulatory Implications

With venture capital being such a highly regulated industry and the existing and potential regulatory pressures facing the crypto and blockchain space, an understanding of the legal and regulatory environment surrounding Investment DAOs is crucial to this analysis. While there are other challenges that Investment DAOs face, such as societal, geopolitical, and cultural hurdles, the legal and regulatory challenges that DAOs face are more concrete and are crucial for DAOs to navigate if they want to cement a spot in crypto and blockchain venture capital. Therefore, an analysis of this subject must consider the regulatory actions and legal implications that currently apply to Investment DAOs and how this environment may change over time.

Chapter 5.1: Business Organization and Legal Recognition

The first key topic is how DAOs are structured as business entities and the legal recognition of DAOs. This is particularly important in the context of Investment DAOs due to the way that traditional venture capital firms are structured and how this structure impacts the parties involved. As mentioned in the previous chapter, the relationship between investors in a VC fund and the venture capitalists that manage the fund can be described as a limited partnership. This structure is optimal for the formation of a VC fund because investors, the limited partners (LPs), have limited liability protections in the case that the VC fund incurs any legal liability. Additionally, as limited partners, they do not have to be involved in decision making as passive investors in the fund. However, a standard limited partnership still exposes general partners (GPs) to legal liability. To protect themselves, venture capital firms are typically organized in a more complex way, especially those with multiple funds under management. Carta, an equity

management software company, provides a simplified analogy involving theoretical firm Krakatoa Ventures with two separate funds. In this example, the structure of the firm is as follows:

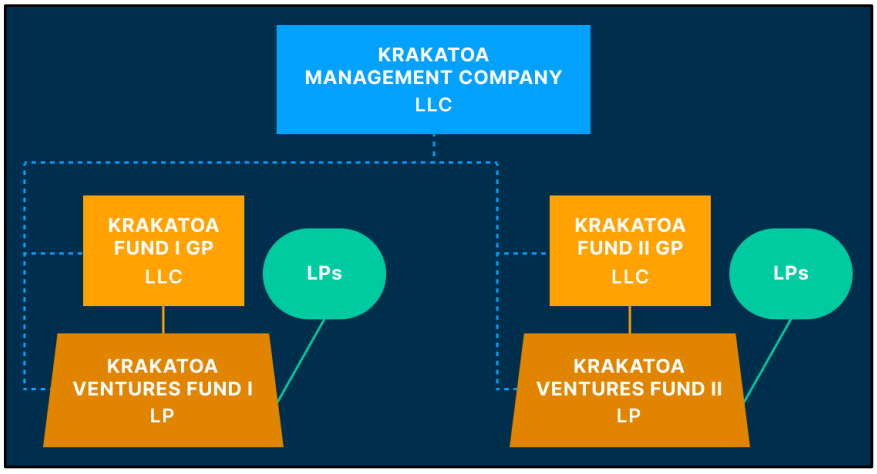


Figure 8: Visual representation of the legal structure of a conventional VC firm

(Source: Carta)

A management company (Krakatoa Management Company) will sit at the top of the firm to oversee the operations of both funds; to protect its members from legal liability, the management is organized as a Limited Liability Company (LLC). When setting up Krakatoa Fund I, Krakatoa Management Company does not want to be the direct GP to the fund, as it would then be subject to unlimited liability. Instead, the management company will form a new LLC beneath it (Krakatoa Fund I LLC) to act as the GP to the fund to isolate the liabilities of the fund to the new LLC and shield the management company from any legal liability of Krakatoa Fund I. This new entity is also organized as an LLC to protect the fund's general partners (who are individuals) from unlimited liability. Now despite the formation of an entire LLC to manage Krakatoa Fund I, the new LLC does not have the necessary operational resources (employees, subscriptions to data sources, an office, etc.) to manage the fund itself.

Furthermore, setting these up would be extremely costly and redundant, especially if a VC firm has multiple funds – it would be unnecessary for the LLC managing each fund to set up these resources individually. However, general partners can hire service providers for their business, so Krakatoa Fund I LLC will hire Krakatoa management company to manage the fund, as the management company actually has the capacity and operational resources to carry out this role. This same structure is applied to Krakatoa Fund II and any subsequent funds formed by Krakatoa Ventures. So, the management company at the top of the VC firm still ends up managing the individual funds, but it utilizes an extra layer of LLCs to shield itself from legal liability.

The limited liability protections afforded to investors and members of venture capital firms is a beneficial characteristic of the traditional VC model that Investment DAOs would ideally like to match in order to become a sustainable model for crypto venture capital. However, DAOs are unable to replicate this exact legal structure as members of Investment DAOs are generally both an "investor" in the DAO and a manager of the funds due to the governance structure of DAOs; there is not necessarily the same principal-agent relationship that exists in the traditional VC model. If one of the end goals of Investment DAOs is to increase the accessibility of venture capital to the average person who has significantly less capital to risk than an accredited investor, it is crucial that DAOs gain legal recognition as business entities with limited liability protections for members in the case that a DAO legally injures another party. Furthermore, if a DAO is not registered or wrapped in an LLC, it cannot legally sign legal documents such as investment contracts using traditional securities (SAFE,

convertible note, warrants, etc.)[27]. However, for most of the prominent Investment DAOs today, particularly those created through Tribute Labs or Syndicate, do have legal status with an LLC frequently behind the DAO.

The regulation of DAOs, as well as the crypto space as a whole, will differ widely depending on the country or jurisdiction in question. Recently, there has been progress made and clarity provided regarding the recognition of DAOs as legal entities in the United States, which is arguably the most relevant geographic market for this space. In 2016, Vermont enacted LLC legislation allowing companies to register as a blockchain-based limited liability company (BBLC). While not explicitly referring to "DAOs", this legislation states that "A BBLLC may provide for its governance, in whole or in part, through blockchain technology", a description that easily fits the mold of a DAO. More recently in July 2021, Wyoming passed the nation's first law to mention DAOs: the "Wyoming Decentralized Autonomous Organization Supplement". With this legislation, DAOs are eligible to be recognized as DAO LLCs in the state of Wyoming and if a DAO elects to take on DAO LLC status, it will also be governed by Wyoming's standard LLC law. Specific provisions pertaining to DAOs in this supplement include:

- There must be a statement in the articles of organization that establishes how the DAO is managed by members, including the extent of algorithmic management (i.e., managerial and governance processes encoded within smart contracts).

[27] See appendix B for an explanation of the types of securities typically used in venture capital.

- The articles of organization must include a publicly available identifier of any smart contract directly used to manage, facilitate, or operate the DAO (for transparency purposes).
    - All smart contracts must be capable of being updated, modified, or upgraded.
- Membership interests at the time of a vote are determined by taking the share of a member's contribution of digital assets to the total amount of digital assets contributed to the organization.

DAO LLCs will also therefore assume the characteristics of an LLC under the current U.S. LLC statue, including:

- All members are protected from personal liability for business debts and claims, meaning that members can only lose the money they've invested in the LLC.
- Pass-through entity for taxation – members report their share of profits or losses on their individual income tax returns (unless an LLC elects to be taxed as a corporation).
- Simplicity in governance – LLCs are not required to have officers and directors, board or shareholder meetings, and do not have the same administrative burdens of a corporation.

