

The Limits of Code Deference

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ABSTRACT

Using smart contract technology, entrepreneurs have created technical structures that allow their users to access novel financial services that operate without legally addressable counterparties and enable groups of people to act collectively to affect rights to digital assets. We call these various structures “decentralized ventures.” These decentralized ventures enable transactions among their participants in accordance with rules created and enforced by their code; human participants in these decentralized ventures interact with the venture, and sometimes with each other, using smart contracts. Smart contracts, however, may be flawed or behave in unexpected ways. What happens when a smart contract defect or error harms a decentralized venture participant? Some

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participants may sue, seeking damages, to reverse the smart contract outcome, or to enjoin the venture's ongoing operation. Litigation over smart contract outcomes may disrupt—if not destroy—decentralized ventures and may have widespread unintended negative effects upon the rights and property of other decentralized venture participants and on third parties.

Many decentralized ventures attempt to prevent their participants from suing over smart contract outcomes by requiring that their human participants defer to and agree to be bound to the outcome of smart contract execution. We call this concept “code deference.” Code deference is critical to the orderly operation of decentralized ventures but has received little attention in the legal literature. This article examines legal and technical attempts to impose code deference on human users of certain types of decentralized ventures. It addresses strategies observed in practice, ranging from generalized obfuscation and on-system dispute resolution, to waivers and contractual covenants not to sue. And it examines other proposed strategies not yet observed in practice. It is likely, however, that, absent significant legal reform, no approach based in code or in law can prevent a lawsuit over a smart contract outcome.

While absolute code deference may never be achievable, code deference attempts should be viewed as mechanisms to rebalance incentives by increasing the opportunity costs for a decentralized venture participant to sue over a smart contract outcome and providing efficient alternatives to litigation. Even with inherent limitations, code deference provisions may functionally create code deference in all but a narrow set of circumstances. Effective incentives toward code deference move participants in decentralized ventures closer to the ideal of systems that allow parties to transact using rules created and enforced by code rather than rules created and enforced by a legal system.

I. INTRODUCTION

Smart contracts have become a common topic of academic scholarship.¹ Legal academics have attempted to contextualize smart contracts within existing law using doctrines of interpretation and construction typically applied to legal contracts.² This approach occasionally views smart contracts as legal contracts, but more often as components of a broader set of representations and promises which, considered together, may constitute legal contracts.³ Through this lens, disputes over smart contracts may be

1. As of June 14, 2021, 741 law review and journal articles available on Westlaw include the term “smart contract.”

2. See Reggie O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 185–87 (2017); Stuart D. Levi & Alex B. Lipton, *An Introduction to Smart Contracts and Their Potential and Inherent Limitations*, HARV. L. SCH. F. CORP. GOVERNANCE (May 26, 2018), <https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/> [<https://perma.cc/RND5-J6GM>] (addressing the legal enforceability of “code only contracts”).

3. Shaanan Cohnen & David A. Hoffman, *Transactional Scripts in Contract Stacks*, 105 MINN. L. REV. 319, 320 (2020); LABCFCTC, A PRIMER ON SMART CONTRACTS 4 (2018), https://www.cftc.gov/sites/default/files/2018-11/LabCFTC_PrimerSmartContracts112718_0.pdf [<https://perma.cc/5EHJ-7UPK>] (“[A] ‘smart contract’ is a set of coded computer functions [that] . . . [m]ay incorporate the elements of a binding contract (e.g., offer, acceptance, and consideration), or may simply execute certain terms of a contract.”). [Eds. Pls fix]

resolved by the application of legal rules using the traditional legal dispute apparatus.⁴

This article takes a different approach to disputes arising over smart contracts based upon observations of their use in decentralized ventures. Instead of asking whether disputes over smart contract outcomes may be resolved using existing law, I ask whether users of decentralized ventures can be compelled to always defer to the outcome of the code used by the venture and to not seek to resolve disputes over smart contracts using litigation and legal remedies.

Smart contracts are code that can transact or alter the state of some digital asset.⁵ This state alteration may modify the power of a party to control a digital asset or alter the digital asset itself.⁶ Smart contracts operate deterministically; if smart contract code receives the appropriate data, its code will execute.⁷ This feature is foundational to smart contracts' appeal; they can be relied upon to perform as expected. Smart contracts have been used to build systems that facilitate collaborative action among their users. These smart contract-powered systems ("decentralized ventures") allow human participants to collaboratively undertake governance tasks, and to collectively affect rights to digital assets.⁸ Various types of decentralized systems rely on different levels of human support and interaction to function. However, all decentralized ventures are premised on two assumptions: first, that smart contracts will operate as expected; and second, that their human participants will agree to be bound to the outcome of those smart contracts.⁹ Given that decentralized ventures rely on sometimes complicated interaction between multiple smart contracts to function,¹⁰ a failure of one smart contract may impact other smart contracts, the venture's participants, and others, including third parties.¹¹

While the architecture of a given decentralized venture will determine how much human interaction is required for it to operate, certain decentralized ventures rely on smart contracts to allow their users to interact, to control transactions of digital assets, and to settle those transactions with finality. Certain decentralized applications enable their users to engage in transactions that do not include identifiable counterparties or without trusting typical third-party intermediaries.¹² Others coordinate large groups of users to act

4. Cohney & Hoffman, *supra* note 3, at 321 ("[C]an contract law make sense of intractable bugs in transactional code? The answer is likewise simple: yes.").

5. *Id.* at 323 ("[T]he code effectuates a consensus change to the state of a ledger.") (emphasis omitted).

6. See generally DANIEL T. STABILE ET AL., DIGITAL ASSETS AND BLOCKCHAIN TECHNOLOGY: U.S. LAW AND REGULATION 218 (2020) (disussing how smart contracts work).

7. *Id.* at 256 ("Smart contracts are intended to automatically execute upon the receipt of triggering data. This automatic execution limits the flexibility of users of these agreements.").

8. Vitalik Buterin, *DAOs, DACs, DAs and More: An Incomplete Terminology Guide*, ETHEREUM BLOG (May 6, 2014), <https://blog.etherium.org/2014/05/06/daos-dacs-das-and-more-an-incomplete-terminology-guide/> [<https://perma.cc/UXE8-6VV2>].

9. We describe the result of the execution of a smart contract as its "outcome."

10. See, e.g., *The Maker Protocol Smart Contract Modules System*, MAKERDAO, <https://docs.makerdao.com/#the-maker-protocol-smart-contract-modules-system> [<https://perma.cc/E6BA-VK7H>] (illustrating the various modules, each of which is powered by numerous smart contracts used by MakerDao) [hereinafter MAKERDAO].

11. "Interested parties" or "parties interested" describes parties who interact with smart contracts, or whose rights, powers, privileges, or assets are affected by the execution of smart contracts. This may include third parties who use assets created by decentralized ventures, but who do not actually participate in the operation or governance of that venture. This term would include, for example, users of the DAI instrument generated by the operation of MakerDao.

12. Such applications include Compound, Aave, and MakerDao.

collectively.¹³ Regardless of their architecture, decentralized ventures generally rely on code to transact assets or to coordinate their users.

Users and designers of decentralized ventures generally attempt to avoid litigation because litigation has uniquely disruptive effects on decentralized ventures. The mere act of being served with a complaint would severely impact decentralized ventures; litigation holds may require smart contracts to stop operating, could require digital assets controlled by smart contracts to be frozen, and may be impossible or extremely burdensome to implement. Injunctive relief that would stop smart contracts from operating, freeze digital assets controlled by smart contracts or require a deployed smart contract to be interrupted or disabled may be impossible to implement. Injunctions and litigation hold obligations impact interested parties, including unnotified third parties who use these smart contracts or assets created by decentralized ventures, and whose rights to digital assets rely upon the continuing operation of smart contracts.

Because the digital assets controlled by smart contracts and their human users are governed by law, any effort to create code deference must be grounded in law.¹⁴ Decentralized ventures sometimes attempt to avoid litigation by imposing prior restraints to prevent their participants from filing lawsuits. This is true even if the relief available from courts may be limited by the intractability of smart contract code, underlying system architecture, or efforts to obfuscate the identity of parties responsible for the decentralized venture and of other participants.¹⁵ Thus, the success of decentralized ventures will rely in part on the enforceability of legal agreements that seek to prevent litigation over smart contract outcomes. Restraint from recourse through the legal system, if available at all, must come in the form of a legal agreement.

It is unclear how effective these legal restraints can be. Can parties bind themselves to the outcome of executory smart contract code, no matter what? Are agreements to defer to the outcomes of smart contract execution and not to sue, even if a smart contract outcome varies from what was expected, fails to execute, or is modified by others, legally enforceable? If so, how effective are such agreements if challenged *ex post*? Even if those agreements are enforceable, are they effective? What are the limits of legal agreements to defer to smart contract code?

This article analyzes various strategies employed by decentralized autonomous organizations, a type of decentralized venture, to prevent their human participants from litigating smart contract outcomes. TheDao, a web of smart contracts that was designed to behave like an investor-led venture capital fund, avoided incorporation, attempted to disclaim legal relationships among its participants and itself, and obscured the identity of its interested parties, insulating the venture with confusion, opacity, and complexity.¹⁶ Other decentralized ventures have formed legal entities that use smart contracts to automate or execute governance tasks and that attempt to use legal contracts to bind their human users to code deference. The MetaCartel Ventures DAO, incorporated as a Delaware

13. See Buterin, *supra* note 8 (describing DAOs).

14. Private computer systems, the Internet, and their users are governed by law.

15. See generally Olaf Meyer, *Stopping the Unstoppable: Termination and Unwinding of Smart Contracts*, 9 J. EUR. CONSUMER & MKT. L. 17 (2020) (discussing limitations of court power to affect deployed smart contracts).

16. Andrew Hinkes, *The Law of the DAO*, COINDESK (May 19, 2016, 10:15 AM), <https://www.coindesk.com/the-law-of-the-dao> [<https://perma.cc/QKU3-46BT>] (detailing the acts of TheDao);

limited liability company, uses covenants in its operating agreement that treat “exceptional” smart contract outcomes as errors to be handled by internal dispute resolution procedures, and otherwise requires its members to covenant not to sue over smart contract outcomes to the extent legally permissible. The LAO, another decentralized venture incorporated as a Delaware limited liability company, deems actions undertaken by its native DApp and smart contract code to be equivalent to a written action approved by a majority vote of its members, narrowing, but not entirely foreclosing, the ability of members to sue over smart contract outcomes.¹⁷ Both the MetaCartel Ventures DAO and The LAO allow disputes to be resolved using on-system tools and procedures.

As yet untested structures or agreements could be used to attempt to create code deference. Users of decentralized ventures could exclude smart contract outcomes from the benefit of the parties’ bargain by agreeing that the outcome of smart contract code execution is not a material term of their agreement. Decentralized ventures could be designed to wind-up and return their human participants to some agreed-upon state when a dispute is litigated, rather than decided by on-system dispute resolution. This article examines strategies to create code deference across three sections. First, this article will briefly explain smart contracts and emphasize that smart contracts are code, not legal contracts. Second, this article will analyze efforts to bind users to the result of agreements made through electronic systems, examining electronic data interchange contracts as a historical model, analyzing approaches taken by existing decentralized ventures, and proposed strategies not observed in practice. Finally, this article will examine the limits of these efforts, and conclude with observations about the future of decentralized ventures.

