BANCA D'ITALIA

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# Questioni di Economia e Finanza

(Occasional Papers)

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by Oscar Borgogno

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# MAKING DECENTRALIZED AUTONOMOUS ORGANIZATIONS (DAOS) FIT FOR LEGAL LIFE: MIND THE GAP

by Oscar Borgogno*

## Abstract

Decentralized Autonomous Organisations (DAOs) can be understood as collective organizations that are run through blockchain-based smart contracts, which allow token holders to participate directly in decision-making processes. By harnessing the key features of distributed ledger technology (DLT), they are increasingly posing tricky questions for policy makers, supervisors, and legal scholars. Even though DAOs are often claimed to be beyond the reach of national jurisdictions, it is clear that a broad array of legal issues need to be solved for DAOs to achieve scalability and widespread application, namely the lack of limitation of liability, governance concerns, and the definition of token-holders' rights. Our paper delves into these concerns and argues that DAOs can benefit from the solutions provided by corporate law over the past decades in coping with management and moral hazard problems involving all complex organizations.

**JEL Classification**: K22, L22, G34.
**Keywords**: blockchain, DAOs, decentralization, corporate governance, tokens.
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## Contents



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## 1. Introduction. The quest for decentralization.[1]

Distributed ledger technology and blockchain are not simply about payments and money. In fact, blockchain applications to decentralized finance (DeFi) are increasingly posing tricky questions for policy makers, supervisors, and legal scholars.[2] One of the most fascinating examples of this sort are Decentralized Autonomous Organisations (DAOs) whose objective is to decentralize entrepreneurial activities through digitally-automated contractual relationships, giving rise to an alleged new paradigm of business organisation. In its very essence, a DAO is a blockchain-enabled organization that allows large numbers of individuals across different jurisdictions to carry out business activity in a decentralized fashion.

DAOs originally made it to the headlines for the hack that happened in 2016 to "The DAO project", a smart contract running on Ethereum that was designed to work as a venture capitalist.[3] This enterprise was meant to allow any token holder to propose a project for financing through decentralized digital voting. Anyone with DAO tokens could vote on plans, and would then receive rewards if the projects turned profitable. Soon after collecting $150 million USD worth of ether (ETH) by means of a token sale, a member leveraged a vulnerability in the code to reap away $60 million of ether. This led the founders to roll back the Ethereum network's history and "un-do" the leakage of funds, ultimately contradicting the much-vaunted immutable and censorship-resistant characteristics of the blockchain, not to mention the overarching principle under which "code is law".

However, as crypto developers went through a learning-by-doing process over recent years, the technology experienced a sizeable evolution, and several running projects already gained worldwide attention. Some examples include DAOs gathering digital artwork[4], raising funds for the Ukrainian army[5], attempting to buy a first-edition copy of the U.S. Constitution[6], and even trying to distribute grants to nurture biotech research.[7] Most of them are projects which engage in venture-style type investments or other forms of funding activity within the crypto-world. We may also find so-called

[1] The author wishes to thank Riccardo Cristadoro, Giovanni Veronese, Claudia Biancotti, Michele Savini Zangrandi, Edoardo Martino, and Sabina Marchetti for their constructive criticisms which lent form and substance.
[2] For an in-depth overview on DeFi: Claudia Biancotti, "What's next for crypto?", Questioni di Economia e Finanza, [*forthcoming*]; Sabina Marchetti, "Web3, blocksplained", Questioni di Economia e Finanza, [*forthcoming*]. See also: Banca d'Italia, "Comunicazione in materia di tecnologie decentralizzate nella finanza e cripto-attività" (2 June 2022).
[3] Samuel Falkon, "The Story of the DAO — Its History and Consequences", Medium (2017).
[4] Jamie Powell, "SpiceDAO paid $3m for a copy of Jodorowsky's Dune" Financial Times (London, 17 January 2022).
[5] Cristina Criddle "Ukraine plans to issue NFT collection to fund armed forces", Financial Times (London, 3 March 2022); Owen Thomas, "How war in Ukraine became war on the blockchain", Protocol (San Francisco, 4 March 2022).
[6] Eric Platt and Madison Darbyshire, "Ken Griffin buys copy of US constitution after bidding war with crypto traders", Financial Times (London, 19 November 2021).
[7] Eric Lipton and Ephrat Livni, "Reality Intrudes on a Utopian Crypto Vision" New York Times (Washington, 8 March 2022).

"protocol DAOs", which use tokens as a voting metric to implement private transactions on blockchain networks.

At the same time, new legislative initiatives have been put forward around the globe to nurture this trend. Notably, on 6 November 2021, a limited liability company bought 40 acres of land close to the Yellowstone National Park in Wyoming. While this sort of transactions happens all the time, the nature of the buyer was somewhat unique: CityDAO is a decentralized autonomous organization running on Ethereum blockchain, with no official leader.[8] This is only one of the 300 DAO LLCs which have been incorporated since the Wyoming's Decentralized Autonomous Organization law became effective on 1 July 2021.[9]

The decision to buy the land involved a group of approximately 6000 members debating and taking common decisions online through the chat app Discord. According to their long-term plan, this is just the first step to build a city on the Ethereum blockchain ("an experiment in decentralized ownership of real-world assets" in their own words).[10] Anyone holding one of the 10.000 "citizenship" tokens issued for 0,25 ether each (almost $1000) can vote on what land to acquire and how to use it.

Before looking at this and other ground-breaking pieces of legislation, it is worth taking one step back to figure out what DAOs are and which legal hurdles are they set to face once widespread adopted. In brief, this essay argues that DAOs are an attempt to establish a decentralized system of corporate governance that relies on blockchain technology and disregards as much as possible the traditional legal tools to address the business organization issues (which they are inevitably set to face as well). Further, this work illustrates the main hurdles that could prevent DAOs from scaling up and delivering on their promises.

