8-13-2018

The Tao of The DAO: Taxing an Entity That Lives on a Blockchain

David J. Shakow

*University of Pennsylvania Carey Law School*

Follow this and additional works at: https://scholarship.law.upenn.edu/faculty_scholarship

Part of the [Computer Law Commons](https://scholarship.law.upenn.edu/computer_law), [Digital Communications and Networking Commons](https://scholarship.law.upenn.edu/digital_communictions_and_networking), [E-Commerce Commons](https://scholarship.law.upenn.edu/e_commerce), [Internet Law Commons](https://scholarship.law.upenn.edu/internet_law), [Policy Design, Analysis, and Evaluation Commons](https://scholarship.law.upenn.edu/policy_design_analysis_and_evaluation), [Taxation Commons](https://scholarship.law.upenn.edu/taxation), [Taxation-Federal Commons](https://scholarship.law.upenn.edu/taxation_federal), and the [Tax Law Commons](https://scholarship.law.upenn.edu/tax_law)

**Repository Citation**


https://scholarship.law.upenn.edu/faculty_scholarship/2009

This Article is brought to you for free and open access by Penn Law: Legal Scholarship Repository. It has been accepted for inclusion in Faculty Scholarship at Penn Law by an authorized administrator of Penn Law: Legal Scholarship Repository. For more information, please contact PennlawIR@law.upenn.edu.
The Tao of The DAO: Taxing an Entity That Lives on a Blockchain

by David J. Shakow

Reprinted from Tax Notes, August 13, 2018, p. 929
The Tao of The DAO: Taxing an Entity That Lives on a Blockchain

by David J. Shakow

David J. Shakow is a professor emeritus at the University of Pennsylvania Law School and of counsel in the Philadelphia office of Chamberlain, Hrdlicka, White, Williams & Aughtry. Shakow thanks Professor Kevin Werbach of the Wharton School for providing page proofs of his coming book, The Blockchain and the New Architecture of Trust, and for his many comments on this report. He also thanks Philip Karter, Reed Shuldiner, and Stanley Veliotis for helpful comments on an earlier draft. He expresses his continued appreciation for the repeated assistance of Bill Draper. He retains full responsibility for any remaining mistakes.

In this report, Shakow explains how a decentralized autonomous organization functions and interacts with the U.S. tax system, and he presents the many tax issues that these structures raise.

Copyright 2018 David J. Shakow.
All rights reserved.

Table of Contents

I. Introduction ........................................... 929
II. DAOs and Their Terminology .................. 930
   A. The Blockchain ............................ 930
   B. Smart Contracts ......................... 930
   C. The Ethereum Platform ............... 931
   D. Blockchain Forks ....................... 932
   E. Decentralized Autonomous
      Organization ........................... 932
III. Why The DAO Failed ......................... 932
IV. The SEC’s Decision on The DAO .......... 934
V. First Tax Issue: Classification ............. 934
VI. Second Tax Issue: FATCA ................... 938
VII. Enforcement .................................... 939
    A. Taxation of Owners .................... 939
    B. Taxation of the Entity ............... 940
VIII. Conclusion ...................................... 941

I. Introduction

In the spring of 2016, a group of developers put forth a proposal for a decentralized autonomous organization (DAO — this term and others will be explained below). The purpose of this DAO, which was called “The DAO,” was to collect funds for investment in new ventures. The investors, through the Ethereum blockchain platform (upon which The DAO was constructed), would decide where The DAO’s funds would be invested and would share in the profits of the enterprise.¹

Unfortunately, a programming error left open the possibility for The DAO’s funds to be diverted to a rogue individual’s account. This did indeed happen, and perhaps one-third of The DAO’s funds were diverted. To mitigate the potential effects of a diversion, the Ethereum community voted to have a “hard fork” of the Ethereum chain, creating two Ethereum chains into the future.²

To add insult to injury, the SEC used this DAO to explain for the first time its view that some blockchain-related issuances would be considered securities subject to SEC regulation.³

Although this specific DAO wasn’t successful, entrepreneurs continue to use the blockchain structure to raise funds and deploy those funds for the benefit of their investors. It has been

² Id.
suggested that such a structure could be used to create the equivalent of corporations. Several DAOs have already been formed.

Absent from the discussion of DAOs is any consideration of how these new structures mesh with the U.S. tax system. An examination of what constitutes a DAO quickly reveals that there are significant tax issues raised by these structures. By describing how The DAO was intended to function, I hope to make clear what these issues are.

II. DAOs and Their Terminology

A. The Blockchain

Many have written about the blockchain, particularly because Bitcoin, blockchain’s initial application, has grabbed the public’s imagination. The following description, while incomplete, is intended to make the discussion of DAOs understandable to those previously unfamiliar with them.

Traditionally, if a system is to keep track of the ownership of assets, it needs a central authority to record ownership and thus provide assurance to the owners and potential purchasers that the property is really there and that ownership can be transferred uniquely. Think, for example, of a government agency with which land ownership is really there and that ownership can be transferred uniquely. Think, for example, of a government agency with which land ownership is transferred uniquely. Think, for example, of a government agency with which land ownership can be transferred uniquely. Think, for example, of a government agency with which land ownership can be transferred uniquely.

The blockchain dispenses with the need for a central authority by making public the ledger showing the assets within its domain. In the classic blockchain, no one viewing this ledger would be able to identify the owner of any of the assets listed in the ledger. However, using cryptographic methods, only the owner of the asset can transfer it to another person. The owner has a “digital key” (which is like a password or PIN) that can uniquely be used to transfer the asset. Thus, the owner can show a potential buyer that the asset exists, because it is listed in the publicly available ledger. The person claiming to be the owner then proves ownership by being able to transfer the item to the transferee’s account.

