

# Law and the Blockchain

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*ABSTRACT: All contracts are necessarily incomplete. The inefficiencies of bargaining over every contingency, coupled with humans' innate bounded rationality, mean that contracts cannot anticipate and address every potential eventuality. One role of law is to fill gaps in incomplete contracts with default rules. Emerging technologies have created new, yet equally incomplete, types of contracts that exist outside of this traditional gap-filling legal role. The blockchain is a distributed ledger that allows the cryptographic recording of transactions and permits "smart" contracts that self-execute automatically if their conditions are met. Because humans code the contracts of the blockchain, gaps in these contracts will arise. Yet in the world of "smart contracting" on the blockchain, there is no place for the law to step in to supply default rules—no "legal intervention point." The lack of a legal intervention point means that law on the blockchain works in a fundamentally different way from law in the corporeal world. Business organizational law provides a prime example of how the law uses default rules to fill gaps in an incomplete contract and how the law works differently in the blockchain context.*

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I. INTRODUCTION

In 2016, a decentralized autonomous organization (“DAO”) launched on Ethereum, a platform that permits layering programs called “smart contracts” on top of a cryptocurrency.<sup>1</sup> This DAO was “decentralized” because no one person or entity controlled it; it was “autonomous” because it ran itself, and it was an “organization” of a type the world had not seen before. More of a “virtual venture capital fund” than a corporation, the 2016 DAO (as I will term this particular DAO) sold tokens in cyberspace that entitled the holders to certain voting rights, including the right to vote on proposals for projects that the DAO would fund.<sup>2</sup>

The 2016 DAO might sound like unintelligible science fiction, but businesses organized in the virtual world of the blockchain have raised millions of dollars over the past eighteen months using this platform.<sup>3</sup> For purposes of this introduction, all the reader needs to understand is that blockchain technology permits “smart contracts” that allow coders to layer on top of currency exchanges particular conditions under which those exchanges will occur.<sup>4</sup> In other words, these contracts are self-executing. The Ethereum blockchain can record not only “X paid Y nine ether,” but also “X

1. Kevin Werbach & Nicolas Cornell, *Contracts Ex Machina*, 67 DUKE L.J. 313, 350 (2017).

2. *Id.*; dat81, *What If the Whole World Was Operated by Blockchain?*, STEEMIT, <https://steemit.com/crypto/@dat81/what-if-the-whole-world-was-operated-by-blockchain> (last visited Oct. 31, 2018).

3. Giulio Prisco, *The DAO Raises More Than \$117 Million in World’s Largest Crowdfunding to Date*, BITCOIN MAG. (May 16, 2016, 2:09 PM), <https://bitcoinmagazine.com/articles/the-dao-raises-more-than-million-in-world-s-largest-crowdfunding-to-date-1463422191>.

4. Antonio Madeira, *The DAO, The Hack, The Soft Fork and The Hard Fork*, CRYPTOCOMPARE (July 26, 2016), <https://www.cryptocompare.com/coins/guides/the-dao-the-hack-the-soft-fork-and-the-hard-fork>.

and promise of the DAO—that the underlying code constituted the unalterable “law” of the DAO, upon which all participants could rely.<sup>190</sup>

The 2016 DAO thus presented an existential crisis. Indeed, the hard fork proposal created great controversy within the Ethereum community, with a fundamental difference of opinion between hard-fork supporters and blockchain purists.<sup>191</sup> Ultimately, the hard fork was supported by a supermajority (85-89%) of ether holders.<sup>192</sup> The Ethereum network erased the blockchain from the point of the token diversion forward, wiping out its effects.<sup>193</sup> All original 2016 DAO investors were refunded, but the hard fork effectively led to the dissolution of the 2016 DAO.<sup>194</sup> Ethereum Classic exists as a kind of alternate reality blockchain version of Ethereum, trading at a significant discount but continuing nonetheless.<sup>195</sup>

#### D. THE DAO'S UNEASY FIT IN EXISTING ORGANIZATIONAL LAW

What does one make of the 2016 DAO story? The first challenge is to locate the 2016 DAO within range of traditional business entities. Historically, limited liability status has been available only by filing an organizational document with a governmental agency, and fulfilling appropriate statutory requirements.<sup>196</sup> Governing rules typically require specifying the entity's organizers, its initial capital structure, its registered agent for service of process purposes, and the payment of the requisite filing fee.<sup>197</sup>

The DAO organizers disclaimed any legal organizational structure.<sup>198</sup> Yet these disclaimers are to no avail when it comes to the application of partnership's default rules. The 2016 DAO participants entered into an

190. Paul Vigna, *Ethereum Gets its Hard Fork, and the 'Truth' Gets Tested*, WALL ST. J. (July 20, 2016, 10:56 AM), <http://blogs.wsj.com/moneybeat/2016/07/20/ethereum-gets-its-hard-fork-and-the-truth-gets-tested>.

191. Note, many DAO investors and ether users discussed the proposal on the online message boards.

192. Madeira, *supra* note 4; Yermack, *supra* note 18, at 23, 28.

193. Madeira, *supra* note 4.

194. *Id.* One legacy of the hard fork solution is that the old Ethereum blockchain continues to exist as “Ethereum Classic.” Burgess Powell, *Ethereum (ETH) vs Ethereum Classic (ETC): What Are the Differences?*, BLOCKER (Oct. 4, 2018), <https://blocklr.com/guides/ethereum-eth-vs-ethereum-classic-etc>. On November 1, 2018, Ethereum Classic traded at \$8.96, while Ethereum traded at \$196.56. COINBASE, <https://www.coinbase.com> (last visited Nov. 1, 2018).

195. Antonio Madeira, *What is Ethereum Classic*, CRYPTOCOMPARE (Sept. 10, 2018), <https://www.cryptocompare.com/coins/guides/what-is-ethereum-classic>.

196. See, e.g., DEL. CODE ANN. tit. 6, § 18-201(a) (West 2011 & Supp. 2018); REVISED UNIF. LTD. LIAB. CO. ACT § 201 (UNIF. LAW COMM'N 2013).

197. DEL. CODE ANN. tit. 6, § 18-201(a); REVISED UNIF. LTD. LIAB. CO. ACT § 201.

198. The legal status of DAOs remains the subject of active and vigorous debate and discussion. Not everyone shares the same definition. Some have said that they are autonomous code and can operate independently of legal systems; others have said that they must be owned or operated by humans or human created entities. Anyone who uses DAO code will do so at their own risk. Jentzsch, *supra* note 144, at 2.

association of two or more persons to carry on as co-owners a business for profit. Foolish or naïve, they tried to disclaim joint and several unlimited liability, but they could not. They were at risk for the full total of the firm's debt, and in theory the firm could be liquidated by any one of the tokenholders' creditors. Cases are legion about how courts use a functional approach to determine whether a partnership was formed.<sup>199</sup> Indeed, the sharing of profits is *prima facie* evidence of a partnership,<sup>200</sup> and the 2016 DAO expressly contemplated that tokenholders would participate in the profits of the business.

The 2016 DAO organizers and DAO enthusiasts often slipped into corporate terminology when describing the potential of the DAO. They rhapsodized about its ability to do away with the board of directors, creating a new level of transparency and direct involvement befitting a virtual corporation.<sup>201</sup> But because they failed to take the requisite statutory steps, they did not create a corporation. The irony was that instead they created the age-old business organization, a partnership.<sup>202</sup>

And that, with the major exception of the impact of U.S. securities law (of which more will be discussed later) is as far as the 2016 DAO goes in terms of organizational law. Yet that's not the end of the story. While the 2016 DAO failed spectacularly, its existence raises the prospect of a radically new phenomenon. The DAO of the future could be an entity that, via a combination of contract and the peculiar characteristics of the blockchain, exhibits the features formerly only available to corporations: limited liability and asset partitioning, including liquidation protection.

This newfound power is the result the blockchain's nature as a public ledger. As we have seen, in traditional business associations, only the corporate form can reliably separate firm assets from the creditors and partner assets from the creditors of the firm. The partnership form automatically fills in as the default form if the parties do not affirmatively organize as a limited liability entity. The risk that poses is ultimately the risks that someone not bound by intrafirm contracts—a creditor, either of the

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199. Glenn G. Morris, *Agency, Partnerships & Corporations*, 51 LA. L. REV. 217, 219–22 (1990).