The article is structured as follows. Section 2 sets forth a working definition of DAOs as well as an overview of their functioning. Section 3 investigates the main legal problems which could affect DAOs, namely the lack of limited liability, the governance issues and the representation of interests. Section 4 looks at some of the most interesting legislative tools and proposals which apply to DAOs around the globe by highlighting the latest legislative developments on the EU side. Section 5 contains some policy-oriented remarks.

Note that this paper does not dwell on the question of whether blockchain applications are actually as far-reaching and socially desirable as argued by so-called "crypto enthusiasts". It focuses on some

[8] Miles Kruppa and Hannah Murphy, 'Crypto assets inspire new brand of collectivism beyond finance' Financial Times (London, 27 December 2021).
[9] Wy. Stat. § 17-31-101 through 17-31-115.
[10] See the website of CityDAO: "It all starts with collective governance of a real parcel of land in Wyoming on chain."

foundational legal challenges that, if not properly addressed, could make DAOs backfire against their members and stakeholders.[11] It is worth pointing out that, even though DAOs share some common features, they nonetheless can differ dramatically from one another in terms of their purpose and operation. As a result, the evidence provided in this study should be considered neither as a comprehensive analysis of the DAOs ecosystem nor, a fortiori, as a guide to the ever-changing crypto landscape.

## 2. DAOs Basics: towards self-driven organizations?

The boundaries of what qualifies as a DAO are still evolving, but, in their current form, DAOs can be understood as collective organizations that run through the automatic functioning of smart contracts. A smart contract is a piece of software run on a distributed ledger enabling automatic execution of activities based on pre-set rules.

Where DAOs are concerned, these rules typically embed an agreement reached between two or more parties, regardless of its lawful character.[12] In this way, each step of the execution (e.g. asset transfer, acquisition of information from an external source, etc.) is timestamped and publicly recorded on the ledger. This means that the activities performed through a smart contract, once recorded on the blockchain, cannot be reversed or deleted.[13]

Allegedly, the chief advantage of smart contracts is represented by the substantial reduction of the costs related to the exercise as well as the verification of rights in the context of business relationships. A complex nexus of smart contracts is the backbone of hard-to-change rules under which DAOs are governed. As a consequence, individuals taking part in a DAO do not need to rely on costly intermediaries to control or manage the organization's assets either directly or indirectly.

Thus, DAOs do not need to resort to legal formalities among their founders and participants. Rather, members abide by and trust the software and the smart contracts underpinning each DAO (so-called "rule of code").[14] This is because they run on a blockchain infrastructure, namely a decentralized, peer validated crypto-ledger consisting of a network of nodes that provides a permanent chronological

[11] Similarly, the paper does not tackle related issues involving the treatment of DAOs under tax law and employment law.
[12] Riccardo De Caria, 'A Digital Revolution in International Trade? The International Legal Framework for Blockchain Technologies, Virtual Currencies and Smart Contracts: Challenges and Opportunities', Vienna, 4–6 July 2017, hdl.handle.net/2318/1632525.
[13] Oscar Borgogno, "Smart Contracts as the (new) Power of the Powerless? The Stakes for Consumers", European Review of Private Law 6 (2019) 885–902.
[14] Usha R. Rodrigues, "Law and the Blockchain", 104 Iowa Law Review 679, 707 (2019).

record of all prior changes.[15] See Figure 1 for a short chart illustrating the main steps required to launch a DAO.