A crucial aspect of this system is that for the transfer to be accepted by the community participating in this system, a complicated mathematical problem must be solved. A correct solution must be confirmed by members of the community. As each group (or “block”) of transfers is confirmed, it is added to the chain of all transactions, and the updated ledger is kept by each member of the community. It is the public nature of the ledger, and the fact that transactions must be confirmed, that prevents the introduction of a counterfeit transfer into the structure.

Because maintaining the honesty of the system depends on solving mathematical problems, those that find solutions (miners) are given a reward. In the bitcoin system, as in many other blockchain systems, the reward consists of a unit of the property that is recorded in the ledger — in this case, a newly minted bitcoin.

One possible flaw in this system is that a group could obtain sufficient voting power to approve a transaction that transfers assets to them. This “51-percent attack” is combated by having a sufficiently large group of persons in the blockchain’s community reviewing and confirming transactions.

B. Smart Contracts

The system described above is relatively simple, to the extent that it deals only with transfers of assets from one person to another. But the blockchain can also be used to record more
complicated transactions: those effected through smart contracts.

A smart contract is one whose terms are reflected in a computer program or, more generally, in a machine. All provisions, including execution and enforcement, are carried out automatically and without human intervention. It was early described in the simple context of a vending machine. When you put money into a vending machine and buy a bottle of soda, the seller is not around to confirm your purchase. The seller has simply set up its machine so that it recognizes when sufficient funds have been deposited to allow for the release of a container of soda and any change owed you.

But the current state of smart contracts goes well beyond that. For example, it allows two parties to set up their computers so that the buyer’s computer issues an order to purchase an item, and the seller’s computer causes the item to be sent on its way without further intervention by the seller. For example, if a company kept its supply of paper so that it could mechanically determine when the supply was running low, its computer could issue an order to an office supply company for more paper, without any employee of the buyer necessarily being aware that the order had been placed. The office supply company’s computer could cause a shipment of paper to be made to the buyer with no conscious intervention of any employees.

C. The Ethereum Platform

The Ethereum platform is a blockchain platform created with flexibility to allow for smart contracts. For our purposes, we need only appreciate an example of its application in The DAO transaction. The DAO structure allowed persons to transfer Ether (the Ethereum cryptocurrency, similar to bitcoin) to The DAO in exchange for The DAO tokens—items that were ownership interests in The DAO. Token owners voted to choose the investments to be made by The DAO and shared ratably in gains and losses of The DAO. Each token was recorded in the blockchain. The intention was that the collected funds would be invested in start-up companies. A proposal brought to The DAO would be voted on by the holders of The DAO tokens. If enough holders approved of the investment, the investment would be made by transferring Ether from The DAO’s account to the account of the successful applicant. Those who didn’t approve of the investment could choose to take their remaining Ether, leave The DAO’s main blockchain and collect their Ether, or create another blockchain. Besides their Ether, those who moved to the new blockchain would also receive “reward tokens.” Holders of the reward tokens would receive from The DAO their allocable portion of any distributions that The DAO received from investments made while the members of the new blockchain were still members of the original blockchain of The DAO, and from the proceeds of the disposition of those earlier investments. All of this—the tallying of the votes, the creation of a new blockchain, any distributions to disapproving holders, the investment of funds with successful applicants—could be effected through smart contracts, without the need for human intervention on behalf of The DAO. In its implementation, The DAO also made use of human “curators” who confirmed the identity of those who submitted proposals.


9 They did not exercise any control over leadership of The DAO (like voting for the board of directors of a corporation) because The DAO’s structure did not include any leadership positions.

10 The description of the operation of The DAO in this paragraph comes from its formal presentation in Jentzsch, “Decentralized Autonomous Organization to Automate Governance (Final Draft)” and Stephen Tual, “On DAO Contractors and Curators,” Slock.it blog, Apr. 9, 2016. Note that voting was based on the number of DAO tokens owned. Some have questioned whether it might be more democratic if each holder had only one vote. See, e.g., Haseeb Qureshi, “Blockchains Should Not Be Democracies,” Hacker Noon (Apr. 26, 2018); Muhammad Mehar et al., “Understanding a Revolutionary and Flawed Grand Experiment in Blockchain: The DAO Attack” (Nov. 26, 2017). This issue is analogous to controversies that exist regarding the proper rules for voting in a cooperative. See David J. Shakow, “From Rochdale Principles to LLCs: The Ongoing Evolution of the Cooperative Structure,” Tax Notes, Aug. 2, 2004, p. 535.
D. Blockchain Forks

A fork is created whenever the rules governing the blockchain are changed. If the change is made through a “soft fork,” a single blockchain will remain, although some users may continue using the old rules and won’t make use of the features in the new software. If the change is a “hard fork,” the result could be two blockchains where one existed before, unless everyone adopts the changed software. The transactions that occurred before the hard fork will be found on both blockchains. The hope and expectation of those introducing the change that leads to a hard fork is that holders will stop using the older prong. However, as a practical matter, if both blockchains remain active, anyone who held an asset on the blockchain before the hard fork will end up with two assets, one on each prong of the forked blockchain.11

E. Decentralized Autonomous Organization

As the above explanation hopefully makes clear, a DAO is decentralized because control over its operations does not reside in one place. It is autonomous because the smart contracts that govern its operation, when they operate properly, control the operation of the entity without the need for human intervention on behalf of the DAO. And, as the name suggests, it is a form of organization. The DAO was an early attempt to implement a DAO structure. Although it ultimately failed, it is useful to study because the details of its intended operation were clearly described.