200. REVISED UNIF. P'SHIP ACT § 202(c) (3) (UNIF. LAW COMM'N 2013).

201. Buterin, *supra* note 141 (“[O]ne can take [a] shareholder-owned corporation . . . and transplant it entirely on the blockchain; a long-running blockchain-based contract maintains a record of each individual's holdings of their shares, and on-blockchain voting would allow the shareholders to select the positions of the board of directors and the employees.”).

202. In *If Rockefeller Were a Coder*, Carla Reyes suggests that DAOs could evade the reach of the partnership penalty default by organizing as business trusts. Carla L. Reyes, *If Rockefeller Were a Coder*, 87 GEO. WASH. L. REV. (forthcoming 2019) (manuscript at 43), available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3082915](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3082915). The DAO would “hold[] the trust property in the form of digital assets,” and there would be trustee tokenholders as well as certificate tokenholders. *Id.* “Only a trustee token, and not a certificate token, would be endowed with the right to transfer or otherwise dispose of the DAO's property.” *Id.*

partnership or the individual partners—will make an unanticipated and unavoidable claim on assets that the parties desire to shield.

The transparency of the blockchain, coupled with its imperviousness to defaults, creates such a shield. Blockchain participants know exactly what contracts and claims they are subject to in a way that their corporeal firm counterparts cannot. We return to the various features of corporate law that have, so far, been understood to be unique to the corporate form to see how the blockchain can approximate them.

#### IV. THE PROMISE OF THE BLOCKCHAIN

With the corporate exceptionalism theories of Part II in mind, we can begin to appreciate the potential the DAO offers of upending the spectrum of business entities. Perhaps it would help to start with how lawsuits look in the real world. Susan operates a small nail care business with Jim, Susan's Salon. She's gotten in over her head, and the salon owes suppliers more than it can pay. The business folds, and it turns out that Susan never filed with the state where she operates as a corporation, LLC, or other limited liability entity. As a result, Susan is personally liable for the debts of the business creditors.<sup>203</sup> They take her to court, prove that she is liable, and obtain a judgment against her. She is forced to sell her house and car to pay the judgment.

Now let's suppose Susan instead set up a different business on the blockchain, Susan's Blockchain Storage ("SBS"), that will create a decentralized marketplace for storing files, using the blockchain to encrypt them.<sup>204</sup> Any business faces two types of potential creditors, voluntary and involuntary (that is, tort) creditors.<sup>205</sup> As to the former, the code of the blockchain would have to specify the terms and conditions of loans in order for an obligation to arise.

The 2016 DAO had no creditors. Although its coders described it in terms of a corporation, it was more of a virtual venture capital fund—it had no operating costs, and thus no need of creditors. But future DAOs could offer a security interest to creditors that could be baked directly into the smart contract. One could imagine a creditor lending to a future DAO, on the condition of a smart contract that provides the terms for repayment with interest. The DAO could in the initial code—or after, presumably, with a subsequent vote—create debt versions of tokens that automatically entitle creditors to assets under certain circumstances: including before a split,

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203. REVISED UNIF. P'SHIP ACT § 306; Ribstein, *supra* note 20, at 192; see *supra* note 56 and accompanying text.

204. Filecoin launched an ICO in August 2017 on this model, raising \$257 million. Bennett Garner, *What is Filecoin? Beginner's Guide to the Largest-Ever ICO*, COINCENTRAL (Feb. 20, 2018), <https://coincentral.com/filecoin-beginners-guide-largest-ever-ico>; Stan Higgins, *\$257 Million: Filecoin Breaks All-Time Record for ICO Funding*, COINDESK (Sept. 8, 2017, 3:00 PM), <https://www.coindesk.com/257-million-filecoin-breaks-time-record-ico-funding>.

205. Ribstein, *supra* note 20, at 193.

before a liquidation, or upon certain dates or under certain conditions, as when token activity reaches a specified level.

The attraction from the creditors' perspective is considerable. Monitoring a borrower's activities constitutes a major transaction cost of any loan arrangement (for this reason, banks and other lenders protect themselves with covenants, inspection rights, and other mechanisms to ensure that the creditor can be assured of repayment).<sup>206</sup> But monitoring would be far less costly if the creditor could code enforcement mechanisms directly into the contract. On the blockchain, creditors would have to do very little in monitoring asset levels and prior claims, because the contract encoded in the DAO would protect their interest. In this sense, creditors could lend money without the risk of opportunism and the commensurate high cost of monitoring, as long as the code itself established, for example, trigger points for return of principal. For example, the code could specify that if the DAO's assets dip below a certain amount, the debt is automatically called and the loan repaid. Interest rates could reset automatically, and creditors could waive protective covenants by means of voting on the blockchain.

A key point is this: In order to mimic their real-world counterparts in obtaining a right to individual tokenholders' personal assets—a right that is automatically theirs in traditional partnerships<sup>207</sup>—creditors would have to establish that right within the blockchain code. Otherwise, although DAO creditors would have the *theoretical* right to reach those personal assets, in practice the blockchain would not permit them to do so. On the other hand, tort creditors are involuntary creditors who cannot anticipate being the victims of a particular tortfeasor.<sup>208</sup> These creditors would have no ability to contract for recourse to tokenholder, and the default code would, as with voluntary creditors, not permit access to individual accounts. A DAO creditor would have to reduce a claim to judgment, track down individual tokenholders, and convince judges to enforce a claim.

Say a loan of one of the creditors of SBS, our hypothetical business, is not repaid because of a fault in the code. The creditor convinces a New York court that it has jurisdiction. It obtains a judgment against SBS for \$100,000. It cannot enforce a judgment against SBS unless the blockchain has a way to recognize valid court orders and effectuate them. In other words, it would need a legal intervention point coded into the blockchain that recognized the legitimacy of the judgment, and provided a means to effectuate it. What of SBS's tokenholders? What of the unlimited joint and several personal liability that makes real-world partnership such a dangerous form? The answer to that question, and the potential for a legal intervention point in the intersection

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206. See Easterbrook & Fischel, *supra* note 19, at 1425.

207. REVISED UNIF. P'SHIP ACT § 306.

208. See Ribstein, *supra* note 20, at 193.

between the blockchain and the tokenholder's corporeal-world identity, takes us to that central corporate feature, limited liability.

#### A. LIMITED LIABILITY

SBS's creditor would need to identify the true identity of Susan, or at least one of SBS's tokenholders in order to get at that tokenholder's personal assets. Then the creditor would have to prove that the tokenholder in question held the tokens at the time of the default. In a sense, the blockchain makes this proof easy by laying bare the history of all of SBS's transactions. Even with this proof, however, SBS's creditor faces two obstacles to satisfying a judgment: The code will almost certainly not automatically provide access to tokenholder accounts. And the pseudonymous nature of the blockchain creates a practical obstacle to pursuing individual tokenholders' real-world assets.

First, while in theory one could imagine tokenholders agreeing to some level of individual recourse (for example, that the DAO creditor could reach into a tokenholder's personal wallet for up to 50 ether), in practice it is hard to imagine a tokenholder affirmatively opting into the partnership's default of unlimited liability by permitting a DAO creditor unlimited access to a personal wallet. Yet, that's exactly what would have to occur in order to mirror real-world unlimited liability. An entity-level escrow account would be the more natural mechanism for providing such protection. More likely would be for the DAOs of the future to encode protections contractually limiting DAO creditors to claims upon the DAO and the DAO alone—thus contracting for limited liability, again in the absence of the corporate code.

Second, the law presupposes that the partnership's creditors will be able to ascertain the partners' identities, and then pursue them to satisfy the firm's debts. While a partnership creditor in the real world can expect headaches and holdups in identifying the appropriate jurisdiction, reducing a claim to judgment and then locating and attaching partner assets,<sup>209</sup> at least the creditor knows what defendants to go after.

The virtual world of the blockchain is a different story. Ethereum and other DLTs are “not anonymous, but, rather, pseudo-anonymous,” or pseudonymous<sup>210</sup>: the blockchain preserves all transactions in the network, allowing anyone to inspect and analyze them.<sup>211</sup> All transactions linked to a particular address are visible on the blockchain, which is public and

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209. See MARIA A. AUDERO & BRENT A. OLSON, CALIFORNIA BUSINESS LAW DESKBOOK §§ 4:17, 4:28 (2017).