Tennessee is the most recent state to adopt DAO legislation, doing so in April 2022. In short, Tennessee's statute is very similar to that of Wyoming's in many respects and borrows language from the provisions of Wyoming's text. In Delaware, DAOs that are already compliant with U.S. law may be organized as a traditional LLC, a method that has already been used by multiple prominent investment DAOs, including

Flamingo DAO and the LAO. Delaware has historically been regarded to be highly business friendly which can only be assumed to be a contributing factor in the more frequent formation of DAOs as LLCs in this state despite there not being specific legislature for DAO LLCs. More generally, however, as DAOs are not able to register legal status by default, this poses a challenge for DAOs seeking legal recognition but may not be set up properly to meet legal requirements. Additionally, non-registered DAOs (i.e., those not wrapped in an LLC) become extremely difficult to regulate as 1) there is no legal entity to protect members from liability in the case of a lawsuit against the DAO and 2) no single governing body has jurisdiction over the DAO as it is not registered with a state, country, etc. For example, Nouns DAO, the governing DAO of the Nouns NFT collection, has elected to remain an exclusively on-chain DAO, which has been problematic given the recent news of an internal dispute arising from the possibility of corruption among the DAO's leadership[28]. Due to the absence of a legal entity representing the DAO, members will likely have a difficult time seeking legal recourse against the corrupt perpetrators, including a whistleblower who was banned from Noun's Discord for speaking up about the issue.

In the near-term, we will likely see DAOs seeking legal recognition flock to these states demonstrating a willingness to write and accept DAOs into their legislature and business environment. Taking the long view, these developments, while few and slow moving, provide optimism for the broader DAO community and add an air of legitimacy to Investment DAOs which presently seem to be garnering the most attention among DAOs. As it stands, traditional venture capital funds are already highly regulated

[28] *Corruption at Nouns DAO?* (Stephen Edelstein). https://www.redlion.news/article/corruption-at-nouns-dao

and scrutinized by the Securities and Exchange Commission, so it's a crucial first step for Investment DAOs to gain legal recognition and be compliant as business entities to prove to regulators that there is legitimacy to this model. With crypto and blockchain being viewed as such a risky and less understood space and crypto venture capital elevating that risk even more, regulatory oversight may have a positive impact on this space given events that have unfolded recently like the collapse of FTX. Therefore, with proper legal recognition as LLCs or any other appropriate business structure, there can be more concrete and standardized regulation put in place to improve the integrity of the Investment DAO space and further increase its legitimacy.

Chapter 5.2: Legal Limitations and Treatment of Smart Contracts

One of the biggest questions surrounding DAOs, and the blockchain space in general, is the legal treatment of smart contracts and whether this idea of "code is law" will be able to take precedent. If smart contracts, the underlying code of DAOs, are not legally enforceable, there would be far too much legal risk and uncertainty involved in utilizing smart contracts, which would significantly hamper the broader adoption and acceptance of DAOs. The legal recognition of DAOs in the aforementioned states implies that legal recourse can be taken against a DAO in these states if a smart contract does not act as intended and injures a party. However, there are no surefire legal protections in the vast majority of jurisdictions in which DAOs operate today, so further progress on the legal front is crucial for the adoption of smart contracts and DAOs. Additionally, there is an interesting dichotomy to consider. The most avid blockchain and smart contract advocates believe that smart contract code should "be law" and thus should not require any external intervention or enforcement by a traditional legal

system. However, it is unlikely that governments will allow smart contracts to go unregulated, meaning that supporters of this technology must be willing to compromise and face formal scrutiny in order to gain broader acceptance. For the United States specifically, there is no federal contract law, which means that the enforceability and interpretation of smart contracts will be determined at the state level, where different states may adopt varying views on how to handle smart contracts.

Over time, as adoption of blockchain spreads and more assets become tokenized, smart contracts will naturally have to become more complex to handle sophisticated transactions. This leads to a significant technological and legal hurdle that smart contracts must overcome; we are likely still years away from code being able to frame more subjective legal criteria, as smart contracts are rigid and objective in nature. Contracts are at the core of how organizations operate and how business is transacted, whether it is an employment contract or a contract to provide services between a business and a customer. Often, these contracts are extremely extensive to cover all possible legal ramifications of a contract under different circumstances and businesses will likely want to continue adding these protections to contracts if they begin to adopt blockchain technology. This means that smart contracts will have to become capable of handling these various contract-related legal issues, many of which can be subjective and interpreted as such by a judge. On another note, courts will need to identify and appoint experts that are capable of deciphering code to aid in cases involving smart contracts, which is not a fault of smart contracts themselves, but is still an inherent challenge of the technology.

Parties seeking to contract using smart contracts face another challenge as it relates to drafting lengthy and convoluted legal documentation, which is both legal and technical in nature. Many businesses today may have attorneys or legal experts that can assist them in the drafting of contracts and other legal documentation. We assume that attorneys and lawyers are highly skilled at their jobs because they have completed extensive education and had experience in this field, so it is natural that businesses will trust them to draft accurate contracts. However, with smart contracts, when that documentation becomes partially or entirely code-based, there is the question of how non-technical parties will negotiate, draft, and adjudicate smart contracts? Parties will have to trust and rely on technical experts in smart contract development, for which there is currently no formal or standardized education for, to capture all aspects of a contract agreement in code or confirm that code written by 3rd party is accurate. In venture capital, term sheets and investment contracts between a fund and its startups are highly extensive and include many clauses and stipulations. If Investment DAOs desire to eventually replicate this type of documentation on-chain, they will either have to draft the code-based contracts themselves or trust that contract templates developed by 3rd parties are comprehensive and accurately capture the terms of a deal, both of which have risks.

From a contract execution standpoint, the rigidity of smart contracts also poses potential challenges for contracting parties. While this rigidity makes the interpretation and execution of a smart contract more straightforward, this may not align with how businesses operate in a traditional sense. It is possible to code "special cases" into smart contracts, but it is virtually impossible to foresee or cover every possible contingency

case that diverges from the original agreement when drafting the contract initially. With smart contracts, the ability of parties to enforce (or not enforce) an agreement on an ad hoc basis or accepting partial performance as sufficient for fulfilling the contract terms will be extremely limited as these more subjective events are not the forte of code. Additionally, the immutability of smart contracts creates additional costs to amending a contract due to the gas fee required to redeploy a smart contract. However, there are developments being made to enable more easily upgradable, alterable, and amendable smart contracts to better suit business needs, which would be a tremendous step forward for the adoption of smart contracts. While this does make smart contracts more feasible in application, one of the core tenets of blockchain and smart contracts is immutability. This indicates conflict in what this space aspires to do and how smart contracts must adapt to become more usable, which is a separate but relevant argument.

While the use of smart contracts in DAOs is primarily for governance and operational purposes, the commercial and transactional applications of smart contracts in Investment DAOs in particular are important to consider when assessing the overall effectiveness of this model. What will likely end up facing the most regulatory and legal scrutiny is the investment contracts that Investment DAOs enter into with projects and startups they invest in. These investment contracts essentially define the entire business relationship between an Investment DAO and one of its portfolio companies, including both economic and governance terms. Those currently involved in the Investment DAO space, including investors and startups, are likely comfortable with the current state of smart contracts and leveraging them to engage in on-chain investments, as they are enthusiasts and supporters of the technology after all. However, if this model were to

expand and become more widely accepted, the capabilities of smart contracts and their legal and regulatory oversight must become more fleshed out for this model to have large-scale commercial viability.