III. Why The DAO Failed

This grand experiment, which accumulated more than $150 million from more than 11,000 investors,12 failed because of a programming error. As noted above, anyone who disapproved of an investment had the right to withdraw from The DAO. Because of the programming error, The DAO, on its books, did not immediately reduce the account of an investor making a withdrawal. As a result, it was possible to make multiple withdrawals of the same amount of Ether from an ownership account in The DAO, and a rogue investor did just that.13

When those observing The DAO’s operations realized that much of its funds had been diverted, two options presented themselves.14 On one hand, this massive withdrawal of funds could be left alone. A significant and vocal minority of The DAO investors were in favor of this alternative. The reason was that, as a matter of principle, these investors believed strongly that anyone investing in The DAO had to accept that the rules governing its transactions would be precisely what was in the computer code in The DAO’s programs. Accordingly, a token holder’s ability to withdraw more funds than it had invested was simply another risk that investors necessarily had to accept, just as they would have to accept that an investment agreed upon might not be successful. This is characterized as a holding that “code is law.”15

The possibility that persons whose investments had essentially been stolen would support the position of the thief will seem inconceivable to those who do not appreciate the devotion of some to the idea that cyberspace should operate without intervention from outside authorities.16 In any event, when the theft was discovered, a group of Robin Hoods who realized

12 David Siegel, “Understanding The DAO Hack for Journalists,” Medium (June 16, 2016). The dollar amounts reported for this project vary in different accounts depending on when the Ethers are translated into dollars.
13 See Emin Gün Sirer, “Thoughts on The DAO Hack,” Hacking Distributed (June 17, 2016).
14 The computer code controlling DAO tokens prevented the rogue investor from using the diverted tokens for 27 days, which gave time for the alternatives discussed below to be debated. See Stephan Tual, “DAO Security Advisory: Live Updates,” Stock.it blog, June 17, 2016.
15 The term comes from Lawrence Lessig, Code: And Other Laws of Cyberspace 5 (2006) (footnotes omitted): “In real space, we recognize how laws regulate — through constitutions, statutes, and other legal codes. In cyberspace we must understand how a different ‘code’ regulates — how the software and hardware (i.e., the ‘code’ of cyberspace) that make cyberspace what it is also regulate cyberspace as it is. As William Mitchell puts it, this code is cyberspace’s ‘law.’ “Lex Informatica,” as Joel Reidenberg first put it, or better, “code is law.” A post in the name of the anonymous investor who had withdrawn the funds apparently adopted this “code is law” view and took umbrage at being characterized as a thief. See “Letter From ‘The Attacker,’” June 18, 2016. An analogous issue in the tax law is whether “substance” should govern when a transaction seems to follow the form described in the statute. See Joseph Isenbergh, “Musings on Form and Substance in Taxation,” 49 U. Chi. L. Rev. 859 (1982). To prevent confusion among tax practitioners reading this, the reference to “code” here is to computer code, not the IRC.
16 See Lessig, supra note 15, passim.
what was happening diverted The DAO’s remaining Ether to a safe place for the benefit of the other investors before anyone else could get control of them.\textsuperscript{17}

Ultimately, this problem could be fixed only through actions taken on the Ethereum blockchain. The vast majority of those who expressed their opinions wanted to undo the theft. They voted for another option: the creation of a hard fork of the Ethereum blockchain. As noted, it is practically impossible for anyone to introduce a counterfeit transaction into a blockchain because the blockchain community must approve of a new transaction, and a counterfeit transaction would not pass muster under this system. However, the community can choose to disregard a host of transactions by simply agreeing to ignore the portion of the blockchain that contains the disapproved transactions.

That is what happened here. Almost 90 percent of those in the Ethereum blockchain who voted were in favor of rolling back the blockchain to before the point at which the rogue investor began transferring tokens to its account.\textsuperscript{18} The Ethereum miners (the only ones who could actually effect a change) then agreed to follow the request of the Ethereum Foundation and upgrade the Ethereum software. That created a hard fork in the blockchain. One prong included the transactions from the point that the rogue investor’s activities began, plus any other transactions that might follow this path after the hard fork occurred. The other prong did not include those transactions, instead functioning as if all transactions in the portion of the original blockchain that included the rogue investor’s transactions never took place. It was anticipated that most people using Ether would follow this second prong.\textsuperscript{19}

\textsuperscript{17} Jentzsch, supra note 1.

\textsuperscript{18} Antonio Madeira, “The DAO, the Hack, the Soft Fork and the Hard Fork” (May 20, 2018). The significance of this overwhelming support for the hard fork is undercut by the fact that only 4.5 percent of Ether (not Ether holders) were voted at all, and apparently, holders of large blocks of Ether played a major role: One voter cast more votes in favor than all the votes cast against. See Vitalik Buterin, “Notes on Blockchain Governance” (Dec. 17, 2017).

\textsuperscript{19} Pete Rizzo, “Ethereum Hard Fork Creates Competing Currencies,” CoinDesk, July 24, 2016 (describing how the transactions using the old prong, called Ethereum Classic, unexpectedly gained some value).