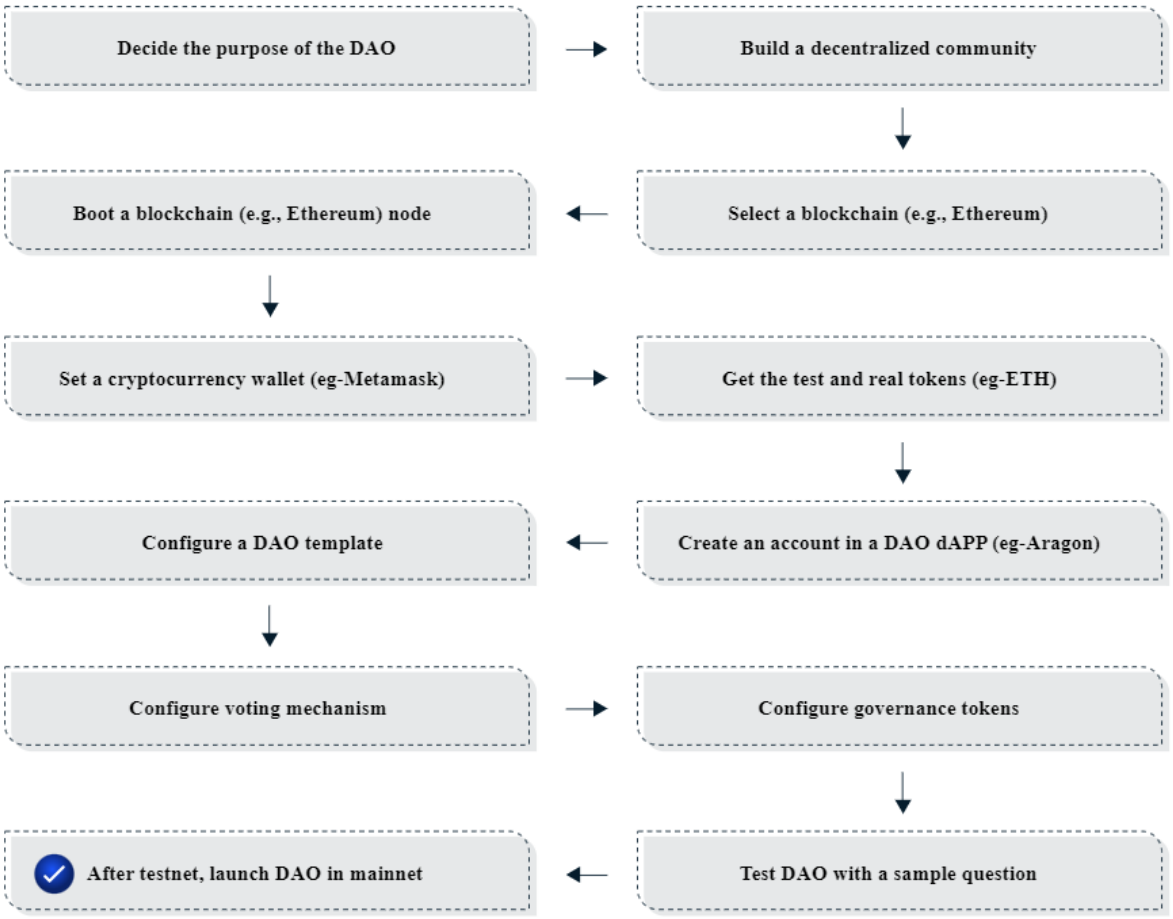


Figure 1: Leeway Hertz (2022).

DAO membership is often transitory and can be purchased or allocated as a reward (often in the form of a blockchain-based token) in exchange for capital, use, or resources and provides for specific rights.[16] Some DAOs give members the right to a portion of an organization's profits and losses others provide their members with the right to access or manage the resources or services that an organization controls.

[15] For the purposes of the present article, it is worth highlighting the two main distinctions in the realm of DLT: unrestricted/restricted and public/private ledgers. Unrestricted (or permission less) ledgers allow all those with the necessary technical capacity to take part in updating and validating new transactions. Restricted or permissioned ledgers are open only to predefined subjects. In sum, public and private ledgers differ in terms of access rights and visibility to third parties. Anyone can have access to the transactions in a public ledger, whereas a private ones can be read only by predetermined subjects (actual participants, third parties or supervisory authorities). On a related note, it is worth pointing out that validation algorithms on the most long-standing blockchains have proven to be extremely hard to hack.

[16] Jonathan Rohr and Aaron Wright, "Blockchain-Based Token Sales, Initial Coin Offerings, and the Democratization of Public Capital Markets", 70 Hastings Law Journal, 463 (2019), 479.

Governance in DAOs is often achieved in a less hierarchical manner than traditional corporate organizations. Voting shares are measured through tokens which are distributed to users of the smart contract, as well as the smart contract's initial developers and sometimes the investors who supported the launch. Decisions usually depend on group consensus or majority voting rather than boards of directors or chief executive officers.

When it comes to "participatory DAOs", software is used to aggregate the votes or preferences expressed by members on a continuous basis. This type of crypto-organization is commonly used to engage in traditional entrepreneurial endeavours - like venture capital financing - or to manage open source technology involving a smart contract running on different blockchains (e.g. Ethereum).

A more extreme alternative is offered by so-called "algorithmic DAOs" where the management choices are entirely algorithmic in nature. They rely on software to structure and coordinate social interactions, in the same vein as Bitcoin and other decentralized blockchain-based protocols. In its essence, the taxonomy of DAOs can be illustrated as follows:

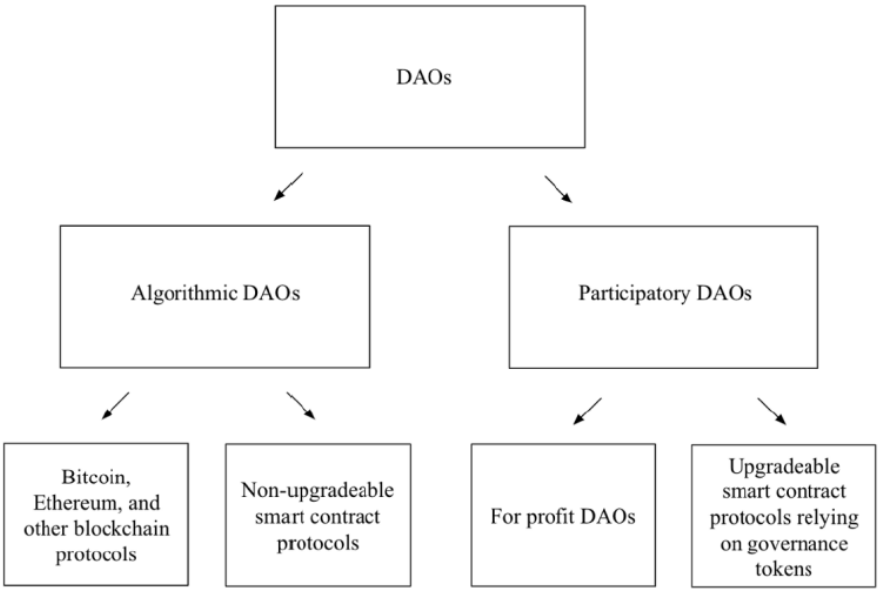


Figure 2: Wright (2021), p. 157.

Participatory DAOs help soften some of the downsides that accompany more autonomous smart contracts. By relying on a DAO, the founders, who usually are the initial developers of the smart contract-based protocol, can transfer ongoing decision-making to the software's users and supporters. Developers of these DAOs generally retain the power to update the smart contract itself.

The advocates of this new kind of digital organization argue that DAOs enjoy significant operational efficiencies compared to traditional legal entities and are already used to manage over $500m in assets.[17] Allegedly, DAOs can rapidly pool and use capital, implement low-cost and fast digital voting schemes, harness transparent monitoring procedures that protect assets and reduce the need for ongoing control to target fraud or other insider abuses. That being said, such advantages come with an extremely rigid organizational architecture that makes next to impossible changing the business model or the inner functioning of a DAO to meet new market dynamics once the token base is highly dispersed. This can be a serious setback especially for start-ups at an early stage of development when continuous adjustments to the business model and the organization framework are often needed.