Chapter 6: Viability of the Investment DAO Model

Regardless of the challenges that Investment DAOs face from internal technological hurdles to external regulatory and legal pressures, the question of whether DAOs can improve upon the traditional venture capital model or add value in any way remains. Investment DAOs must be able to provide additional value to the crypto venture capital ecosystem if they are to carve out any sort of role moving forward. Based on observations of the first wave of legitimate Investment DAOs, the model does appear to possess characteristics that have already enabled Investment DAOs to disrupt of crypto venture capital on a small scale. It is difficult to tell how significant this disruption will become and how much the value offered by the Investment DAO model will increase or decrease over time, however, there are signs that this model may be here to stay barring any drastic changes in the ecosystem. On the other hand, there are inherent challenges and limitations of the Investment DAO model that may restrain how substantial of a role Investment DAOs play in crypto venture capital in the long-term.

Chapter 6.1: Advantages and Benefits of Investment DAOs

The community support that Investment DAOs offer to startups and founders is one of the primary benefits of this model compared to traditional venture capital funds. A traditional fund typically runs on a low headcount with the median size of a VC fund being six employees according to a 2020 Deloitte survey[29]. In contrast, Investment DAOs running on Tribute Labs or Syndicate infrastructure have a maximum of ninety-nine members per investment DAO or club. Larger venture capital firms may have

[29] *VC Human Capital Survey, Third Edition, March 2021* (Deloitte). https://www2.deloitte.com/content/dam/Deloitte/us/Documents/audit/vc-human-capital-survey-3rd-edition-2021.pdf

upwards of 50-100 employees, but they are generally still unable to rival the subject matter expertise of the crypto-native communities that Investment DAOs can offer to startups and founders. Those involved in Investment DAOs are likely to be much more knowledgeable about and familiar with the topics of crypto and blockchain. This is an extremely complicated space, so this understanding of the space is arguably just as important as the business development expertise that traditional venture capitalists can offer. In addition to the valuable advice and feedback that Investment DAO members can provide to founders, the wide-reaching network of the DAO's members and its connections to others in the space is a tremendous resource for founders. This network can help founders quickly build a community for their projects and get their products used and tested, which would otherwise be difficult for a founder to do without a substantial audience. This remedies the user adoption and product-market fit challenges that non-crypto startups still sometimes face today. As a result, Investment DAO-backed projects gain an early advantage as proving product viability and driving user adoption can put a project ahead of the curve at the initial stages in the VC process.

Additionally, according to crypto startup founder Jenil Thakker, Investment DAOs even offer resources including media, hiring, and legal services to portfolio companies at scale and with little to no cost. Traditional venture capital firms do have the capability to offer these services, however, Thakker points out that it is oftentimes too costly and difficult to scale for firms with lower headcounts and the large number of startups they are working with at any given time. The fund may instead provide funding at different rounds in part for the startup to take on these additional expenses. Traditional VC funds typically do not provide funding for these types of expenses at a

startup's early stage when product development and creating a business plan are more important for non-crypto startups. Therefore, the Investment DAO model is also at an advantage here as they can provide these services to a crypto startup in its earlier stages when these services and expenses may be necessary due to their naturally accelerated growth trajectory. The challenge here of course is that the DAO must have members proficient in providing these services or at least have connections to those who are, which may not be the case for every Investment DAO that is formed.

The Investment DAO model is also advantageous from an investment perspective as they can function with much less capital (less than $1 million in many cases) compared to large VC funds that naturally target early and late-stage crypto startups. This enables DAOs to be nimbler in raising smaller pools of capital around a very specific and focused investment thesis. In May 2022, a16z[30] raised its fourth crypto fund at $4.5 billion and simply due to its size, the fund must be more generalized in the areas of crypto and blockchain it invests in to be able to deploy that amount of capital. Additionally, crypto startups typically require much smaller investments each round, which may not appeal to large venture funds that need to make bigger investments that can move the needle on their returns. In contrast, substantially smaller Investment DAOs are likely to have a much easier time raising smaller amounts of capital from its existing or prospective members to invest in a particular niche segment of the crypto space that the DAO has an interest in at any given time. Traditional venture capital firms do raise funds and make investments according to a particular investment thesis, but they spend on average 31 weeks raising funds which reduces the

[30] Abbreviation for Andreessen Horowitz

flexibility of shifting or identifying new investment theses to target in the short-term. Theoretically, Investment DAOs can raise funds from new or existing members at any time on a rolling basis or recycle profits from prior investments (by majority vote) to make subsequent investments. This is not the case in traditional venture capital where all returns are distributed to the limited partners and the VC firm.

Another reason Investment DAOs have been able to disrupt the traditional VC model is their internet and blockchain-native capabilities. First, Investment DAOs have improved on a more niche area of venture capital where individual angel investors band together to form syndicates to compete against traditional venture capital firms for investments in startups. Now instead of having to spend time coordinating these networks and likely dealing with everyday bureaucracy in the process, DAOs enable human and financial capital to coordinate natively on the internet with the automated smart contracts and various tools that can optimize this process. Investment DAOs are also better equipped than traditional VC firms to build capabilities to handle challenges that are native to the crypto and blockchain space. For the sole purpose of investing in crypto projects, capabilities such as cryptocurrency custody solutions to manage large quantities of tokens is crucial to storing and protecting the assets that these groups manage. However, as mentioned previously, traditional VC firms may not be as knowledgeable about the available tools and may not have as robust of solutions as Investment DAOs to tackle these challenges.

Based on these advantages of this emerging model for venture capital, it is evident that Investment DAOs can provide a unique value proposition to crypto startups on the basis of the community support and resources they can offer that better suit the

needs of these startups. Additionally, the natural size and crypto-native presence of Investment DAOs seemingly makes them better positioned than traditional venture capital firms to operate within this niche space. As the DAO model is optimized over time and more effective operational tools for DAOs are built, these existing advantages may be further cemented, or new advantages may arise that allow Investment DAOs to add even more value to this space. Finally, one important intrinsic benefit to the entrance of DAOs into venture capital is their alignment with the ethos of the broader crypto and blockchain space. In the spirit of decentralization, crypto startup founders should want their projects to be owned and supported by democratized communities, rather than traditional venture capital firms. As a result, there is a clear motivation here for Investment DAOs to continue advancing their capabilities and pushing for further decentralization in this industry as they represent the interests of the broader crypto and blockchain community.

Investment DAOs also possess advantages over traditional investment clubs, which they resemble more closely in terms of size and the distribution of decision-making. First, as a blockchain-based entity, Investment DAOs have global access to capital and can derive more diverse insights from members as any individual from anywhere in the world can join a DAO and contribute capital (so long as they meet the DAO's legal compliance requirements). While the internet has dramatically changed how capital can be coordinated in the modern age, most investment clubs are still typically local groups, which limits their access to a wider pool of capital and the diverse perspectives of the global investment community. Investment DAOs also trump investment clubs in the category of trust as decisions involving the deployment or flow

of capital are facilitated by smart contracts. Although investment clubs are usually structured as partnerships or LLC's, it would not be difficult for a member of the club, particularly the treasurer or a designated money manager, to start stealing or siphoning off funds for their own personal use. This is not possible in Investment DAOs since all the capital contributed by members is locked into a smart contract and can only be moved upon consensus from a certain number of members.