The investors in The DAO could not themselves generate this solution. Creating a hard fork in the Ethereum blockchain was a decision that had to be made by those in the Ethereum community. What probably influenced that decision was that The DAO had accumulated about 14 percent of all outstanding Ether in its successful fundraising.\textsuperscript{20} Once the fork was created, The DAO investors were able to retrieve their investments and The DAO ceased to function.

However, because not everyone agreed to the solution, both blockchains (recording ownership of Ether) remained active. While the new blockchain became the one most investors looked to, the old blockchain continued to be used. Thus, anyone holding Ether from before the time of the hard fork ended up with two assets instead of one: Ether on the new blockchain and Ether on the old blockchain (called Ethereum Classic).\textsuperscript{21} Although Ethereum Classic is not as valuable as Ether on the new blockchain, it became an additional asset of those who held Ether before the hard fork occurred.\textsuperscript{22}

Creating the hard fork disappointed those who felt that code, once set out, is unalterable. Indeed, discussions of smart contracts emphasize that they have no flexibility because they lack safety valves that an outside review would provide.\textsuperscript{23} But as the solution to the problem created by The DAO shows, a safety valve can be

\textsuperscript{20} Klint Finley, “A $50 Million Hack Just Showed That The DAO Was All Too Human,” Wired, June 18, 2016; Siegel, supra note 12 (suggesting that from the standpoint of the Ethereum blockchain, The DAO was “too big to fail”).

\textsuperscript{21} Alyssa Hertig, “Ethereum’s Two Ethereums Explained” (July 28, 2016).

\textsuperscript{22} The tax result of such a hard fork might be additional income. See discussion in American Bar Association Section of Taxation, “ABA Tax Section Offers Suggestions for Cryptocurrency Guidance” (Mar. 20, 2018). The ABA tax section suggested that as an administrative matter, hard forks occurring in 2017 (which would not include The DAO hard fork) be treated as taxable events, but with an amount realized of zero. This would have the effect of making the new assets generated by a hard fork capital assets with a zero basis for most taxpayers, and would defer income recognition regarding those assets to the time those assets were disposed of. The American Institute of CPAs argued that no income should be recognized because the additional asset received in the case of a hard fork is unsolicited and extremely difficult to value. See AICPA, “AICPA Seeks Updated Guidance on Tax Treatment of Virtual Currency” (May 30, 2018) (section 6 of comment letter to IRS). The practical result of this suggestion would seem to be the same as for the ABA’s.

found by using what is in effect a 51 percent attack that those on the blockchain can agree to. The hard fork used in the context of The DAO was an extreme measure. But any change in the operation of the blockchain left open by the blockchain’s code that the community can agree to is available as a backstop to unexpected applications of the original code.

Note that the post hoc change in rules that was applied in The DAO situation is not unique to the blockchain world. It has been argued that the same type of solution was used at the end of the tulip craze in the 1600s. The rules governing delivery under tulip contracts were changed so that those committed by contract to buy tulips (at extraordinarily high prices) could satisfy their obligation by paying only 3.5 percent of the contract price.24 Similarly, when Nelson Bunker Hunt and William Herbert Hunt accumulated substantial amounts of silver and contracts for the delivery of silver (arguably setting up a corner of the silver futures market), the commodity exchanges simply changed their rules, ultimately resulting in a substantial reduction of the Hunts’ wealth. It has been suggested that some of those who made those decisions profited from the change in the rules.25 This element of self-interest may have played a role in the hard fork that saved The DAO investors.26

IV. The SEC’s Decision on The DAO

Long after The DAO ceased functioning, the SEC considered the treatment of The DAO’s tokens under the securities laws.27 Its release alerted those issuing blockchain-based tokens to the SEC’s general views on these assets. According to the SEC’s reasoning, a security includes an investment contract, which is an investment of money in a common enterprise with a reasonable expectation of profits from the efforts of others. Although the purchasers of The DAO tokens could vote on proposals presented to them, they were relying on the persons who developed the structure and on the curators who selected the proposals for them to vote on.28 Because of the wide dispersion of ownership of The DAO tokens and the anonymity of their owners, the SEC concluded that the voting rights granted to these ownership interests were “akin to those of a corporate shareholder.” It followed that interests like The DAO tokens normally require registration under the securities laws.29

V. First Tax Issue: Classification

The organizers of The DAO were very concerned about their possible liability to investors. Thus, there is language throughout the documents that describe The DAO to potential investors emphasizing that no “legally binding contract” was created through the investment.30 This was presumably intended to rebuff any claims that those who developed The DAO might be responsible for any losses the investors incurred.31 But it also suggests that while a DAO is called an “organization,” its developers thought it might not have any formal character for local law purposes.

However, a surprising aspect of analyzing any DAO for tax purposes (to someone not a tax practitioner) is that it can be a tax entity. In some sense, it appears like a disembodied creation...
floating in cyberspace, with no apparent form. Yet as The DAO’s short history makes clear, the group of investors in The DAO intended to consult together to decide on investments, to make the investments, and to share in the profits. They, and those on the Ethereum blockchain, ultimately worked together to resolve the problem created by the rogue investor. Despite the disclaimers in the material presenting The DAO to potential investors, the structure operated very much like a contract. Effectively, the computer code governing the operation of The DAO was the contract. Remember that no change was made in the rules governing the operation of The DAO in order to thwart the plan of the rogue investor. Rather, a change was made in the operation of the Ethereum blockchain by creating a hard fork in that blockchain. And the possibility of a hard fork was inherent in the rules governing the operation of the Ethereum blockchain.