210. Aaron van Wirdum, *Is Bitcoin Anonymous? A Complete Beginner's Guide*, BITCOIN MAG. (Nov. 18, 2015, 2:34 PM), <https://bitcoinmagazine.com/articles/is-bitcoin-anonymous-a-complete-beginner-s-guide-1447875283>.

211. Ameer Abbas, *Understanding Privacy: How Anonymous Can Bitcoin Payments Be?*, BITCOINIST (Oct. 14, 2016, 4:48 PM), <https://bitcoinist.com/understanding-privacy-anonymous-bitcoin>.

transparent.<sup>212</sup> “However, it is not possible to link a particular wallet address to the real world identity of a person/company without any additional information.”<sup>213</sup>

Security experts described this as “pseudonymous privacy,” comparing it to “writing books under a nom de plume.”<sup>214</sup> An anonymous author can produce dozens of books under a pseudonym. J.K. Rowling penned the *Cuckoo’s Calling* under the nom de plume Robert Galbraith—just as Stephen King wrote under the name Richard Bachman.<sup>215</sup> In each case, the pseudonym cloaked the author’s true identity effectively for a time. But once the pseudonym was linked to its real-life counterpart, the author’s entire pseudonymic writing history became compromised. Similarly, as soon as individuals’ personal details are linked to their bitcoin (to use the most widespread cryptocurrency) address, their entire transaction history—including any available assets—are laid bare as well.<sup>216</sup>

As former federal prosecutor Jason Weinstein explains:

A user’s bitcoin address is just an account number that stays with the user; if you can connect that address to a particular user, you can identify and trace all of the transactions in which that individual has participated using that address. Indeed, if the individual uses an exchange or wallet service as the “on ramp” to the blockchain, then the bitcoin address is essentially about as anonymous as a bank account number, because the exchange or wallet service will maintain records linking the address to a particular identity, much like a bank maintains records establishing the owner of each bank account.<sup>217</sup>

Note that the pseudonymity of cryptocurrency does not perfectly protect against identification. There are three main ways in which to de-anonymize bitcoin users (and the same principles apply to Ethereum)<sup>218</sup>:

- (1) “Since Bitcoin is a peer to peer network (vulnerable to hackers), if hackers can connect to the Bitcoin network using several nodes or

212. *Id.*

213. Jacob J., *IRS Uses Chainalysis to Track Down Bitcoin Tax Cheats*, COINTELEGRAPH (Aug. 23, 2017), <https://cointelegraph.com/news/irs-uses-chainalysis-to-track-down-bitcoin-tax-cheats>.

214. Emerging Technology from the arXiv, *Bitcoin Transactions Aren’t as Anonymous as Everyone Hoped*, MIT TECH. REV. (Aug. 23, 2017), <https://www.technologyreview.com/s/608716/bitcoin-transactions-arent-as-anonymous-as-everyone-hoped>.

215. Haroon Siddique, *JK Rowling Publishes Crime Novel Under False Name*, GUARDIAN (July 14, 2013, 7:22 AM), <https://www.theguardian.com/books/2013/jul/14/jk-rowling-crime-novel-cuckoos-calling>.

216. Emerging Technology from the arXiv, *supra* note 214.

217. Jason Weinstein, *How Can Law Enforcement Leverage the Blockchain in Investigations?*, COIN CTR. (May 12, 2015), <https://coincenter.org/entry/how-can-law-enforcement-leverage-the-blockchain-in-investigations>.

218. See Abbas, *supra* note 211; van Wirdum, *supra* note 210.



computers there is a high chance that they can extract enough information to decipher where transactions originated.”<sup>219</sup>

(2) Bitcoin addresses can be used to identify users:

Bitcoin addresses can be linked to real identities if these real identities are used in combination with the bitcoin addresses in some way. This includes addresses used to deposit or withdraw money to or from a (regulated) exchange or wallet service, publicly exposed donation addresses, or addresses simply used to send bitcoin to someone (including the online store) when using a real identity.<sup>220</sup>

Cryptocurrency exchanges are subject to know-your-customer and anti-money laundering rules, so individuals making use of these exchanges—as will most unsophisticated users—can be relatively easily identified by law enforcement.<sup>221</sup>

(3) The inherent transparency of cryptocurrency networks facilitates user identification:

Perhaps most importantly, all transactions over the Bitcoin network are completely transparent and traceable by anyone. It’s typically this complete transparency that allows multiple Bitcoin addresses to be clustered together, and be tied to the same user. Therefore, if just one of these clustered addresses is linked to a real-world identity through one or several of the other de-anonymizing methods, all clustered addresses can be [revealed].<sup>222</sup>

Nevertheless, as one commentator has observed, sophisticated users who are “willing to go [to] extraordinary lengths can find ways to acquire and use bitcoin anonymously.”<sup>223</sup> Even so, “the open nature of the transaction ledger and other unknowns leave open the possibility that identities and activities once considered perfectly secure may be revealed at some point down the road.”<sup>224</sup>

219. Abbas, *supra* note 211 (emphasis omitted).

220. van Wirdum, *supra* note 210.

221. Robinson, *supra* note 18 (manuscript at 25–26).

222. van Wirdum, *supra* note 210.

223. Adam Ludwin, *How Anonymous Is Bitcoin?*, COIN CTR. (Jan. 20, 2015), <https://coincenter.org/entry/how-anonymous-is-bitcoin>.

224. *Id.* The most common method to improve a user’s level of financial privacy protection is to use a “tumbler” (also called a “mixer”). *Id.* Tumblers work by literally mixing up a user’s payment with lots of other payments from other users. *Id.* Put another way, tumblers “take a set of bitcoins and return[] another set of the same value (minus a processing fee) with different addresses and transaction histories, thus effectively ‘laundering’ the coins.” *Id.* This makes it very difficult for any observer to be able to work out who is actually sending money to whom. An observer who knows your addresses will still be able to see that you have sent or received a certain amount of money. *Id.* But if an individual uses a tumbler, in theory, the observer will not be able

In conclusion, DAO tokenholders enjoy two main bulwarks against personal liability for firm liabilities. First, the blockchain itself can limit contract creditors to the assets of the firm. Though this is a smart contract, presumably a court would recognize its validity in the corporeal world, since the creditor has affirmatively agreed not to have recourse to individual tokenholders' assets. Second, for tort creditors<sup>225</sup> or non-tort without contractual protections in place, pseudonymity provides a weaker shield against firm liabilities. A creditor faced with the prospect of finding the right jurisdiction, reducing a claim to judgment, and then identifying and tracking down tokenholders may well conclude the effort is not worth her time.

### B. ASSET PARTITIONING VIA CONTRACT ALONE

Remember, the reverse of limited liability is entity shielding.<sup>226</sup> Here the concern is the threat that the debts of the partners pose to the entity itself. Say Susan owns tokens of a DAO. Further say that her creditors are able to reduce their claims against her to judgment. Susan, like presumably most debtors, would likely try not to disclose that she had a blockchain asset. Her creditors or the bankruptcy court would first have to know of the existence of her wallet, with the tokens, ether, or bitcoins contained therein to potentially use that asset to make themselves whole. But what if creditors determine that she owns DAO tokens? They could go to court (presuming they can find a court with jurisdiction) to require her to divulge her key. They would have to prove their claim on any tokens or assets in the wallet—presumably they could do so with ease. Then they could force her to transfer any tokens in the wallet. But they could not use those tokens to force liquidation of the actual

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to tell to whom the user has made a payment. Dean, *How to Use a Bitcoin Mixer or Tumbler*, CRYPTORIALS (Feb. 17, 2017), <http://cryptorials.io/use-bitcoin-mixer-tumbler>; Ludwin, *supra* note 223. Tumbling services pose serious risks:

Users must hand over control of their bitcoins and trust the service to return them. Transaction graph analysis can identify use of a mixing service and flag the user as potentially suspicious. Mixers do not work well for very large sums, unless others with similarly large sums happen to be mixing their bitcoins at the same time. Some mixing services do not work as advertised and can be reverse-engineered. Services that operate legally must keep detailed records of how the coins were mixed, which could later be hacked or subpoenaed. And the new bitcoins received might themselves be tainted by illegal activity.

