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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

Decentralised autonomous organizations: looking for a suitable regulatory treatment

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Abstract: *Decentralised autonomous organisations (DAOs) represent a new innovative type of investment vehicle that may fundamentally change the way business and social ventures are constructed and managed, as they offer, inter alia, enhanced supervision, auditing and democracy.*

Yet, there has been no legal examination of the relevant advantages and opportunities. Specifically, the legal nature of DAOs in terms of existing legal forms, such as partnerships or collective investment schemes, and the inherent risks and disadvantages of these novel digital creatures based on blockchain technology have not been explored yet. The latter include inter alia technology risk, transfer risk and cybersecurity risk.

These issues could be solved or managed with the introduction of principle and standard-based safe harbour rules followed by a new convention, a Law of the Cyber Entities (Lex Corpus Cybernetica) that mirrors the eleven Principles for Business contained in the UK FCA Handbook. Such convention could be overseen by a new standard-setter organisation similar to the Basel Committee on Banking Supervision, which could include international regulatory and supervisory bodies along with regulators.

Summary: 1. Introduction – 2. Decentralised autonomous organisations and ‘The DAO’ – 3. UK general partnerships. – 4. US investment contracts. – 5. EU investment funds. – 6. UK collective investment schemes. – 7. Safe harbour rules and lex corpus cybernetica. – 8. Concluding remarks

1. In November 2008, an unknown person or group of persons called ‘Satoshi Nakamoto’^[1] launched ‘Bitcoin’, a new cryptographically secure digital payment system, and its native cryptocurrency, ‘bitcoin’. With these came the underlying blockchain technology,^[2] a type of distributed ledger technology (DLT), which solved the inherent double-spending issue of digital assets.

Blockchain technology promises greater financial inclusion of the world’s 2.5bn unbanked,^[3] smarter and more efficient financial systems and growth of the digital economy by utilising the full potential of the Fourth Industrial Age.^[4] Its potential use-cases within financial technology (FinTech),^[5] regulatory technology (RegTech),^[6] and wider general market use (BigTech),^[7] are increasing daily as entrepreneurs and firms experiment new innovative solutions.^[8]

FinTech-related improvements alone are expected to keep on growing, with the digital economy potentially reaching 25% (\$24,615bn) of the world economy over the next few years.^[9] Consequently, the impact of FinTech, RegTech and BigTech on the global digital economy cannot be understated.^[10]

With the Financial Conduct Authority’s (FCA)^[11] Project Innovate and other initiatives, the UK is already a leading FinTech start-up hub.^[12] To consolidate this position, the House of Lords in its 2017 report urged the government to further increase its focus on DLT.^[13]

The greater inter-connectedness ushered in by the FinTech-revolution with the ‘Internet of Things’ (IoT)^[14] has led to the development of new business models and businesses, so-called ‘FinTechs’.^[15] Among them is a new business model established as an unincorporated entity in the form of ‘The DAO’, an acronym for ‘The Decentralised Autonomous Organisation’.^[16] This has stimulated global debate as to the legal nature and classification of ‘The DAO’ and DAOs generally. Yet, relatively little published work has seemingly been dedicated to this subject.^[17] There does not seem to exist any meaningful legal analysis of ‘The DAO’ and its possible relationship with other unincorporated businesses, such as partnerships and collective investment schemes (CISs),^[18] and the legal framework governing DAOs remains unclear.^[19] This leads to the purpose of this paper, which seeks to analyse and discuss whether ‘The DAO’ is adequately encompassed in the existing framework for partnerships and CISs under EU and UK law (and to a certain extent US law), or if it constitutes a new type of legal entity that calls for a ‘law of cyber entities’ (*‘lex corpus cybernetica’*).

Because of ‘The DAO’s international nature, references will be made to EU law, UK law and to a certain extent US law. The legal analysis will be made on the basis of the ‘black letter’-method, which ‘... focuses almost entirely on the law’s own language of statutes and case law to make sense of the legal world.’^[20] This paper is structured as follows: after this introduction, chapter 2 presents and defines ‘The DAO’ and DAOs in general, and analyses associated advantages and disadvantages. Chapters 3, 4, 5 and 6 analyse whether ‘The DAO’ would constitute a partnership under UK law, a US investment contract, an EU investment fund, and/or a UK collective investment scheme, respectively. Chapter 7 argues in favour of the need for a *Lex Corpus Cybernetica* and discusses on how it may be structured. Chapter 8 concludes.

On 30 April 2016, Slock.it led by Christoph Jentzsch launched ‘The DAO’. Besides the definition of ‘The DAO’ provided in its Whitepaper, Jentzsch further described it as a for-profit entity where investors would participate through purchases of its cryptotokens^[21] with Ether. The tokens gave governance, economic and information rights in the form of, *inter alia*, voting and rewards/value appreciation. DAOs were, therefore, referred to as digital corporations.^[22] Indeed, Jentzsch likened the purchase of tokens to ‘... buying shares in a company and getting ... dividend’.^[23] and he envisioned that ‘The DAO’ could acquire physical assets and form independent business relations with external service providers.^[24]

Besides Jentzsch’s general description of this new phenomenon, there is no uniformly applied definition of a DAO,^[25] and some even consider Bitcoin to be the original DAO.^[26] This is slightly different from Tapscott and Tapscott’s definition of DAOs, this being ‘open networked enterprises (ONEs) combined with autonomous agents—software that makes decisions and acts on them without human intervention—we get what we’re calling a distributed autonomous enterprise that requires little or no traditional management or hierarchy to generate customer value and owner wealth. And we think that very large numbers of people, thousands or millions, might be able to collaborate in creating a venture and sharing in the wealth it creates—distributing, rather than redistributing, wealth’.^[27]

In this paper, a DAO is understood as an unincorporated, DLT-structured, 'smart contracts'-enabled, profit or non-profit,[28] entity or system, which is ultimately controlled collectively by its participants. Funds for DAOs are typically raised from participants globally through crowdfunding schemes, specifically initial coin offerings (ICOs).[29]

This broad definition allows, *inter alia*, DAOs to be established:

- i) independently or on existing DLT-systems;[30]
- ii) with different administrative setups. For example, some users may have greater administrative powers than others; and
- iii) with or without the participants having any previous or existing formal and/or legal connection to each other.[31]

DAO's attributes entail both general advantages and disadvantages.

The advantages of DAOs include a high level of information symmetry, real-time asset tracking, system integrity, system availability, cost efficiency, direct participation, democratic inclusion, and cross-border investor collaboration to generate and share wealth through associated system-issued cryptotokens, as these investment vehicles are marketed directly to investors through the Internet. Moreover, the larger a DAO is, the more robust, secure and useful will it generally be as new applications are added onto its protocol layer.

The disadvantages include FinTech risks such as legal and regulatory risk,[32] blockchain risk, smart protocol risk, and ICO risk.[33] Furthermore, as stakeholders may collectively have little strategic leadership, severe governance and compliance issues may arise.

Although there is no uniform definition, 'The DAO' and other DAOs can be likened to an innovative business model whereby investors globally can partake in new disruptive technologies and projects. To better understand the advantages and disadvantages of these schemes, their mechanics are discussed. Three fundamental mechanisms of 'The DAO' can be identified: (i) its underlying blockchain technology; (ii) the smart contract applications programmed on top of the blockchain; and (iii) the ICO funding mechanism typically opted for.

2.1. Blockchain technology.

A blockchain is in essence a cryptographically secure, distributed ledger. On a more technical level, blockchains can be understood in terms of their characteristics as either permissioned or permissionless (open),[34] digitally distributed, transparent and immutable ledgers, which can record anything expressible in code in timestamped and chronologically arrayed blocks.[35]

In permissionless blockchains such as 'The DAO', the often pseudonymous users can propose new transactions from each of their system-connected nodes, such as computers, smartphones and tablets,[36] whereas the compiling and creation of new size-limited blocks containing those transactions are proposed and maintained by specific nodes called 'miners'. [37] Any node can become a miner and thereby earn mining-fees and coinbase transactions. [38] This typically requires specialist hardware, such as application-specific integrated circuits (ASICs), and is very energy-cost intensive.[39]

Users can also propose amendments to a blockchain's existing features, such as transaction-speed, and implementation of additional features, such as 'smart contracts' and off-chain ledgers.[40] These characteristics facilitate trust and system-robustness, as the coded value cannot be double-spent or undone.[41] This makes golden copies known from centralised systems redundant, as all the distributed electronic devices connected to a blockchain, so-called 'nodes', [42] are able to keep records of that collective ledger.