As long as DAOs work on a publicly accessible blockchain, transparency and business accountability are expected to be significantly higher than in traditional corporations.[18] By making use of a blockchain-based voting system, members should be able to cryptographically verify the results of member votes (e.g. who voted and how) and whether token holders' identities are correlated with the addresses used for voting. DAO members' decisions are open for public audit by all members of the organization (and potentially even the public), helping to ensure compliance with procedural rules for decision-making and avoid risks of vote miscounting.

A more consistent and streamlined reliance on member-voting, so the crypto-narrative goes, should allow DAO-members to take care of the management of organizations. Thus, this new blockcahin-based kind of organization is set to make obsolete the old-fashioned primacy of allocating managerial authority in the hands of the board of directors.

Lastly, DAOs are often described as useful tools to cope with misappropriation or the misuse of common funds. As opposed to traditional organizations, DAOs are governed according to rigid rules defined in the code of smart contracts. This should make it possible to structure the business dynamics in a more deterministic manner, with code detailing the rules under which members and insiders can interact.[19] Other DAOs give members control over any assets deposited into the organization. An increasing number of recently launched DAOs provides members with smart contract-enforced

[17] Aaron Wright, "The Rise of Decentralized Autonomous Organizations: Opportunities and Challenges" The Stanford Journal of Blockchain Law & Policy (2021).

[18] For the purpose of this article, it is worth highlighting the two main distinctions in the realm of DLT: unrestricted/restricted and public/private ledgers. Permissionless (or unrestricted) ledgers allow all those with the necessary technical capacity to take part in updating and validating new transactions. Conversely, permissioned (or restricted) ledgers are open only to predefined subjects. Further, public and private ledgers differ in terms of access rights and visibility to third parties. Anyone can have access to the transactions in a public ledger, whereas a private ones can be read only by predetermined subjects (actual participants, third parties or supervisory authorities).

[19] For instance, DAOs often allocate organizational duties among members and rely on smart contracts to prevent any DAO-related transaction from taking place absent the express approval of different parties.

mechanisms to withdraw their investment at any time. This process, emphatically named "rage quitting" provides members with a back-up option and a degree of control over any funds deposited into a DAO. In sum, members can vote to deploy assets for a particular purpose or can withdraw their capital if they disagree with the activities of the organization.

## 3. The gap between technological expectations and legal realities.

Even though the widespread narrative underpinning DAOs hinges on autonomy from national jurisdictions and the legal order, it is clear that a broad array of legal issues need to be solved for DAOs to achieve scalability and widespread application. This section briefly focuses on the main legal issues at stake, ranging from the lack of limitation of liability to governance concerns and the definition of token-holders' rights within DAOs.[20]

By looking at these problems, it becomes clear that the traditional issues faced by corporate governance over the last century are not set to disappear once we enter the DAO environment. For instance, how to solve the conflicts between majority and minority token holders, the allocation of due diligence duties of developers towards token holders, whether to prohibit some governance structures, and so forth. To put it briefly, the experience developed by corporate governance practitioners and scholars on how to resolve them should not be disregarded by DAO developers and practitioners.

### 3.1. (Un)limited liability.

According to the mantra "code is law", DAOs are meant to be totally self-sufficient from a legal perspective. No intermediary is required to enable their smooth functioning, including a legal system. After all, smart contracts are praised for functioning as a sort of self-implementing software mechanism which ensures the performance of an agreement without the need of judicial enforcement.[21] Such an unshakable confidence in the potential of blockchain led a large share of crypto evangelists to believe that there is no need to create an underpinning legal entity.

[20] For an up-to-date overview of the legal wrappers that DAO developers could rely on, see: Chris Brummer, Rodrigo Seira, "Legal Wrappers and DAOs" (2022), Working Paper.

[21] M. Raskin, 'The Law and Legality of Smart Contracts', (2017) 1 Georgetown Law Technology Review 305, at 306, DOI http://10.2139/ssrn.2842258; P. Cuccuru, 'Beyond Bitcoin: An Early Overview on Smart Contracts', (2017) 25 International Journal of Law and Information Technology 179, at 185, DOI http://10.1093/ijlit/eax003.

Unfortunately, this approach would prevent DAOs from enjoying the benefits that usually come with the recognition of legal entity, namely the ability to shield the personal assets of an organization's directors and owners from creditors. Even though DAOs mimic to a certain extent the functioning and structure of corporations (such as governance rights conferred to token holders along the lines of equity stakes), they do not automatically qualify as legal entities subjected to a limited liability regime. On a broader level, when two or more individuals engage in even a tenuous economic or business relationship they are deemed a "general partnership" (a sort of *de facto* company). That is to say that the partners of an organization which lacks any corporate form are fully exposed to unlimited liability towards the creditors of the organization itself.

One could argue that the actual exposure to unlimited liability is quite low as well-designed DAOs would provide for specific compensation schemes and resources to automatically cope with every possible on-chain transaction scenario. Having said that, there is a wide range of potential risks triggering legal liabilities from which DAOs are not exempted. For instance, if a court ordered the members of an unregistered DAO to provide compensation in favour of a specific subject, the relevant financial resources could be released only subject to the rule of the blokchain-based organization. If DAO members were unwilling to abide by the judgment, liability could jointly fall on all individual participants.

This risk has not yet materialized in a judicial ruling as extant DAOs gather communities of members who share a common optimism towards the potential of blockchain applications and are generally aware of the risk to lose their initial investment. Further, a portion of a DAO's treasury could be specifically allocated to work as a self-insurance fund to weather unforeseen circumstances generating liability. However, if DAOs scaled up outside the limited circles of crypto-enthusiasts, they would be unlikely to have sufficient funds to cover potential liabilities.