Chapter 6.2: Challenges and Limitations of Investment DAOs

While the Investment DAO model has gained some traction, it does present certain challenges that have and will limit the extent to which Investment DAOs can disrupt traditional venture capital. This model is clearly a work in progress, so there are challenges and limitations as with any developing space. However, they have not appeared to restrict growth of Investment DAOs thus far, simply due to the excitement surrounding crypto and blockchain. Nonetheless, as crypto and blockchain progresses and Investment DAOs become even more ambitious in their pursuit of competing with traditional VC firms, the impact of these challenges and limitations will become more evident and may potentially put a cap on what this model is capable of. For some of these challenges, there are potential improvements that may be realized over time, but others are more natural limitations that may be more difficult for Investment DAOs to overcome on their own.

As mentioned previously, Investment DAOs typically operate with significantly less capital than traditional venture capital funds. While this provides more focus to the Investment DAO model in terms of the size and types of investments Investment DAOs will make, it also limits where they can participate in the overall venture capital process.

Since it is difficult to raise large amounts of capital (in the hundreds of millions to billions of dollars), Investment DAOs are ineffective at later stages of the process (i.e., series A and beyond) where startups begin to require larger sums of funding to support their growth. For now, Investment DAOs are limited to raising funds from their individual members and lack the same access to the institutional capital that traditional venture capital firms do. Investment DAO's may have wealthy individuals and accredited investors as members, but without access to institutional capital, a billion-dollar Investment DAO fund to compete with the Andreessen Horowitz's and Sequoia's of venture capital is largely out of the question. For this reason, Investment DAOs have largely seen the most success at the pre-seed and seed rounds where amounts less than even $500,000 are sufficient to fund crypto startups at earlier stages[31].

In general, DAOs also fall short on their operational capabilities, which can hinder decision making and reduce the overall efficiency of a DAO's operations. This is a byproduct of the decentralized governance structure of DAOs and the existing systems that DAOs have in place that are simply not as robust and streamlined as the equivalents used by more traditional organizations today. While the managerless decentralized governance structure and flat hierarchy of DAOs does democratize decision making, this model has shown to be highly inefficient when it comes to effectively managing an organization and coordinating business activities. Under the hierarchies seen in traditional business entities, higher-level employees are entrusted with decision making power because they generally offer the most experience and knowledge, which are clearly important when making difficult and technical decisions. This removes the need

[31] See appendix C for a shortlist of investments The LAO has made, and the amounts invested in each project.

for tens or hundreds of potentially less knowledgeable and experienced employees to vote on every single decision that a business must make; this a struggle that is evident in DAOs and will be difficult to overcome so long as this structure persists. DAOs may use one of many voting mechanisms to reach a consensus on various proposals, whether that be a governance issue or an investment decision, however, in every case the DAO must wait for a sufficient number of members to vote on a given proposal. This is woefully inefficient and slows the progress of DAOs especially if members are not fully engaged in the DAO's activities or abstain from voting. Investment DAOs in particular can have proposals from hundreds of different projects requesting funding up for review in addition to the proposals to actually fund projects and governance decisions that must be voted on. These are hundred-thousand-dollar decisions being made and must logically be made carefully, but there needs to be a more streamlined process for handling decision making involving tens or hundreds of members for Investment DAOs to be stronger operationally.

On a similar note, DAOs in their current state may not be as effective in carrying out the role of a VC simply because members in most cases are unable to contribute to DAOs to the same extent as a traditional full-time job. Traditional venture capital is far from a traditional 9-5 job with work weeks often exceeding 60 hours, reflecting the highly engaged role of a venture capitalist and the time they must devote to their portfolio companies. This is one of the main reasons why crypto projects still overwhelmingly prefer traditional venture capital firms to lead funding rounds, according to Kyle Wang of Valhalla Capital. Various venture capitalists have acknowledged that Investment DAOs are gaining traction and stated that they are

willing to partner with DAOs. However, they do not see DAOs bringing the same experience leading large funding rounds or reliable commitment that founders look for in a VC. At the moment, Investment DAOs look to be more of a part-time or side gig for individuals that want to be invested and involved in crypto and blockchain projects. This contributes to some of the operational inefficiencies mentioned previously where communication between members and the general flow of operations are disjointed because members may not always be working on DAO-related activities at the same time. Additionally, this may cause a detriment to the projects they are invested in due to the inconsistent availability of members and less coordination of responsibilities on the DAO's part.

One reason for why an Investment DAO's members may not commit to making it their full-time priority is the limited compensation that an Investment DAO can offer. While members can receive a share of the profits earned from an investment made by the DAO, these profits only come when the DAO has invested in a successful startup, which is never guaranteed, and that position is liquidated. If Investment DAOs were to adopt a similar 2% management fee like traditional VC funds to compensate members for "managing" the DAO's treasury, this 2% fee would hardly be enough to compensate just one member of the DAO, let alone 50-100 members. For comparison, the total compensation of general partners at traditional VC funds typically ranges between $500,000 to $1 million[32]; taking a 2% management fee out of a DAO with a $10 million treasury would result in total compensation of $200,000 – sufficient for one or two members at most.

[32] *The Venture Capital Partner: The King of Tech and Finance?* (Mergers & Inquisitions). https://mergersandinquisitions.com/venture-capital-partner/

Investment DAOs certainly face significant hurdles to greater adoption, some of which are intrinsic to the model itself. Nevertheless, it is evident that these hurdles have not impeded Investment DAOs in establishing themselves as a resource for crypto startups and gaining market share on startup cap tables. The more intrinsic challenges may be more difficult to overcome entirely without a significant overhaul in the general DAO model and available DAO infrastructure solutions. However, the fact that Investment DAOs have gained the attention of traditional venture capitalists who are willing to partner with DAOs to raise capital for startups demonstrates that Investment DAOs do in fact offer enough value to remain in play in the crypto venture capital landscape. Moving forward, it will be crucial to monitor if and how the DAO community chooses to address the outstanding concerns and better position DAOs to succeed as VC funds.

Chapter 7: The Future of DAOs in Venture Capital

Chapter 7.1: Current State and Short-Term Trends

With cryptocurrency and blockchain exploding on to the scene in recent years and disrupting countless industries, it is no surprise that Investment DAOs have been able to find success early on. Despite the long history of the venture capital industry and the powerful firms that dominate the VC landscape, Investment DAOs have managed to thrive thus far, finding a niche role in the crypto venture capital space at the pre-seed and seed stages. If all the internal and external forces impacting this space were to remain as is, it is quite easy to see this being a sustainable role for Investment DAOs moving forward. However, the current landscape and ecosystem is bound to change, and it is these changes in Investment DAOs and the broader crypto and blockchain space that will be very telling in where Investment DAOs end up.

Up until this point, it seems that Investment DAOs have managed to stay under the radar of any negative publicity, not having faced significant regulatory scrutiny or been involved in major controversies compared to other parts of the crypto and blockchain space. Additionally, any pertinent regulation thus far has applied to DAOs more broadly. This potentially indicates that the venture capital application of DAOs has not been problematic enough or raised the eyebrows of any authorities to warrant immediate regulatory action. However, with the growth and implications of Investment DAOs, it is inevitable that they will gain increasing publicity and become a larger topic of discussion, both socially and politically.

In reality, the long-term success of Investment DAOs is a large unknown that this analysis will only be able to speculate on. However, even though the promises of

cryptocurrency and blockchain are long-term, there are still short-term, macro challenges that Investment DAOs must endure before the ecosystem can progress and catalyze long-term actions. Due to events that have transpired in the few years preceding 2023 such as the collapses of Luna and FTX, and the performance of the overall cryptocurrency market in 2022, the broader population has lost significant trust and confidence in the crypto space. While there are many that are still bullish about this space and continue to contribute to it, the sentiment surrounding the cryptocurrency markets is generally negative at this point in time.