II. SMART CONTRACTS ARE INSTRUCTIONS TO COMPUTERS, NOT LEGAL AGREEMENTS

Smart contracts are the technology that allow decentralized ventures to operate. As explained by Nick Szabo, smart contracts allow “contractual clauses [to] be embedded in hardware and software . . . in such a way as to make breach of contract expensive (if desired, sometimes prohibitively so) for the breacher.”¹⁸ Smart contracts deployed on blockchains allow code to directly affect digital assets by using “if-then” logic to trigger transactions. The smart contract code deployed at a wallet address controls when and how a digital asset may be transacted to another wallet address.¹⁹ To use a smart contract, a user transacts some digital asset (*i.e.*, a technically compatible form of information) to the smart contract wallet address. That smart contract code thereafter exercises on-system control over that digital asset subject to its execution.²⁰ Upon the receipt of some external information by the smart contract code,²¹ the code will “execute,” and affect the digital

17. See Section III(C)(iii)(2), *infra* for more discussion of the LAO.

18. Nick Szabo, *Formalizing and Securing Relationships on Public Networks*, 2 FIRST MONDAY (Sept. 1997), <https://firstmonday.org/ojs/index.php/fm/article/view/548/469> [<https://perma.cc/SWEM-84HZ>].

19. Werbach & Cornell, *supra* note **Error! Bookmark not defined.**, at 321–22; see also ANDREAS M. ANTONOPOULOS, *MASTERING BITCOIN: UNLOCKING DIGITAL CRYPTO-CURRENCIES* 61 (2014) (describing how bitcoin addresses are generated from public keys).

20. The smart contract code defines and limits how the smart contract will act upon the digital asset controlled by the smart contract.

21. Data is supplied by an “oracle,” which is a trusted third party designated in the smart contract code to

asset under the code's control.²² Both the smart contract code and the underlying network upon which the smart contract operates define and limit the power of the code and the assets upon which the code can act.²³ In many cases, smart contracts are used like technical middleware; smart contracts can be used to modify or transform a digital asset, or to transmit information.²⁴

Smart contracts were suggested as a potential replacement for conventional contracting²⁵ and transactional lawyers.²⁶ Although there is a rich academic literature discussing the steady progress of logic-based computing automating aspects of legal contracting,²⁷ to date, smart contracts are mostly used in experimental ventures, proof of concept projects, and in the booming DeFi sector.²⁸

This does not suggest that smart contracts are not worthy of serious examination; given their flexibility, smart contracts enable perhaps the purest expression of private law.²⁹ Smart contracts provide a hyper-flexible framework for agreement with a fully-integrated, alegal enforcement mechanism. Smart contracts thus provide the tools necessary to implement an independent private system of order.³⁰ The decentralized

provide information necessary to trigger the smart contract to execute. LabCFTC defines an oracle as "a mutually agreed upon, network authenticated reference data provider (potentially a third-party)." LABCFTC, *supra* note 3, at 6.

22. We describe the result of the execution of the smart contract as its "outcome."

23. See generally Meyer, *supra* note 15; Jenny Balliet, *Professor Andrew Hinkes Discusses Throw Away the Keys or the Key Holder?*, MEDIUM (July 14, 2019), <https://medium.com/athena-trade/professor-andrew-hinkes-discusses-throw-away-the-keys-or-the-key-holder-696c18bb1a40> [https://perma.cc/9J3F-U5RV].

24. See MAKERDAO, *supra* note 10 (visually representing the MakerDAO Smart Contract Modules System which facilitates DAI, a stablecoin cryptocurrency); see also Sklaroff, *infra* note 83, at 276.

25. See Cohney & Hoffman, *supra* note 3, at 321 n.9 (quoting Mark Verstraete, *The Stakes of Smart Contracts*, 50 LOY. U. CHI. L.J. 743, 743 (2019) ("The most ardent supporters of smart contracts . . . claim that smart contracts might replace large swaths of the traditional contract system."); Werbach & Cornell, *supra* note **Error! Bookmark not defined.**, at 316 n.9, citing to Alexander Savelyev, *Contract Law 2.0: «Smart» Contracts as the Beginning of the End of Classic Contract Law* 21 (Nat'l Rsch. Univ. Higher Sch. of Economics, Working Paper No. BRP 71/LAW/2016, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885241 [https://perma.cc/6XAN-YLSS].

26. See Dean Sonderegger, *Blockchain: Can Smart Contracts Replace Lawyers?*, ABOVE THE L. (Feb. 27, 2018, 11:56 AM), <https://abovethelaw.com/2018/02/blockchain-can-smart-contracts-replace-lawyers/> [https://perma.cc/9WBQ-UAZ6]; see also Amy J. Schmitz & Colin Rule, *Online Dispute Resolution for Smart Contracts*, J. DISP. RESOL. 103, 104 (2019), <https://scholarship.law.missouri.edu/facpubs/726> [https://perma.cc/ZUS6-E5GG] (discussing "ODR" and the fact that "[a]lthough most do not fully understand smart contracts, hype about their use is building").

27. See generally Harry Surden, *Computable Contracts*, 46 U.C. DAVIS L. REV. 629 (2012) (discussing the legal impact of representing contractual obligations as data); Carla Reyes, *A Unified Theory of Code-Connected Contracts*, 46 J. CORP. L. 981 (2021).

28. See David Gay & Andrew Hinkes, *The Coming Storm: DeFi and Bankruptcy Courts*, CARLTON FIELDS (June 24, 2020), <https://www.carltonfields.com/insights/publications/2020/the-coming-storm-defi-and-bankruptcy-courts> [https://perma.cc/4KDU-FJ5A] (exploring DeFi platforms' approaches to establishing legal relationships);

29. See James Grimmelmann, *All Smart Contracts Are Ambiguous*, 2 PENN. J.L. & INNOVATION 1, 3 (2019) (explaining smart contracts as "a way for parties to enjoy the benefits of binding contracts without relying on a legal system: private law without a public authority"). Contract law can be thought of as providing parties the "facilities for realizing their wishes, by conferring legal powers upon them to create, by certain specified procedures and subject to certain conditions, structures of rights and duties within the coercive framework of the law." H.L.A. HART, *THE CONCEPT OF LAW* 27 (1961).

30. Grimmelmann, *supra* note 31, at 3.

ventures examined in this article seek just that—to use code to make new systems through which their users may transact, under rules created and enforced by their code.

Using code alone to order human relationships and transactions, however, is complicated. Code is a series of statements in an appropriate syntax to be understood by a programming language compiler that provides instructions for a computer to follow.³¹ A human reviewer of code must interpret the code and—based on that interpretation—infer what the computer will do in the future, if that code executes, and the effect of the computer’s response.³² The decentralized ventures discussed in this article use multiple smart contracts in combination, which may further complicate the effort to understand the impact of any given code segment, and from that understanding, infer the “expectations” of a participant in a decentralized venture. Code is written to be compiled and executed, not to be read and understood in the context of the law.³³

While interpreting the meaning of a smart contract may be difficult, these code-driven systems, however, do not exist in an information void. Users of smart contracts do not simply “happen upon” and send assets to a smart contract without any information.³⁴ Most users will receive some information about the smart contract, typically in the form of representations about what the code is intended to do, prior to transacting a digital asset to that code.³⁵ Not all users of smart contracts have sufficient technical skills to review the smart contract code, and code review is not required for a user to interact with a smart contract.³⁶ Instead, smart contracts exist and are used in a greater context—within a larger venture, or as an element of a broader set of representations and promises.³⁷ If a smart contract is used in the context of a legal contract, offer and acceptance of contract terms will typically occur through communications independent of the smart contract code.³⁸ In that case, the smart contract will be used to execute some performance called for by the contract.³⁹ Thus, as Cohnsey and Hoffman suggest, smart contracts can be thought of as

31. See Wulf A. Kaal & Craig Calcaterra, *Crypto Transaction Dispute Resolution*, 73 BUS. LAW. 109, 135–39 (2017).

32. An appropriately trained code reviewer could review code and understand what impact its execution would have on digital assets. However, ambiguity may persist. See generally, Grimmelman, *supra* note 31.

33. See Kaal & Calcaterra, *supra* note 33 (discussing the problems facing courts in enforcing smart contracts).

34. Although this may occur in testnet -type environments, most users would not commit assets of value or meaning to code that they know absolutely nothing about.

35. In some instances, users have funded smart contracts that are known to be unaudited and untested. See, e.g., Andre Cronje (@AndreCronjeTech), TWITTER (Sept. 28, 2020, 9:09 PM), <https://twitter.com/AndreCronjeTech/status/1310763506170499072> (describing the immediate funding and subsequent attack on an unaudited smart contract). Even in this extreme case, however, users had some information about the smart contract; those funding the smart contract knew that the code was written by the developer who previously launched the successful DeFi platform, Yearn Finance.

36. Although a smart contract may be restricted, most smart contracts are available for any party to use provided that party is able to transact a compatible type of digital asset to the proper public network address. In the Ethereum system, smart contract code is publicly viewable. See Chen et al., *infra* note 41, at 3 (“Their bytecode and transactions are all stored on the blockchain and visible to all users.”).

37. See Cohnsey & Hoffman, *supra* note 3, at 363 (“...the code never stands alone”).

38. See STABILE ET AL., *supra* note 6, at 221 (discussing degrees of integration of human language agreements into smart contracts).

39. Zachary L. Catanzaro & Robert Kain, *The Revolution Will Be Memorialized: Selected Blockchain-Based Smart Contract Use Cases*, 94 FLA. BAR J. 52, 52 (describing smart contracts as “automat[ing] contractual performance”).

part of a “stack” of representations, statements, and promises that together may create the elements of an agreement which together may create a legal contract.⁴⁰

Smart contracts are used because their behavior is predictable and efficient; when triggered, a smart contract will generally execute. Whatever value may be gained by smart contracts’ predictability and automated execution may be offset by their inflexibility. Smart contracts generally cannot be modified once deployed,⁴¹ which means that errors or bugs in their code are usually not repairable.⁴² Similarly, smart contracts usually cannot be stopped or paused once deployed and funded.⁴³ This becomes problematic because smart contracts may have latent defects,⁴⁴ may be undermined by actions of others affecting their code,⁴⁵ or affecting their underlying blockchains,⁴⁶ which may cause smart contracts to behave in unexpected ways,⁴⁷ or to fail to execute when expected.⁴⁸ Other smart contracts relied upon to act as oracles may have bugs or may fail, which may affect the smart contracts at issue.⁴⁹ These conditions may give rise to disputes over smart contract

40. See Cohney & Hoffman, *supra* note 3, at 362–68 (describing “the stack”).

41. Usha R. Rodrigues, *Law and the Blockchain*, 104 IOWA L. REV. 679, 682 (2018) (“Because of the decentralized, distributed nature of the blockchain ledger, changes in the code will be rejected unless the code itself contemplates subsequent modifications.”); Levi & Lipton, *supra* note 2 (“[S]mart contracts cannot easily be amended or terminated unless the parties incorporate such capabilities during the creation of the smart contract.”); see also Jiachi Chen et al., *Defining Smart Contract Defects on Ethereum*, 46 IEEE TRANSACTIONS ON SOFTWARE ENG’G 4 (2020), <https://arxiv.org/pdf/1905.01467.pdf> [<https://perma.cc/TZ9Q-7DAW>] (“Smart contracts cannot be patched after deploying them to the blockchain.”).

42. Modifiable smart contracts have been proposed but have not achieved common use. See Schmitz & Rule, *supra* note 27, at 116 (discussing Sagewise, a smart contract system that builds in the ability to freeze a contract and initiate dispute resolution).

43. System governance, however, may condition the immutability of smart contract code. See, e.g., Robert Stevens, *\$130 Million of KuCoin Hacker’s Haul to Be Frozen by Crypto Projects*, DECRYPT (Sept. 27, 2020), <https://decrypt.co/43066/130-million-of-kucoin-hackers-haul-to-be-frozen-by-crypto-projects> [<https://perma.cc/6XV6-MLT5>] (explaining how in response to an exchange hack, multiple cryptocurrency systems and smart contract platforms updated their code, paused their blockchains, froze assets issued by their blockchains, invalidated assets issued on their blockchains, or issued replacements for existing tokens issued on their blockchains).