A blockchain ensures agreement amongst its participants through a consensus mechanism. That is, the tool by which a new block, amongst all the proposed blocks, is accepted and added on the chain. Examples hereof are: Proof-of-Work (PoW), as applied in Bitcoin; [43] Proof-of-Stake (PoS), [44] as applied in NEO; [45] Proof-of-Burn, [46] as applied in Slimcoin; [47] and hybrids such as the PoW-PoS-mechanism applied in the Decred-blockchain. [48] This analysis focuses on PoW, as it is currently the most adopted consensus mechanism within the cryptoeconomy.

With PoW, miners race to solve a mathematical puzzle to find a random number, a so-called 'nonce', [49] by spending electricity as proof of their work. [50] This also solves the issue of unintended forks, as the longest forked-version of the blockchain wins because of the greater electricity consumption. [51] The miner [52] who finds the unique number can add its block to the blockchain. [53] The consequence of miners compiling and proposing new blocks is that they to some extent have administrative powers within the system.

Blockchains may be coded independently as 'meta-chains' or programmed on top of existing blockchains as 'alt-chains'. With the latter, a hard forked-version of the underlying blockchain will be created, and this may have a different consensus mechanism. [54]

2.1.1. Blockchain potentials and risks

The transformative power of blockchains and other distributed ledgers may result in the replacement of legacy systems. It may develop into a key driver for the global digital economy and new information, data and knowledge societies, as it allows for new innovative ways of information and asset exchange, validation, and sharing across large distributed networks. [55] Several potential use-cases have been identified, including cost reduction, greater efficiency and increased digitalisation of international trade. However, any use case must address the associated risks.

In addition to any legal and regulatory risk and data protection risk, blockchains are inherently susceptible to, *inter alia*, technology risk, value transfer risk, security risk, and country risk.

Technology risk exist, *inter alia*, in the form of bugs and the public-key cryptography, where all users have a pair of private and public keys. The public key is the transaction reference point, whereas the private key control the blockchain-stored digital assets, as it creates the digital signature used to authenticate transactions. The private key is stored in the users' digital wallets (accounts), [56] and if it is lost all access to the digital assets it governs is lost with no recourse mechanism.

Value transfer risk exists as all proposed transactions will practically cost a variable transaction fee, as transactions proposed by non-paying nodes risk being excluded from new blocks by the miners. [57] The difficulty is that in practice users are subjugated to a blind auction, as they have to guess and pay a sufficiently large fee for their transaction to be approved and registered. Although, most blockchains are unique, this setup of size-limited blocks and blind auction transaction fees limits their transactions per second. [58] One 2017 study on Bitcoin finds that only 43% of all bitcoin-transactions are accepted within an hour, with 20% of all transactions unconfirmed after 30 days. [59] However, initiatives for cryptoexchanges to mitigate this issue are being developed and deployed, for example, Segregated Witness (SegWit) and Plasma Cash, to upgrade various blockchains with lower transaction time and fees, and smoother incorporation of smart contracts and other decentralised applications (DApps). [60]

Cybersecurity risk exists, *inter alia*, because of the use of digital wallets connected to the Internet, which are susceptible to hacks, and attacks by dishonest nodes.

2.1.2. Governance

One of the major issues with blockchain is governance. 'The DAO' sought to solve this with the involvement of so-called 'Curators'.^[61] These were eleven users chosen by Slock.it who had been delegated ultimate and arbitrary power to whitelist proposals for voting on the blockchain. This arguably guaranteed system integrity and security in terms of protecting the system against 51%-attacks and upholding of minority stakeholders' rights.^[62] Although there were no official channels for proposal submissions.

However, this also had the unfortunate effect that Curators could only be changed or terminated if they decided to step down themselves, or if the system's users unanimously decided to change or terminate Curators through a hard fork.^[63] This in effect created a form of digital feudalism, which was highly ineffective.

In essence, a DAO's governance mechanism is the result of its underlying protocol. As software, this can easily be modelled as a standard form to fit the needs of modern corporate governance. Different nodes can be designed and designated, or special status can be conferred to users who register with the appropriate regulators to ensure a basic level of responsibility, accountability and access for judicial review, as problems can and will arise. For example, five tiers of Council of Nodes, or 'Senātus' are imagined: (i) Executive Node (Curators); (ii) Voting Node (shareholders); (iii) Auditor Nodes (regulators, accountants, etc); (iv) Operational and Service Nodes (miners); and (v) Developer Nodes. All nodes would then collectively police the system in accordance with their respective obligations, duties and powers. Nevertheless, DAOs may not be appropriate for larger more complex industrial businesses or conglomerates.

2.2. Smart protocols

In his 1994 paper titled 'Smart Contracts', Nick Szabo coined the now widespread term. He defined a smart contract as '... a computerized transaction protocol that executes the term of a contract'.^[64] As such, Szabo thought of a smart contract not as a legal contract, but merely a self-executing Ricardian Contract.^[65]

In the UK, smart contracts can constitute separate digital legal contracts or form part of an oral agreement or contract, if the general requirements (offer, acceptance, and consideration) are fulfilled.^[66] Because these legal criteria are not necessarily existent in a setup where the term 'smart contract' is applied, smart protocol is hereinafter applied instead.

Smart protocols distinguish themselves from conventional 'event-condition-action'-rules based on Boolean logic^[67] in that they are programmed on blockchains, and that their execution cannot be interfered with when commenced.^[68]

For these reasons, smart protocols can be understood as DLT-embedded protocols that self-execute pre-defined outputs (scripts) when pre-defined conditions are met, and which, once execution is commenced, cannot be interfered with.^[69]

Whether a smart protocol's input-variable has been met is determined through third-party data feed, so-called 'Oracles', which pass/fail-test input against the smart protocol's requirements. This can, for example, be GPS-input to establish whether a shipment of goods has arrived at a specific port.^[70]

2.3. Initial coin offerings

In general, ICOs, also known as 'crypto-crowdfunding' or 'crowdsale',^[71] may be used to crowdfund^[72] or promote distributed projects such as DAOs.

An ICO can be understood as the launch of a new blockchain (meta-chain or alt-chain), with an offer to the investing public or a designated investor group for the new system's pre-mined cryptoassets^[73] in exchange for fiat currencies, such as USD or EUR, or other cryptoassets, such as bitcoin or Ether.

As with both blockchains and smart protocols, any application of ICOs must duly address the associated risks, including compliance risk and reputational risk.

Compliance risk exists as ICOs may be subject to securities laws across the jurisdictions where the associated cryptoassets are offered or investors reside. For example, the US SEC has brought cease-and-desist proceedings against several ICO issuances, including Munchees Inc^[74] and Recoin.^[75] For this and other reasons, several regulators, including FCA^[76] and ESMA,^[77] have warned against ICOs.

3. Paragraph 3 looks at whether 'The DAO' could be qualified as a UK partnership, should it be established in that jurisdiction.

From an economic perspective, firms are in simplified terms collective endeavours whose primary goals are profit maximisation.^[78] In a broader perspective, firms also seek to maximise value for their stakeholders.^[79]

From a legal perspective, firms can be established in various forms with each one having various minimum requirements depending on the applicable private law of the jurisdiction in which the legal entity is seated (*lex loci situs*).