Investment DAOs have been impacted by the performance of the crypto markets both directly and indirectly. First, the market crash has decimated the value of the treasuries held by Investment DAOs in cryptocurrencies such as ETH. Second, the eroded confidence in the crypto space damages the reputation of everything that is a part of it, including Investment DAOs. While DAO treasuries may recover with another eventual cryptocurrency market bull-run, there is always the possibility of another downturn due to the volatility of the market, which is an inherent challenge of this space. Additionally, the skepticism surrounding cryptocurrency and blockchain may always linger and hamper interest or willingness of the average individual to join and put money into an Investment DAO. These are both short-term outcomes and examples, but they demonstrate the long-term consequences of being part of the crypto and blockchain ecosystem, which is arguably the biggest overarching question facing Investment DAOs moving forward.

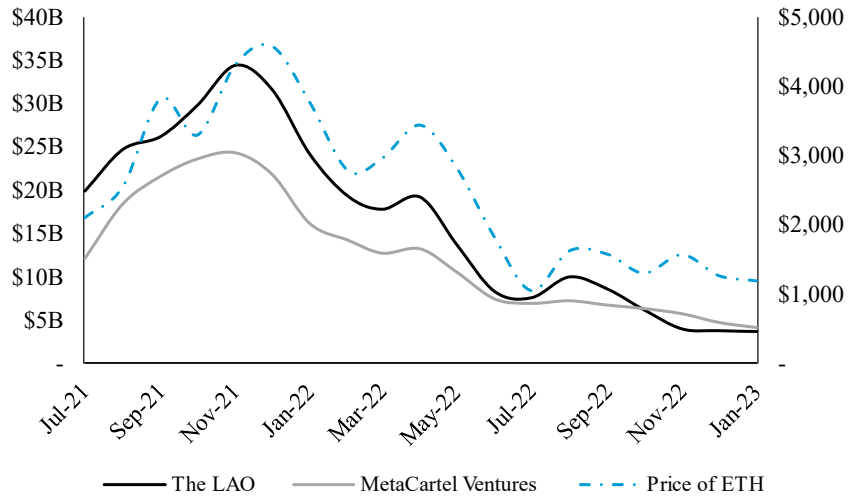


Figure 9: Treasury values of The LAO and MetaCartel compared to price of ETH

(Source: DeepDAO and Yahoo Finance)

At first glance, the short-term outlook for DAOs may appear bleak considering this so-called "crypto winter" that has seen the crypto market cool significantly since its peak in late 2021. However, this doesn't mean that Investment DAOs are without opportunities to continue carrying out their missions and supporting emerging projects in the blockchain ecosystem. Traditional VC firms are still pouring money into crypto, blockchain, and related spaces in 2022 despite the crypto market downturn as crypto startups still need funding to survive and continue scaling. Investment DAOs may not have the same stable capital base of traditional VC firms as they hold volatile cryptocurrencies, but more established groups such as The LAO and MetaCartel Ventures still boast multi-million-dollar treasuries that can be used to prop up Investment DAO activity. Whether or not Investment DAOs choose to invest or preserve their funds is up to their discretion, but crypto startup valuations have plummeted along with the rest of the market. As a result, there is a window of

opportunity to invest at or near the bottom where the cost to acquire stakes in these startups is significantly cheaper than even just a year ago.

Despite the short-term challenges and uncertainty, it appears that the broader DAO community is still expanding at a rapid pace, with the total number of DAO governance token holders increasing by more than 350,000 in the past month (at the time of writing) and the number of active voters and proposal makers increasing by 125,000 over the same period (November to December 2022). While these are not figures specific to Investment DAOs, this bodes well for them as the continued growth in broader DAO activity indicates that people are still buying into the idea of DAOs and actively contributing to the advancement of this space. As Investment DAOs are part of the DAO community, the growth of the entire ecosystem only bodes well for Investment DAOs.

Chapter 7.2: Future Developments Impacting Investment DAOs

As alluded to previously, there are a number of moving pieces and long-term questions regarding Investment DAOs that will determine how prevalent Investment DAOs become in the future. Based on internal and external forces impacting Investment DAOs that have been identified throughout this paper, this section will outline some of these key variables and how the landscape may shift as a result of their outcomes. It is important to note that how and on what timeline one variable plays out may impact the outcome of another, so this discussion will primarily explore the variables as if they are mutually exclusive. Additionally, where these factors currently stand does vary, from expected future regulatory oversight (of potentially varying degrees) there has not yet

been movement on, to the continued improvement of operational tools and processes for DAOs that are already a work in progress.

Chapter 7.2.1: Improvements in Operational Capabilities

In their limited years of existence, Investment DAOs have been a step below their traditional counterparts on operational efficiency, an issue that has plagued DAOs as a whole. Being able to make both quick and informed decisions while maintaining a flat hierarchy and decentralized governance structure has proven to be difficult thus far for DAOs. Additionally, the tools available for DAOs to manage important functions of their operations, including compensation and membership, are naturally still raw and under development, thus making it difficult for DAOs to optimize their operations and scale effectively. Luckily, popular DAO formation solutions such as Syndicate and Tribute Labs that offer frameworks and modular tools for building DAOs have somewhat increased standardization in this area and provide more immediate operational stability to DAOs just getting off the ground. However, like DAOs themselves, these infrastructure solutions and other standalone solutions are unrefined and must continue to be improved to optimize the way DAOs operate. This is similar to how innovation in enterprise and cloud software solutions have completely changed the way businesses function today.

One model that DAOs can follow to streamline coordination of responsibilities and reduce bottlenecks in deployment of resources is the “Pod Model”, which is leveraged by an infrastructure solution called Orca. With the Orca solution, a DAO is divided into smaller “pods” that have their own sub-membership and wallet to manage a delegated portion of the DAO’s treasury. We have seen how delegation of

responsibilities is crucial in the governance of modern corporations with a primary example being the separation of the audit and compensation committees on the board of a corporation. For DAOs, Orca pods in effect accomplish the same goal of reducing the number of members involved in decision making and simplifying coordination within a DAO. This is particularly beneficial for Investment DAOs, as members can be assigned to sub-DAO pods to oversee and manage one of the tens or hundreds of investments made by the DAO; this is logically a much more efficient model for running a venture capital investment fund. Within Investment DAOs, higher-level investment decisions are still currently being made by DAO members as a collective. It would be an interesting but unsurprising development if Investment DAOs eventually converged on the multi-fund structure of larger and more traditional VC firms. This would allow a DAO to manage distinct pools of capital within its treasury that members can individually contribute to. However, operational efficiency is still a major question in the debate over the viability of DAOs as a vehicle for conducting business. For this reason, Investment DAOs must continue adopting solutions such as Orca pods and find other creative ways to simplify the coordination of activities and keep its members engaged to gain traction as a vehicle for VC in the long-term.