44. Some estimate that code errors are common, if not endemic, in smart contracts. See David Zaslow, *What to Expect When Litigating Smart Contract Disputes*, LAW360 (Apr. 4, 2018, 5:11 PM), <https://www.law360.com/articles/1028009/what-to-expect-when-litigating-smart-contract-disputes> [<https://perma.cc/86KE-5EJJ>]. For a discussion of common latent defects on Ethereum, see generally Chen et al., *supra* note 41 (identifying common defects in smart contracts). Given that cultural conventions encourage code library re-use, it is likely that defects will be found across a variety of different smart contracts. See Cohney and Hoffman, *supra* note 3, at 328–329.

45. See Santiago Palladino, *The Parity Wallet Hack Explained*, OPENZEPPELIN (July 19, 2017), <https://blog.openzeppelin.com/on-the-parity-wallet-multisig-hack-405a8c12e8f7/> [<https://perma.cc/GXR9-4P6G>] (detailing an instance of smart contract behavior being modified because of a code library being deleted).

46. See discussions about the fork of Ethereum implemented to address the exploit of the Dao, in Part III(C)(ii), below.

47. *Id.*

48. See Christine Kim, *Ethereum’s Istanbul Upgrade Will Break 680 Smart Contracts on Aragon*, COINDESK (Sept. 30, 2019, 10:35 AM CDT), <https://www.coindesk.com/ethereums-istanbul-upgrade-will-break-680-smart-contracts-on-aragon> [<https://perma.cc/6WL7-CB2F>] (describing how a fork of Ethereum affected existing smart contracts used by Aragon).

49. See, e.g., Cathy Barrea, *MakerDAO’s Problems Are a Textbook Case of Governance Failure*, COINDESK (Mar. 17, 2020, 1:00 AM CTD), <https://www.coindesk.com/makerdaos-problems-are-a-textbook-case-of-governance-failure> [<https://perma.cc/K57U-VKUY>] (describing how a malfunctioning oracle resulted in a \$8

outcomes which may in turn result in litigation.

Scholars have argued that courts may or may not choose to involve themselves in disputes over smart contracts, which arguments roughly track the historical tensions between the law as regulator of private transactions and the historical recognition of self-help as a legal remedy. Raskin has suggested that smart contracts should be viewed as a kind of extra-legal self-help, and that courts should only get involved in disputes over smart contract outcomes when their execution would violate public policy or be unconscionable.⁵⁰ As Werbach noted, however, law defines and limits what forms of self-help are available.⁵¹ This tension—between what a smart contract can do, and what the law will allow it to do⁵²—remains an open question.

Notwithstanding hypothetical and academic approaches to smart contracts and the assets controlled by them, those who are interested in their outcomes exist in a world of laws. Nothing can stop a party interested in the outcome of a smart contract from filing a lawsuit over its execution.⁵³ Litigation involving smart contracts has already occurred,⁵⁴ and may become commonplace if the technology is widely adopted.⁵⁵ Litigation in the context of a decentralized venture, however, can be highly disruptive and damaging to a decentralized venture, its participants, interested parties, and third parties who rely upon its operation.

What if a decentralized venture wanted to opt-out of law and compel its human participants to accept the outcome of its code execution? How can a decentralized venture avoid litigation? Can a decentralized venture bind its participants to smart contract outcomes, no matter what?

million loss). See also Whiterabbit, *Black Thursday for MakerDAO: \$8.32 million was liquidated for 0 DAI*, MEDIUM (Mar. 14, 2020), https://medium.com/@whiterabbit_hq/black-thursday-for-makerdao-8-32-million-was-liquidated-for-0-dai-36b83cac56b6 [<https://perma.cc/HY4N-Q7EW>] (explaining how a sharp drop in Ethereum price, along with blockchain congestion resulted in an oracle failure and a loss of over \$8million).

50. Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. REV. 305, 333 (2017). (“Automated execution of a contract is a preemptive form of self-help because no recourse to a court is needed for the machine to execute the agreement.”).

51. Werbach & Cornell, *supra* note **Error! Bookmark not defined.**, at 320 (describing the evolution and utilization of smart contracts).

52. See Raskin, *supra* note 50, at 306 (positing that smart contracts that can be effectively altered *ex post* by courts, which he calls “weak smart contracts,” are little more than a new way to articulate existing contracts, but that strong smart contracts that cannot be adjudicated *ex post* create new challenges).

53. Judicial remedies rely on the availability of actors who will respond to and be accountable to courts. Orders and writs, while effective on the human participants, may be ineffective against ventures created and operated by code. Significant issues exist as to the ability of courts to assert jurisdiction over entities that are not incorporated. See Part III(C)(ii), *infra* where we address some of these concerns in our discussion of 2016’s theDao. Absent the entry of a pre-filing injunction order by a court, there is nothing to stop a party from filing a lawsuit. See discussion of judicially imposed pre-filing injunctions in Part III, below.

54. See *B2C2 v. Quoine Pte Ltd*, [2019] SGHC(I) 03 (Sing.) (addressing limited issues related to smart contracts in the more complex context of automated trading bots interacting with automated market making bot on a cryptoasset trading platform).

55. Sir Geoffrey Vos, Chancellor of the High Ct., Annual COMBAR Lecture: Future Proofing for Commercial Lawyers in an Unpredictable World (Nov. 12, 2019), https://www.judiciary.uk/wp-content/uploads/2019/11/COMBAR.lecture2019.final_.pdf [<https://perma.cc/S63V-3Z93>].

III. DECENTRALIZED VENTURES AND THE GOAL OF CODE DEFERENCE

A. Concepts Underlying Decentralized Ventures

Ethereum founder Vitalik Buterin proposed various types of decentralized ventures that may be created with smart contracts, including decentralized applications (DApps) decentralized organizations (DOs), and decentralized autonomous organizations (DAOs).⁵⁶ Although entrepreneurs have experimented with various types of decentralized entities,⁵⁷ the first significant decentralized venture was theDao,⁵⁸ which used a web of smart contracts to create a user-directed form of investment fund.⁵⁹ TheDao was a DAO, characterized as an autonomous venture made of code and smart contracts, existing online, itself controlling some property and engaging with humans on a limited basis, primarily to perform tasks that the DAO itself cannot perform.⁶⁰

More recently decentralized applications have been used to provide financial services without intermediaries or in some cases, without legally addressable counterparties. These so-called “DeFi” systems use smart contracts to provide financial services that traditionally require trusted third parties.⁶¹ Examples include decentralized applications like automated market makers, which facilitate peer-to-peer exchanges of digital assets without a trusted third party,⁶² decentralized margin and derivatives contracts,⁶³ and collateralized debt positions which allow users to obtain “overcollateralized loans” of digital assets.⁶⁴ These DeFi systems may be mere smart contracts providing services to their users, may be operated and managed by identifiable issuers, or may be governed by diffuse groups

56. See Buterin, *supra* note 8 (noting these proposals).

57. See BITSHARES, <https://bitshares.org/> [<https://perma.cc/DB5A-V92E>] (exemplifying a decentralized entity).

58. Christoph Jentzsch, *The History of the DAO and Lessons Learned*, SLOCK.IT BLOG (Aug. 24, 2016), <https://blog.slock.it/the-history-of-the-dao-and-lessons-learned-d06740f8cfa5> [<https://perma.cc/578Y-FAL2>].

59. *Id.* See also Hinkes, *supra* note 16 (discussing why investment in The DAO is probably a security)

60. See Buterin, *supra* note 8.

61. Fabian Schär, *Decentralized Finance: On Blockchain- and Smart Contract-Based Financial Markets*, ECON. RSCH. FED. RSRV. BANK ST. LOUIS (Feb. 5, 2021), <https://research.stlouisfed.org/publications/review/2021/02/05/decentralized-finance-on-blockchain-and-smart-contract-based-financial-markets> [<https://perma.cc/S3WP-TZJH>] (“DeFi uses smart contracts to create protocols that replicate existing financial services in a more open, interoperable, and transparent way.”). See generally, *What Is DeFi?*, COINDESK, <https://www.coindesk.com/what-is-defi> [<https://perma.cc/S6J8-MDN4>] (Dec. 17, 2020).

62. See *Id.* (describing automated market makers as “Constant Function Market Makers”); see also EYAL HERTZOG ET AL., BANCOR PROTOCOL: CONTINUOUS LIQUIDITY AND ASYNCHRONOUS PRICE DISCOVERY FOR TOKENS THROUGH THEIR SMART CONTRACTS; AKA “SMART TOKENS” 1, 7 (May 30, 2017), <https://whitepaper.io/document/52/bancor-whitepaper> [<https://perma.cc/G4TB-DXLR>] (detailing the actions of automated market makers).

63. See generally ANTONIO JULIANO, DYDX: A STANDARD FOR DECENTRALIZED MARGIN TRADING AND DERIVATIVES, <https://whitepaper.dydx.exchange/> [<https://perma.cc/8JCR-PW9S>] (Aug. 6, 2018).

64. A variety of different DeFi lending protocols also match lenders and borrowers using smart contracts. See, e.g., ERNESTO BOADO, AAVE PROTOCOL WHITEPAPER (v1.0) (2020), https://github.com/aave/aave-protocol/blob/master/docs/Aave_Protocol_Whitepaper_v1_0.pdf [<https://perma.cc/E9E9-8TRL>]; ROBERT LESHNER & GEOFFREY HAYES, COMPOUND: THE MONEY MARKET PROTOCOL (2019), <https://compound.finance/documents/Compound.Whitepaper.pdf> [<https://perma.cc/36ZK-47CK>].

exercising defined power over the system's operation via so-called "governance tokens."⁶⁵ The range of control over governance provided to governance token holders varies widely.⁶⁶ Although the characteristics of these decentralized ventures vary, users of decentralized applications and DAOs alike rely upon smart contracts to operate as expected.

B. Necessity of Code Deference

Deference to smart contract outcomes is critical for the orderly operation of decentralized ventures that rely on smart contracts to affect rights to assets, implement their human participants' governance decisions, and facilitate participant interaction. If a participant claims that a smart contract was defective, or that somehow the outcome of a smart contract damaged that participant, they may file a lawsuit and seek damages or other relief against the decentralized venture. Changes to the smart contract code enabling DeFi systems that provide a service to their users will impact all users of those decentralized ventures and other interested parties, including users of assets created by those decentralized ventures. Thus, it may be impossible to change the functionality of the decentralized ventures without altering the rights or powers of interested parties, including other users of the system, or users of assets created by the decentralized ventures. Unlike other more conventional ventures, even the mere filing of a lawsuit may have a uniquely devastating impact on a decentralized venture, its users, and third parties who rely upon the venture. This article addresses the impact of lawsuits against decentralized ventures by considering the disruptive impact of litigation and judicial remedies.

The mere filing and service of a lawsuit is disruptive to a decentralized venture. Parties to litigation are generally required to impose a "litigation hold" to preserve the *status quo* and to preserve relevant evidence.⁶⁷ In a lawsuit brought against a decentralized venture, litigation hold obligations may require that smart contracts that might affect the information, records, and assets at issue be stopped or frozen. This requirement may be problematic given that many smart contracts used by decentralized ventures cannot be frozen, suspended, or modified to prevent them from executing or to prevent human participants from interacting with them.⁶⁸ A litigation hold may require a decentralized venture to modify its code, which may be impossible, or prejudicial to interested parties.

For the same reasons, courts may encounter difficulties implementing remedies affecting smart contracts. Decentralized ventures may not be incorporated or registered and

65. Schär, *supra* note 613, at 19 ("Some projects rely on voting schemes, where the respective governance tokens grant their owners the right to vote on the protocol's future. However, in many cases, the majority of governance tokens are held by a small group of people, effectively leading to similar results as with admin keys.").

66. A fulsome comparison of governance over DeFi systems using governance tokens merits deeper investigation but is beyond the scope of this article.