Under an unlimited liability regime, creditors can request the payment from any DAO member that they would be able to reach.[22] Unsurprisingly, the ones with the deepest pockets (or perceived as such) would naturally be the preferred target of creditors. The risk that membership could put their assets at an unlimited risk would naturally discourage individuals and legal entities with significant assets on hand (institutional investors and financial institutions) to join or otherwise support unregistered DAOs.

[22] There are also important unresolved questions about this theory, including whether each DAO member would be deemed to be a general partner just by virtue of being a token holder, or whether more formal involvement by DAO token holders is required to be liable as a general partner (for example, participating in governance). However, in a worst case scenario, a DAO member could be responsible for all of the liabilities facing a DAO.

### 3.2. The struggle towards decentralized governance.

By leveraging blockchain-based smart contracts, DAOs promise to streamline voting schemes and engage a larger number of participants in governance and decision making. Ultimately, in line with the mantra of the crypto community, this would enable the decentralization of entrepreneurial governance. As a greater number of business decisions could be taken by token-holders, DAOs are expected to avoid any reliance on central managers and directors to manage the organization. Having said that, we are still in the early days of DAOs and an optimal governance structure is far from being settled.[23]

Despite all the enthusiasm that comes with decentralized governance and straightforward decision-making, such factors fall short of overcoming the need for corporate governance. In fact, it is not even clear whether complete transparency and decentralization within a business organization are desirable from an incentive-framework perspective.[24] As long as participatory DAOs are concerned, it seems unlikely that a large array of token-holders would have the time and skills to meaningfully engage with the management choices of the organization. Indeed, direct voting involves a constant alignment between token holders and the DAO itself. Potential social frictions among members could even lead to higher inefficiencies comparing to traditional hierarchical organizations. Indeed, the concepts of "direct democracy" and active member participation applied to DAOs showed all its limits when faced with the old-fashioned issue of voter apathy.[25]

To solve these problems, new attempts have been put forward to facilitate participation in governance-related decisions and alleviate voter apathy. For instance, there are DAOs in which votes are weighted according to how long a token-holder support a specific proposal in order to take into account individuals' conviction.[26] An alternative solution is the so called "quadratic voting" which is based on the willingness of each member to pay for achieving a given outcome.[27] Finally, developers tried to tackle the problem by replicating traditional corporate law mechanisms, such as proxy and

[23] Edoardo Martino and Simone Spijkerman, "How Decentralized are 'Decentralized Autonomous Organisations' (DAOs)?" Oxford Business Law Blog (5 November 2021) arguing that "DAOs' governance structure largely depends on the initial distribution and the protocol-specific voting mechanisms".
[24] Edmund Schuster, "Cloud Crypto Land", 84 Modern Law Review 5 (2020), noting that "It is hardly surprising that the challenges posed by blockchain technology can be avoided by adopting a design which removes the very feature of blockchain technology which distinguishes it from other, existing and widely available systems, ie the reliable establishment of consensus between parties who do not necessarily know or trust each other". Martin C. W. Walker, "'Unnecessary complexity': the crypto industry's continuing efforts to avoid regulation", LSE Business Review (2021).
[25] LimeChain, "DAO Voting Mechanisms Explained" (last accessed June. 22, 2022).
[26] Jeff Emmett, "Conviction Voting: A Novel Continuous Decision Making Alternative to Governance", MEDIUM (2019).
[27] Santiago Siri, "Polish, Test and Deploy a Quadratic Voting DAO" (last accessed June. 20, 2022).

quorum voting. This is an arguably disappointing result if tested against the promises of disruptive decentralization extolled by crypto-enthusiasts.

A more drastic way to circumnavigate frictions related to individuals' limited rationality and information asymmetries is to rely on algorithmic DAOs. Such an option implies that token holders should fully trust the functioning of the underlying code. The only governance tool in their hand would be the choice to acquire – or not acquire – the related tokens.[28] Needless to say, algorithmic DAOs build on the (bold) assumption that the underlying code is actually fit for purpose and capable of automatically drive the organization throughout its life. In particular, such concept implies the ability of relying on artificial intelligence systems able to automatically manage a complex organization, ultimately making self-driven companies possible.[29]

In case of software bugs or problems due to unforeseen circumstances which cause the DAO to experience technical disruptions, members can either abandon it or modify the underlying software thereby giving rise to a "fork" of the DAO with updated rules and hoping that the other token-holders move their assets to the new entity.

### 3.3. Defining token-related rights.

There are blurred lines between governance tokens and traditional securities, which are broadly categorized in debts, equity, or a combination of the two. Economic rights, participation rights, governance rights, and utility rights can all be associated with tokens which are then sold to the public in ways that are similar to a traditional initial public offering.

Jurisdictions around the world are still grappling with the question whether tokens should be treated as financial securities from a regulatory perspective. If they are, it follows that the issuer must comply with disclosure requirements and disclosure obligations.[30] Since most DAOs work with tokens providing non-traditional interests (e.g., a digital token that solely provides governance earned through use), it is highly disputed if they should be deemed as equity securities (or even securities at all). Under modern corporate laws of most countries, DAO developers will struggle with finding a

[28] Carla L. Reyes, "(Un)corporate Crypto-Governance", 88 Fordham L. Rev. 1875 (2020).
[29] This essay does cover the fascinating relationship between AI and business organization. For a complete overview of the matter see: John Armour and Horst Eidenmüller, "Self-Driving Corporations?", Harvard Business Law Review (2020).
[30] In the US, Section 12(g) of the Securities Act of 1934 provides that a company is required to register with the SEC and comply with ongoing disclosure requirements if it has more than $10 million in assets and a class of *equity* securities that are "held of record" by either 2,000 persons or 500 persons who are not accredited investors.

structure that does not either (i) risk the potential unlimited liability of general partnerships, or (ii) risk that the DAO interests are deemed securities by market supervisors, tax authorities, and courts.