Chapter 7.2.2: Changes in the Regulatory Environment

There are many possibilities for how the government may approach regulating Investment DAOs (and DAOs in general) in the U.S., both at the state and federal levels; potential regulation primarily covers tax law, contract, business law, and securities law. In tax law, an important question is how taxation of anonymous members from different locations and jurisdictions will work for DAOs. Since DAOs

are pass-through entities for tax purposes, whether registered as an LLC, general partnership, or not registered at all, taxation becomes problematic because 1) identities of DAO members remain anonymous on the blockchain and 2) members may be located in different jurisdictions, across states and potentially even countries. In general, this borderless nature of blockchains networks and DAOs poses a significant challenge to regulatory authorities with a big question being *which* government entity should regulate DAOs? If the decision on how to tax members of DAOs ends up being unfavorable or rules are too convoluted for DAOs and their members to follow correctly, this may deter individuals from joining DAOs and subsequently inhibit the growth of the space. If DAOs become a more prevalent and legitimate form of conducting business, governments will surely respond and ensure that DAOs and their members contribute their fair share to tax revenue. How governments apply and enforce tax laws on entirely digital organizations with anonymous members is another issue to consider when discussing the tax implications of DAOs.

In the context of business law, the most relevant issue for Investment DAOs is the limited liability protections afforded to members. The recognition of DAOs as legal entities and its benefits have already been discussed in this paper, but the most important implication moving forward is that DAOs will undoubtedly choose to become legally recognized and compliant as they form and expand. This will further the establishment and acceptance of DAOs as a standard practice for conducting business, which at the end of the day is where the DAO community would like to be. An interesting development for DAOs in business law discussions would be if state governments enabled DAOs to incorporate as corporations. This would provide DAOs

another option to become legally recognized and offer them a new set of benefits (and challenges) to operate with. In the context of taxation, this would also give tax authorities a single business entity to tax, although the individual shareholders of the corporation would still have to be identified for tax purposes.

For Investment DAOs, the benefit of being able to issue common stock and equity securities would allow them to raise more capital beyond the contributions of its members and potentially increase the scope of where Investment DAOs can be involved in the VC process. This may seem unconventional for an investment fund that typically raises funds from private investors and invests in private assets, however, there are instances of publicly traded private equity firms, such as Apollo Global Management and KKR & Co., that Investment DAOs could model themselves after should they issue stock and eventually become publicly traded. Now given how DAOs are structured, the governance and operational structure of a publicly traded DAO corporation may become quite complicated and unintuitive for government entities to properly regulate. This may also implicate various investment advisor and investor protection laws since DAOs would now be investing funds on behalf of others who are not members of the organization. Additionally, the way in which DAOs are allowed to raise capital from public investors will be an important discussion as securities law may require them to use traditional equity or convertible debt securities for this purpose. Alternatively, if legislation and regulation surrounding blockchain and digital assets becomes more established and ends up being favorable to the space, DAOs could potentially raise capital in the form of tokenized equity securities (which would be distinct from their traditional governance tokens) that are native to the blockchain. Should this or any other

scenario involving DAO-issued securities (traditional or tokenized) come to fruition, securities law will play a significant role in managing this transition.

Potential changes in securities law to better incorporate digital assets will also be important to monitor, as many of the blockchain-based projects that Investment DAOs invest in offer digital tokens to represent stakes in the project. Additionally, DAOs themselves do not want their membership interests to be considered securities, as that would subject the organization to various securities compliance requirements. In the U.S., the Howey Test is used to determine what qualifies as an investment contract and is therefore subject to securities law. However, despite efforts from the SEC to devise a framework to analyze digital assets in the context of investment contracts and other progressive legislation, there is still uncertainty regarding how digital assets should be treated and as a result, digital assets have been left underregulated. Additionally, it is unclear which regulatory body should be responsible for the oversight of digital assets market, whether it be the SEC, CFTC, or OCC. This leaves further uncertainty to how this space will be regulated and when that regulation will come into effect. If and when more comprehensive regulation is put into place, Investment DAOs may be more heavily impacted than the general crypto markets as traditional venture capital is already a highly regulated industry and authorities will likely want to protect individuals involved in the high-risk investments that are crypto startups. This brings into question if Investment DAOs will actually be able to democratize the venture capital space and enable the average individual to participate in venture investments. There will likely be questions raised about the ethics of allowing those that are "unsophisticated" financially to invest in these high-risk assets and what actions regulatory authorities might take to

preserve the stability and integrity of venture capital if Investment DAOs grow to become more prevalent.

Contract law is also relevant to this discussion, some aspects of which have already been outlined in this paper, including the enforceability of smart contracts and the challenges of entirely replacing traditional contracts with code-based contracts. One important and growing trend in the decentralized investing space is the wrapping of investment contracts in NFTs to tokenize these contracts on-chain and ensure the uniqueness and originality of an investment contract between an investor (an Investment DAO) and investee (a crypto startup). Depending on how regulatory agencies choose to define and regulate venture capital investments made on-chain, this may very well become a standardized way to legally bind Investment DAOs and their portfolio companies when an investment is made. For crypto startups that behave like traditional VC investments that can be financed with standard securities like SAFEs, Investment DAOs will have no trouble structuring investments contracts around these securities and defining each party's rights in the relationship as long as they are a registered legal entity. However, for crypto startups that are protocols or natively on-chain, could there potentially be tokenized and cryptocurrency denominated equivalents for these traditional investment mechanisms that would be legally accepted? This is just speculation about potential shifts in the external environment, but it is still suggestive of what authorities may consider when determining how this space should be regulated in the future and how the Investment DAO model may have to evolve to adapt to these changes.

Overall, increased regulatory oversight will go a long ways towards building trust in cryptocurrency markets and blockchain technology, which is arguably the biggest hurdle in the push towards more widespread adoption of the technology. For Investment DAOs, this trust will go a long way in establishing DAOs as a more viable vehicle for venture capital investments and somewhat quieting the "highly risky" and "purely speculative" narratives that currently deter many people from putting their money anywhere near cryptocurrency. It is this social and economic acceptance that crypto and blockchain advocates will have to continue to wrangle with in the long-term. And just like any new and unfamiliar technology, education will play a large role creating a safer and better understood environment for Investment DAOs to operate in.

Chapter 7.3: Future Scenarios

While there will undoubtedly be shifts in the Investment DAO space, it is impossible to determine the exact outcomes of the previously mentioned variables and the extent to which a given change will impact Investment DAOs. However, we can still put into perspective the range of possible scenarios for the adoption of Investment DAOs by analyzing worst, neutral, and best-case scenarios. We can then identify a point on the spectrum that is most likely based on generalized assumptions about the anticipated changes coming to the Investment DAO landscape. As a reminder of where Investment DAOs currently stand, they have found a niche in supporting smaller, pre-seed and seed crypto startups and have disrupted the traditional venture capital model at these earlier stages. However, they lack the same level of operational efficiency of traditional VC firms and must adopt additional technological capabilities (that are still raw) to address blockchain-specific operational challenges. Positive progress has been

made on the regulatory front, as DAOs have become eligible to register as legal entities (LLCs) in a few states. However, the overall regulatory and legal environment remains uncertain with limited and slow-moving legislation surrounding the crypto space and issues pertinent to Investment DAOs.