67. See *Zubulake v. UBS Warburg LLC*, 220 F.R.D. 212, 216–19 (S.D.N.Y. 2003); Patrick W. Michael, *E-Discovery Since Zubulake—Litigation Holds*, 11 NAT'L L. REV. (Apr. 4, 2011), <https://www.natlawreview.com/article/e-discovery-zubulake-litigation-holds#:~:text=The%20duty%20to%20preserve%20relevant,Zubulake%2C%20220%20F.R.D.&text=In%20the%20case%20of%20Plaintiff,anticipates%20the%20possibility%20of%20litigation> [https://perma.cc/3MNU-79B3] (detailing a litigation hold). However, a blockchain may preserve historical data reflecting the activity of smart contracts and their users.

68. See Chen et al., *supra* note 41, at 3 ("Smart contracts cannot be patched after deploying them to the blockchain."); *id.* at 8 ("Since we cannot modify smart contracts after deploying them . . .").

may not act through legally cognizable agents.⁶⁹ Provisional remedies like injunctions or freeze orders that prohibit, interrupt, or halt transactions are only effective if there is a legally responsible party available and able to implement them.⁷⁰ Courts cannot compel code to respond to their orders; orders must be effectuated through legally addressable persons.⁷¹ In certain decentralized ventures, compliance with an injunction or freeze order seeking to prevent a smart contract from executing may be practically impossible.

Even if possible to implement, these remedies may impact the overall operation of the decentralized venture, affect the rights of its users, interested parties, and others who rely on the venture. Many DeFi systems use data provided by other decentralized ventures as oracles to trigger their smart contracts' execution.⁷² Decentralized ventures often create digital assets which may be used by persons who do not otherwise interact with the decentralized venture.⁷³ Thus remedies which would alter smart contracts may alter the rights and assets of third parties, which implicate significant due process and notice concerns.⁷⁴ This suggests that in many cases, court power to compel decentralized ventures will be limited to *ex ante* and *ex post* remedies against participants, as opposed to remedies that impact the decentralized ventures themselves.⁷⁵

Even where decentralized ventures are legally incorporated or act through legally recognized agents, the functionality of smart contracts is limited by their code. Although a blockchain may preserve historical data reflecting the activity of smart contracts and their users, a "litigation hold" preventing future transactions that would alter the *status quo* may functionally require the entire venture to grind to a halt, or be impossible to implement.⁷⁶

Litigation also creates a risk that transactions occurring among participants of the decentralized venture may not settle with finality and may subsequently be reversed. The fear of a challenge to a smart contract's outcome that may divest participants or third parties of their property or powers in the future would undercut the key attribute of smart contract-driven ventures—their predictability. As a result, uncertainty of transaction settlement may significantly discourage decentralized venture adoption and use.

69. See, for example, theDao, as discussed *infra* Section III(C)–(iii).

70. See generally Meyer, *supra* note 15.

71. See *id.*

72. See Barrea, *supra* note 49.

73. See, for example, MakerDao's DAI instrument, which was issued as a result of participants interacting with MakerDao vaults, and which is both widely traded on exchanges and used as a stablecoin by people who do not open vaults or participate in MakerDao governance. See generally DAI 1.0, MAKERDEVELOPER, <https://developer.makerdao.com/dai/1/> [<https://perma.cc/X6Y4-EPTU>] (last visited May 12, 2021). Changes to the MakerDao code may impact the DAI instrument and would also impact those who hold, use, and facilitate trading in it.

74. A common consideration in granting injunctive relief is whether the injunction will not disserve the public interest. See, e.g., *Stormans, Inc. v. Selecky*, 586 F.3d 1109, 1139 (9th Cir. 2009) ("If, however, the impact of an injunction reaches beyond the parties, carrying with it a potential for public consequences, the public interest will be relevant to whether the district court grants the preliminary injunction. . . . In fact, 'courts . . . should pay particular regard for the public consequences in employing the extraordinary remedy of injunction.'"). An injunction depriving thousands of unnoticed third parties' of their property rights and powers on DeFi systems would create considerable harm and implicate the public interest.

75. See Werbach & Cornell, *supra* note **Error! Bookmark not defined.**, at 140 ("Once the smart contract is made, the machinery for its execution is unavoidably set in motion, ending the parties' opportunity to affect the transaction *ex post*.").

76. See generally *Id.* (describing this potential consequence).

Human participants in DeFi platforms may hail from around the world.⁷⁷ Given that different nations' legal systems vary, disputes may be addressed under a variety of different laws that may apply different standards of proof and make available different legal remedies. The result may be inconsistent outcomes and uncertainty which would tend to discourage decentralized venture use.

Because courts may have limited power over decentralized ventures, deference to code outcomes will be necessary for decentralized ventures to avoid being interrupted and impaired by litigation holds, orders granting injunctive relief, and the uncertainty of litigation.

C. Code Deference Strategies

i. EDI Master Agreements

Before blockchains and smart contracts, electronic data interchange (EDI) agreements were used to structure an "electronic communications relationship between . . . parties," who intended to rely on those communications to establish terms of enforceable agreements.⁷⁸ EDI is defined as the computer-to-computer interchange of strictly formatted (*i.e.*, machine-readable and typically only machine-read) messages that represent documents other than monetary instruments.⁷⁹ Parties using EDI agreements attempted to leverage the speed and border-crossing character of electronic communication to create enforceable contracts but were confronted by a legal system that had not yet embraced the formation of contracts via electronic communication.⁸⁰ Electronic data interchange agreements established the basis by which electronic messages exchanged between parties will result in the creation of a legally enforceable contract.⁸¹ Parties contracting using EDI expressly agreed not to contest the "validity or terms of [agreements] on the basis that they were concluded by EDI, that the original records were in electronic form, or that no signature(s) evidence such [agreements]."⁸² The essence of EDI agreements is that the parties agree to use the EDI system to exchange information, and to agree to form binding agreements in reliance on that information, even in the absence of laws that would otherwise provide applicable gap fillers.⁸³ These agreements were limited by their legal

77. TheDao, for example, was known to have users from multiple countries.

78. Amelia H. Boss, *Electronic Data Interchange Agreements: Private Contracting Toward a Global Environment*, 13 NW. J. INT'L L. & BUS. 31, 38 (1992). EDI was frequently used for shipping, logistics and manufacturing. *See id.* (describing the integration of EDI in the global trading economy).

79. *See* U.S. DEP'T OF COM., NAT'L INST. OF STANDARDS & TECH. SPECIAL PUBL'N 800-9, GOOD SECURITY PRACTICES FOR ELECTRONIC COMMERCE, INCLUDING ELECTRONIC DATA INTERCHANGE 1 (Roy G. Saltman ed., 1993), <https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-9.pdf> [<https://perma.cc/9Q2R-J9KD>] (defining EDI).

80. Boss, *supra* note 78, at 33 (discussing the history of EDI contracts).

81. *See, e.g.*, INT'L AIR TRANSP. ASS'N, *Model Electronic Data Interchange Agreement (EDI)*, 36 CARGO SERVS. CONF. RESOLS. MANUAL 251, 252 (2015–2016), <https://www.iata.org/contentassets/b38f5c2910e843bc967f4fff2d4fc53a/tp1670.pdf> [<https://perma.cc/X32B-LU85>]. This form of agreement has been used to permit freight forwarder agreements to be created via electronic data interchange instead of by paper airway bills and has as its objective "to permit the Parties to conclude legally binding Cargo Contracts by electronic means." *Id.*

82. *Id.* at 253.

83. *See* Jeremy M. Sklaroff, Comment, *Smart Contracts and the Cost of Inflexibility*, 166 U. PA. L. REV.

context; most agreements recite that they are only effective in jurisdictions where the law does not require traditional, *i.e.*, non-electronic, contracts.⁸⁴

Notwithstanding their novelty, there is little evidence that the waiver of objection to the formation of a legal contract by EDI was ever successfully attacked in court.⁸⁵ However, these waivers only applied to contract *formation* via EDI. The decentralized ventures described herein rely on code to affect their human users' powers and rights relative to assets controlled by the venture.⁸⁶ Notwithstanding this limitation, EDI agreements are an example of parties who rely upon technology to form enforceable relationships "using a paper contract to create an 'interpretive regime' to govern the particular risks of their transaction," and successfully bind themselves to it.⁸⁷

ii. Examining DAO Code Deference Strategies

Many decentralized ventures have attempted either expressly or implicitly to create code deference. The need for code deference and the strategy to attempt to obtain it varies based upon the extent of human participant governance and interaction with assets and other participants, and thus varies by decentralized venture type. Users of DApps, for instance, generally use code to obtain an outcome or perform a transaction.⁸⁸ DAOs are used to facilitate collective activity by their human participants. I will examine three attempts to create code deference by DAOs, all of which have in common their delegation of significant governance responsibilities to their participants.

The best-known decentralized venture is theDao,⁸⁹ which both succeeded and failed within a few weeks.⁹⁰ TheDao marketed that its "code is law," and disclaimed the creation of any legal relationships among its participants.⁹¹ Its promoters marketed theDao as if it

263, 278 n.59 (2017) (citing BENJAMIN WRIGHT, THE LAW OF ELECTRONIC COMMERCE 11 (1991) ("[T]he day of 'interactive' EDI is coming Futurists see the day when computers negotiate. One computer will offer to buy 500 widgets, and the second counteroffers with 300. The first will accept the counteroffer to form a contract.")).

84. See INT'L AIR TRANSP. ASS'N, *supra* note 81, at 251 (noting that EDI mediated agreements may be effective unless the applicable law requires paper airway bills).

85. See Sklaroff, *supra* note 83, at 289 (citing Lawrence A. Cunningham, *Language, Deals, and Standards: The Future of XML Contracts*, 84 WASH. U. L. REV. 313, 321 (2006) ("In EDI's four-decade history, no litigation concerning EDI-formed contracts occurred.")).

86. See *id.* at 286 ("On the other hand, blockchain not only enables information to be stored, accessed, and secured according to infinitely complex business rules. It also connects smart contracts to the information systems responsible for executing those business rules.").

87. *Id.* at 291 n.137.

88. See generally *Decentralized Applications (DAPPS): Ethereum-powered Tools and Services*, ETHEREUM, <https://ethereum.org/en/dapps/> [<https://perma.cc/GP7Z-KJTA>] (describing various aspects of decentralized applications including their public and open nature).

89. See Nathaniel Popper, *A Venture Fund with Plenty of Virtual Capital, but No Capitalist*, N.Y. TIMES (May 21, 2016), <https://www.nytimes.com/2016/05/22/business/dealbook/crypto-ether-bitcoin-currency.html> [<https://perma.cc/4MDL-UFR4>] ("The start-up, a sort of venture capital fund that calls itself the Decentralized Autonomous Organization, has essentially come out of nowhere in the last month and attracted about \$152 million, at last count . . . making it the most successful crowdfunded venture ever, by a significant margin.").

90. See Matthew Leising, *The Ether Thief*, BLOOMBERG (June 13, 2017), <https://www.bloomberg.com/features/2017-the-ether-thief/> [<https://perma.cc/X9YW-ZLZL>] (reporting on its success and failure).