*Id.* Steven Goldfeder, a fifth-year PhD student in the Department of Computer Science at Princeton University, has observed “that if an individual uses CoinJoin [a popular mixer] to make several purchases . . . it is straightforward to link them back: ‘If the victim employs 3 rounds of CoinJoin and the adversary observes two of the victim’s payments, he can link them back to her wallet (despite mixing) with 98% accuracy.’” Emerging Technology from the arXiv, *supra* note 214 (quoting Steven Goldfeder).

225. It is hard to imagine what a DAO tort creditor would even look like. As Section V.B details, governmental fines may be more likely claims.

226. See *supra* notes 96–103.

business—or, following the more modern rule, a buyout of whatever the tokens are worth.

This inability stems from the fact that the blockchain is a decentralized and distributed technology. There is no one person who controls the code. Even if a court rendered judgment in favor of a particular creditor, if the code did not permit a liquidation, then any attempt by a creditor or a coder in the creditor's employ to update the blockchain to liquidate the entity would be rejected by the consensus of miners. Such a change would therefore not become part of the distributed ledger. Thus, even after finding a court with jurisdiction, attempts to enforce a judgment against an organization would founder if that organization's basic code does not recognize such a judgment.

Again, the lack of a legal intervention point protects against the traditional partnership vulnerability to partner creditors. Thus, while the DAO in theory may be a partnership, that most vulnerable of business forms, legal recourse in practice will prove well-nigh impossible.

To summarize, the DAO is legally a partnership, so that personal creditors could in theory liquidate it. But the tokens do not give those creditors that power. Hansmann, Kraakman, and Squire assert that only organizational law can perform the entity shielding function of providing protection from the creditors of individual investors, but in the virtual world contract can play the role.<sup>227</sup> Because the smart contract does not permit liquidation, effectively it provides entity shielding.

More broadly than mere entity shielding, the blockchain provides a radical form of asset partitioning. Because of the ability to code smart contracts directly into the blockchain, assets can be reliably apportioned to specific uses without the need for a separate entity structure, obviating the need for the separate organization Triantis identifies.<sup>228</sup> Similarly, addressing Blair's concern about capital lock-in, a DAO's blockchain could provide that no single tokenholder could liquidate the blockchain.<sup>229</sup> Indeed, as a practical matter, it would be difficult, if not impossible, to enforce any theoretical liquidation right if it is not already encoded in the block chain.

This point is worth restating. In theory, the tokenholders' creditors would have the right to liquidate the DAO. But in practice, the DAO would have to code that right in to provide a legal intervention point on which the penalty default rules of partnership a place to take effect. The law gives creditors that power in the real world. But it cannot in the DAO.

## V. LEGAL INTERVENTION POINTS

So far, I have treated the blockchain as being unto itself, a nexus of contracts made flesh. The first section of this part will continue in that vein.

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227. See Hansmann et al., *supra* note 60, at 1340.

228. See Triantis, *supra* note 94, at 1104, 1106; *supra* notes 104–05 and accompanying text.

229. See Blair, *supra* note 50, at 393; *supra* notes 106–07 and accompanying text.

But the idea of a fully autonomous business organization untethered to the corporeal world is, and may always be, largely fanciful. In the second section, however, the lens will widen to explore the question of legal intervention points for blockchain entities not organized wholly on the blockchain. Here the law can and will intervene.

#### A. THE PURE BLOCKCHAIN BUSINESS ORGANIZATION

Can business entities exist on the blockchain alone? If so, then no legal intervention point will exist unless explicitly coded. Section 1 argues that such entities *can* in fact exist, and Section 2 sketches out some possible governance models for such organizations.

##### 1. The Possibility of a Purely Blockchain Entity

The easiest way for blockchain entities to evade the reach of the law would be to organize entirely on the blockchain, without the organizers identifying themselves in any way as associated with the blockchain entity. The idea of strangers organizing via pseudonyms and trying to coordinate a governance structure is not as unthinkable as one might suppose. The true identity of bitcoin's designer or designers is unknown—"Satoshi Nakamoto" is the pseudonym he, she, or they used.<sup>230</sup> Bitcoin was born out of a distrust for authority and driven by a desire for governance by community consensus rather than central authority.<sup>231</sup> Nakamoto seems not to have been a promoter looking to make a quick buck, but rather an idealist looking to break governments' monopoly on currency by offering an alternative to fiat currency.<sup>232</sup> Bitcoin suggests that it might be possible, even likely, given the open source ethos of the blockchain, for a business organization to exist that encoded real governance into its code, enabling pseudonymous participants to engage in real decision-making for the firm without identifiable organizers claiming credit for doing so.

One white paper describes a DAO as "a self-organizing entity" that "better resembles an organism rather than an organization."<sup>233</sup> In fact, a fully autonomous, self-reproducing DAO now exists: the Plantoid, "a robot or

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230. SATOSHI NAKAMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM 1 (2008), <https://bitcoin.org/bitcoin.pdf>.

231. Ryan Clements, *Decoding the Demand for Cryptocurrency: What Is Driving the Historic Price Surge?*, FINREG BLOG (Sept. 26, 2017), <https://sites.duke.edu/thefinregblog/2017/09/26/decoding-the-demand-for-cryptocurrency-what-is-driving-the-historic-price-surge>.

232. See Joseph Young, *It's Not Really About Bitcoin Price Surging, It's Fiat Currencies in Free Fall*, COINTELEGRAPH (Dec. 4, 2017), <https://cointelegraph.com/news/its-not-really-about-bitcoin-price-surging-its-fiat-currencies-in-free-fall>.

233. DAOstack, The Operating System for DAOs: White Paper V1.0, at 6 (Oct. 29, 2017) (unpublished white paper), <https://icorating.com/upload/whitepaper/hGKjXjrHPLu4F6vLLzLhdgMgbHFU1FdcWzE6yvcB.pdf>.

synthetic organism designed to look, act and grow like a plant.”<sup>234</sup> As Carla Reyes describes it:

If an onlooker passing by the Plantoid sufficiently appreciates the Plantoid’s artistic qualities, the onlooker may send a donation to the Plantoid through the decentralized virtual currency called bitcoin. The onlooker sends the bitcoin directly to a wallet owned by the Plantoid itself. As an expression of gratitude for the funds transfer, the Plantoid performs a dance for the onlooker. Once the Plantoid raises sufficient funds, the Plantoid advertises for, selects, and commissions an artist to create a new Plantoid.<sup>235</sup>

If the DAO is an organism, creating its own nexus of contracts as it goes, there may be little room in its operation for formal law at all. It can make its own rules (as we will see, quite sophisticated rules), and even replicate, all autonomously, without an identifiable individual doing the organizing. And without an individual on the scene, there is no actor for the law to latch onto. The code really is the law—the only law. There is no legal intervention point on which the law can work.

To be clear, this point is not a normative one. I am not a cyber-separatist, arguing that regulation should *not* apply to the blockchain.<sup>236</sup> I am merely pointing out that, for the first time as a practical matter, the possibility exists of a type of business organization that can exist apart from the defaults of contract law. It may be that this possibility will remain an obscure footnote in the history of the blockchain, and that examples such as the Plantoid or bitcoin are aberrations. It may be that people who create entities generally do so to make a profit, and ultimately cannot do so solely on the blockchain. If international regulation makes it impossible to exchange bitcoin for fiat currency, and the bitcoin economy remains as limited as it is now, even Satoshi Nakamoto (or the Satoshi Nakamotos of the future) may not see much profit in pure blockchain entities. The intersection between blockchain and the corporeal world will then provide a legal intervention point, as Section V.B will describe.

For now, it remains to be seen whether pure blockchain entities are viable. Accept for the moment that such entities will exist in the future. Any discussion of the purely blockchain entity must deal with the problem the 2016 DAO posed—the problem that represents the flipside of the freedom from default rules that the 2016 DAO cast in stark relief. As Easterbrook and Fischel have observed, even when parties think they have planned for every eventuality, “they are apt to miss something” because “[a]ll sorts of

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234. *I’m a PLANTOID: A Blockchain-Based Life Form*, <http://okhaos.com/plantoids> (last visited Nov. 1, 2018).

235. Reyes, *supra* note 18, at 385–86 (footnotes omitted).

236. Mayer-Schönberger, *supra* note 23, at 618.

complexities will arise later.”<sup>237</sup> The central argument of *The Economic Structure of Corporate Law* is that corporate law supplies majoritarian default rules that fill the gaps of parties’ necessarily incomplete contracts.<sup>238</sup> Yet, as we have seen, when gaps arise in the blockchain’s smart contracts, there are no legal intervention points upon which the law can work. The blockchain needs intervention points in order to fill the gaps in incomplete contracts. Said differently, blockchain entities have a governance problem.