In the UK, the general partnership (hereinafter simply referred to as 'partnership') is the residual business model for joint business undertakings, and the question is whether DAOs, in general, and 'The DAO', in particular, would constitute general partnerships under the UK Partnership Act 1890 (PA1890), ss 9 and 24(1), should they be set up in this jurisdiction.^[80]

While partnerships have historically been referred to as 'companies',^[81] the fundamental difference between partnerships and companies can be understood in terms of the various incorporation requirements for companies under the UK Companies Act (CA06), s 7 *et seq*, which do not apply to partnerships.^[82] Being unincorporated, 'The DAO' therefore cannot constitute a company. Furthermore, in contrast to companies,^[83] Scottish partnerships^[84] and limited liability partnerships (LLPs),^[85] English partnerships do not form legal persons.^[86] Partnerships may nevertheless replicate the ability of companies to have a substantial and fluctuating numbers of members.^[87]

In general terms, a partnership is the relation which subsists between persons carrying on a business in common with a view of profit.^[88] This naturally implies the existence of an agreement (oral, implied or by conduct)^[89] or contract,^[90] and some degree of sharing of liability.^[91]

Besides these criteria, there are no absolutely necessary features.^[92] Neither describing participants as 'partners',^[93] or sharing of gross returns and net profits^[94] or losses between the participants in themselves form partnerships.^[95] Although these facts are naturally taken into consideration, the assessment of whether a partnership exists is based on an overall and objective assessment of the facts.

'The DAO' has been described as a corporation between a large multitude of pseudonymous or anonymous participants with its associated tokens being described as 'shares in a company'.^[96] The reference to the corporate structure, however, is not correct as 'The DAO' is not incorporated. By contrast, that 'The DAO' could constitute a partnership can be argued on the basis of:

1. ^[97]
2. ^[98]

Against these arguments it is noted that 'The DAO' tokens do not confer any rights against other 'The DAO' participants.^[99]

Also, it is dubious at best that the participants have intended to form such legal relations with the multitude of dispersed and pseudonymous (or even anonymous) participants as to create a business in common. Furthermore, although the term 'company' has historically been applied to partnerships, simply describing a scheme as such does not make it so legally.^[100]

However, the decisive argument 'The DAO' not being a partnership is likely the fact that the scheme is between a large multitude of pseudonymous or anonymous participants. As noted by Hanbury, '... absolute strangers could hardly be said to carry on a business in common'.^[101] In the US case *Williamson v Tucker*,^[102] it was held that 'Similarly, one would not expect partnership interests sold to large numbers of the general public to provide any real partnership control; at some point there would be so many partners that a partnership vote would be more like a corporate vote, each partner's role having been diluted to the level of a single shareholder in a corporation. Such an arrangement might well constitute an investment contract'.

In that case, the judge instead contemplated whether a partnership could be reclassified as an investment contract under US securities law. He held that this could be the case, if, for example, investors lacked sufficient control, knowledge and skill.^[103]

Instead, 'The DAO' participants trade for their own account with losses and profits attributable to the individual investor alone with no implied agency function conferred to the other participants.^[104] With regard to the use of the voting rights attached to the tokens, this may instead be construed as beneficiaries' power to assent.

Following this line of arguments, 'The DAO' should not constitute a partnership under UK law, although a recharacterization risk exists for smaller DAOs.

If reclassified as a partnership, participants would have the rights and liabilities arising from partnership law. Specifically, the participants would not be protected by any corporate veil, as 'The DAO' would not form a legal person. Hence, participants would have joint and several liabilities for all debts and obligations incurred by 'The DAO', whilst being partners. Other legal issues typically dealt with in a well-drafted Partnership Agreement would likely arise, with regard to, for example, exit by partners,^[105] disputes, and governing law and jurisdiction.^[106]

4. Paragraph 4 looks at whether 'The DAO' could be qualified as an investment contract under US law, should it be set up in that jurisdiction.

The proposition made by the judge in *Williamson v Tucker* opens up for 'The DAO' being regulated as a security under the US Securities Act 1933 (SA1933)^[107] and the Securities Exchange Act 1934 (SEA1934),^[108] hereinafter collectively referred to as 'the Acts'.

The term 'security' is defined in the Acts in broad terms, which make it very flexible rather than static.^[109] It includes '... any note, stock, treasury stock, security future, security-based swap, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust certificate, preorganization certificate or subscription, transferable share, investment contract ...'.^[110]

Of particular interest to this paper is the term 'investment contract', which is defined in the four-prong test found in *SEC v Howey Co* (the 'Howey-test').^[111]

To constitute an investment contract, there must be: (i) an investment of money; (ii) in a common enterprise; (iii) with an expectation of profit from the investment; and (iv) such profit arises solely from the efforts of others.^[112]

In the following it is analysed whether 'The DAO' could constitute an investment contract under US law.

4.1. 'An investment of money'

The first criterion is interpreted broadly whereby 'money'^[113] is to be understood as an investment of something of monetary value. As noted in *Useton v Comm Lovelace Motor Freight, Inc.*:^[114] '... in spite of *Howey's* reference to an "investment of money," it is well established that cash is not the only form of contribution or investment that will create an investment contract. Instead, the "investment" may take the form of "goods and services," ... or some other 'exchange of value'.^[115] This includes cryptoassets, specifically Bitcoin and Ether, accepted as payment for 'The DAO' tokens.

4.2. 'A common enterprise'

The second criterion was not defined in the *Howey*-case, and this has left the Circuit Courts to interpret the meaning of the term. Three approaches have been developed: (i) the horizontal approach, which focuses on the *inter partes* relationship between investors; and (ii) the vertical approaches (narrow and broad), which focus on the relationship between investors and promoters.^[116]

A detailed discussion of the advantages and disadvantages of each approach goes beyond the scope of this paper. Instead, it suffices to give a brief overview of each approach.

The horizontal approach '... focuses on the relationship among investors in an economic venture',^[117] and is applied by the DC, First-Fourth and Sixth-Seventh Circuit Courts.^[118] This approach is then satisfied if there is a pooling of investors' funds in a common venture where '... the individual investor shares all the risks and benefits of the business enterprise' according to their own individual investment.^[119]

The narrow vertical approach focuses on whether '... there is a correlation between the fortunes of an investor and a promoter',^[120] and is applied by the Ninth Circuit Court.^[121] Thus, it is not necessary for funds to have been pooled. Instead, the test is satisfied if: (i) both investor and promoter are exposed to risk; and (ii) their profits and losses are correlated.^[122]

The broad vertical approach focuses on whether '... the success of an investor depends on a promoter's expertise',^[123] and is applied by the Fifth and Eleventh Circuit Courts.^[124] The criterion is vague and thus flexible as it does not require any pooling of funds nor that the investor and promoter are exposed to risk and that their profit and losses are correlated.

'The DAO' would constitute a common enterprise under all approaches, as:

1.

4.3. 'An expectation to profit from the investment'

The third criterion was clarified by the Supreme Court in *SEC v Edwards*,^[125] as was held that 'The profits this Court was speaking of in *Howey* are profits—in the sense of the income or return—that investors seek on their investment, not the profits of the scheme in which they invest, and may include, for example, dividends, other periodic payments, or the increased value of the investment. There is no reason to distinguish between promises of fixed returns and promises of variable returns for purposes of the test, so understood'. Thus, profit may arise from the appreciation of 'The DAO' tokens, and an expectation of profiting therefrom can motivate a reasonable investor to invest.

4.4. 'Arising solely from the efforts of others'

The fourth criterion should not be interpreted in the strictest literal sense,^[126] so as to avoid 'a mechanical, unduly restrictive view of what is and what is not an investment contract'.^[127] The Supreme Court has several times emphasised that the economic realities of a scheme are of greater importance than form. Therefore, it does not automatically preclude the existence of an investment contract that 'the investors [are] required to exert some efforts if a return [are] to be achieved ...'.^[128]

For example, in *SEC v Glenn W Turner Enterprises, Inc*^[129] the court was faced with a *pyramid franchise scheme* in which the success of the scheme partly derived from the scheme's promoters, who sold the scheme's products, and partly from the investors, who received a commission for any new prospect customers. It was held that the scheme constituted an investment contract, although, the profits were not 'solely' derived from the scheme's promoters.^[130]

In 'The DAO', investors may, for example, take on the role of miners, and thereby contribute to a scheme's success, but this does not alter the fact that 'The DAO' is based on the critical expertise of the Slock.it team and the management Curators.^[131]

Investors may also retain power in the scheme insofar as this power is limited.^[132] In 'The DAO', the protocols were predetermined by the Slock.it developers, and Curators exercised immense managerial control, as vetting and whitelisting of proposals were subject to their subjective criteria.^[133] This power included the ability to allow proposals for removal of one or several Curators.^[134]

Therefore, 'The DAO' scheme fulfils the fourth criterion. However, other DAOs may be established with frameworks that allow participants to retain power and be capable of exercising that power. Such schemes probably would not constitute investment contracts,^[135] regardless of any power actually exercised by the participants.