91. See Adam J. Kolber, *Not-So-Smart Blockchain Contracts and Artificial Responsibility*, 21 STAN. TECH.

existed outside any legal system.⁹²

TheDao itself was a series of smart contracts built and deployed on the Ethereum blockchain; theDao was not incorporated or registered under any legal authority.⁹³ No legal compliance, including participant identity disclosure or verification, or contractual undertakings were required to participate in theDao; any user could transact ether (ETH) to theDao's smart contract and receive DaoTokens which could then be used to participate in the governance of theDao.⁹⁴ TheDao's structure required its human participants to partake in governance tasks for the venture to function; smart contracts allowed participants to vote on almost all material transactions and decisions affecting theDao, including whether to authorize technical upgrades to the code, in what projects to invest assets controlled by theDao, and to allow participants to exit and withdraw their invested funds.⁹⁵

TheDao raised about \$150 million USD worth of ETH from its human participants⁹⁶ and was the first widely used DApp built on Ethereum.⁹⁷ TheDao failed shortly after its launch when a human participant identified and exploited a code defect⁹⁸ that allowed that user to withdraw her own investment, plus approximately \$50 million worth of ETH contributed by others.⁹⁹ The exploit prompted philosophical debates over whether the exploiter's use of the code was improper,¹⁰⁰ and who, if anyone, had the responsibility or authority to attempt to remedy the effect of the exploit.¹⁰¹ Various commentators considered the exploit to be theft,¹⁰² while others viewed it as permitted by the code, and

L. REV. 198, 204–07 (2018) (discussing the various philosophical approaches to remediate the various failures of theDao).

92. See Drew Hinkes, *A Legal Analysis of the DAO Exploit and Possible Investor Rights*, BITCOIN MAG. (June 21, 2016), <https://bitcoinmagazine.com/articles/a-legal-analysis-of-the-dao-exploit-and-possible-investor-rights-1466524659> [<https://perma.cc/UC4X-M9S5>] citing to the theDao Terms of Service:

The terms of The DAO Creation are set forth in the smart contract code existing on the Ethereum blockchain at 0xbb9bc244d798123fde783fcc1c72d3bb8c189413. Nothing in this explanation of terms or in any other document or communication may modify or add any additional obligations or guarantees beyond those set forth in The DAO's code. Any and all explanatory terms or descriptions are merely offered for educational purposes

Notwithstanding its considerable marketing of “code is law,” theDao did in fact include a series of contradictory representations regarding the legal status of its participants and their contributed assets, some of which implied the existence of agreements. However, there was no “clickwrap” or “browsewrap”-type agreement required for a participant to purchase DaoTokens or otherwise interact with theDao.

93. Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, Release No. 81207-1 (July 25, 2017), <https://www.sec.gov/litigation/investreport/34-81207.pdf> [<https://perma.cc/4JLS-F932>] (describing theDao as an “unincorporated organization”).

94. DaoTokens could also be traded for other assets on liquid exchange markets independent of the operation of theDao. See *The DAO*, COINMARKETCAP, <https://coinmarketcap.com/currencies/the-dao/> [<https://perma.cc/86QA-5AKM>] (showing historic prices for DaoTokens on various markets).

95. See David Siegel, *Understanding the DAO Attack*, COINDESK, <https://www.coindesk.com/understanding-dao-hack-journalists> [<https://perma.cc/V4Y2-AN8B>] (Dec. 17, 2020, 10:00 AM CST) (reporting on the attack).

96. *Id.*

97. *Id.*

98. *Id.*

99. See Leising, *supra* note 90 (detailing the debates over the appropriate response to the attack).

100. *Id.*

101. *Id.*

102. *Id.*

presumptively valid.¹⁰³ After contentious debate, a software update forking the Ethereum blockchain to eliminate theDao's smart contract code from the post-fork Ethereum blockchain was widely implemented by Ethereum node operators, which resulted in most investors in theDao receiving back their invested ETH.¹⁰⁴

While the exploit was ongoing and prior to the Ethereum fork that eradicated theDao's smart contract, commentators suggested that affected participants might sue. The concept of the code creating the "law" that governs an agreement is appealing but results in a complex interpretive task for the Court. Any participant in theDao who was harmed by the attack and filed a lawsuit seeking damages would face several challenges: Who can be sued? Under what theory? Compounding these issues, theDao did not require its participants to verify or disclose their identities. Given that theDao did not legally incorporate and delegated governance to its broad population of unidentified DaoToken holders, it would be difficult to identify "theDao." Further, given its distributed governance system, it is not immediately clear who could be said to "represent" theDao.

The lack of legal personhood associated with theDao and lack of identity verification of its participants would complicate efforts to sue. The putative plaintiff must identify a legally addressable person or entity that is legally accountable for theDao. However, theDao had no officers, directors, managers, or registered agents. Certain participants, identified as "Curators," owed duties to other participants, and were empowered to alter the governance of theDao.¹⁰⁵ However, it is unclear who, if anyone, was an agent for theDao itself. The lack of incorporation and lack of clear roles among participants is unlikely to protect theDao or its participants; as noted by many commentators, under the specific circumstances presented, a court could conclude that the venture was a joint venture or general partnership,¹⁰⁶ and subject *all* participants to full joint and several liability.¹⁰⁷ Under this interpretation, any participant could be held liable for all acts of all participants and the venture itself, and be served with process on its behalf.¹⁰⁸ Certain

103. This assertion has been advanced but appears dubious. See Mircea Popescu, *To the Dao and the Ethereum Community: Fuck You*, TRILEMA (June 18, 2016), <http://trilema.com/2016/to-the-dao-and-the-ethereum-community-fuck-you/> [https://perma.cc/67LQ-K2S3] (defending the legality of the DAO exploitation in a blog post claimed to be written by the thief).

104. See Leising, *supra* note 90 (noting the circumstances of the attack on theDao and response to that attack remain controversial).

105. Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, *supra* note 93, at 7.

106. These questions have been addressed by multiple commentators. See, e.g., Hinkes, *supra* note 94; Stephen Palley, *How to Sue a Dao*, COINDESK (Mar. 20, 2016, 10:17 AM CDT), <https://www.coindesk.com/how-to-sue-a-decentralized-autonomous-organization> [https://perma.cc/8ZVN-LSCE].

107. Evaluation by regulators in the context of a securities analysis point to both the code deployers and the curators as acting on behalf of the entity as an issuer of securities. See generally Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, *supra* note 93. The analysis found in the Rule 21 Report necessarily only focuses on theDao's pre-operation state and does not account for theDao's post issuance operation by its participants. *Id.*

108. See, e.g., Ballard v. United States, 17 F.3d 116, 118 (5th Cir. 1994) ("Under Texas law, a joint venturer, or partner, is jointly and severally liable for all the debts of his partnership."); Radaker v. Scott, 855 P.2d 1037, 1041 (1993) ("All members of a joint venture are jointly and severally liable to third persons for wrongful acts committed in furtherance of the joint enterprise. Moreover, under principles of law related to joint ventures, the negligence or fraud of one venturer, while acting within the scope of the enterprise, may be imputed to co-venturers so as to render the latter liable for the injuries sustained by third persons as a result of the negligence or fraud."). [eds. Pls fix footnote spacing/move quote up]

jurisdictions allow for service of process upon unincorporated unregistered collective entities. These laws could be used to serve legal process on decentralized ventures.¹⁰⁹

A participant in theDao could have filed suit against theDao if they suffered damages as a result of the exploit. Because all participants expressly disclaimed contractual relations as part of their participation in theDao, claims would likely sound in tort, implied contract, or equitable theories. If a participant sued alleging, for instance, breach of implied contract, that participant would need to identify the terms of the implied contract and identify the term allegedly breached. If the implied contract was based in terms of communications and representations, it is unlikely that a given smart contract term would be relevant; the terms would likely relate to what the participant's expectations, rather than on any specific code provision. However, if the implied contract was based upon an understanding of what specific code provisions would do when they execute, a plaintiff may be required to identify what expectation based upon which smart contract term was purportedly breached: "the code of the split contract included a recursive call error."¹¹⁰ Alternatively, the plaintiff could characterize the breach in behavioral terms: "the Dao was only supposed to return each user's contributed ETH." The plaintiff in this particular case could identify a specific code segment that malfunctioned—the split transaction code¹¹¹—but would have to allege that another participant's use of the code which resulted in that participant taking value from theDao caused her damage, and then allege that the venture itself is liable.¹¹²

Another obvious issue is the language of the smart contract code itself. Although the code underlying theDao was publicly available, no human participating in theDao was required to read the code to participate in theDao; all user interaction was conducted by software interfaces that obscured the underlying code. If a user of a smart contract did not read the code and only used the software interface, it is difficult to assert that the user knowingly assented to any specific line of code, unless it was deemed accepted by use, as is common in end-user license agreements.¹¹³ However, users of theDao were not required to enter into any agreement that included such a term.¹¹⁴ Thus, the assumption that parties are bound to terms because they accepted them, which is argued in "clickwrap" type license agreements, does not apply.

Likewise, if the human participant is incapable of reading code, she may have had a different understanding of what would occur upon the code's use than what would be understood by a user who actually reviewed the code. Parol evidence may be introduced to

109. See, e.g., GA. CODE ANN. § 9-2-25(b) (2020) ("Service of process in the action against the organization or association shall be had by service upon any officer or official member of such organization or association . . .").

110. Phil Daian, *Analysis of the Dao Exploit*, HACKING DISTRIBUTED (June 18, 2016, 1:11 AM), <https://hackingdistributed.com/2016/06/18/analysis-of-the-dao-exploit/> [https://perma.cc/G9YC-JZ85] (describing the specific code defect that led to theDao exploit).

111. *Id.*

112. The attack on theDao is a complex case. A claim by a user would require allegation that (a) the code was defective as created, (b) a third party used the code in a way that exploited the defect in the code, and (c) that the third party's use of the code triggered the defect that caused the plaintiff damage. This claim is more attenuated than a hypothetical claim that the code used by the plaintiff failed to execute or executed in an unexpected manner and as a result failed to produce the outcome expected, causing damage.

113. TheDao expressly disclaimed contracts among its participants and did not feature any "browsewrap" or "clickwrap" acceptance of terms before a user could acquire DaoTokens or otherwise participate in governance tasks.

114. See Hinkes, *supra* note 924 (covering various statements related to the existence or non-existence of legally enforceable agreements among theDao and its participants).

establish the other representations and information which together constitute the “terms of the agreement” which were allegedly breached.¹¹⁵ However, a court would defer to an objective, rather than subjective understanding when attempting to identify what a participant would reasonably expect to avoid inconsistent outcomes. Those objective interpretations would likely be drawn from the overall set of communications about the venture, rather than the code used by the venture.¹¹⁶

However, even if a plaintiff could serve an appropriate party and could identify the terms of the contract at issue, the court’s power to impose a remedy would likely be limited to *ex post* remedies. As noted above, smart contract code may be unable to be altered or interrupted once deployed.¹¹⁷ Even if technically possible, remedies that interrupted or altered the operation of theDao itself would probably affect the rights of many unidentified interested parties, including third parties.¹¹⁸ Given the limitations of smart contracts, *ex post* remedies applied against human participants in decentralized ventures may be the best available outcome.¹¹⁹

TheDao’s strategy of attempting to “opt out” of the law, the legal equivalent of technical “security by obscurity,”¹²⁰ created confusion, complexity, and increased the difficulty of filing lawsuits. It also limits available remedies, effectively creating a “shield” of confusion and obfuscation, insulating theDao and its participants against litigation. However, none of the complexity would actually bar any party from filing suit, and as discussed above, parties in court may have arguments to surmount the agency and jurisdiction-related hurdles. Instead, however, Ethereum forked its network to eradicate theDao’s smart contracts and return most of theDao’s human participants to their original position. As a result, no claims related to the exploitation of theDao by any human participant in theDao are known to have been filed or determined by any court.

iii. “Legally Compatible” Attempts to Impose Code Deference in DAOs

Some decentralized ventures have legally incorporated and used legally enforceable agreements to provide their human participants with clear allocations of rights and powers in an attempt to protect the decentralized venture from litigation over smart contract outcomes. We address two such examples below.

115. “Where a valid contract is incomplete, extrinsic evidence is admissible to complete the writing if it is apparent from an inspection of the writing that all the particulars of the agreement are not present, and that evidence does not vary or contradict the writing.” *Matthius v. Platinum Estates, Inc.*, 903 N.Y.S.2d 477, 479 (N.Y. App. Div. 2010).