Further, such issues are set to influence the ability of markets to rightly price governance tokens. As things stand, information costs are expected to be significant as market players would need to understand what the code embedded within a specific DAO means and how it works. Even though an in-depth analysis of taken-related financial regulation goes beyond the scope of the present work, it is worth highlighting that private ordering alone could fall short of ensuring the informational efficiency of crypto-markets. Thus, since governance tokens are a major factor for the functioning of DAOs, new legislative initiatives should aim to clarify the boundaries and the nature of such new assets.

Last but not least, DAOs raise serious issues when it comes to tax enforcement over token-holders. The emergence of blockchain-based anonymization techniques and decentralized exchanges compromise the enforcement of a regulatory framework for taxation akin to that of cloud-based agents.[31] Since DAOs processes and procedures are carried out by code existing in cyberspace, they cannot be conventionally connected to an agent or a specific jurisdiction. This means that token holders, rather than being above (or outside of) the law, are exposed to a high degree of legal uncertainty and fiscal liabilities.

## 4. Navigating the legal crypto-landscape.

When it comes to the legal status of blockcahin-enabled organizations, it is worth drawing a main distinction between registered and unregistered DAOs. The former are those registered within a corporate registry and managed in compliance with the laws of the jurisdiction where they operate. The latter rely exclusively on informal cooperation based on software. From a practical viewpoint, the absence of a formal legal identity can generate any number of troubles for DAOs when interacting with the off-chain environment. Opening bank accounts, hiring employees, paying taxes, contracting with services providers, and so on, become significantly more difficult or even impossible, without a formal identity.

Notably, an increasingly number of DAO initiatives has managed to obtain a legal entity structure by offshoring in jurisdictions other than that of operation with favourable tax frameworks (e.g. the

[31] See David Shakow, “The Tao of The DAO: Taxing an Entity That Lives on a Blockchain” (2018) 160 Tax Notes 929, 937, arguing that "the pure blockchain form does not work well for an entity under the IRC [United States Internal Revenue Code]"

Cayman Islands, Singapore, Panama, Switzerland and Ireland). Those jurisdictions offer the opportunity to set up foundation entities with a very flexible governance structure. In its very essence, the foundation regime allows to ensure that proposals which were validly executed on the blokchain are closely replicated off-chain so that the DAO can legally operate in the outside world. However, the choice to rely on a foreign jurisdiction comes with substantial barrier to entries and legal uncertainties (from a tax law and employment law perspective).[32]

Further, one should not forget that under existing legal systems, it is a tricky task to identify with certainty the jurisdiction which applies to a specific DAO.[33] This does not mean that DAOs and token holders can easily avoid law enforcement. In fact, national laws statutes allow courts to stretch their jurisdiction to non-resident entities whenever they have 'sufficient minimum contacts' within the state (so-called "long arm statutes"). What falls within the umbrella of such minimum contacts is a matter of case-by-case evaluation by government, agencies and courts. Factors that are usually considered by lawyers are the presence of transaction within the jurisdictions, or the execution of a tort in the state or the residency of the consumers who allegedly incurred damages. In order for DAOs to avoid legal uncertainty, it is thus preferable to choose a specific jurisdiction by means of legal incorporation. For some crypto enthusiasts, legal formalities defeat the point of DAOs, which usually aim to employ "direct democracy" and non-hierarchical governance systems with fluid membership bases under which participants are also decision makers.

However, the reasons which usually lead traditional businesses to form legal entities are appealing also to DAO developers, regardless of the most extreme narratives under which blockchain-related implementations are set to overcome legal systems and a clear path to limited liability is key to put DAOs to good use for society. In particular, a legal entity officially recognized within a specific jurisdiction allows to partition assets, to secure limited liability, and benefit from an autonomous corporate legal personhood for the DAO itself (in this way the DAO's representatives would be able to sue and negotiate agreements in the entity's name).[34] It is widely acknowledged that business players need certainty with regard to the contractual counterparties they are negotiating with and which assets are available to meet potential future liabilities.

[32] David Kerr and Miles Jennings, "A Legal Framework for Decentralized Autonomous Organizations", Working Paper.
[33] According to international private law principles, the jurisdiction which applies to entities is largely based on the place of incorporation of such organisation (incorporation theory) or the place where key managerial decisions of such organisation are taken (real seat theory). Since DAO are based on digital and decentralized ledgers, traditional principles are not very helpful in delivering legal certainty and predictability.
[34] Henry Hansmann and Reinier Kraakman, "The Essential Role of Organizational Law", 110 Yale Law Journal 387 (2000).

Having said that, the main issue policy makers are facing is the degree to which the substitution of blockchain-based governance for traditional structures should be legally accommodated. This challenge stems from the inherent features of this new kind of digital organization. While traditional corporate governance deals with the impossibility of complete contracting by means of a wide array of "gap fillers" (e.g. fiduciary duties), most of DAO advocates purport to avoid any such legal tools through code-based mechanisms. Notably, the rules behind the DAO's architecture have to be comprehensive before the underlying smart contracts are launched. If the smart contract code is exposed to a particular vulnerability, that (hidden) flaw has the potential to be exploited, ultimately disrupting the DAO. The necessity to take into account any potential future scenario that could arise is set to be a major weakness of DAOs, especially in light of the difficulties to enforce legal rules and rely on judicial intervention within blockchain environments.[35] Having said that, it is not entirely clear whether or not fiduciary duties in the field of corporate governance can be satisfied by software and, even more fundamentally, what smart contracts automation means in the context of fiduciary duty.