4.5. 'The DAO' as an investment contract under US law

'The DAO' could constitute an investment contract according to the *Howey*-test. If that were to be the case, then participations in 'The DAO' would qualify as securities and consequently US securities law provisions would apply. However, depending on their characteristics, this may not be true for other DAOs.

5. The EU legal framework on investment funds distinguishes between Undertakings for Collective Investment in Transferable Securities ('UCITS') under the UCITS Directives^[136] and Alternative Investment Funds ('AIFs') under the Alternative Investment Fund Managers Directive.^[137] Chapter 5 looks at whether 'The DAO' could be qualified as an investment fund (either a UCITS scheme or an AIF) under EU law, should it be set up in a EU member state.

5.1. UCITS schemes

UCITS are open-ended retail investor funds, which are regulated by the UCITS Directives.

Under the UCITS Directives, the operation of UCITS, *inter alia*, requires:

1. ^[138]
2. ^[139]
3. units, directly or indirectly, on demand;^[140] and
4. ^[141]

Authorisation under the UCITS Directives is valid for all Member States, whereby the schemes may market themselves throughout the European Economic Area through their passporting rights.

In analysing whether a scheme is a UCITS under the UCITS Directives emphasis is to a large extent placed on the objective economic activity and reality of a scheme, rather than its legal form. A UCITS may be formed in many ways, which is largely dependent on the national rules in the respective EU jurisdictions; yet, a UCITS cannot take the form of closed-ended investment company.^[142]

With regard to 'The DAO', it is noted that it has been marketed to retail investors both domestically and internationally through the Internet. However, 'The DAO' does not constitute a UCITS because:

1. ^[143]

5.2. Alternative investment funds

Alternative Investment Funds are defined by the Alternative Investment Fund Managers Directive ('AIFMD') as 'collective investment undertakings, including investment compartments thereof, which: (1) raise capital from a number of investors, with a view to investing it in accordance with a defined investment policy for the benefit of those investors; and (2) do not require authorization pursuant to Article 5 of Directive 2009/65/EC'.^[144]

Interestingly, the definition of AIFs under the AIFMD refers to the UCITS Directives with a view to catching every collective investment undertaking which is not a UCITS scheme. Building on this definition, it has been argued that, at European Union level, every collective investment scheme which does not comply with the strict rules of the UCITS Directives is now to be qualified as an AIF under the AIFMD.^[145] Therefore, the category of the AIFs is very broad and comprehensive, given that it includes every undertaking for collective investment with whatever legal form and whatever structure that is not authorized under the UCITS Directives.

Despite such a definition, however, the EU legal framework does not regulate the AIFs themselves. Rather, AIFs continue to be subject to the domestic rules of the Member State where they have been established and possibly supervised by the national competent authorities. According to Recital 10 of the AIFMD, the AIFMD does not regulate AIFs, as it would be disproportionate to regulate the structure or composition of their portfolios at EU level. Indeed, it would be difficult to provide for such extensive harmonization due to the huge variety of existing investment schemes. As a legal effect, the Member States can adopt or continue to apply national requirements in respect of AIFs established in their territory. However, this circumstance should not prevent the exercise of rights of AIFMs authorized in accordance with the AIFMD in other Member States to market to professional investors in the EU certain AIFs established outside the Member State imposing additional requirements and which are, therefore, not subject to and do not need to comply with those additional requirements.

With the adoption of the AIFMD, the EU legislature decided to regulate, at EU level, only the activities of management^[146] and marketing^[147] to professional investors of AIFs after defining both AIFs and AIFMs. According to Article 4(1)(b) of the Directive, AIFMs are legal persons whose regular business is managing one or more AIFs.

Also, specific provisions on the internal organization of AIFMs and their authorisation are set forth. Particularly, mirroring the UCITS Directives, the AIFMD provides that AIFs are also meant to work on the basis of the investment triangle model. Hence, the relevant asset manager decides the investment strategies, whereas the depositary holds the assets on behalf of the fund in order to grant more protection to the investors. Therefore, at the European legislation level, the investment triangle model is the only available model for every collective investment scheme addressed both to retail and professional investors.

Due to the broad definition of AIF under the AIFMD, it cannot be excluded that 'The DAO' would be accordingly qualified as an AIF, since it would raise capital from a number of investors, with a view to investing it in accordance with a defined investment policy for the benefit of those investors while not requiring an authorization pursuant to the UCITS Directives.

6. In the UK, establishing, operating and winding up CISs are regulated activities under FMSA.^[148] Therefore, a CIS must obtain FCA authorisation under FSMA, s 19 in order to promote its investment activities through invitations or inducements, unless an exemption applies.^[149]

Breach of the general prohibition in FSMA, s 19 is a criminal offence,^[150] and an agreement entered into in contravention of hereof is unenforceable against the other party.^[151] Furthermore, any breach entitles the authorities to pursue remedies, including issuing fines,^[152] injunctions and restitution orders,^[153] and the courts may be petitioned to wind up a company on grounds of public interest, where the company's sole business is unlawful.^[154]

In contrast to partnerships, it is typical for CIS that the investors, present and future, have no formal or legal connection to each other. FSMA, s 235(1) defines CIS as '... any arrangements with respect to property of any description, including money, the purpose or effect of which is to enable persons taking part in the arrangements (whether by becoming owners of the property or any part of it or otherwise) to participate in or receive profits or income arising from the acquisition, holding, management or disposal of the property or sums paid out of such profits or income'.

Any arrangement must also have either or both of the following characteristics:

1. ^[155]

The definition does not encompass corporate bodies other than OEICs, which excludes investment companies within CA06, s 833, or LLPs.

Other arrangements are also explicitly exempt from being CISs under the Financial Services and Markets Act 2000 (Collective Investment Schemes) Order 2001 (CIS Order), art 3.^[156]

Besides these exceptions, the CIS definition is flexible and encompasses any arrangement that pools funds from investors with similar speculative profitmaking objectives and channel these into specified managed investment portfolios for the benefit of its investors.^[157] This includes communal investments such as credit unions, co-operatives and other social investments.^[158]

The DAO does not fall within any of the mentioned exemptions.^[159] In the following, the prongs in section 235(1) of FSMA 2000 are analysed with a view to analysing whether 'The DAO' meets the related requirements, thereby being potentially qualified as a CIS under UK law.

6.1. 'Arrangements'

The term 'arrangement' is not limited to the meaning under the RAO. Rather, FSMA, s 22 applies a very broad usage of the term which has no clear boundaries, as the section does not require the observation of any formality.^[160] For example, the term may also include communications between parties, even if they are not legally binding.^[161]

Furthermore, one scheme may comprise several arrangements, whilst separate schemes in various jurisdictions may pose as one single arrangement,^[162] as 'The core definition has no territorial limitation and thus where 'arrangements' are made is irrelevant'.^[163]

The broad interpretation of 'arrangements' is flexible enough to potentially encompass 'The DAO'.