In determining the status of The DAO for tax purposes, classification for local law purposes is not relevant (even assuming that the quoted language about no legally binding contract had its desired effect). In determining whether the agreements entered into in creating The DAO, or any similar entity, result in an entity for tax purposes, the regulations state:

> Whether an organization is an entity separate from its owners for federal tax purposes is a matter of federal tax law and does not depend on whether the organization is recognized as an entity under local law.

The regulations go on to state what makes an organization an entity separate from its owners:

> A joint venture or other contractual arrangement may create a separate entity for federal tax purposes if the participants carry on a trade, business, financial operation, or venture and divide the profits therefrom.

Those regulations simply echo the language of the statute:

> The term “partnership” includes a syndicate, group, pool, joint venture, or other unincorporated organization through or by means of which any business, financial operation, or venture is carried on, and which is not, within the meaning of this title, a corporation or a trust or estate.

Case law does not require much formality to create a partnership for tax purposes. In Podell, an oral agreement under which a taxpayer supplied funds to allow another person to rehabilitate homes, after which the two divided the profits, was treated as a partnership. In Bergford, taxpayers who were formally merely co-owners of computer equipment were deemed to be in a partnership with the manager of the sale-leaseback program through which they bought the equipment. The Court of Appeals accepted the Tax Court’s conclusion that “the economic benefits to the individual participants were not derivative of their coownership of the computer equipment, but rather came from their joint relationship toward a common goal.” Similarly here, the significance of holding an interest in The DAO was the ability to vote on the proposals brought to the attention of The DAO and to share in any profits generated by the

---

32 Analyses of the relationship between smart contracts and conventional contract law generally conclude that parties governed by smart contracts are likely tied to the terms of the agreement at least as strongly as those entering conventional contracts. See Sklaroff, supra note 23 (smart contracts more rigid than other contracts); Mark Flood and Oliver Goodenough, “Contract as Automaton: The Computational Representation of Financial Agreements,” OFR Working Paper 15-04 (Mar. 26, 2015) (a well-written contract can be function like a contract a computer could work with); Werbach and Cornell, supra note 8, at 343 (“smart contracts are contracts”); but see Lauren Henry Scholz, “Algorithmic Contracts,” 20 Stan. Tech. L. Rev. 128, 151 (2017) (there is a very strong argument that arrangements like The DAO are not enforceable).

33 This was reflected in a post purportedly from the rogue investor, which argued against the creation of a hard fork because it would harm the market value of Ether. See letter, supra note 15. The post did not argue that this change could not be made:


35 Reg. section 301.7701-1(a)(2).
36 Sections 761(a) and 7701(a)(2).
38 Bergford v. Commissioner, 12 F.3d 166, 169 (9th Cir. 1993). It should be noted that the tax law will find an arrangement to be a partnership when securities law might not. Thus, the SEC’s release on The DAO, supra note 3, concluded that The DAO was not a partnership because “the pseudonymity and dispersion of the DAO Token holders made it difficult for them to join together to effect change or to exercise meaningful control.” The SEC’s analysis would not lead to a conclusion that there was a partnership under the facts of Bergford.
investment of the funds that were under the control of the holders of The DAO tokens.

It is clear that The DAO, a group of investors that intended to review investment proposals and invest in some of the proposed ventures, was carrying on a business or financial operation with the intention of dividing the profits therewith from the others who invested in The DAO. The DAO was expected to provide capital to chosen investments, and those who bought into The DAO were promised a share of any resulting profits. As the effects of the diversion of Ether from The DAO’s account showed, the investors would also share in the losses of The DAO. All these arrangements were inherent in the software under which The DAO operated. It is worth emphasizing that although it was a change in the structure of Ethereum and the Ether issued through it that frustrated much of the rogue investor’s plans, if a change in the operation of The DAO itself could have been made, it would not change the analysis. Such a change is inherent in the blockchain structure to the extent it allows for soft forks and hard forks. Analogously, the agreements governing the organization and operation of a corporation or partnership are subject to amendment, within the parameters of the documents and local law.

Some recent cases have required that there be significant sharing of income and losses to support partner status. However, in a DAO, all those contributing capital share proportionately in the income and losses of the enterprise. Those who invested Ether in The DAO were certainly in a position to share the losses of the enterprise, as became clear when the programming error in the arrangement was exploited to potentially deplete one-third of the money invested.

There are arrangements that do not rise to the level of being a partnership, but The DAO’s activities went beyond those exceptions. The regulations exclude from being a partnership “a joint undertaking, merely to share expenses” or “mere co-ownership of property that is maintained, kept in repair, and rented or leased.” Those phrases do not describe The DAO. Also, The DAO is not a trust for tax purposes because a trust is an arrangement “whereby trustees take title to property for the purpose of protecting or conserving it for the beneficiaries under the ordinary rules applied in chancery or probate courts.” The DAO was not expected merely to preserve the funds invested in it. Moreover, the beneficiaries of a trust “do no more than accept the benefits thereof and are not the voluntary planners or creators of the trust arrangement.” In contrast, the investors in The DAO were to be actively involved in The DAO’s decision-making.

That The DAO should be treated as an entity for tax purposes does not suggest that all blockchain-based assets are ownership interests in tax entities. Pure cryptocurrencies, like bitcoin, are based on a blockchain structure, but they do not reflect an ownership interest in any entity. Investors in bitcoin are looking for profits solely from a change in the value of bitcoin. There is no underlying entity whose profits will affect the value of bitcoin. And as I have discussed at length elsewhere, many tokens issued in initial coin offerings are not interests in the issuing entity.