Further, one should consider that forcing DAOs developers to rely on legal agreements and formalities on top of their digital activity would hinder blockchain-related innovation. Arguably, the obligation to enlist lawyers and other professional consultants to follow the creation and the development of a DAO could run against the original crypto-objective not to rely on intermediaries and move quickly in the web3 environment.[36]

### 4.1. A comparative assessment.

For starters, it is worth highlighting that only two of the problems identified in Section 3 are targeted by new legislative initiatives, namely the legal status of DAOs and tokens. Conversely, the issue of decentralized governance is not addressed. This can be explained by the fact that from a legal perspective it is already possible under specific circumstances to delegate most managing powers to token-holders.[37] Of course, the question remains of whether such a decentralization is actually feasible to facilitate the DAO functioning.

While the EU still lacks a fully-fledged legislative strategy targeting DAOs, in September 2020 the European Commission put forward the Proposal for a Regulation on Markets in Crypto-assets

[35] Nathan Tse, "Decentralized Autonomous Organisations and the Corporate Form", Victoria University of Wellington Law Review (2020).
[36] Sabina Marchetti, "Web3, blocksplained", Questioni di Economia e Finanza, [*forthcoming*].
[37] Edmund Schuster, "DAOs are better than corporations?", The Blockchain Debate Podcast.

(MiCA) to set a legal standard governing the crypto-economy.[38] This piece of legislation is intended to lay down uniform rules on transparency and disclosure requirements for the issuance, offer to the public and admission to trading of crypto-assets. In addition, there are rules on the authorisation and supervision of crypto-asset service providers and their issuers.

As the MiCA proposal recently exited trilogue negotiations, the European Parliament and the Council are now expected to officially approve the provisional political agreement reached on 30 June 2022.[39] It is interesting to note that the negotiating position adopted by the Economic and Monetary Affairs Committee of the European Parliament on 14 March 2022 amended the original draft with new provisions targeting DAOs.[40]

According to the European Parliament, a new recital should recognize that "some types of crypto-assets are not issued by legal entities, but are instead managed by decentralized autonomous organisations".[41] Notably, the draft sets forth a legal definition of a DAO, meant as "a rule-based organisational system that is not controlled by any central authority and whose rules are entirely routed in its algorithm".[42] DAOs should thus be admitted to offer crypto-assets to the public or seek an admission of such crypto-assets to trading on a trading platform for crypto-assets. Having said that, the European Parliament proposed to entrust competent authorities with the task of ensuring that DAOs comply with all the requirements laid down in the regulation for other crypto-assets (such as the notification and publication of an appropriate white paper as well as the authorization regime).[43]

On the other side of the Atlantic, neither Congress nor any federal agency has yet passed specific regulation on DAOs. However, on 7 June 2022, Senator Kirsten Gillibrand (D-NY) and Senator Cynthia Lummis (R-WY) introduced the Responsible Financial Innovation Act (RFIA) with the goal of establishing a comprehensive regulatory framework for digital assets in the United States.[44] As the Securities and Exchange Commission (SEC) and the Commodities Futures Trading Commission

[38] European Commission (2020), "Proposal for a Regulation on Markets in Crypto-assets, and amending Directive (EU) 2019/1937COM/2020/593 final", 2020/0265(COD).
[39] European Council, "Digital finance: agreement reached on European crypto-assets regulation (MiCA)" (30 June 2022).
[40] European Parliament (2022), "Report on the proposal for a regulation of the European Parliament and of the Council on markets in crypto-assets and amending Directive (EU) 2019/1937", COM(2020)0593 – C9-0306/2020 – 2020/0265 (COD).
[41] European Parliament (2022), Recital 13(a).
[42] European Parliament (2022), Article 3(1)(1a)
[43] European Parliament (2022), Article 3(b).
[44] This proposal defines DAOs as organizations (i) which utilize smart contracts to effectuate collective action for a business, commercial, charitable, or similar entity, (ii) the governance of which is achieved primarily on a distributed basis, and (iii) which are properly incorporated or organized under the laws of a State or foreign jurisdiction as a decentralized autonomous organization, cooperative, foundation, or any similar entity. See: <https://www.gillibrand.senate.gov/news/press/release/-lummis-gillibrand-introduce-landmark-legislation-to-create-regulatory-framework-for-digital-assets> accessed 22 June 2022.

(CFTC) lack explicit authority on the issue, they implemented a "regulation-by-enforcement"[45] approach with the goal of shaping the legal framework for crypto assets. Having said that, federal agencies are clearly struggling to apply existing laws to innovative crypto-products.

To the contrary, several US jurisdictions tried to fill the regulatory gap with crypto-tailored legislative initiatives. Delaware and Vermont made some steps over the last years, but Wyoming has taken a leading position with the goal of establishing a friendly reputation towards the blockchain community by means of a favourable legal framework. On 1 July 2021 the state passed a law granting DAOs the status of limited liability companies.[46] However, this initiative was harshly criticized for classifying all DAOs as being member-managed unless they opt to be "algorithmically managed".[47] This means that a start-up DAO cannot be nurtured and grown by an initial group of founders when it is at its most vulnerable stages of development. In fact, DAOs are often launched in a centralised fashion, granting a sufficient amount of governance tokens to the founders so to ensure the core functionality and carry out the necessary code overhauling. After this starting phase, the governance tokens are allocated among the other (non-developing) supporters as provided for in the protocol. It is likely that such process requires different legal entities according to the development phase of the DAO at stake.