6.2. 'With respect to property'

In *National Provincial Bank Ltd v Ainsworth*,^[164] the term 'property' was held to include anything that is: (i) definable; (ii) identifiable by third parties; (iii) capable of assumption; and (iv) permanent or stable to some degree. To these criteria, in obiter Lady Hale added 'independence' as a fifth criterion in *OBG Ltd et al v Allan et al*.^[165] Furthermore, 'some degree of control' has been proposed as a sixth criterion.^[166]

Any contribution that satisfies these criteria fulfils the property prong,^[167] such as cryptoassets, as it is not necessary to acquire property that is distinct from the contributions.^[168] The investments made by 'The DAO's participants, therefore, fulfil the criterion.^[169]

6.3. 'Purpose or effect'

Fundamentally, the participants must have an intention to participate in a scheme,^[170] although, this prong is satisfied even by preparatory actions, including pooling of funds in a bank account.^[171] As a consequence, schemes not established as CISs by design, but that objectively operate as such in practice, may satisfy this criterion.^[172]

The purchase of tokens is a positive action towards participating in 'The DAO', and the scheme's purpose in promotional material has explicitly been stated in phrases such as 'buying shares in a company'. 'The DAO' therefore would fulfil this criterion.

6.4. 'Persons'

The plural form makes it clear that a CIS requires more than one participant. However, there is no requirement that the participants must be known. It is sufficient that participants' existence can be asserted from the material facts.

This is the case with 'The DAO's blockchain where all transactions and users (pseudonymous or anonymous) are recorded.

6.5. 'Participate in or receive profits or income arising from the property'

The investors must have a right to a direct or indirect ratable share in any revenue or profit stemming from the scheme's assets, regardless of how it has been generated.[173]

So far, 'The DAO' has not generated any revenue. However, this does not mean that no profit has been made, as the term includes any increased value of an investment,[174] such as the appreciation of 'The DAO's cryptoassets.[175]

'The DAO's value is intricately linked to the use of the applications that is offered, and consequently its value and the value of its tokens[176] is largely based on the network effect or networkexternalitycreated by large number of users of that application.[177]

'The DAO's tokens represent investors' right to a ratable share in any profit stemming from the scheme, and therefore this criterion would be fulfilled.

6.6. 'No day-to-day control'

Scheme participants must not have day-to-day control over the management of the property, and any intention of investors retaining day-to-day control speaks for the existence of a CIS.[178] This does not include any executive right by the participants to be consulted or to give directions.[179]

However, in *Russell-Cooke Trust Co v Elliott* it was held that a CIS may also exist if one investor, but not the other investors, retain day-to-day management control over the invested funds. This was confirmed by Arden LJ in *FSA v Fradley and Woodward*,[180] who found it critical to the existence of a CIS that day-to-day control had been ceded. Although, it was also noted that '... it does not matter that the scheme was not a CIS as regards any participant who retained day-to-day control of the management of his monies'.[181] It is uncertain whether an analysis of a scheme must be undertaken from a collective or individual perspective.

In 'The DAO', it was said that the individual participants have effectively day-to-day control of their investments through the Curators and the Slock.it teams. Yet, their voting rights, and thus their control rights are limited to the opportunities shortlisted by these scheme managers. This seems to mean that participants do not actually have day-to-day control over their investment in that they are not able to influence the business strategy of the scheme which will be instead determined by the Slock.it team.[182] Should that be the case, then the requirement of the lack of participants' day-to-day control would be met.

6.7. 'Pooled contributions and payments' and/or 'property is managed as a whole'

Under section 235(3) there must be a pooling of the contributions and payments and/or a management of the property as a whole. As previously noted, funds are pooled with 'The DAO' scheme, and already for this reason the criterion would be fulfilled.

However, it is also noted that the funds raised by 'The DAO' are effectively managed as a whole by the Curators and the Slock.it management and development team, whereby the participants rely on their significant managerial efforts.[183] Furthermore, 'The DAO's individual participants may simply be too disparate to become organised and effectively assert any meaningful power.[184]

6.8. 'The DAO' as a CIS under UK law

'The DAO' seems to fulfil the requirements for being a CIS under UK law, and therefore promotion of the scheme requires FCA authorisation, unless the scheme is qualified as a UK Unregulated Collective Investment Scheme.[185] But if that were to be the case, then 'The DAO' could only be promoted to: (i) certified high networth investors; (ii) sophisticated investors; (iii) self-certified sophisticated investors; and (iv) existing investors in 'The DAO'. [186] This means that it could not be offered to retail investors.

7. The general applicability of the geographical scope of the laws and rules that govern cyberspace is complicated by the global nature of the Internet, [187] which is instrumental to modern commerce. [188] New digital instruments offered, such as cryptoassets, disregard physical boundaries and challenge any territorial legal framework. And, the enormous transnational flow of data and other wealth associated with these new asset classes emphasise the need for legal certainty in the symbiotic relationship between commerce and the law.

DAOs and other global fundraising schemes may usher in a new era of global hyper-interconnectedness, and a lack of a common foundation in the digital economy undermines full, effective and comprehensive international digital commerce. There is no proprietary right to blockchain technology, which will undoubtedly go beyond cryptoassets, and '... the regulatory approach to blockchain simply cannot be different in different countries, since the technology is borderless and global'. [189] This may eventually also result in global systemic risk, as thousands, if not millions, of people could invest their savings in DAOs and other schemes.

The Law Commission in the UK has recognised that there is need for review and potentially regulatory reform to encompass these new technologies. [190] However, viewing these developments in an entirely regulatory prism, which is the case in the US, is not the answer. [191] These innovative bodies should not be regulated as expensive and heavy public companies. [192]

In the early years of the Internet, Johnson & Post proposed to view cyberspace as a distinct self-governed place in itself with its own 'legally significant border'. [193] The idea finds its inspiration from the Law of Merchants (*Lex Mercatoria*) developed throughout the Middle Ages, during a time when local feudal lords struggled to establish meaningful rules to cross-border trade. Instead, the inadequate legal conditions were dealt with by the merchants themselves through their own legal code. The new rules did not replace or make the existing laws and regulations redundant but were applied in conjunction with these. [194]

Yet, cyberspace, in all its infinity, may not be ready to develop its own private legal framework for effective self-governance, although exceptions may be found in classes and subclasses, such as DAOs, within cyberspace.

In contrast with any popular belief amongst techies that code can replace law, [195] any such private solutions would, as with *Lex Mercatoria*, necessarily only supplement the law, and fundamental questions on, for example, the legal status, rights and obligations of DAOs, would still need a suitable framework within international and national law. [196]

In this paper, we have looked at two overall and broad frameworks, which can cover DAOs: partnerships and investment funds. But these were not drafted with DAOs and their global scope and the related issues in mind, and this may stifle any innovative application of DAOs. The emergence of DAOs necessitates fundamentally rethinking of the legal framework applicable to these new bodies for common enterprise.

Solutions to the transnational issues with DAOs could, as a constructive first step, be safe harbour rules, or rather broad principles and standards, for international cooperation. This could then be followed by a new convention – a Law of the Cyber Entities (*Lex Corpus Cybernetica*). This would also be principle and standard-based rather than a rigid entity and rules-based framework.

The envisioned scheme would essentially consist of principles and standards dealing with five main issues: (i) finance (authorisation systems and capital); (ii) markets (cryptocurrencies and other exchanges); (iii) conduct (firms and individuals); (iv) assets (products and services); and (v) systems and stability (including ‘too big to fail’ provisions and mechanisms).

Such principles already exist in international financial law. For example, the principles dealing with conduct of firms and individuals can be modelled after the eleven simple, yet powerful, Principles for Business in the FCA Handbook. These being: (i) integrity; (ii) skill care and diligence; (iii) management and control; (iv) financial prudence; (v) market conduct; (vi) customers’ interest; (vii) communication with clients; (viii) conflicts of interest; (ix) customers: relationship and trust; (x) clients’ assets; and (xi) relations with regulators.^[197]

Furthermore, the international body to oversee proper implementation of these principles and standards could then be a standard setter similar to the Basel Committee on Banking Supervision (BCBS) under the Bank for International Settlement (BIS).^[198]

Where ‘The [BCBS] is the primary global standard setter for the prudential regulation of banks and provides a forum for regular cooperation on banking supervisory matters’,^[199] the new international body would be the primary global principle and standard setter for the prudential regulation of transnational DLT products, services, and related issues, and provide a forum for regular cooperation on these matters.