Chapter 7.3.1: Worst-Case

On one end of the spectrum, there is the absolute worst-case scenario where governments and regulators globally become uncomfortable with the idea of crypto and blockchain taking on a larger role in their nations' economy and technological infrastructure after initially warming up to the technology in its early days. This may cause them to entirely ban the use of cryptocurrency and blockchain applications, if effective methods to do so are discovered. They may alternatively implement regulation over the space that is so restrictive that the ecosystem starts to deteriorate and users begin to lose interest as a result. Should this play out, the number of developers and projects aimed at building out the blockchain ecosystem would decline, leaving Investment DAOs out of a job since there would be very few crypto startups, if any at all, to invest in. However, unless the crypto space crumbles with widespread FTX-like disasters occurring and crypto token scams continuing to go unchecked, this scenario does not seem likely. Countries have taken varying views on the usage of crypto and blockchain applications meaning that there will be "safe-havens" for this space if certain countries to decide to ban or heavily restrict activity in the space. Additionally, since this space is built on decentralized networks, it will likely be extremely difficult to governments and regulators to develop an effective method to suppress the usage of crypto and blockchain. Instead, regulators may choose take aim at more established

entities in the crypto ecosystem that play a crucial role, such as cryptocurrency exchanges like Coinbase and Binance, and liquidity providers such as Tether to reduce access to and the efficiency of the ecosystem. Regardless, any significant restriction of the crypto space will be a detriment to Investment DAOs, which will only be viable and thrive if this space continues grow.

Chapter 7.3.2: Neutral Case

A more neutral outlook would project Investment DAOs to maintain a similar role to the one they currently hold and continue to grow in number and size in a moderately favorable, but still cautious regulatory environment. Partnerships between Investment DAOs and traditional VCs would likely continue to increase with the latter's understanding of the value that Investment DAOs can bring to the table growing over time. The best and most impactful rounds for startup companies would involve still traditional VCs leading rounds as the more experienced venture investors, coupled with Investment DAOs as part of the cap table to provide founders with the support of a blockchain-native community. This scenario could very well unfold naturally with Investment DAOs simply settling into this role as early-stage investors in crypto startups due to operational limitations or an inability to raise capital in greater amounts. Shifts in the regulatory and legal landscape may also play a role in confining Investment DAOs to this type of role, intentionally or unintentionally, via laws that increase the complexity of operating an Investment DAO or reduce the viability or appeal of investing through an Investment DAO.

One important storyline to follow that will only be possible in scenarios where Investment DAOs have a sustainable role at the very minimum, is whether Investment

DAOs will be able to accomplish their ambition of truly democratizing the venture capital industry. Currently, this is still not quite the case across the entire ecosystem as the most established and prominent Investment DAOs either require prospective members to be an accredited investor to be legally compliant or have a substantial initial buy-in that far exceeds what the average individual could invest. As such, the Investment DAO community must prioritize increasing accessibility to the average individual, in a safe manner, if it wants to achieve its vision of democratizing venture capital. Accomplishing this would also increase the total potential amount of capital available to the ecosystem. If this is made a reality, the long-term viability and outlook of Investment DAOs may improve, however, the chances of this may largely be dependent on how regulatory authorities respond to protect the average investor.

Chapter 7.3.3: Best-Case

Substantially increasing the total amount of capital that could potentially be funneled into the Investment DAO ecosystem is one of the key elements of a best-case scenario for Investment DAOs. In an ideal world for the most extreme supporters of the model, Investment DAOs would become *the* standard vehicle for venture capital and entirely replace the traditional VC model, which includes expanding to other types of startups beyond the crypto space. For this scenario to play out, regulation and legal treatment of Investment DAOs would unquestionably have to be extremely lax and favorable, and potentially even provide benefits and incentives to VC funds structured as DAOs. This includes allowing Investment DAOs to raise capital from the public markets, so that they can reach a similar stature to traditional funds and offer a comparable amount of funding to founders at later rounds. As discussed previously, the

biggest challenge here would be determining an appropriate governance and legal structure for DAOs managing public investor funds while keeping the traditional DAO model intact.

This path to a best-case scenario discussed thus far relies on the Investment DAO ecosystem expanding and optimizing itself operationally to a point where it is simply superior to the traditional venture capital model. Investment DAOs would then be capable of overtaking and pushing out conventional firms from the venture capital landscape. The other potential path in which the Investment DAO ecosystem would "win" involves traditional venture capital firms structuring their funds as DAOs and adopting this model to make investments on behalf of their LPs. Similar to Investment DAOs going public, this blend between DAOs and traditional investment funds would trend towards investing billions of dollars at scale and put Investment DAOs squarely on the map in the financial markets. Traditional venture capital firms would still theoretically exist in this scenario, however, a mass convergence towards a DAO-based model for venture capital would nonetheless be a win in the books of the DAO community. Now while a bullish case on Investment DAOs seems somewhat more plausible than the worst-case scenario outlined previously, it is unlikely that they will completely dominate the entire VC landscape in the future. The traditional model has been proven for nearly a century and still offers a tremendous amount of value to entrepreneurs and startups that is difficult for anyone to match.

Overall, it seems that the most likely outcome for Investment DAOs is one of a more neutral outlook based on the expected shifts in key factors. On the regulatory front, assuming the United States is the primary market Investment DAOs, there will

arguably neither be sizeable or sudden changes towards either end of the spectrum as the country has been more pragmatic in its approach compared to other countries and will likely continue as such. If anything, the United States government seems to recognize that the country is one of the more progressive with respect to being a hub, technologically and financially, for innovation in this space and appears willing to allow it to continue growing, albeit safely and sustainably. This balanced and cautious approach is suggestive of a more neutral scenario unfolding for Investment DAOs where they can continue thriving in the early-stage crypto and blockchain niche they have settled into but not expand too aggressively and disrupt venture capital on a larger scale. For this to be a sustainable role for Investment DAOs, however, they must adapt to future changes impacting the ecosystem and embrace the tools and infrastructure being developed to enhance their capabilities. This will help Investment DAOs optimize coordination among members and the deployment of their treasuries into crypto startups, which will only improve the viability and favorably impact the perception of this model over time.

Chapter 8: Conclusion

Since the concept of venture capital was born centuries ago, investing in this exciting asset class has naturally and eventually purposefully been limited to entities deemed capable of stomaching the risk attached to it. However, Investment DAOs have emerged as novel structure for venture funds, one that could lower the barriers to being an investor in venture capital while strengthening the ecosystem for crypto and blockchain startups. Venture capital DAOs do face a steep hill to climb as they must prove their legitimacy and effectiveness, all while navigating the tremendous amount of uncertainty in how they will eventually be regulated. As such, those in roles that touch each aspect of the ecosystem, from blockchain developers to federal regulators, must take a strategic and pragmatic approach in understanding the context and implications of their actions.

Surprisingly, Investment DAOs have quickly established a distinct value proposition as a model for investing in startups that points to Investment DAOs becoming a mainstay in the venture capital landscape should certain details fall into place. How prevalent they become, however, is another question that I have attempted to frame with a more defined set of potential outcomes. These outcomes are heavily dependent on a number of unsettled factors that must be re-evaluated as change occurs, so I would encourage more research to be conducted on this topic. Specifically, I would suggest both discipline-specific research to provide an in-depth picture of the variables at play as well as interdisciplinary collaboration to outline cooperative action that could be taken to ensure that this space receives the proper oversight and development. Blockchain developers and legal professionals may discuss the usage of smart contracts

to frame traditional investment contracts and legal documentation. State governments, financial market regulators, and DAO infrastructure solution providers may have conversations about an appropriate legal structure that enables Investment DAOs to thrive while protecting the interests of investors. It is these types of intertwined issues that must be explored at greater lengths to put Investment DAOs on the right path and cultivate an ecosystem that can be more widely accepted.