Arguably, this kind of legislative efforts can be considered a form of legal branding rather than a true innovation for corporate governance. The reason for this is because they try to fit intrinsic features of DAOs into existing legal business structures.[48] However, traditional legal entities were designed with traditional corporations in mind, and based on the 20th century assumptions about individuals' ability to collectively associate themselves. It is hardly the case that the alleged innovative potential of DAOs can be fully harnessed by relying on traditional legal structures which do not account for the inherent features of blockchain based entities.

The most interesting alternative to the creation of new types of registered DAO forms is the proposal to rely on "regulatory equivalence".[49] This concept requires to identify the policy objective of a

[45] By the concept "regulation-by-enforcement" is usually meant the willingness of Government agencies to extend the boundaries of existing laws into new areas (such as the crypto industry), even in the absence of perfectly fitting regulation providing market players with legal certainty and predictability. Nizan Geslevich Packin, "Regulation By Enforcement And Crypto Assets" (Forbes, 8 February 2022).

[46] Pursuant to § 17-31-104(a), a decentralized autonomous organization is precisely a limited liability company whose articles of organization contain a statement that the company is a decentralized autonomous organization.

[47] Unfortunately, the bill does not clearly define what "algorithmically managed" means. See 17-31-104(e).

[48] Edmund Schuster, "Cloud Crypto Land", 84 Modern Law Review 5 (2020); Chris Brummer, Rodrigo Seira, "Legal Wrappers and DAOs" (2022), Working Paper.

[49] Regulatory equivalence in its most common use refers to the equivalence of the regulatory regime of two different jurisdictions, often in the context of trade or financial regulations. The proposal was put forward in November 2021 by Primavera De Filippi et al. <https://blockchaingov.eu/model-law-for-daos/>.

regulation in order to figure out whether a particular technology can achieve that same purpose, being then subject to the same rules already provided for traditional businesses.

A notable example of regulatory equivalence is the relationship between registration requirements for corporate entities and the use of a DAO on a blockchain. Registration requirements are justified by the objective of publicity and reliability, which is underwritten by the trust that market players have in public supervisors. Similarly, the implementation of a smart contract on a blockchain with relevant data about a DAO can achieve the policy objectives of publicity and certainty without the need to rely on third-party ledgers.

This approach represent a valuable alternative to the current fragmentation trend witnessed by several corporate governance systems. Further, as it embeds new technologies into the existing legal framework, it does not necessitate large-scale legal reforms. On the downside, such a proposal may not be easy to turn into legal realities as it implies that the current state of the art of blockchain technologies offers workable solutions to achieve the same levels of transparency, accessibility, and openness available with traditional registries. To be sure, experiments and sandboxes should be initiated to test current solutions and assess their ability to perform better than traditional legal procedures.

## 5. Conclusion: a technology in the service of an ideology?

DAOs build on a technology that promises to be more efficient and useful that current centralized procedures to launch and run businesses. It is yet to be seen whether blockchain together with the crypto-mantras of decentralization and full transparency will prove to be as socially desirable as promised from a business organization perspective. In fact, one could legitimately wonder whether DAOs are a truly genuine breakthrough able to change social dynamics or yet another attempt by the crypto-community to achieve the "promised land" of decentralization and transparency by means of blockchain technology.

Having said that, it is undeniable that DAOs rises fascinating questions for policy makers and market supervisors as to the interplay between technological automation and business organization. By prioritizing the concept of decentralization as an overarching value, DAOs advocates purport to offer a new template for organizational behaviour where ownership and participation (and the prospect of control) are tethered, if not mutually conflated. Interestingly, this narrative goes against the very premises of modern corporate law, which over the centuries evolved towards the separation of ownership and control of the firm.

At a more practical level, this work showed that informality could expose DAO members to significant legal risks in terms of unlimited liability, governance dynamics and token legal status. Taxation also can quickly become a legal issue if DAOs spread and new forms of token remuneration arise with them. Thus, DAO developers need to carefully gauge whether or not (and to what extent) the activities of their organization give rise to potential scenarios for litigation, disputes, and ultimately legal liability towards stakeholders.

From a legal perspective, we are witnessing a new era of regulatory competition among jurisdictions with the aim of drawing crypto-related economic growth. While in the EU the MiCA proposed regulation could strike a reasonable balance between efficiency, investor protection, and financial stability for the market of crypto-assets, the European legal framework applying to DAOs is still fuzzy. Conversely, several initiatives put forward in the US by policy makers and scholars are more ambitious as they explicitly try to establish a crypto-friendly legal environment. Admittedly, many of these initiatives are examples of legal marketing rather than substantial steps forward for DAO governance. Unsurprisingly, these bills (such as the one of Wyoming) try to channel DAO developers towards traditional legal structures (foundation or limited liability company).

At the same time, proposals put forward by academics and experts to recognize regulatory equivalence between blockchain-enabled activities and traditional operations look promising, albeit complicated to implement as they would require joint efforts from market participants, policy makers and supervisors to develop and test new technological solutions that could achieve the traditional goals of corporate law (transparency, accessibility, trustfulness, etc.) in a more efficient fashion.

Further, this essay sounded a note of caution with reference to the DAOs potential to carry out a fully-fledged disruption of the current legal order. As showed throughout the paper, it is highly unlikely that the common core of modern corporate governance will be overcome by blockchain-related organizations. On the contrary, we can argue that DAOs can benefit from the solutions provided by corporate law over the past decades in coping with management and moral hazard problems involving all complex organizations (as already demonstrated by the issue of voter apathy).

Finally, this work renewed a call for regulatory humility, stating that policy makers must be wary of the temptation to multiply existing business structures for the only sake to attract the attention of the crypto-industry. Moreover, one should not forget that traditional legal entities were developed to meet the need of brick-and-mortar companies, and based on the 20th century limited ability of individuals' to collectively coordinate themselves. This is why new empirical and legal research is needed to figure out whether existing (or new) legal wrappers can suit DAOs features, ultimately putting blockchain to good use for society.