## 2. The Problem of Blockchain Governance

The failure of the 2016 DAO made clear the problem of governance on the blockchain. There is no code that could anticipate all problems that will arise. The problem with the 2016 DAO was that it didn’t provide a mechanism for the tokenholders to vote to change the code to address the flaw once it arose. This section will describe three different governance models that emerged in the post-2016-DAO era to address the governance failures of the DAO. Notably, each of these mechanisms creates an intervention point—a place in the code where participants can supply terms to the incomplete contract in light of events following the initial launch of the code-contract. None of them supply a *legal* intervention point—that is, a point where a legal authority can assert jurisdiction. But they supply intervention points, nonetheless.

First, DAOstack illustrates a dizzying array of governance options unimaginable in a traditional corporation. For example, imagine a corporation that weighs some shares more than others using a reputation system, rather than operating on a vote-per-share basis. DAOstack enables a DAO to institute such a system, whereby tokenholders can earn reputation—for example, for past contributions or successful proposals to the DAO.<sup>239</sup> Reputation, unlike a token, is not transferrable, but instead awarded to or earned by “specific members, according to their merits and contributions made to the organizations.”<sup>240</sup> To guard against locking up decision-making power with a group that could become less engaged down the road, an organization can provide that reputation will dissipate over time.<sup>241</sup>

A common concern in public corporations is voter apathy, and the corporation generally offers the blunt tool of quorum to ensure that low voter turnout does not allow a minority preference to govern.<sup>242</sup> With DAOstack, voting schemes can be weighted by reputation.<sup>243</sup> There can be a finite

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237. Easterbrook & Fischel, *supra* note 19, at 1444.

238. See EASTERBROOK & FISCHEL, *supra* note 38, at 14–15.

239. DAOstack, *supra* note 233, at 15.

240. *Id.* at 16.

241. *Id.*

242. Robert B. Thompson & Paul H. Edelman, *Corporate Voting*, 62 VAND. L. REV. 129, 137–39 (2009).

243. DAOstack, *supra* note 233, at 15, 21.

number of proposals open to vote at any one time—with all other proposals in a queue.<sup>244</sup> Tokenholders need not rely on an individual or individuals to serve as gatekeepers or agenda-setters.<sup>245</sup> If there is a queue, a tokenholder can “boost” a proposal by putting tokens at stake that will be returned if the proposal is successful.<sup>246</sup>

Moreover, just as bitcoin has issuance limits, the DAOStack organization can build in certain constraints. Examples offered include a cap of the total number of tokens that can be issued, a rate of token inflation, a limit on the use of funds, a maximum amount of reputation that can be issued in a given time period, and more.<sup>247</sup> For lawyers, these strictures might seem akin to charter-based limits on the authorized number of shares. As a practical, matter, however, they provide protection against future dilution even more robust than those found in the corporeal corporation: they are self-enforcing structural constraints. Finally, DAOStack provides what the 2016 DAO failed to offer: a mechanism for amending its governance structure. Called “governance upgrades,” these allow the organization to specify the mechanism for changing their governance models.<sup>248</sup> As the DAOStack white paper remarks, “the spectrum of possib[ility a] scheme’s design [allows] is nearly endless.”<sup>249</sup>

Another blockchain operator, Aragon, offers would-be entrepreneurs the ability to organize on the blockchain, issue tokens, and raise funds.<sup>250</sup> But Aragon goes further in creating private law on the blockchain. As the whitepaper observes, “The traditional solution[s] to [opportunistic behavior] are government-powered jurisdictions. Since Aragon organizations are location and government-agnostic—they are meant to be run on the

244. *Id.* at 21–22.

245. Sofie Cools, *The Real Difference in Corporate Law Between the United States and Continental Europe: Distribution of Powers*, 30 DEL. J. CORP. L. 697, 741–43 (2005).

246. DAOStack, *supra* note 233, at 22. To avoid “finalization attacks,” where voting in the final period changes the outcome, the DAO can provide that “if on the last day of opening the majority changed from yes to no (or vice versa), the voting period would extend by another day. The vote is closed only once there is no change of decision during the last day of voting.” *Id.*

247. *Id.* at 18.

248. *Id.* at 17.

249. *Id.* at 18.

250. Its white paper promises to implement “basic features of an organization like a cap table, token transfers, voting, role assignments, fundraising, and accounting. The behavior of an Aragon organization is easily customized by changing the bylaws.” Luis Cuende & Jorge Izquierdo, *A Decentralized Infrastructure for Value Exchange* § 1.1 (Apr. 20, 2017) (unpublished white paper), <https://www.chainwhy.com/upload/default/20180705/49f3850f2702ec6be0f57780b22feab2.pdf>. Like DAOStack, Aragon enables organizations to account for reputation, and it allows tokens to be issued with limited transferability according to a vesting calendar. *Id.* at 9–10. It promises organizations a way off the “VC unicorn rollercoaster” of fundraising, where they “can easily issue new shares in exchange for capital without operating with a third party, both through direct sales and public offerings.” *Id.* § 2.2(D), (F). What’s more, Aragon offers a simpler way to hire and pay employees by allowing organizations to issue tokens under specific time- or task-based parameters. *Id.* § 2.2(H).

Ethereum network—we came out with a better solution.”<sup>251</sup> The Aragon Network provides “basic constitution and governance methods.”<sup>252</sup> Within the Network, organizations can create new laws specific to their organization.<sup>253</sup>

Aragon also provides an “unbiased arbitration system . . . for cases where conflict is not explicitly resolved in the smart contract code.”<sup>254</sup> The nuances are beyond the scope of this Article, but some details make clear the level of thought behind the effort. Arbitration requires an applicant posting a bond of tokens, or putting a freeze on an organization’s contracts if the applicant has an ownership interest in the organization.<sup>255</sup> A panel of judges render a verdict via a “two-step reveal” to prevent collusion on the part of the judges.<sup>256</sup> They must reveal their verdict in order to learn their fellow panelists’ decision. If the applicant is successful, her bond is returned; if unsuccessful, the judges keep it. If applicants are dissatisfied, they can appeal (or “request an upgrade,” in Aragon parlance) by posting a “significantly larger” bond and having all of the available judges participate.<sup>257</sup> All judges who “voted the incorrect answer are extremely penalized.”<sup>258</sup> Finally, a supreme court is composed of the top nine judges, as measured by which judges have sided with the majority the most in the past.<sup>259</sup>

It has not likely been lost on the reader that each of these examples is, in one manner or another, recreating governance mechanisms familiar in the corporeal world—even to the extent of Aragon mimicking the number of the justices on the U.S. Supreme Court.

Tezos stands as a cautionary tale regarding blockchain governance. Hard on the heels of the 2016 DAO’s hard fork, the first problem Tezos aimed to solve was the “‘hard fork’ problem, or the inability for Bitcoin to dynamically innovate due to coordination issues.”<sup>260</sup> A Tezos tokenholder could propose an alteration to the community of token holders.<sup>261</sup> If a quorum was reached, and a majority voted for the proposal, the alteration would be implemented to the blockchain.<sup>262</sup> This structure provided a fluid system of governance over time and was intended to eliminate the need for a 2016-DAO-style hard

251. *Id.* app. A § 1.

252. *Id.* § 5.4.

253. *Id.* (“Effectively, organizations will be able to use the Aragon Network’s services basic constitution and services as a framework, and build a custom set of rules to govern relationships inside organizations.”).

254. *Id.* § 1.2.

255. *Id.* app. A § 3.

256. *Id.*

257. *Id.* app. A § 3.2.

258. *Id.*

259. *Id.* app. A § 3.3.

260. L.M. GOODMAN, TEZOS: A SELF-AMENDING CRYPTO-LEDGER POSITION PAPER 3 (2014), [https://tezos.com/static/papers/position\\_paper.pdf](https://tezos.com/static/papers/position_paper.pdf).

261. *Id.* at 3, 12.