As such, the new proposed body would mirror the BCBS with, for example, its monitoring and assessment scheme, the Regulatory Consistency Assessment Programme’.^[200] This can be established as a committee involving other standard setting bodies, for example, International Organization of Securities Commissions (IOSCO), the International Association of Insurance Supervisors (IAIS), the Financial Stability Board (FSB), Committee on Payments and Market Infrastructures (CPMI) and/or the Organisation for Economic Co-operation and Development (OECD).

As with the BCBS and its work, the proposed committee would allow for flexibility and increased global cooperation, as its members would comprise national regulators, such as the FCA and the SEC. The framework will maintain an appropriate level of oversight while allowing a natural development of the FinTech industry and its new products, services and frameworks, such as DAOs. Furthermore, where a rules and entity-based framework will have difficulty catching up with the technological advancements, a broad transnational, umbrella framework of principles and standard-based provisions will easily encompass new developments.

As the world becomes increasingly interconnected, this could in the longer term also be constructed as part of a larger global framework under a Law of the Digital Economy (*Lex Digitalis Economica*).

8. The concept of FinTech is not new. Rather, what has increased is the importance of technology in modern finance and commerce. Furthermore, information is power in this age of the Internet of Things where new information, knowledge and data societies are being constructed.

The decentralised organisation exemplified by ‘The DAO’ may be the corporation of the future. However, as Lord Nicholls noted, ‘All investment involves risk’.^[201] Still, as this paper shows, the existing legal and regulatory framework has not been designed to accommodate DAOs.

At this development stage, any perceived benefits of ‘The DAO’ and other DAOs are outweighed by continued global legal, regulatory and policy uncertainty, including significant risk of reclassification into other legal forms and schemes, which leads to compliance risk.

Although DAOs are not panaceas to corporate issues, they may be used to increase financial inclusion, commerce and economic wealth, which are intimately linked. The benefits of such entities include trustworthiness and provenance (asset tracking)^[202] whilst being an alternative to corporations and their two fundamental problems: scant rule abidance and divergent rule interpretation. With DAOs all stakeholders have access to all information recorded on the underlying blockchain, which allows for an enhanced corporate democracy. As such, DAOs can be the corporate bodies of the future, as they may:

1. simplify in terms of the system being run on blockchain with every transaction being immutably and transparently recorded;
2. codify (and digitalise) in terms of tokenisation of assets, including real and financial assets;
3. modify in terms of the way business and social communities are developed and undertaken in the future;
4. rectify by dealing with any lack of democracy, and agency problems; and
5. ratify in terms of organising, systemising and validating digital trade and potentially the Internet itself.

However, any associated risks, including technology risk, transfer risk, and cybersecurity risk, should not be underestimated. Furthermore, although smart protocols will self-execute when the pre-defined input variables are met, the overall strategic decision-making still requires consensus amongst stakeholders who will often be located in several jurisdictions with different legal frameworks. In business, this dependency on ‘the mind of the crowd’^[203] arguably severely stifles efficient governance. This could result in a lack of corporate social responsibility with strategies, if existing, being emergent rather than intended. To this end, although blockchain systems are susceptible to several types of attacks, the self-interest of the participants in an increased network effect^[204] may lead them to seek to preserve and develop the safety of their systems, and to enforce any underlying ‘bylaws’.

At this stage, there is no effectively functioning DAO in existence. However, it is possible to create a DAO model that works and complies with relevant law, such as common law, civil law, public law, and allows for judicial review, depending on local laws, and this will be very important going forward in the absence of other dispute resolution and remedy mechanisms. Applying the solutions and mechanisms suggested in this paper could allow adequate and proper supervision, control, responsibility, accountability, and governance within these new organisational structures. Specifically, new node classes may be created and developed to effectively police and improve the operation of DAOs as business and social corporations that complies with the legal and regulatory (financial and non-financial) framework of the time.

Such nodes five-tiered Council of Nodes could be constituted by: (i) Executive Node (Curators); (ii) Voting Node (shareholders); (iii) Auditor Nodes (regulators, accountants); (iv) Operational and Service Nodes (miners); and (v) Developer Nodes.

However, their usefulness ultimately depends on the policies of lawmakers.^[205] For this reason, new principle and standard-based safe harbour rules and a *Lex Corpus Cybernetica* should be worked towards at international and global level. This would ensure an appropriate and adequate level of investor and market protection, whilst tackling the aforementioned risks without stifling the innovative nature of DAOs and their associated advantages.

A related issue is that regardless of whether DAOs constitute partnerships or CIs, they would not form separate legal persons. However, legal personality allows for growth as investors are protected from any personal liability, and should, therefore, be sought by giving DAOs a form of quasi digital corporate status, for example, through the creation of a unique form of digital limited liability. This would avoid any fragmentation.

DAOs may potentially create a massive opportunity for creating a common core unified form of global business organisation that could support financial inclusion, development, small and medium size business growth, earnings and welfare benefit across the world.

As has been acknowledged by the UK government, the importance of these new technologies and opportunities cannot be underestimated.^[206] The existing rules must be re-examined for compatibility with DAOs and the technologies and innovative solutions they incorporate and represent. Although Brexit has brought uncertainty, the UK may harness the opportunity to spearhead the development of the new digital legal and regulatory infrastructure envisioned and proposed in this paper and become the global FinTech market leader envisioned by the government.^[207]

[1] Chris Burniske & Jack Tatar, *Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond* (McGraw-Hill 2018) 11. See also Gideon Greenspan, 'Blockchain vs centralized databases (*Multichain*, 17 March 2016) <<https://www.multichain.com/blog/2016/03/blockchains-vs-centralized-databases/>>.

[2] Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2009) <<https://bitcoin.org/bitcoin.pdf>>.

[3] Jude Webber, 'Developing world blazes trail for 2.5bn with no banking access' (*FT*, 9 July 2014) <www.ft.com/content/efffb19c-fdf2-11e3-bd0e-00144feab7de>.

[4] Digitalisation characterises the third industrial age, whereas hybrid technology innovation characterises the fourth industrial age; see Klaus Schwab, 'The Fourth Industrial Revolution: what it means, how to respond' (*WEC*, 14 January 2016) <www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.

[5] See George Walker, 'Financial Technology Law' (2017) 50 TIL, 140, arguing that although there is no universal definition of FinTech, 'FinTech can generally be understood in terms of the electrification and digitalization of banking and financial services, bank accounts and ledgers, and their use in innovative and unconventional ways'. See also Douglas W Arner, Janos N Barberis & Ross P Buckley, 'The Evolution of FinTech: A New Post-Crisis Paradigm?' (2015) HKU Faculty of Law Research Paper No 2015/047; UNSW Law Research Paper No 2016-62 <<https://ssrn.com/abstract=2676553>>.

[6] See George Walker, 'Financial Technology Law' (2017) 50 TIL, 140, who argues that 'Regulatory technology (RegTech) refers to the use of financial technologies for regulatory and supervisory purposes'.

[7] Bigtech refers to large globally active technology firms with a relative advantage in digital technology', see generally the Bank for International Settlement (BIS), 'Sound Practices: Implications of fintech developments for banks and bank supervisors' (February 2018) 16 <www.bis.org/bcbs/publ/d415.htm>.

[8] Peter Vanham, 'Blockchain Will Become 'Beating Heart' of the Global Financial System' (*WEF*, 12 August 2016) <www.weforum.org/press/2016/08/blockchain-will-become-beating-heart-of-the-global-financial-system/>.

[9] Mark Knickrehm, Bruno Berthon & Paul Daugherty, 'Digital disruption: The growth multiplier' (*Accenture*, 2016) <www.accenture.com/gben/insight-digital-disruption-growth-multiplier>.

[10] See KPMG, 'The Pulse of Fintech Q4 2016' (21 February 2017) <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf>; 'The Pulse of Fintech Q4 2017: Global analysis of investment in fintech' (13 February 2018) <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2018/02/pulse_of_fintech_q4_2017.pdf>.

[11] The Financial Services Act 2012 split the Financial Services Authority (FSA) into the FCA and the Prudential Regulation Authority (PRA). The PRA oversees prudential regulation and supervision of banks, building societies, credit unions, insurers, and major investment firms.