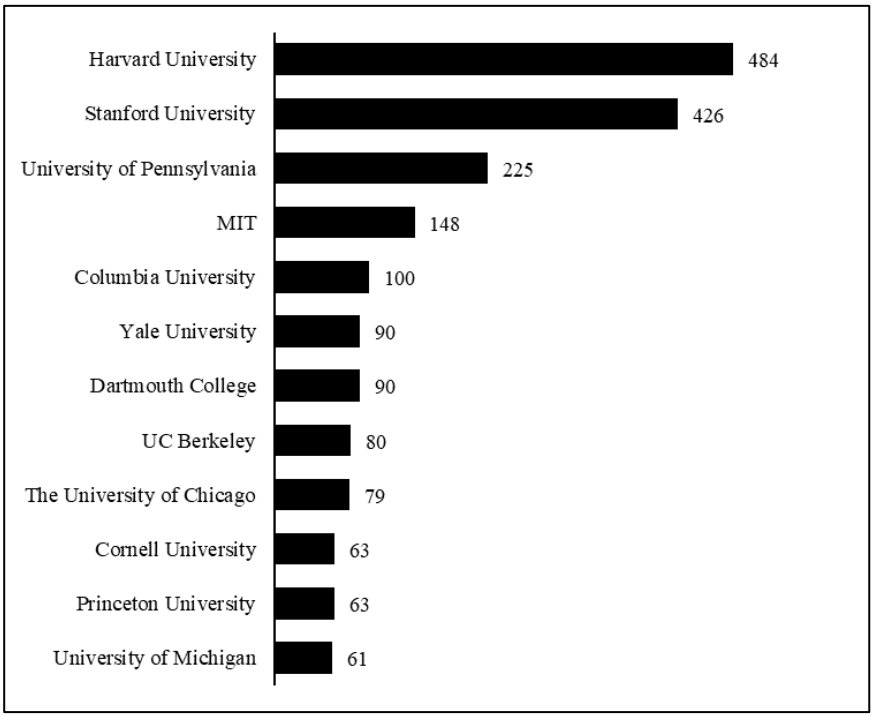
While the cryptocurrency and blockchain space is stereotypically associated with risk and under the table activities that many want to stray away from, there is value to be had with certain applications within the space and Investment DAOs are one of those. The Investment DAO model may not entirely replace traditional venture capital, but it certainly brings a valuable perspective to the crypto venture capital landscape that established VCs have been very welcoming of thus far. While DAOs are still in their early stages of development and regulators deliberate what actions to take, it is critical that all angles of the story be considered before one side acts too quickly and derails what could be a very promising opportunity. I hope that this piece provides a firm starting point for further academic research on this topic and acts as a catalyst for a well-reasoned and actionable plan to guide the future of DAOs in venture capital.

Appendix

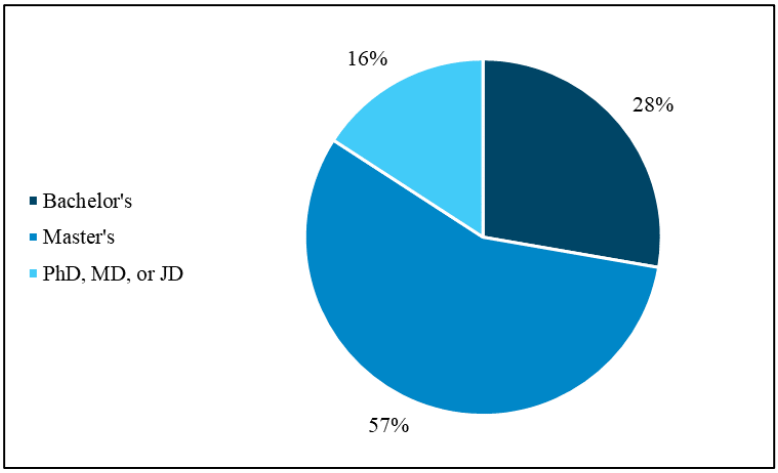
A) Educational background of surveyed venture capitalists

Crunchbase News survey of ~4,500 US and Canadian venture investment partners:

Top 12 Universities with most degrees granted.



Highest Recorded Degree



As suggested by Crunchbase's survey, postgraduate degrees are extremely valuable and highly sought after among those pursuing employment in venture capital. On the business side, MBA's can substantially enhance one's professional network (crucial to reach potential investors and founders) and provide executive-level business strategy and leadership training, both of which are essential for a successful venture capitalist. Prior to working in a more senior venture capital role, professionals will also typically have worked in highly prestigious business roles (investment banking, private equity, management consulting, etc.) or technical roles that align with the investment focus of the fund they have been hired at (engineering, technology, healthcare, etc.). Each path offers prospective venture capitalists a highly transferable background, such as working on large-scale financial transactions/deals, operational and business development expertise, and industry-specific knowledge. Without experience in these areas, it is extremely difficult to break into venture capital, let alone succeed as a venture investor.

B) Types of securities used in venture capital financing

Common Stock

- Most simple form of equity in a company; typically held by founders and employees of a startup.
- Grants voting rights to holders but can be limited, especially compared to preferred shareholders.
- Subordinate/junior to preferred equity and debt holders in the event of liquidation.

Preferred Stock

- Typically issued to outside investors (i.e., venture capital firms)
- Given additional rights/privileges that offer more protective provisions (e.g., anti-dilution protection and liquidation preference) and greater influence on economic/governance making (e.g., approval of a liquidation event).
- In venture capital, preferred equity is virtually always convertible to common stock.

Debt/Note Alternatives

- Convertible Notes
    - Short-term debt that can convert into equity. In venture capital, these securities typically convert in conjunction with a future financing round to simplify the valuation and capitalization of the startup first.
    - Simpler documentation that requires less legal time and expense than term sheets for equity investments.
    - At earlier stages, convertible notes are advantageous from a valuation perspective because they do not force the VCs or founders to punt on the valuation of the company when there is little information to support a reasonable valuation.
- SAFE (Simple Agreement for Future Equity)
    - Not a debt instrument; the VC is instead buying the right to purchase stock in a future equity round.
    - Financing round triggers conversion of the security into common stock.
- Warrant

    - Holders of warrants have the right (but not the obligation) to purchase stock at stated price (exercise price) for a limited period (until the warrant expires).
    - Will generally not dilute shareholders by more than 1-2% once the warrant is exercised.
    - Can be attached to a SAFE security; more commonly used by venture debt lenders.
- Token warrants
    - May also used by an investor in a crypto project that gives them the right to purchase tokens in the issuing project at a specified price, on or before a specified date.
    - Similar to traditional warrants, token warrants are often used in conjunction with an promissory contract to purchase a stake in the future (SAFE), except crypto startups will use SAFTs (simple agreement for future tokens)

C) Select investments made by The LAO

Project Name	Purpose of Project	Proposed Investment
Astaria	Lending Platform	$100,000
Bunker Finance	Lending Protocol	$125,000
DebtDAO	Credit/Debt Financing	$150,000
Blackbird	Web3 Hospitality Platform	$200,000
SwanDAO	Trading Algorithms/Treasury Management	$300,000
Lit Protocol	Decentralized Computing Platform	$350,000
Metastreet	NFT Credit Market Protocol	$500,000
Nifty Comedians	NFT Platform	Not Published
GEAR	Smart-Contract Engine	Not Published
Tinyman	Decentralized Trading Protocol	Not Published
Solv Protocol	Financial NFT Platform	Not Published

Obol Network	Ethereum Infrastructure Primitive	Not Published
Thales	Decentralized Trading Platform	Not Published
Taker Protocol	NFT Lending/Liquidity Protocol	Not Published
NFT Oasis	3D/XR NFT Marketplace	Not Published
Tracer DAO	Derivatives Smart Contract Templates	Not Published

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