262. *Id.* at 12.



fork.<sup>263</sup> Tezos's ICO in July of 2017 garnered \$232 million in bitcoin and Ether, which rose to be worth almost \$1 billion at the end of the year as the cryptocurrency it raised increased in value.<sup>264</sup> Ironically, however, Tezos' ICO has been mired in a governance dispute amongst its founders and is on indefinite hold.<sup>265</sup>

Voltaire once declared that "If God did not exist, it would be necessary to invent him."<sup>266</sup> In similar fashion, it may well be that, if business associations law does not exist on the blockchain, the blockchain will have to create it. DAOs, like all organizations and all organisms, require some kind of governance mechanism when inevitable gaps arise in the incomplete contract of the firm. As the emergence of Aragon illustrates, newfangled organizations have an appetite to address these governance issues. They seem willing to borrow from traditional models, but also ready to adapt them to the challenges of the pseudonymous world of the blockchain. This Section has provided examples of the many governance options available on the blockchain. While many of these options will be obsolete by the time this Article goes to print, the larger point will not: The DAO opens up a dizzying array of governance possibilities as long as intervention points exist in the code, where governance can be exercised. As long as these organizations exist solely on the blockchain, their interaction with traditional business law—as well as securities law and other forms of state regulation—could be minimal.

The contours of governance on the blockchain—and the extent to which jurisdictions will recognize it, or even have the chance to recognize it—remain open questions. Another open question is how securities law, and other law, will interact with the blockchain. Most entities organized on the blockchain thus far have had identifiable human organizers who remain susceptible to the reach of laws, even if the blockchain itself resists it. This is a key point: As

263. *Id.* at 2–3. Additionally, to guarantee the smart contract alterations and additions did not contain avoidable bugs, Tezos's smart contract language used "formal verification," which essentially allowed developers to mathematically prove the correctness of their code. *Id.* at 10; see Omri Barzilay, *Tezos' \$232 Million ICO May Just be the Beginning*, FORBES (July 15, 2017, 8:39 AM), <https://www.forbes.com/sites/omribarzilay/2017/07/15/tezos-232-million-ico-may-just-be-the-beginning>; Linda Xie, *A Beginner's Guide to Tezos*, MEDIUM (Aug. 3, 2017), <https://medium.com/@linda.xie/a-beginners-guide-to-tezos-c9618240183f>.

264. Barzilay, *supra* note 263.

265. See Joon Ian Wong, *A Cryptocurrency Raised \$400 Million to Avoid Bitcoin's "Civil War" and Now Has Its Own*, QUARTZ (Oct. 19, 2017), <https://qz.com/1106594/tezos-dispute-puts-400-million-raised-in-the-ico-at-risk>. Three class-action lawsuits have been filed against Tezos founders Arthur and Kathleen Breitman. They are mired in a dispute with Johann Gevers, President of the Tezos Foundation, that controls the ICO proceeds. The Tezos project is on indefinite hold. Steve Stecklow et al., *Exclusive: Tezos Founders Push for Legal Bailout from Swiss Foundation*, REUTERS (Dec. 1, 2017, 5:06 AM), <https://www.reuters.com/article/us-bitcoin-tezos-lawsuits-exclusive/exclusive-tezos-founders-push-for-legal-bailout-from-swiss-foundation-idUSKBN1DV4Ko>.

266. VOLTAIRE, *ÉPÎTRE À L'AUTEUR DU LIVRE DES TROIS IMPOSTEURS* [EPISTLE TO THE AUTHOR OF THE BOOK, "THE THREE IMPOSTORS"] (Jack Iverson, trans., 1770), <http://www.whitman.edu/VSA/trois.imposteurs.html> (last visited Nov. 1, 2018).

long as there are identifiable organizers in the corporeal world—as long as an entity does not exist solely on the blockchain—they will provide a legal intervention point. The next Section begins with U.S. securities law, as it is the law that has been the most influential in shaping the contours of ICOs. But the two key questions are broader ones: Where are the legal intervention points in the blockchain? And how should the law work upon them?

#### B. CORPOREAL ENTITIES WITH ASSOCIATED BLOCKCHAIN ORGANIZATIONS

So far most ICOs and DAOs have not organized purely on the blockchain. Instead they have opted for some identifiable group of promoters. This move puts them squarely subject to regulation by governing authorities. The ways in which the United States and other jurisdictions will regulate the blockchain are still open questions. Coin exchanges, for example, are subject to anti-money laundering and Know Your Customer regulations.<sup>267</sup> South Korea recently put in place measures to curb cryptocurrency speculation by requiring trading only through real-name bank accounts linked to cryptocurrency exchanges.<sup>268</sup>

Staying within the scope of business associations law, once the identity of a blockchain owner is known, a court could establish jurisdiction over the blockchain business association as a partnership by establishing personal jurisdiction over the known individual. Personal jurisdiction over a single partner is enough to establish personal jurisdiction over the partnership and, in some jurisdictions, over the remaining partners.<sup>269</sup> Any enforcement against the blockchain entity would suffer from the handicaps discussed in Section IV.B. A judgment calling for dissolution of a DAO would have no effect upon code unless the code permits it. But a court *could* enforce a judgment against any individual partners whose identities are known, either because they were chief organizers or because the true identity behind their pseudonym has been discovered.

The reach of U.S. securities law to these groups provides a slightly more developed case study of how regulation might impact blockchain entities—and, indeed, how it is shaping the evolution of those entities. Essentially,

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267. See Dan Ryan, *FinCEN: Know Your Customer Requirements*, HARV. L. SCH. F. ON CORP. GOVERNANCE & FIN. REG. (Feb. 7, 2016), <https://corpgov.law.harvard.edu/2016/02/07/fincen-know-your-customer-requirements>. “Know Your Customer” rules require financial institutions to obtain certain information about their customers before doing business with them. Genci Bilali, *Know Your Customer—Or Not*, 43 U. TOL. L. REV. 319, 319 (2012).

268. Press Release, Financial Services Commission (South Korea), Financial Measures to Curb Speculation in Cryptocurrency Trading (Jan. 23, 2018), <https://www.fsc.go.kr/downManager?bbsid=BBS0048&no=123388>.

269. *Brown v. 1995 Tenet ParaAmerica Bicycle Challenge*, 931 F. Supp. 592, 594 (N.D. Ill. 1996). But see *RCI Contractors & Eng’rs, Inc. v. Joe Rainero Tile Co.*, 666 F. Supp. 2d 621, 624 (W.D. Va. 2009) (“If a court has personal jurisdiction over a partnership, an exercise of personal jurisdiction over individual partners depends on a partner’s contacts with the forum and the forum’s laws dictating the agency relationship among partners.”).

the question is one of how much power tokenholders have, and what rights and responsibilities should flow from that power. Both questions are very much open, as we will see. As we will also see, the nature of the solution to the governance problem has direct repercussions for securities law.

On July 25, 2017, the SEC released a “Report of Investigation” (SEC Report) deeming 2016 DAO tokens to be securities—meaning that their issuance was illegal because the 2016 DAO did not register an initial public offering with the SEC or qualify for an exemption from registration.<sup>270</sup> While the SEC did not pursue an enforcement action against the 2016 DAO organizers, the SEC Report did have a profound effect on subsequent initial coin offerings, which now seek to evade the reach of U.S. securities laws.<sup>271</sup>

The SEC’s conclusion that the 2016 DAO tokens were securities is not surprising giving the breadth of the definition of one type of security, the investment contract.<sup>272</sup> The *Howey* test for what constitutes an investment contract is an “investment of money in a common enterprise” where profits are expected to be derived “solely from the efforts of others.”<sup>273</sup> A key focus of the SEC Report was the fact that the DAO’s profits were to be derived from the efforts of others, namely the DAO’s founders and its curators.<sup>274</sup> In particular, the SEC cited the fact that Slock.it created the DAO website, published a White Paper describing the DAO, and created, maintained, and “closely monitored” online fora about the DAO.<sup>275</sup> They held themselves out as experts on Ethereum, “and told investors that they had selected . . . [c]urators based on their expertise and credentials.”<sup>276</sup> Slock.it also informed investors that it would make the first proposal to the DAO.<sup>277</sup> In short, “[t]hrough their conduct and marketing materials, Slock.it and its co-founders led investors to believe that they could be relied on to provide the significant managerial efforts required to make The DAO a success.”<sup>278</sup>

270. Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81,207, *supra* note 32, at 1–2.

271. *See id.* at 1.