[12] Sir Mark Walport, Gov't Chief Scientific Advisor, 'FinTech Futures' (*Gov't Office for Science*, March 2015) <<https://bravenewcoin.com/assets/Industry-Reports-2015/UK-Gov-Fintech-Futures.pdf>>. See also the House of Commons report by Gloria Tyler, 'Financial services: contribution to the UK economy' (*HC*, 31 March 2017) Briefing Paper No 6193. <<http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06193#fullreport>>. Brexit makes it uncertain whether the position can be maintained, which undoubtedly will require implementation of domestic policies to further spur innovation and technology adoption; see on this Mark Carney, Governor of the Bank of England, 'A Fine Balance' (*BoE*, 20 June 2017) <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech983.pdf>

[13] Lord Chris Holmes, 'Distributed Ledger Technologies for Public Good' (*HL*, December 2017) <http://chrisholmes.co.uk/wp-content/uploads/2017/11/Distributed-Ledger-Technologies-for-Public-Good_leadership-collaboration-and-innovation.pdf>.

[14] Internet of things, also known as 'Net 3', is the interconnectedness of electronic devices and systems through cloud computing. 'Net 4' (the semantic net) and 'Net 5' (the immersive net) are expected to follow, respectively; see on this George Walker, 'Financial Technology Law' (2017) 50 TIL, 137-8.

[15] These are businesses that use new technologies to improve and increase effectivity of financial services, for example, the so-called BATs (Baidu, Alibaba and Tencent) in China. FinTechs are also referred to with regard to their market value as 'unicorns' (\$1bn+), 'decacorns' (\$10bn+), or 'hectocorns' (\$100bn+).

[16] Christoph Jentsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <<https://download.slock.it/public/DAO/WhitePaper.pdf>>.

[17] Dan Awrey, 'Artificial Intelligence versus Human Nature: Protecting Ourselves from the Perils of DAO-based Collective Investment Schemes' (*OBLB*, 12 July 2016) <www.law.ox.ac.uk/business-law-blog/blog/2016/07/artificial-intelligence-versus-human-nature-protecting-ourselves>.

[18] On the relevant US regulatory framework, see Marco Bodellini, 'From Systemic Risk to Financial Scandals: The Shortcomings of U.S. Hedge Fund Regulation' (2017) 11 Brook J of Corp, Fin & Com L 417; on the relevant UK regulatory framework see Marco Bodellini 'The marketing of hedge funds in the U.K.: did the system maintain its attractiveness after the transposition of the AIFMD?' (2016) *Business Law Review* 162 – 172; on the relevant EU regulatory framework see Marco Bodellini, 'Does it still make sense, from the E.U. perspective, to distinguish between UCITS and non-UCITS schemes?' (2016) *Capital Markets Law Journal* 528 – 539.

[19] Christoph Jentzsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <<https://download.slock.it/public/DAO/WhitePaper.pdf>>>.

[20] Caroline Morris & Cian Murphy, *Getting a PhD in Law* (Hart Publishing 2011) 31.

[21] Cryptoassets have been referred to as sophisticated financial instrument that are '... structured differently from conventional products', see Inutu Lukonga, 'Islamic Finance, Consumer Protection, and Financial Stability' (May 2015) IMF WP 15/107 <https://www.imf.org/external/pubs/ft/wp/2015/wp15107.pdf>.

[22] Isaak Crofton, *Crypto Anarchy* (Lulu.com 2015) 39; see Seth Bannon, 'The Tao of "The DAO" or: How the autonomous corporation is already here' (*Crunch Network*, 16 May 2016) <https://techcrunch.com/2016/05/16/the-tao-of-the-dao-or-how-the-autonomous-corporation-is-already-here/>.

[23] Christoph Jentzsch, 'Slock.it DAO demo at Devcon1: IoT + Blockchain' (*YouTube*, 13 November 2015) <www.youtube.com/watch?v=49wHQofxYPo>.

[24] *Ibid*; as an aside, albeit both being cryptoassets, cryptotokens differ from cryptocurrencies, such as bitcoin, that represents '... neither a security conferring a property right nor a security of a comparable nature', see *Skatteverket v David Hedqvist* (C-264/14), [55]; see Shawn Bayern, 'Dynamic Common Law and Technological Change: The Classification of Bitcoin' (2014) 71 Wash & Lee L Rev Online 22, 31.

[25] DAOs have also been referred to as 'decentralised autonomous corporations' (DACs), 'fully automated business entities' (FABs), and 'distributed autonomous enterprises' (DAE); see Isaak Crofton, *Crypto Anarchy* (Lulu.com 2015) 39.

[26] William Mougayar, 'What Does it Take to Succeed as a Decentralized Autonomous Organization?' (*CoinDesk*, 21 February 2015) <www.coindesk.com/succeed-as-decentralized-autonomous-organization/>.

[27] See Don Tapscott & Alex Tapscott, *Blockchain Revolution How the Technology behind Bitcoin is Changing Money, Business and the World* (Penguin Random House 2016), 121.

[28] For example, social or scientific. Non-profit DAOs can be likened to unincorporated associations, because: (i) they do not have any independent legal existence apart from its members; (ii) they are under the control of the members themselves; and (iii) their purpose is for something other than business, *Re Koepler's Will Trust* [1985] 3 WLR 765, 771 (Slade LJ), see *Steele v Gourley and Davies* (1886) 3 TLR 772; *Conservative and Unionist Central Office v Burrell* [1982] 1 WLR 522, 525. See also Jean Warburton, *Unincorporated Associations: Law and Practice* (2nd edn, Sweet & Maxwell 1992) 3.

[29] See Christoph Jentzsch, 'Slock.it DAO demo at Devcon1: IoT + Blockchain' (*YouTube*, 13 November 2015) <www.youtube.com/watch?v=49wHQofxYPo>.

[30] For example, The DAO is established on the Ethereum-blockchain, see Christoph Jentzsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <<https://download.slock.it/public/DAO/WhitePaper.pdf>>>.

[31] Alternatively, DAOs could also be analysed in terms of their ability to fulfil and sustain the five fundamental principles of structured finance. These being: (i) equality; (ii) severality; (iii) democracy; (iv) proportionality; and (v) limited delegation of functions.

[32] For example, whether The DAO constitutes a partnership or a CIS, as tokens may represent a transactional or organisational right in the same way a partnership interest or unit in a CIS does.

[33] The European Banking Authority (EBA) has identified 70 risks associated with cryptoassets, see EBA, 'EBA Opinion on "virtual currencies"' (4 July 2014) <www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>. See also Bank for International Settlement (BIS), 'Sound Practices: Implications of fintech developments for banks and bank supervisors' (February 2018) <www.bis.org/bcbis/publ/d431.pdf>.

[34] That is, whether vetting is required of the user before transactions can be made.

[35] Such as deeds, titles of ownership, financial accounts and votes.

[36] Participants may affect the balance of power within the network by creating more nodes.

[37] Jean Bacon, *et al*, 'Blockchain Demystified' (2017) QMUL, School of Law WP No 268/2017 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3091218>>.

[38] These are system-rewards in the form of new cryptoassets. See Arvind Narayanan, *et al*, *Bitcoin and Cryptocurrency Technologies* (PUP 2016), 39-42.

[39] It is estimated that one transaction on Bitcoin consumes 77-215 kWh, Tor Johannesson, 'Beregninger: En enkelt Bitcoin-transaktion bruger nu mere strøm end et køleskab i et år' (Børsen, 3 November 2017) <<http://borsen.dk/nyheder/generelt/artikel/1/353597/beregninger-en-enkelt-bitcoin-transaktion-bruger-nu-mere-stroem-end-et-koeleskab-i-et-aar.html>>>.

[40] 'Off-chain ledgers' refer to any ledger other than the respective blockchain dealt with. An example hereof is the Thunder Network which allows up to 100,000 transactions per second, see Angus Leung, 'Blockchain Gets Ready for Thunder Network, Transactions Ultra Cheap' (*Cointelegraph*, 19 May 2016) <<https://cointelegraph.com/news/blockchain-gets-ready-for-thunder-network-transactions-ultra-cheap>>>.