116. See, for example, *AG Oncor, LLC v. Ligand Pharmaceuticals Inc.*, C.A. No. 2018-0556-JTL, 2019 WL 2245976 (Del. Ch. May 24, 2019), which in an analogous case found that errors in the underlying bond indenture documents could be conformed to the offering and marketing documents which were relied upon by purchasers.

117. Werbach & Cornell, *supra* note 14, at 378.

118. Given that theDao participants were mostly unidentified and that DaoTokens were traded on exchanges and otherwise used for commercial purposes beyond theDao governance, a remedy that would impair or alter a smart contract would impact users of theDao, others who own DaoTokens, and others who transact with DaoTokens, including cryptoasset exchanges.

119. See Raskin, *supra* note 50, at 325 (“[T]he remedies will be either *ex post* through legal action or *ex ante* through regulation.”).

120. Consideration of jurisdiction over unincorporated, unregistered ventures comprised of smart contracts supported by global networks of computers operated by volunteers is a fascinating discussion best left for another day.

1. *MetaCartel “Pact” and “Qualified Code Deference”*

“MetaCartel Ventures (MCV) is a for-profit DAO created by the MetaCartel community for the purposes of making investments into early-stage Decentralized Applications (DApps).”¹²¹ Its members “sourc[e], conduct[] due diligence, propos[e], and vot[e] on investments” through its smart contract system.¹²² The MCV DAO implementation of code deference relies on both code and law.¹²³ Legally, the MCV DAO is a member-managed Delaware limited liability company governed by the “Official Grimoire Setting Forth the Sacred and Inviolable Pact of the MetaCartel Ventures Dao,” (the Pact), which is a highly customized Delaware LLC Operating Agreement.¹²⁴ Like theDao, MCV DAO members interact with the MCV DAO and with other members through software interfaces, and their actions are implemented by smart contracts.¹²⁵

The Pact embraces “Qualified Code Deference,” or a policy of “code is law, except” when (a) the code malfunctions in specified ways or (b) prohibition or limitation of right to bring a legal proceeding would be illegal or unenforceable.¹²⁶ The Pact includes a covenant that smart contract outcomes are presumptively correct and binding on Members, and a covenant not to sue for claims related to smart contract outcomes,¹²⁷ except for certain types of smart contract failures, described as Material Adverse Exception Events, which may give rise to dispute resolution within the MCV DAO,¹²⁸ or in limited cases, a right to file suit.¹²⁹ Members who may be subject to specific statutory prohibitions against releasing unknown claims under California law are also deemed to have waived that protection.¹³⁰

The Pact allows Members to sue where (a) the limitation of a right to bring a claim is “illegal or unenforceable under the laws of the State of Delaware or any applicable U.S.

121. *Metacartel/MCV*, GITHUB (Mar. 6, 2020), <https://github.com/metacartel/MCV/wiki> [<https://perma.cc/J93E-HH7S>].

122. *Id.*

123. *See Moloch Ventures/Moloch*, GITHUB, <https://github.com/MolochVentures/moloch> [<https://perma.cc/XAM7-6TJJ>] (providing an explanation of the design principles, explaining that the technical structure is based on Moloch v2 smart contract standard).

124. GABRIEL SHAPIRO, OFFICIAL GRIMOIRE SETTING FORTH THE SACRED & INVIOABLE PACT OF THE METACARTEL VENTURES DAO (Feb. 14, 2020), <https://github.com/metacartel/MCV/blob/master/Legal/Grimoire%20and%20Exhibits/MCV-Grimoire-Final-All-Exhibits.pdf> [<https://perma.cc/KD6A-AFTP>] [hereinafter PACT]. Yes, it is really called that!

125. *See id.* at § 1.10(a)(ix) (detailing the process).

126. *See id.* at § 1.10(c) (“Qualified Deference to Results of Designated Smart Contract”) (defining its code deference provisions).

127. *Id.* (“[T]he results of operation of the Designated Smart Contracts shall be determinative of the rights and obligations of, and shall be final, binding upon and not permitted to be contested or disputed by, the Org and each of the Members with respect to the Org and all matters relating to the Org or the Members in their capacities as Members (including the management powers and duties of Members), and shall not be contested (in a Legal Proceeding or otherwise) by any of them . . .”).

128. *Id.* at § 7.5 (providing that disputes over the outcome of the on-system dispute resolution system are to be determined by the Delaware Court of Chancery).

129. PACT, *supra* note 124, at § 1.10(c). [eds. Should this be *Id.*?]

130. *See id.* at § 1.10(e) (stating that wherein California members are deemed to have waived section 1542 of the Civil Code of the State of California, which limits the extent of a general release to not cover claims that the releasing party does not know or suspect exists at the time of the release and that would have materially affect his or her settlement with the released party).

federal law,”¹³¹ or (b) when a Material Adverse Exception Event, as defined therein, occurs due to fraud, willful misconduct, or a knowing violation of a Legal Requirement, or resulted in an improper personal benefit to the presumptive defendant and caused damages to the presumptive plaintiff.¹³²

For other Material Adverse Exception Events, the Pact implements a system-native dispute resolution process that calls for dispute resolution by the Members on the platform, subject to the affected smart contract and property at issue being held at a “standstill,” *i.e.*, frozen, to be held in trust, and not subject to withdrawal.¹³³ The Members then use internal voting procedures, also conducted by smart contract, to determine whether the claim is valid and what actions, if any, are to be taken, which determination Members are bound to follow.¹³⁴ Members who violate the code deference provision may be liable to the “defendant,” who may either be the actual MCV DAO or an affected member, for damages and “reasonable costs of defense.”¹³⁵

The Pact offers other alternatives to litigation or on-system dispute resolution. Under most circumstances, any Member may immediately exit the MCV DAO using its “RageQuit” function whereby a Member immediately discontinues participation in the MCV DAO and withdraws their investment.¹³⁶ Likewise, Members can remove other Members via the “GuildKick” function which quickly reimburses and removes a Member from the MCV DAO.¹³⁷ Members can also propose a new project that would reverse, negate, or modify a prior smart contract outcome.¹³⁸

The Pact offers “qualified code deference” through a contract whereby Members covenant not to sue over smart contract outcomes, deferring instead to a venture -native dispute resolution procedure, but may sue under a narrowly defined set of exceptional circumstances. Alternative remedies in the form of immediate exit from the venture or corrective action within the venture are also available to MCV DAO Members.

2. The LAO

The LAO is a decentralized venture that attempts to create “a member-directed venture capital fund organized in the United States, with an aim to be compliant with U.S. law.”¹³⁹ Like the MCV DAO, the LAO is a Delaware LLC that is “primarily administered via an online application (a ‘Dapp’) and related smart contracts.”¹⁴⁰ The LAO is governed

131. *Id.* at § 1.10(c)(i).

132. *Id.* at § 1.10(c)(ii).

133. *See id.* at § 1.10(d) (detailing the “standstill” function which may ameliorate the burdens associated with a litigation hold addressed above).

134. PACT, *supra* note 124, at § 1.10(d).

135. *Id.* at § 1.10(e) (“Any violation or breach of this Section 1.10, including the covenant not to sue . . . shall entitle the . . . Plaintiff(s) to any Damages . . . including reasonable costs of defense arising from breach or violation of the covenant not to sue.”).

136. *See id.* at § 5.4(a) (detailing the “RageQuit” function).

137. *See id.* at § 5.4(b) (detailing the “GuildKick” function).

138. *Id.* at § 4.4 (stating the proposal process).

139. *What Is the LAO*, THE LAO (Mar. 9, 2021, 5:55 PM), <https://docs.thelao.io/> [<https://perma.cc/HT6L-3XZ7>].

140. *Id.*

by an Operating Agreement entitled The LAO Operating Agreement (LaoOA).¹⁴¹ The goal of The LAO is to allow its participants “to pool capital, invest in projects, and share in any proceeds from the investment.”¹⁴² Like the Dao and the MCV DAO, The LAO Members interact through smart contracts or a DApp software interface.¹⁴³ Unlike the MCV DAO, members of The LAO act to affect property primarily, but not exclusively, through software and smart contracts.¹⁴⁴

The LaoOA includes a code deference provision that addresses the validity of operations of the DApp and its smart contracts, in Section 4.01(a)(2):

... whenever any action, including any approval, consent, determination, resolution, or decision is to be taken or given by the Members or the LAO under this Agreement or under the Act, it shall be authorized by a Majority Vote of the Members. *Such an authorization may be evidenced by a vote recorded via a Dapp and facilitated, in part, by one or more smart contracts or by a written consent, in accordance with this Agreement.* Any such written consent shall set forth the action taken, and be signed by Members holding the minimum Tokens necessary to authorize such action. *The Members and the Service Provider intend that any action taken by the Members via a Dapp and facilitated, in part, by one or more smart contracts shall be treated as a written consent for purposes of this Agreement and the Delaware Act, and no Member or the Service Provider shall challenge the authority or validity of any such action based solely on such fact.* Further, *the Members and the Service Provider intend that any action . . . taken by the LAO via a Dapp, a smart contract, or the blockchain, including with respect to any Potential LAO Investment or LAO Investment, shall be a valid action of the Members or the LAO, as applicable, and no Member or the Service Provider shall challenge the authority or validity of any such action based solely on such fact.* The Members expressly intend to give the fullest effect to Section 18-113 of the Delaware Act.¹⁴⁵

The LaoOA treats actions undertaken by the Members through the DApp or any smart contract as an action by written consent of the LAO approved by Majority Vote of the Members and recites that “no Member . . . shall challenge the authority or validity of any such action based solely on such fact.”¹⁴⁶ Thus, smart contract outcomes are treated as if

141. LAO Operating Agreement, at § 4.01(a) (Jan. 30, 2020) [hereinafter LaoOA] (unpublished draft) (on file with author) (“Except as otherwise expressly required in this Agreement, the business and affairs of the LAO shall be carried on and managed exclusively by the Members, who shall have sole and absolute discretion with respect thereto.”).

142. *Id.*

143. *See id.* at § 4.01(a)(2) (explaining that members may authorize actions of The LAO through smart contracts, through the DApp, or by written consent); *see also Voting Rights*, THE LAO (Mar. 9, 2021, 5:55 PM), <https://docs.thelao.io/votingrights.html> [<https://perma.cc/DP66-24K3>] (“Members will be prompted to vote via The LAO DApp . . . at various points during the lifecycle of The LAO Voting is primarily facilitated by blockchain-based smart contracts and all voting records will be searchable via the DApp and recorded to the Ethereum blockchain.”).

144. *Id.*

145. LaoOA, *supra* note 141, at § 4.01(a)(2) (emphasis added).

146. *Id.* This provision is limited on its face by its applicability under § 18-113 of the DLLCA, which provides general authorization for the use of electronic transmission and electronic signatures in entity actions or

they were written votes of the majority of the LAO's Members. The LaoOA also binds its Members to a waiver similar to that found in EDI Agreements, which attempts to bar claims premised upon the use of smart contracts or Dapps.¹⁴⁷

A Member of the LAO who wishes to challenge a smart contract outcome may offer a proposal that would reverse, negate, or modify the smart contract outcome at issue, subject to the fixed procedures of the LaoOA.¹⁴⁸ A Member can withdraw from the LAO "at any time," and recover their undeployed capital, or be removed.¹⁴⁹

3. Comparing the Pact and the LaoOA Code Deference Strategies

Both the MCV DAO and The LAO are incorporated as Delaware LLCs, which allows them to rely upon the flexibility and predictability of established statutory law, and the well-developed body of case law interpreting that law. Both ventures include code deference provisions in their operating agreements but use different approaches.

The Pact's "Qualified Code Deference" combines an agreed presumption of correctness of smart contract outcomes with limited alternative dispute resolution within the venture, and an express covenant not to sue over smart contract outcomes, subject to exceptions for specific types of adverse outcomes and where a waiver is unenforceable under applicable law.