272. The Securities Act’s definition of “security” includes traditional financial instruments such as stocks, bonds, and debentures, but also includes what has proved a capacious catch-all term, “investment contract.” 15 U.S.C. § 77b(a)(1) (2012); Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81,207, *supra* note 32, at 11.

273. SEC v. W.J. Howey Co., 328 U.S. 293, 298, 301 (1946); *see* SEC v. Edwards, 540 U.S. 389, 393 (2004) (applying the *Howey* test to investment contracts that promise a fixed rate of return).

274. Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81,207, *supra* note 32, at 12. In the SEC’s analysis, “[t]he DAO’s investors relied on the managerial and entrepreneurial efforts of Slock.it and its co-founders, and The DAO’s Curators, to manage The DAO and put forth project proposals that could generate profits for The DAO’s investors.” *Id.*

275. *Id.*

276. *Id.*

277. *Id.*

278. *Id.*

The SEC emphasized in particular how dependent tokenholders were on the efforts of Slock.it and its co-founders. “At the time of the offering, The DAO’s protocols had already been pre-determined by Slock.it and its co-founders, including the control that could be exercised by the Curators.”<sup>279</sup>

This characterization of the 2016 DAO tokens as securities remains in dispute, however. Randolph Robinson takes issue with the SEC’s Report, challenging the claim that the 2016 DAO was a “common enterprise” under the *Howey* test.<sup>280</sup> Most intriguingly, he argues that commonality requires “investors’ dependence on the promoter’s expertise.”<sup>281</sup> But he argues, once the 2016 DAO’s code was launched, Slock.it, the 2016 DAO promoter, exercised *no* expertise—indeed, it retained no control over the management of the DAO at all:

Unlike in a traditional enterprise where the promoter or management enjoys special decision making privileges . . . or the ability to control entity assets, here, as the promoter, Slock.it was just one of many token holders, holding the same rights as any other token holder in the DAO enterprise. Neither Slock.it nor any other individual or entity could take any action to spend DAO resources, incur obligations, or take any other action independent of a vote of DAO Token holders.<sup>282</sup>

Robinson argues that because, after launch, all decisions “were made collectively by all token holders,” there was no collective reliance on the DAO promoters’ expertise.<sup>283</sup> Similarly, Rohr and Wright argue that “[b]ecause each token holder was entitled to participate in each funding decision, it is at least arguable that token holders participated sufficiently in the profit-making activities of the enterprise” for them not to qualify as securities under *Howey*.<sup>284</sup> This feature means that DAO investors did not have an expectation of profits solely from the efforts of others. Robinson also takes issue with the SEC’s

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279. *Id.* at 13. That control was indeed substantial: Curators had the power to “(1) vet Contractors; (2) determine whether and when to submit proposals for votes; (3) determine the order and frequency of proposals that were submitted for a vote; and (4) determine whether to halve the default quorum necessary for a successful vote on certain proposals.” *Id.* The tokenholders could exercise relatively little power over the process, and still less over the Curators themselves. Tokenholders could only vote on proposals whitelisted by the curators. *Id.* at 8, 14. While they could submit a proposal for a vote, the curators would need to greenlight it before it was eligible for a tokenholder vote. *Id.* at 13. A tokenholder could propose replacing a curator, but current curators would have to whitelist the proposal in order for it to come before the full body for a vote. *Id.* “In essence, Curators had the power to determine whether a proposal to remove a Curator was put to a vote.” *Id.*

280. Robinson, *supra* note 18 (manuscript at 6–7).

281. *Id.* (manuscript at 39).

282. *Id.* (manuscript at 40) (citations omitted).

283. *Id.*

284. Rohr & Wright, *supra* note 18, at 68.

characterization of the Curators' power, arguing that it was much less significant than the SEC portrayed.<sup>285</sup>

Harkening back to the various governance possibilities Part V described, we begin to see how complicated, important, and unsettled the question of intervention on the blockchain is. Even if the 2016 DAO tokens *were* securities, if a future DAO tokenholder earns reputation and uses that to weigh her votes heavily, at what point is she no longer dependent "solely on the efforts of others" for her profits?

The SEC Report could be describing common critiques of whether the shareholder vote provides an effective constraint on a public corporation's managers when it observed:

The voting rights afforded DAO Token holders did not provide them with meaningful control over the enterprise, because (1) DAO Token holders' ability to vote for contracts was a largely perfunctory one; and (2) DAO Token holders were widely dispersed and limited in their ability to communicate with one another.<sup>286</sup>

The SEC Report emphasizes the passive, public-company-shareholder-like role that the tokenholders played.<sup>287</sup> But the blockchain vote, as we have seen, need not be largely perfunctory, and DAOs of the future could make voting far from "perfunctory" by, for example, creating reputation-weighted voting in the manner of DAOStack.<sup>288</sup> The blockchain could counteract wide dispersion of holdings by coding limits on the number of tokens and could augment tokenholders' ability to communicate with one another.

Thus far, ICOs have not followed this robust governance path—nor have they used anonymity or pseudonymity to evade regulation. Currently many ICOs are launched by an organization or group of developers.<sup>289</sup> Some are traditional business entities or non-profits.<sup>290</sup> Others, like the 2016 DAO, are not formally organized at all.<sup>291</sup> They have taken various paths with regard to

285. Robinson, *supra* note 18 (manuscript at 41–48); Rohr & Wright, *supra* note 18, at 68–69. As we saw in Section III.B., the role of the Curators in the DAO was controversial and disputed. Rohr and Wright observe that just because tokenholders could only vote for whitelisted proposals does not necessarily mean that they were "sufficiently dependent" on Curators' efforts to deem the 2016 DAO tokens securities. *See id.*

286. Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81,207, *supra* note 32, at 14. Rohr and Wright take issue with the SEC's analysis here, observing that it "may not be completely accurate." Rohr & Wright, *supra* note 18, at 69. "Ten accounts owned over 20%" of the tokens, and overall the 2016 "DAO was substantively controlled by only a handful of token holders." *Id.*

287. Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, Exchange Act Release No. 81,207, *supra* note 32, at 13–15.

288. *See supra* notes 239–46 and accompanying text.

289. *See* Rohr & Wright, *supra* note 18, at 30.

290. *Id.*

291. A particular canton in Switzerland has been home to a disproportionate number of ICOs. "The small canton of Zug, near Zurich, has unofficially become 'Crypto Valley.'" Ralph

securities laws. Some have openly flouted the SEC—and the SEC has taken an increasingly active role in actions against them.<sup>292</sup> Others have tried to evade the reach of U.S. securities laws in three ways.

First, some ICOs have tried to bar would-be investors from the United States from participating, in the hopes that they will qualify as foreign offerings under Regulation S.<sup>293</sup> In particular, many recent ICOs have been launched by nonprofits organized in Switzerland to evade the reach of U.S. securities law and the law of other jurisdictions.<sup>294</sup> Second, promoters have directed offerings not to the general public, but instead only to accredited investors, the wealthy individuals who qualify to invest in private securities.<sup>295</sup> The SAFT (Simple Agreement for Future Tokens) suggests one way to avoid liability under the securities laws is to offer investment exclusively to accredited investors, who are more sophisticated and better prepared to accept the risk.<sup>296</sup> In other words, the SAFT promoters acknowledge that

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Atkins, *Switzerland Embraces Cryptocurrency Culture*, FIN. TIMES (Jan. 24, 2018), <https://www.ft.com/content/c2098ef6-ff84-11e7-9650-9c0ad2d7c5b5>.

292. See generally, e.g., Sec. & Exch. Comm'n v. PlexCorps, No. 17 CIV. 7007 (CBA), 2017 WL 6398722 (E.D.N.Y. 2017) (granting a preliminary order and asset freeze against Dominic LaCroix and his owned entities for likely violation of securities laws); Press Release, SEC, *supra* note 32 ("The Securities and Exchange Commission today charged a businessman and two companies with defrauding investors in a pair of so-called initial coin offerings (ICOs) purportedly backed by investments in real estate and diamonds.").