But The DAO was an entity for tax purposes. An entity like The DAO that was not organized explicitly as a corporation could normally choose to be treated either as a partnership or as a corporation for federal income tax purposes. However, partnership classification is not available for an entity that is classified as a “publicly traded partnership.” A publicly traded partnership is one whose interests are either traded on an “established securities market” or “readily tradable on a secondary market (or the substantial equivalent thereof).” Interests in entities like The DAO can be bought and sold on exchanges. The IRS has not ruled on whether such exchanges are either “established securities exchanges are either “established securities

---

39 See, e.g., TIFD III-E v. United States, 459 F.3d 220 (2d Cir. 2006).
40 McKee, Nelson, and Whitmire, Federal Taxation of Partnerships & Partners, para. 3.02 (1996).
41 Both quotations are from reg. section 301.7701-4(a).
42 This activity would not usually rise to the level of “material participation” for purposes of the passive loss rules of section 469. See reg. section 1.469-5T.
43 Shakow, supra note 29.
44 Reg. section 301.7701-2(b) and -3(a).
45 Section 7704.
markets” or “secondary markets (or the substantial equivalent thereof).”

In any event, operating a DAO either as a corporation or as a partnership will not mesh easily with the rules of the IRC. There would have been significant tax liabilities if The DAO had operated as planned. Every investment made by The DAO when it transferred Ether to a successful applicant would be a taxable event to the DAO. Any income earned from investments would be either taxable to The DAO as a corporation or taxable to its investors as a partnership. And any time disgruntled investors who disapproved of an investment withdrew from The DAO into a new blockchain, taking their Ether and reward tokens with them, there would be liquidating distributions with tax consequences — both to the entity and to the investors — that would have to be determined. If The DAO is a U.S. taxpayer, it will have to file a tax return and alert its owners to any taxable income they have.

The obvious problem with applying those conclusions in the real world is that the pure blockchain structure intentionally omits a central authority playing any role in its ongoing operation. If a DAO is truly “autonomous,” those who developed it and promoted it no longer have any power to control it. Thus, in a DAO blockchain, there is no one responsible for filing the forms and returns needed by the tax system. There is no one to file corporate or partnership tax returns with the IRS; there is no one to furnish forms K-1 or 1099 to the owners to inform them of their income from the entities; and there is no one to withhold from any payments made to owners (or, indeed, if it is appropriate, to withhold from payments made to the miners, without whom the blockchain would not be maintained). If forms are not filed and amounts are not withheld, who will be responsible for making the resulting payments and paying any penalties that the IRS will levy?

The most straightforward answer is that the pure blockchain form does not work well for an entity under the IRC. This fact was recognized by the company Overstock.com, which issued conventional stock using a blockchain structure. Recognizing that it would have to comply with SEC requirements (and, presumably, IRS requirements), it used a blockchain structure that included an entity, Overstock.com itself, that could monitor and identify the actual owners of its stock. Overstock.com would file its own tax returns and furnish to stockholders, all of which it could identify, the appropriate tax forms reflecting such things as dividends paid to the owners.

It would seem that any entity located in the United States should use that type of structure in 46

In his testimony in February, SEC Chair Clayton noted significant differences between cryptocurrency exchanges and more traditional exchanges. See testimony, supra note 29. A discussion of the different services cryptocurrency exchanges may provide can be found in James R. Brown and Franziska Hertel, “Virtual Currencies and the Commodity Trading Safe Harbor,” Tax Notes, June 18, 2018, p. 1731.

47 Notice 2014-21, 2014-16 IRB 938, section 4, Q-6 (exchange of virtual currency for another asset is a taxable disposition of the virtual currency).

48 A white paper of one DAO, ETF, supra note 5, recognizes the potential for tax liabilities arising from its operations. The project tries to avoid problems at the entity level by stating:

The Association’s tax affairs will be dealt with according to the law of the land at the individual level, operating as a pass-through entity with each token holder paying taxes in their local jurisdiction relative to their own gains or losses.

ETF white paper, at 51. It characterizes its own legal status as follows:

The Association is a body corporate with its own legal identity. It is separate from its office-bearers and token holders. The Association will continue to exist even if the token holders change. The association exists online and is governed in a digital jurisdiction for managing decentralized autonomous organizations.

ETF white paper, at 50. As suggested in Section VI, operating in a digital jurisdiction may not protect it from the Foreign Account Tax Compliance Act rules.

49 Because the miners are working to maintain the blockchain, they probably aren’t being paid by the entity making use of the Ether on the blockchain. Whether a currency blockchain like bitcoin’s, which is not an entity, can have any obligation to withhold on payments made to miners is not considered here.

50 If the entity is a partnership, it will almost surely be subject to the new partnership audit rules, sections 6221 through 6241, either because it has more than 100 partners (section 6221(b)(1)(B)) or because it cannot show that all its partners fit the description in section 6221(b)(1)(C). This will result in more obligations and liabilities of the entity.

51 The S-3 registration statement says:

The personal identity information necessary to associate a public key representing a given block of digital securities with the owner of those securities will be maintained in a proprietary ledger system that is not exposed to the public.

52 See the discussion in Section VII regarding the question of whether the phrase “located in the United States” has any meaning in this context.
order to comply with IRC requirements. What about an entity that is not located in the United States? A foreign corporation or partnership not within the jurisdiction of the United States cannot be required to file forms that conform with IRC requirements. However, owners of such entities who are U.S. taxpayers must still obtain the information they need to properly complete their own tax returns. This would be especially important if the DAO were a partnership, because a partner must include its share of income on its tax return, even if the income has not yet been distributed to the partner. A U.S. investor who plans to comply with the tax law would be wise to ensure that it will get that information before entering into this type of investment.