Covenants not to sue are commonplace in certain agreements, including settlement agreements.¹⁵⁰ A covenant not to sue is an agreement to not file a lawsuit, rather than an abandonment of any right.¹⁵¹ A covenant not to sue differs from a release in that a covenant not to sue is executory and demands ongoing performance while no further performance is required by a release.¹⁵² A release is the abandonment of a claim; a covenant not to sue is an agreement not to enforce a cause of action.¹⁵³ A covenant not to sue cannot actually prevent a lawsuit from being filed or excuse a party from any duties that arise when a suit is filed, including the duty to preserve evidence. Violation of a covenant not to sue, however, may give rise to a claim for breach of contract and damages.¹⁵⁴

transactions, subject to important statutory exceptions found in Delaware statutes and restrictions fixed in the entity's organizational documents. Section 18-113 allows for "[a]ny act or transaction contemplated or governed by" the applicable Entity Act or the entity organizational documents to "be provided for in a document, and an electronic transmission shall be deemed the equivalent of a written document." Limited Liability Company Act, DEL. CODE ANN. tit. 6, § 18-113 (2020).

147. LaoOA, *supra* note 141, at § 4.01(a)(2).

148. Although the option of a new proposal that would address any problems created by a prior smart contract outcome is not offered expressly as a remedy in the LaoOA, it would be available pursuant to § 4.01 and § 4.06 of the LaoOA. *Id.*

149. See LaoOA, *supra* note 142, at § 7.01, and accompanying text. Like the MCV DAO, members can also be subject to "compulsory withdrawal" or removed. *Id.* at § 7.03.

150. See RICHARD A. ROSEN ET AL., SETTLEMENT AGREEMENTS IN COMMERCIAL DISPUTES: NEGOTIATING, DRAFTING, AND ENFORCEMENT § 9.01 (2d ed. 2021).

151. 19A N.Y. JUR. 2D *Compromise, Accord, and Release* § 81 n.1, Westlaw (database updated Feb. 2021) (citing *Colton v. New York Hospital*, 385 N.Y.S.2d 65 (1976)).

152. *Id.*

153. *Id.*

154. *Id.* at § 81; see also *Pro Done, Inc. v. Basham*, 210 A.3d 192, 205 (N.H. 2019) (awarding the costs of defending suit in violation of a covenant not to sue as damages). A provision including a covenant not to sue may allow a party to seek injunctive relief to enforce that covenant, but that term would still require the party entitled to enforce it to seek relief from the court.

The Pact allows participants to submit certain disputes to alternative dispute resolution conducted by Members through the venture.¹⁵⁵ This is consistent with historical practices found in insular or small communities that have used their own means of dispute resolution according to local norms and principles.¹⁵⁶ The range of acceptable alternative dispute resolution procedures is vast. Provided that the alternative dispute resolution provision is voluntary and its procedures are fair (meaning that it accords with due process) courts will generally enforce alternative dispute resolution provisions and support their outcomes.¹⁵⁷ Judicial consideration of arbitration procedures, for instance, are illustrative. Legally recognized alternative dispute resolution must meet constitutional requirements of due process.¹⁵⁸ Arbitration provisions have been thrown out where the forum for arbitration is found to be illusory,¹⁵⁹ and where provisions are procedurally arbitrary and capricious by, for instance, imposing unreasonable delays and unreasonable burdens on litigants.¹⁶⁰ Alternative dispute resolution (ADR) provisions that require a party to engage in that alternative dispute resolution as a condition precedent to bringing a suit have also been rejected for unreasonably denying litigants reasonable access to courts.¹⁶¹ Given that the Pact is silent as to procedural details of its alternative dispute resolution system, including whether evidence may be presented, it is unclear on its face whether its proposed alternative dispute resolution would be held enforceable if challenged.

The Pact also includes a waiver of “any statute or common law regarding protection or release of unknown claims in any jurisdiction.”¹⁶² Although parties to a private agreement have broad latitude to organize their own affairs, “freedom of contract is a qualified, and not an absolute, right.”¹⁶³ The extent to which parties may waive rights and obligations is limited. ‘Waiver’ has been defined by the U.S. Supreme Court as requiring “an intentional relinquishment or abandonment of a known right or privilege.”¹⁶⁴ Certain contract rules are implied in all contracts and cannot be waived, such as a duty of good

155. See PACT, *supra* note 124, at § 1.10(d) (describing the alternative dispute resolution process).

156. Schmitz & Rule, *supra* note 27, at 115 (discussing the *sui generis* emergence of alternate dispute resolution among niche communities and industries).

157. See generally the Federal Arbitration Act, 9 U.S.C. § 2; *FusionStorm, Inc. v. Presidio Networked Sols., Inc.*, 871 F. Supp. 2d 1345, 1353 (M.D. Fla. 2012) (“the FAA expresses . . . ‘a liberal federal policy favoring arbitration agreements, notwithstanding any state substantive or procedural policies to the contrary.’”).

158. See U.S. CONST. amend. V (“No person shall . . . be deprived of life, liberty, or property, without due process of law . . .”); *id.* at amend. XIV (“[N]or shall any State deprive any person of life, liberty, or property, without due process of law . . .”). For a discussion of constitutional challenges to arbitration provisions, see generally Kimberly J. Mann, Comment, *Constitutional Challenges to Court Ordered Arbitration*, 24 FLA. STATE U. L. REV. 1055 (1997). Due process usually requires formal testimony and the right to cross-examine witnesses. See *id.* (citing Dwight Golann, *Making Alternative Dispute Resolution Mandatory: The Constitutional Issues*, 68 OR. L. REV. 487, 540 (1989)).

159. See *Inetianbor v. CashCall, Inc.*, 768 F.3d 1346, 1349 (11th Cir. 2014) (“[I]f a forum selection clause is integral to an arbitration agreement, and the forum is unavailable, then arbitration cannot be compelled.”).

160. See *Aldana v. Holub*, 381 So. 2d 231, 236–37 (Fla. 1980); *Mattos v. Thompson*, 421 A.2d 190, 196 (Pa. 1980) (rejecting provisions that were procedurally arbitrary and capricious).

161. *People ex. rel. Christiansen v. Connell*, 118 N.E.2d 262, 270 (Ill. 1954).

162. PACT, *supra* note 124, at § 1.10(e). Although there is a covenant not to sue that MCV DAO members, there is no pre-emptive release of any claims.

163. *Chi., Burlington, & Quincy R.R. Co. v. McGuire*, 219 U.S. 549, 567 (1911).

164. *Johnson v. Zerbst*, 304 U.S. 458, 464 (1938).

faith.¹⁶⁵ Other rights are freely waivable, such as the right to trial by jury.¹⁶⁶ Although statutory rights generally may be waived,¹⁶⁷ some waivers are prohibited. For instance, private parties cannot waive public obligations and cannot waive or release statutory rights conferred on private parties that affect the public interest if that waiver contravenes the statutory policy.¹⁶⁸ In this case, however, in the absence of a specific statute that is on its face unwaivable, or that confers some statutory protection that benefits third parties, the waiver found in the Pact would likely be enforceable.¹⁶⁹

Instead of using a covenant not to sue, ADR, or waivers, the LaoOA instead characterizes smart contract outcomes as properly authorized written votes of the majority of Members of the LAO, which establishes those outcomes as *prima facie* valid under the LaoOA.¹⁷⁰ The effect of this covenant is to pre-approve operations conducted by the smart contract or DApp. Implied, but not expressly noted, is that any member could bring a suit against the LAO,¹⁷¹ alleging that the operation of the smart contract was defective and that the vote of the majority of the members of the LLC was erroneously reported by the smart contract or DApp. A Member could file suit for reformation of the LAO's records, which is essentially a request to correct a scrivener's error.¹⁷² The result of such a suit would be tantamount to reversing or re-writing the results of the smart contract's outcome.

Both the Pact and LaoOA allow a Member to reclaim their uninvested capital and quickly to exit the decentralized venture, and both allow any Member to propose a new project to be voted upon which might correct a purportedly improper smart contract outcome. However, these options may be insufficient for a participant whose right to assets is contested, or if those options require considerable time or come at significant expense.

The approaches taken by the Pact and the LaoOA attempt to shift incentives and burdens associated with Member challenges to smart contract outcomes. The Pact seeks to preclude litigation over routine smart contract outcomes and requires that challenges to certain exceptional smart contract outcomes be handled by on-system dispute resolution.

165. Gregory Klass, *Interpretation and Construction in Contract Law*, GEO. L. FAC. PUBL'NS. & OTHER WORKS 15 (2018), <https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=2971&context=facpub> [https://perma.cc/BF3A-GF6B]. "Every contract imposes upon each party a duty of good faith and fair dealing in its performance and its enforcement." RESTATEMENT (SECOND) OF CONTS. § 205 (AM. L. INST. 1981). Other mandatory rules that are non-waivable "include [for example] the minimum wage and civil rights laws, the penalty rule for liquidated damages, and the nonenforcement of contracts contrary to public policy." Klass, *supra* note 167, at 15. These rules may in some cases be modified by agreement, but not fully waived. *Id.* at 15 n.51.

166. See generally *Cannon v. Wells Fargo Bank N.A.*, 917 F. Supp. 2d 1025, 1058 (N.D. Cal. 2013) (waiving the right to a trial by jury).

167. See *Dinan v. Patten*, 116 A.3d 275, 282 (Conn. 2015) (explaining waiver of statutory rights under Connecticut law).

168. See *Pereira v. State Bd. Educ.*, 37 A.3d 625, 654–55 (Conn. 2012) (citing *Hatch v. Merigold*, 176 A. 266, 267 (Conn. 1935)) ("We previously have held that '[o]ne cannot waive a public obligation created by statute . . . but he may waive a statutory requirement the purpose of which is to confer a private right or benefit.'").

169. PACT, *supra* note 124, at § 1.10(e).

170. See LaoOA, *supra* note 142, at § 4.1(a)(2).

171. Under Delaware law, a member of an LLC may bring a derivative claim against the LLC. *Kroupa v. Garbus*, 583 F. Supp.2d 949, 953 (N.D. Ill. 2008).

172. *Richard B. Gamberg 2007 Fam. Tr. v. United Rest. Grp., L.P.*, C.A. No. 10994-VCMR, 2018 WL 566417, at *5 (Del. Ch. Jan. 26, 2018) ("One way that a written instrument may fail to reflect the 'real agreement' of the parties is the presence of a scrivener's error. A scrivener's error occurs where the written instrument 'fails to reflect the intention of the parties' through 'the mistake of the scrivener who drew the contract for the parties.'").

In any case, notwithstanding the contractual agreement not to bring suit, a member may file a lawsuit. The LaoOA does not offer a system-native dispute resolution mechanism; all smart contract outcomes are presumptively valid.¹⁷³ Notwithstanding, a member of the LAO can always file suit against the LLC. Both systems allow the objecting participating member to propose a new action that could be used to reverse or correct any given smart contract outcome.