293. Although EOS, a smart contract and cryptocurrency platform, maintains that its tokens are not securities, it banned U.S. investors because of state regulations. See Frances Coppola, *When Is a Security Not a Security*, FORBES (Sept. 5, 2017, 10:29 PM), <https://www.forbes.com/sites/francescoppola/2017/09/05/when-is-a-security-not-a-security;clickside, Upcoming EOS Token Distribution—US Citizen Restriction—and Other NOOB Questions>, STEEMIT, <https://steemit.com/eos/@clickside/upcoming-eos-token-distribution-us-citizen-restriction-and-other-noob-questions> (last visited Nov. 1, 2018). The Monaco Visa ICO employed a click-wrap block so U.S. investors would not join. dana-edwards, *ICOs Are Not for US Citizens? Should ICOs Reject Self Proclaimed US Citizens as a Way to Reduce Legal and Regulatory Risk?*, STEEMIT, <https://steemit.com/icos/@dana-edwards/icos-are-not-for-us-citizens-should-icos-reject-self-proclaimed-us-citizens-as-a-way-to-reduce-legal-and-regulatory-risk> (last visited Nov. 1, 2018). The Cobinhood ICO also banned U.S. investors (and, unrelatedly, employed celebrity Jamie Foxx to advertise via his twitter feed). See *Frequently Asked Questions About COBINHOOD*, CRYPTO INDON., <https://cryptoidonesia.com/frequently-asked-questions-cobinhood> (last visited Nov. 1, 2018) ("While most participants of any citizenship can join the ICO, unfortunately, we are unable to accept participation from citizens of The United States of America, Canada, China, and Taiwan due to existing regulations in their respective states."); see also Eugene Kim, *Cryptocurrency Investors Worry About a Bubble as Jamie Foxx and Other Celebrities Jump on Board*, CNBC (Sept. 19, 2017, 2:28 PM), <https://www.cnbc.com/2017/09/19/jamie-foxx-ico-investors-worried.html> (discussing actor Jamie Foxx's promotion of Cobinhood, "a free cryptocurrency exchange," and noting that some cryptocurrency investors see such celebrity endorsements as "a worrying sign of a bubble" warranting actions by regulators).

294. Atkins, *supra* note 291 ("Of the 10 biggest proposed initial coin offerings—by which startups raise funds by selling tokens—four have used Switzerland as a base . . .").

295. Robinson, *supra* note 18 (manuscript at 27).

296. JUAN BATIZ-BENET ET AL., THE SAFT PROJECT: TOWARD A COMPLIANT TOKEN SALE FRAMEWORK 19 (2017), <https://saftproject.com/static/SAFT-Project-Whitepaper.pdf>. The SAFT is modeled on the SAFE—the Simple Agreement for Future Equity. The SAFE is a contract in a fledgling corporation that provides that an investor's interest will convert automatically into

SAFTs are investment contracts subject to the 1933 Act, but argue that they qualify for exemption from registration because they are offered only to accredited investors.<sup>297</sup> SAFT investors fund developers who “develop [a] genuinely functional network, with genuinely functional utility tokens, and then deliver those tokens to the investors once functional. The investors may then resell the tokens to the public, presumably for a profit, and so may the developers.”<sup>298</sup> The tokens themselves are merely “consumptive products,”<sup>299</sup> leading to the third manner of evading the reach of U.S. securities law.

Finally, there has been an effort to develop public token offerings that would not be securities offerings under the *Howey* test. These token offerings are “utility tokens” or “app coins,” that is, tokens to be used for consumptive purposes, and whose primary purpose is not to be held for future profit.<sup>300</sup> Utility tokens are more like a right to buy a future product or service than a right to participate in the profits of a future enterprise. Rohr and Wright contrast these tokens with what they term investment tokens, which “bestow express economic rights on their holders.”<sup>301</sup> Nevertheless, many of these utility token offerings have had a speculative component—either because investors are betting that their use rights will go up in value, or because they do not understand that they are not receiving an equity interest in the offering.

The SEC is closely monitoring these developments and has expressed skepticism about the proliferation of ICOs. Jay Clayton, Chairman of the SEC, stated in December of 2017, “[m]erely calling a token a ‘utility’ token or structuring it to provide some utility does not prevent the token from being a

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equity if the company raises finances in the future, is sold, or goes public. Joseph M. Green & John F. Coyle, *Crowdfunding and the Not-So-Safe SAFE*, 102 VA. L. REV. ONLINE 168, 172 (2016). SAFEs were created to offer a simple solution to the problem often confronting early-stage entrepreneurs who needed to raise funds quickly and cheaply, without the time and cost intensive negotiations that surround venture financing and, increasingly, angel investing. *Id.* at 172–73.

297. BATIZ-BENET ET AL., *supra* note 296, at 4, 16–17.

298. *Id.* at 1.

299. *Id.* Several platforms have used the SAFT framework, including Unikrn, a sports betting platform backed by Mark Cuban, and Kik, which raised \$100 million in Ethereum to develop a new social internet platform. See Unikrn Bermuda Ltd., Notice of Exempt Offering of Securities (Form D) (Oct. 6, 2017), [https://www.sec.gov/Archives/edgar/data/1718925/000171892517000003/xslFormDX01/primary\\_doc.xml](https://www.sec.gov/Archives/edgar/data/1718925/000171892517000003/xslFormDX01/primary_doc.xml); Eugene Kim, *Crypto Start-Ups are Trying to Get Their House in Order Ahead of a Possible SEC Crackdown*, CNBC (Oct. 12, 2017, 12:16 PM), <https://www.cnbc.com/2017/10/12/crypto-start-ups-turn-to-safts-for-icos-raising-more-than-350m.html>.

300. Gertrude Chavez-Dreyfuss, *Global Crypto-Currency Crackdown Sparks Search For Safe Havens*, REUTERS (Nov. 28, 2017, 12:04 AM), <https://www.reuters.com/article/us-blockchain-regulation-tokens-insight/global-crypto-currency-crackdown-sparks-search-for-safe-havens-idUSKBN1DS0F2> (“[M]any U.S. startups thought they could avoid such scrutiny by selling ‘utility tokens,’ which gave buyers access to products or services rather than a stake in the company.”); see also Rohr & Wright, *supra* note 18, at 41 (“Because [utility] tokens entitle the holder to use, consume, or access an online service or serve other functional purposes (for example, participating on a messaging platform or surfing the Internet without ads), elements of a consumption purpose are present.”).

301. See Rohr & Wright, *supra* note 18, at 52.

security.”<sup>302</sup> Clayton further noted that offerings that “emphasize the potential for profits based on the entrepreneurial or managerial efforts of others” are “the hallmarks of a security under U.S. law.”<sup>303</sup>

One neat solution to the securities problem ICOs confront involves not trying to evade the *Howey* test by not offering an ownership interest; instead, it involves embracing the need for governance and gap-filling by creating intervention points for tokenholders to fill. Once set in motion, a smart contract continues to operate autonomously—no single individual can stop it once it has begun running. Thus, if the contract codes for meaningful governance amongst DAO tokenholders, then the ownership interest would not generate profits “solely through efforts of others.” Instead, it would look more like a true partnership interest. This solution has the benefit of neatly tying two threads this Article has explored: It not only solves the *Howey* securities problem, but also reintroduces a place for gap-filling in what will inevitably be an incomplete contract for firm organization at the outset of an undertaking. The result would be that the DAO will function more like the partnership it technically is under the law.

The point of this Article, however, is not to suggest a solution to the *Howey* problem current ICOs confront. Instead, its argument is simply that the blockchain reshuffles the relationship between the law and private ordering. For better and for worse, the blockchain does not provide parties with the intervention points corporeal firms naturally supply. That lack of intervention point is both a bug and a feature. Incomplete contracting teaches that intervention points are necessary. The DAOs of the future, if they exist, will be able to configure governance rules in ways previously unimaginable. But legal intervention points remain wherever blockchain organizers and their identifiable organizers meet.

## VI. CONCLUSION

This Article makes no claims that the blockchain is an unregulable space. The history of Internet regulation has taught us that borders, governments, and authority will inexorably extend wherever legal intervention points exist.<sup>304</sup> Instead, its focus has been on the world of private ordering and the usual relationship between contracting parties and private law that arises on the blockchain. If parties generally “bargain in the shadow of the law,”<sup>305</sup> so

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302. Public Statement, SEC Chairman Jay Clayton, Statement on Cryptocurrencies and Initial Coin Offerings (Dec. 11, 2017), <https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11>.

303. *Id.*

304. See JACK GOLDSMITH & TIM WU, WHO CONTROLS THE INTERNET?: ILLUSIONS OF A BORDERLESS WORLD 65–85 (2006).

305. Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950, 968, 997 (1979).