VI. Second Tax Issue: FATCA

But there is another potential problem in the case of any DAO that is located outside the United States and is not subject to U.S. jurisdiction. To prevent U.S. taxpayers from hiding their assets overseas, the United States has developed rules under the Foreign Account Tax Compliance Act. FATCA requires entities that may be dealing with U.S. taxpayers to report information about those taxpayers and their financial transactions to the IRS. If they fail to do so, any payment made to them becomes subject to an automatic 30 percent withholding tax that must be collected by anyone who is a U.S. person (or by a nonparticipating FFI) of an interest that can be required to report the holdings under the rules of FATCA and FBAR requirements. See AICPA letter, supra note 22, at section 12.

The AICPA has suggested that centralized virtual currency exchanges located outside the United States would qualify as FFIs. Accordingly, someone whose virtual currency is held by the exchange could be required to report the holdings under the rules of FATCA and FBAR requirements. See AICPA letter, supra note 22, at section 12.

IRC includes as a financial institution an entity engaged in investing in securities or partnership interests. The IRS includes within that category “private equity and venture capital funds.” A foreign entity organized like The DAO would seem to fit that description. That would be true of any DAO whose goal was to invest the funds it receives from its investors. Hence, if it were not a U.S. entity, it would be an FFI.

An FFI is encouraged to enter into an agreement with the IRS. Under the agreement, the FFI commits to identifying whether its account holders are U.S. taxpayers and to supplying information to the IRS regarding payments to those taxpayers. If it cannot determine whether an account holder is a U.S. taxpayer, it must withhold 30 percent from any payment to that account holder. Given the anonymity of the blockchain, a DAO that enters into an agreement with the IRS would be withholding on any payment made to an account holder that did not properly identify itself to the entity.

If an FFI does not enter into an agreement with the IRS, any payment of interest or dividends to the nonparticipating FFI by a U.S. person (or by a participating FFI) must have 30 percent withheld from it. Thirty percent withholding is also required from the gross proceeds of the sale by the nonparticipating FFI of an interest that can produce U.S.-source interest or dividends. Thus, the nonparticipating FFI would have 30 percent of its proceeds of any sale of stock in an investment withheld if it sold the interest to a U.S. entity or one that had an FFI agreement with the IRS. This would cover many potential buyers.

If an entity like The DAO does not qualify as an FFI, it would be a nonfinancial foreign entity (NFFE). In general, payments to NFFEs made by a U.S. entity or a participating FFI are subject to 30 percent withholding. The NFFE can avoid such withholding only if it can represent to the payer...
that it has no substantial U.S. owners or it provides information about U.S. owners to the U.S. payer or FFI. A DAO would normally have difficulty making that representation.

It is worth noting that while ownership in a DAO is anonymous, a DAO that attempted to enforce tax-related requirements (for example, by asking its owners to reveal their identities) would have some power over uncooperative holders of their tokens. Given the centrality of anonymity in the blockchain structure, a DAO that had not adopted the Overstock.com structure might be reluctant to request identifying information from the holders of its tokens. However, to the extent a DAO was itself subject to any taxes or penalties, it could try to require its token holders to pay their proportional share of those payments. The rules governing a DAO could provide that a holder who did not cooperate with a request from the DAO (regarding a tax issue or anything else, for that matter) would lose its voting rights and the right to receive any distributions from the DAO. This is because while the holders of DAO tokens are anonymous, the addresses (that is, the locations on the blockchain) of those who can vote or receive distributions from a DAO must be known to the DAO — otherwise, it would not be possible to confirm their right to vote and their right to receive distributions. Presumably, if an address were blacklisted in terms of voting and receiving distributions, the transferee would also be subject to the same penalties until whatever caused the address to be penalized was corrected. This might mean that the DAO would have to provide a service to potential transferees confirming whether the token they plan to buy is limited in any way. Of course, adding these trappings of an organized entity would be somewhat inconsistent with the attempt to create a totally autonomous entity, but perhaps these procedures could be programmed in a smart contract so they would operate without human intervention.

VII. Enforcement

The reader may have noted one point missing from much of the above discussion: If a DAO retains the usual blockchain structure and does not keep a record of its owners, how are any tax liabilities enforced? After all, one of the beauties of the blockchain structure is that no one can identify who owns the assets listed on the blockchain.

A. Taxation of Owners

There are several levels of response to that question. First, many people file their tax returns honestly. The absence of a Form 1099 will not deter them from including appropriate income items on their tax returns.

Those who are tempted to ignore the income from a DAO operating with a standard blockchain may be encouraged by the fact that, unlike investors in Swiss bank accounts and the like, there is no danger of a whistleblower revealing their identity, because there is no central authority with a list of all the DAO’s investors.