In summary, the Pact features a limited covenant not to sue over smart contract outcomes, with carve-outs for certain types of claims, while the LaoOA clothes each outcome in the presumption of correctness found in a ratified action of the members of the entity.¹⁷⁴ Although the Pact adds the option of on-system dispute resolution in specified instances, and carve-outs allowing suits under limited circumstances, both systems ultimately arrive at the same place. Smart contract outcomes are presumptively valid, and dissatisfied participants have three options: (1) propose a new project or action that would have the effect of correcting the smart contract outcome at issue; (2) exit the venture; or (3) file a lawsuit.

iv. Alternative Approaches

Other strategies not yet observed in practice may disincentivize litigation over smart contract outcomes. Participants in decentralized ventures may agree that smart contract outcomes are not material to their participation in the decentralized venture, do not form any part of the benefit of their bargain, and that no remedies are available if the execution of smart contracts results in unexpected outcomes. However, to the extent that a decentralized venture uses a Dao-like structure, smart contracts will be relied upon by its participants to govern the venture and to affect interests in digital assets. These terms are likely to be less attractive to participants, who may rightfully understand them to limit their recourse in case of a defective smart contract or some unexpected or manipulated smart contract outcome. However, given the success of DeFi systems which expressly disavow creating legal relationships among their users, this cannot be assumed.¹⁷⁵ If such a provision was used, an exceptional or unexpected smart contract outcome would not amount to a breach of contract, but as noted above, could give rise to other claims including *implied contract*, *estoppel*, or *quantum meruit* and tort claims if a participant is damaged.

A decentralized venture could use game theory to motivate its human users to address disputes within its system. Such design could use both code and legally enforceable agreements to create a structure designed to mimic the result of the Ethereum fork that resolved the exploit of the Dao by “collapsing” or winding down the venture if a dispute over a smart contract outcome is filed in a court against the venture or against any person claimed to represent the venture.

173. See LaoOA, *supra* at 142, at § 4.01(a)(2) (stating this policy).

174. *Id.*

175. See David Gay & Andrew Hinkes, *The Coming Storm: DeFi and Bankruptcy Courts*, *supra* at 30; see also Andrey Yanai, *Decentralized Finance (DeFi)—The Future of Finance?*, BARNEA JAFFA LANDE (Oct. 15, 2020), <https://www.barlaw.co.il/high-tech/decentralized-finance-defi-the-future-of-finance> [https://perma.cc/GNK4-TKFZ] (“DeFi systems may be structured to mimic familiar legal relationships, like lender or escrow agent. However, most platforms will fail to adhere to the formalities necessary legally to establish that a given DeFi system has created an enforceable loan or is holding an asset as legal collateral to secure a promise.”).

This structure would require aligned code and legal provisions to be effective. First, human participants would need to enter into a legally enforceable agreement to wind down the venture, to return each participant's initial investment to that investor, and to otherwise discontinue operation of the venture's code if a lawsuit is filed related to a smart contract outcome. The venture's code would need to allow a participant to trigger smart contract code that, upon notification of a lawsuit being filed, would programmatically wind down the entity's smart contracts and return to its human participants their initial investment.¹⁷⁶

This proposed structure is ripe for abuse. Designers of such a system should be thoughtful about the threshold showing necessary to evidence to the code that a lawsuit has been filed. If any decentralized venture participant can unilaterally declare that a suit has occurred, there is little to prevent tampering with the system, and the system is not likely to operate for very long. Thus, appropriate design will be critical to prevent "pranks" from causing constant wind-ups. For instance, a system may be designed to require more than one participant to report the existence of a lawsuit which would trigger the wind down, reducing the likelihood of a wind down being accidentally or improvidently triggered. The wind down provision could require evidence of the lawsuit to be submitted to a group of compensated verifiers who would be contractually obligated to verify if a lawsuit was filed based on public records, and who could be liable for damages if they fail to perform honestly. Participants could be required to post collateral which is surrendered upon proof of improper invocation of the wind down procedure. Although such options may mitigate the risk in this design, a participant who has lost or spent considerable funds from her use of a decentralized venture may have "buyer's remorse" and manufacture a dispute to invoke the wind-down procedure, shut down the system, and return herself to her initial (*i.e.* more beneficial) state.

However, if such a wind down functionality was used in combination with effective on-venture ADR, the combination of strategies could provide incentives for participants who are benefitting from the operation of the platform to cooperate with aggrieved participants to resolve disputes without litigation. As each participant is on actual notice of the design of the system, participants who wish to continue using the system have incentives to resolve disputes within the venture's ADR and to prevent disputes by unhappy or damaged participants from being addressed via lawsuits.

This proposed strategy, however, may be challenged as damaging other users of assets generated by the operation of the decentralized venture who do not otherwise participate in the venture. In the case of theDao, for instance, many initial participants in theDao sold DaoTokens on exchange markets to buyers who did not participate in theDao. Thus, resolution of a claim related to a smart contract outcome that may appear fair to a claimant may damage others who have benefited from the operation of the system; those participants may sue to enjoin the operation of such a clause. Notwithstanding risks, such a provision could be viewed as a type of "mutually assured destruction"¹⁷⁷ and compel benevolent and

176. Historically, ventures that by design resist court power have resulted in negative consequences for those who benefit from them. *See, e.g.*, In re: Lawrence, 279 F.3d 1294 (11th Cir. 2002) (debtor who controls offshore trust and who created impossibility of compliance with a court order calling for turnover of assets held by that trust, is properly held in contempt of court). It remains to be seen whether such a structure, if attempted, will invite further litigation or prevent it.

177. Donald G. Brennan, *Strategic Alternatives*, N.Y. TIMES (May 24, 1971), <https://www.nytimes.com/1971/05/24/archives/strategic-alternatives-i.html> [<https://perma.cc/8G5Q-AHD6>]

cooperative behavior to resolve disputes within the decentralized venture's ADR systems.

Finally, a decentralized venture could require its participants to stipulate to a pre-filing injunction which would bar a participant from filing a lawsuit that relates to the venture. However, even a stipulated injunction cannot prevent a plaintiff from filing a lawsuit.¹⁷⁸ Private stipulated injunctions differ from judicial pre-filing injunctions or "gatekeeper orders" which are judicial remedies entered by courts under the All Writs Act¹⁷⁹ that prevent a party from filing a lawsuit without court approval.¹⁸⁰ These orders require court clerks to not permit an action to be filed.¹⁸¹ However, judicial prefiling injunctions are considered to be disciplinary measures, to be used as a "remedy of last resort" for abusive vexatious repeat filers.¹⁸² A contractual pre-filing injunction, like a covenant not to sue, would create a counterclaim if violated, and would require a court to enforce. Only judicial remedies that direct a court clerk to turn away filings could effectively prevent a case from being filed.

IV. IS THE PURSUIT OF CODE DEFERENCE WORTHWHILE?

Each of the code deference strategies discussed in this article use different tools, including anonymity, legal agreements (or a lack thereof), and code to attempt to bind their human participants to smart contract outcomes. These strategies may make litigation over smart contract outcomes more difficult by including prior agreements not to sue, and by creating counterclaims and legal defenses to suit. Other strategies offer alternatives to litigation including on venture dispute resolution. However, neither legal contracts nor code can prevent a party from filing a lawsuit.¹⁸³

None of the observed or suggested strategies will absolutely bind any participant to the outcome of any smart contract. This is a function of the relative ease with which a litigant can invoke and access the U.S. judicial system. And even a meritless lawsuit against a decentralized venture could materially impact its operation and impair the powers, rights, or assets of its human participants and a variety of third parties. Under existing law, absent judicial intervention, no combination of code or legal agreement can prevent a lawsuit from being filed, and even the mere filing and service of a lawsuit can have disastrous impacts on a decentralized venture. Perfect code deference is, for now, an impossible dream.

This conclusion does not suggest that all efforts to create code deference should be

(coining the phrase "mutually assured destruction" in the context of the nuclear arms race). [eds. Pls fix footnote indent]

178. See, e.g., *Wanke, Indus., Com., Residential, Inc. v. Keck*, 147 Cal. Rptr. 3d 651, 655 (2012), as modified on denial of reh'g (Oct. 29, 2012) (violation of stipulated injunction between parties enforced by filing suit); *G.G. Marck & Assocs., Inc. v. Peng*, 309 F. App'x 928, 934 (6th Cir. 2009) (viewing a stipulated injunction that purported to foreclose further litigation as a contract to be enforced by the court).

179. All Writs Act of 1789, 28 U.S.C. § 1651(a).

180. *Larrimore v. Exxon Mobil Oil Corp.*, 301 F. App'x 212, 212 (4th Cir. 2008) ("Federal courts may issue prefiling injunctions when vexatious conduct hinders the court from fulfilling its constitutional duty.").

181. See, e.g., *Vexatious Litigants*, Cal. Judges Benchbook Civ. Proc. Before Trial § 10.101 (explaining the role of the clerk of the court as gatekeeper to prevent filings by parties subject to pre-filing injunctions).

182. See *Koshkalda v. Schoenmann et al. (In re Koshkalda)*, 622 B.R. 749, 765 (B.A.P. 9th Cir. 2020) ("[i]n light of the seriousness of restricting litigants' access to the courts, pre-filing orders should be a remedy of last resort.") (internal citations omitted).

183. Kevin Werbach & Nicolas Cornell, *Contracts Ex Machina*, 67 DUKE L.J. 313, 376 (2017); ("Litigation—like nature—will find a way. Parties will inevitably feel they were treated unfairly at times, and they will inevitably bring those complaints to court.").

abandoned, or that code deference is not a worthwhile pursuit. Code deference provisions may increase the burden on a participant who seeks to challenge a given smart contract outcome using the conventional legal system, either by making litigation more difficult, creating a legal counterclaim, or by offering cheaper, faster, or more efficient alternatives to litigation. The availability of other options, such as easy withdrawal from the decentralized venture, the ability to rectify an exceptional smart contract outcome with a new proposal or action, and in some cases, on-platform dispute resolution, create faster and less disruptive alternatives to litigation which may be more appealing. Because court orders cannot necessarily cause code to be amended or revised, or interfere with code operation, some remedies may be available through a venture's alternative dispute resolution that are not available through legal systems, as is the case in the Pact's qualified code deference approach.¹⁸⁴ Likewise, disputes which may be impractical or overly burdensome to address via traditional legal dispute resolution because of cost, convenience, or inability to identify and assert jurisdiction over necessary parties may be more efficiently resolved via decentralized venture-native alternative dispute resolution.

Although anonymity may appear to be a solution, a fully anonymized system carries extreme risk for participants who may not be able to conceal their identities. A venture created, operated, and funded by unknown or anonymous participants that expressly disclaims contractual relations, that does not incorporate, and that delegates its governance to its unidentified participants may create enough legal issues to populate a bar exam, and may protect participants who cannot be identified. However, a suitably motivated plaintiff could file an action alleging the existence of implied contracts or torts, and a court, using the law of agency and legal gap fillers, could hold any identifiable participant in the venture liable for the acts and omissions of all other participants and for the venture itself. This approach may insulate some, but not all, of the venture's participants from the risk of litigation. Any unfortunate participant who may be identified could be subject to unlimited liability for the acts or omission of all participants and of the entire venture. Thus, anonymity may protect some participants, but may increase the magnitude of liability for participation, and thus disincentivize adoption and use of decentralized ventures by participants who cannot remain fully anonymous.

Even with inherent limitations, existing code deference strategies may functionally create code deference in most situations. Code deference terms should be viewed as mechanisms to rebalance incentives, increasing the opportunity costs for a decentralized venture participant to sue over a smart contract outcome, and creating incentives for participants to use alternatives to litigation provided by these ventures. These strategies may reduce the frequency of litigation, lower the risks of disruption of decentralized ventures and negative impacts on the rights and assets created by those ventures and enjoyed by their users and third parties. In turn, the reduced risk of disruption caused by litigation may enhance the utility of decentralized ventures by eliminating a significant risk to their ongoing operation.

Decentralized ventures work best if their code define relationships among their users and define transactions undertaken by their users with certainty and finality. In the absence of significant legal reform permitting legally addressable actors to consent to operate and transact within "law-proof" closed systems where they inextricably bind themselves to the

184. See PACT, *supra* note 124, at § 1.10(d)(iii) (authorizing the implementation of remedies).

outcome of the code, no matter what, code deference will remain an unattainable, but worthwhile goal. Effective incentives toward code deference move participants in decentralized ventures closer to the ideal of systems that allow parties to transact using rules created and enforced by code rather than rules created and enforced by a legal system.