However, as those who have failed to include their bitcoin (and other cryptocurrency) transactions on their tax returns have learned, the IRS can obtain records of exchanges when holders of blockchain currencies convert their holdings into fiat currencies — dollars and other conventional government-issued currencies. This may encourage investors who wish to hide their income to use exchanges that are not subject to U.S. jurisdiction. It is unclear the extent to which other countries might cooperate with an attempt by the United States to obtain information from exchanges outside U.S. jurisdiction. Many countries are concerned with cryptocurrencies because of their potential to aid criminal activities. An ideal solution would involve international cooperation to obtain information from cryptocurrency exchanges. Absent such

---

63 Section 1472(a) and (b).
64 See Jentzsch, supra note 10, at 2; and Madeira, supra note 18.
65 It is possible to “blacklist” items in a blockchain using a soft fork. See Siegel, supra note 12 (Vitalik Buterin of the Ethereum Foundation suggested using a soft fork in the Ethereum blockchain to blacklist the misappropriated Ether from The DAO).
66 See Bradley Birkenfeld, Lucifer’s Banker: The Untold Story of How I Destroyed Swiss Bank Secrecy (2016).
68 Irish Department of Finance, “Virtual Currencies and Blockchain Technology” (Mar. 23, 2018) (discusses countries that have formally banned bitcoin and other cryptocurrencies).
cooperation, a FATCA-like solution might be developed to deter the use of foreign exchanges.

B. Taxation of the Entity

If DAOs begin to proliferate, they are likely to command the attention of the OECD project on base erosion and profit shifting. The international concern with base erosion is focused on “stateless income” — income that through sophisticated tax planning is not treated as income in any jurisdiction. If a DAO can successfully assert that it “exists online and is governed in a digital jurisdiction for managing decentralized autonomous organizations,” those trying to avoid all taxing jurisdictions will no longer need complicated structures to gain their desired result.

There is certainly a serious question about how an entity formed as a DAO can be located in any physical place. If a DAO adopts a structure like that of Overstock.com, the location of the entity that is in charge of that DAO may properly be referred to as the DAO’s location. But otherwise, identifying a location of a DAO may not be a meaningful exercise under our current rules of jurisdiction. I have previously written about the difficulty of identifying the location for tax purposes of items located in the cloud. But a cloud arrangement at least consists of a set of physical computer servers. A DAO is located in cyberspace, so that it could be viewed either as everywhere or nowhere. The German company Slock.it developed The DAO, but The DAO structure was intentionally removed from Slock.it’s ownership and made available to anyone who wanted to use that structure.

The legal ramifications and treatment of an entity like The DAO have not been discussed much in the legal literature. Professor Lawrence Lessig distinguishes between the internet and cyberspace. Messages are sent on the internet; purchases are made on the internet. The messages are sent between entities that exist in the real world; the purchases are made from sellers who have a real-world existence. Much of the legal literature dealing with new technologies focuses on those interactions occurring over the internet. But The DAO itself existed nowhere other than in cyberspace. Its operations were carried out by means of its code. If you try to look for an entity like The DAO in the world, you will find that there is no there there. While its owners were real entities — however hard it might have been to identify them — and while The DAO’s investments would have been made in the real world, the entity itself existed only in cyberspace. Conventional analysis could not sensibly connect it to any one location on Earth.

The BEPS project is clearly focused on the digital economy. The possibility that there might be international cooperation under BEPS at all arose from the recognition of the serious loss of revenue to all countries because of sophisticated tax planning, among other things. If the DAO structure cannot fairly be located in any jurisdiction, it would seem to embody a classic generator of stateless income. A growth in the use of DAOs could well lead to international cooperation to tax the income of DAOs.

One way of getting some control over DAOs would be to insist that cryptocurrency exchanges make available the identities of those trading on them. To a significant degree, entities running wallet applications (where most cryptocurrency investors store their holdings) already require anti-money-laundering/know-your-customer checks upon sign-up. If all nations charged exchanges with the responsibility of knowing who their customers are, and customers trading on exchanges realized that their identities would

---

69 Information about BEPS can be found at the OECD website.


71 The language is from the ETF white paper, quoted in supra note 48.

72 See supra text accompanying note 51.


75 Jentzsch, supra note 1. The SEC release, supra note 3, concluded that Slock.it retained significant effective influence over The DAO’s actions.

76 Lessig, supra note 15, at 9.

77 Action 1 of the BEPS project is called “Addressing the Tax Challenges of the Digital Economy.”

be made known to tax authorities, it would make hiding behind a blockchain more and more difficult. Whether such a level of international cooperation could be achieved is certainly unclear.

But this solution assumes that we can locate exchanges in a jurisdiction. If exchanges can themselves operate solely in cyberspace, with no connection to any jurisdiction, governments will need to find another way of dealing with the DAO phenomenon.

Another player that governments might be able to pursue would be an entity that was known to interact with a DAO. For example, The DAO planned to bring investment proposals to its owners, and to fund entities whose proposals the owners approved of. Profits would result from distributions from those entities and from gains on the disposition of those investments. Taxing authorities might require entities receiving those invested funds — assuming they operate outside of cyberspace — to withhold from payments going to any DAO that was not complying with tax reporting requirements. And if a DAO’s ownership interests in those entities were transferred on conventional exchanges, withholding could be applied to the proceeds of any sale of an interest by a noncomplying DAO. Again, that could only succeed with substantial international cooperation.

VIII. Conclusion

There is no evidence that entities structured like The DAO have considered the likelihood that they are subject to various requirements under the tax laws. The simple solution for those that want to comply would be to use blockchains like that of Overstock.com, which allow an outside entity to oversee the ownership registry of the DAO. If they fail to do so, they may find that they are subject to limitations under FATCA or may be subject to penalties imposed by the IRS and collected, if possible, from their owners. But there remains a significant possibility that absent international cooperation and innovation, it won’t be easy for tax administrators to discover who should be taxed on the income of a DAO.

---

79 This point was suggested to me by Professor Reed Shuldiner.
80 See supra note 51.