[41] Transactions can only be unincorporated through a permanent update of the system, also known as a 'hard fork'. Hard fork risks undermining the platform's integrity, as subsequent transactions would be invalidated. In contrast, 'soft forks' are temporary divergences. Users who do not join a particular version of the blockchain will not have access to that fork's user base and transactional traffic, Credit Suisse, 'Blockchain 2.0' (11 January 2018) 15, 54 <https://research-doc.credit-suisse.com/docView?language=ENG&format=PDF&sourceid=csplusrsearchcp&document_id=1080109971&serialid=pTkp8RFIoVyHegdqm8EIIIGT5H4VpXC%2BTFLnTn2cL>.

[42] They may either be 'full nodes' or 'partial nodes' depending on whether they data store the complete blockchain or a hash of the blockchain.

[43] Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' (2009) <<https://bitcoin.org/bitcoin.pdf>>>.

[44] Arvind Narayanan, *et al*, *Bitcoin and Cryptocurrency Technologies* (PUP 2016), 39-42.

[45] <<https://neo.org>>>

[46] Arvind Narayanan, *et al*, *Bitcoin and Cryptocurrency Technologies* (PUP 2016), 39-42.

[47] <http://www.doc.ic.ac.uk/~ids/realdotdot/crypto_papers_etc_worth_reading/proof_of_burn/slimcoin_whitepaper.pdf>.

[48] <www.decred.org>.

[49] Arvind Narayanan, *et al*, *Bitcoin and Cryptocurrency Technologies* (PUP 2016), 39-42.

[50] *ibid*, 40-47.

[51] David Gerard, *Attack of the 50 Foot Blockchain* (CreateSpace Independent Publishing Platform 2017) 91.

[52] Because of the hardware requirements and high energy costs, miners are often banded together in cloud-based mining pools, such as Genesis Mining.

[53] Tapscott D & Tapscott A, *Blockchain Revolution How the Technology behind Bitcoin is Changing Money, Business and the World* (Penguin Random House 2016), 30-33.

[54] The Ethereum blockchain gives an easy 100-line coding-framework for alt-chains with its ERC token standard, Rachel O'Leary, 'Ethereum's ERC-20 Token Standard Has been Formalized' (*CoinDesk*, 11 September 2017) <www.coindesk.com/ethereums-erc-20-token-standard-formalized/>.

[55] EU Commission, 'FinTech Action Plan: For a more competitive and innovative European financial sector' (8 March 2017) COM(2018) 109/2, 12 <https://ec.europa.eu/info/sites/info/files/180308-action-plan-fintech_en.pdf>.

[56] Wallets are either 'hot' (online) 'cold' (offline), Paul Vigna & Michael Casey, *Cryptocurrency The Future of Money?* (Vintage 2016) 105. See also William Suberg, 'Bitfinex Hack: US Regulation "Prevented Cold Storage Use"' (*Bitcoin.com*, 3 August 2016) <<https://news.bitcoin.com/bitfinex-us-regulation-cold-storage/>>.

[57] Justin O'Connell, 'The Quick Death Of The Zero-Fee Bitcoin Transaction' (*CryptoCoinsNews*, 21 May 2016) <www.cryptocoinsnews.com/death-zero-fee-bitcoin-transaction/>.

[58] In Bitcoin there is currently a 1 MB block size limit.

[59] Giuseppe Pappalardo *et al*, 'Blockchain Inefficiency in the Bitcoin Peers Network' (arXiv:1704.01414 [cs.CY], *Cornell U Library*, 5 April 2017) <<https://arxiv.org/abs/1704.01414>>.

[60] See Molly Zuckerman, 'Coinbase And Bitfinex Integrate Bitcoin Scaling Upgrade SegWit' (21 February 2018) <<https://cointelegraph.com/news/coinbase-and-bitfinex-integrate-bitcoin-scaling-upgrade-segwit>>; Asseth Association Ethereum, 'Ethereum Community Conference – Vitalik Buterin' (9 March 2018). See Molly Zuckerman, 'Buterin Presents Blockchain Scaling Solution That Could Make Exchanges "Hack Resistant"' (10 March 2018) <<https://cointelegraph.com/news/buterin-presents-blockchain-scaling-solution-that-could-make-exchanges-hack-resistant>>.

[61] Andrew Quentson, 'Are The DAO Curators Masters or Janitors?' (*CoinTelegraph*, 12 June 2016) <<https://cointelegraph.com/news/are-the-dao-curators-masters-or-janitors>>.

[62] Christoph Jentsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <https://download.slock.it/public/DAO/WhitePaper.pdf>.

[63] *Ibid.* 2-3.

[64] Nick Szabo, 'Smart Contracts' (1994) <www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html>.

[65] This is a file that incorporates '... all information from [a conventional legal document] in a format that can be executed by software', Diederick Cardon, 'Ricardian contracts—legally binding agreements on the blockchain' (*Medium*, 30 November 2017) <<https://medium.com/legalthingsone/ricardian-contracts-legally-binding-agreements-on-the-blockchain-4c103f120707>>.

[66] Michael Furmston, *Law of Contract* (15th edn, OUP 2007) 37, 93.

[67] In essence, this logic requires all input-variables to be either 'true' or 'false', Lotame, 'Back to Basics: What is Boolean Logic?' (13 July 2016) <www.lotame.com/what-is-boolean-logic/>.

[68] See David Gerard, *Attack of the 50 Foot Blockchain* (CreateSpace Independent Publishing Platform 2017) 101.

[69] See Konstantinos Christidis & Michael Devetsikiotis, 'Blockchains and Smart Contracts for the Internet of Things' (2016) 4 *IEEE Access* 2292.

[70] Commonwealth Bank of Australia, 'Commonwealth Bank, Wells Fargo and Brighann Cotton Pioneer Landmark Blockchain Trade Transaction' (24 October 2016) <www.commbank.com.au/guidance/newsroom/CBA-Wells-Fargo-blockchain-experiment-201610.html>.

[71] See Jin Enyi & Ngoc Le, 'Regulating initial coin offerings ("crypto-crowdfunding")' (2017) 32 *JIBFL* 495.

[72] 'Crowdfunding is a way in which people and businesses (including start-ups) can try to raise money from the public to support a business, project, campaign or individual', see <www.fca.org.uk/consumers/crowdfunding>.

[73] Developers will typically receive pre-mined tokens from the funds raised, see Anothony Eufemio, Kai Chng & Shaun Djie, 'Digix's Whitepaper: The Gold Standard in Crypto-Assets' (*DigixDAO*, January 2016) <<https://dgx.io/whitepaper.pdf>>.

[74] Case No 3-18304 (Munchee Inc, Order), cease-and-desist order <www.sec.gov/litigation/admin/2017/33-10445.pdf> accessed 12 December 2017. See Securities Exchange Commission (SEC), 'SEC Exposes Two Initial Coin Offerings Purportedly Backed by Real Estate and Diamonds' (2017) <www.sec.gov/news/press-release/2017-185-0>; Philipp Hacker & Chris Thomale, 'Crypto-Securities Regulation: ICOs, Token Sales and Cryptocurrencies under EU Financial Law' (*SSRN*, 22 November 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3075820>.

[75] Securities and Exchange Commission (SEC), 'Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO' (25 July 2017) No 81207, 5 www.sec.gov/litigation/investreport/34-81207.pdf.

[76] <www.fca.org.uk/news/statements/initial-coin-offerings>.

[77] <www.esma.europa.eu/press-news/esma-news/esma-highlights-ico-risks-investors-and-firms>.

[78] Mark Hirshey & Eric Bentzen, *Managerial Economics* (14th edn, Cengage Learning 2016), 6.

[79] See Edward Freeman, *Strategic Management: A Stakeholder Approach* (CUP 1984).

[80] The general partnership is a common law phenomenon derived from Roman law, which had the so-called '*societas universorum quae ex quaestu veniunt*', see Ferdinando Bona, 'Contributi alla storia della *societas universorum quae ex quaestu veniunt* in diritto romano' Studi in onore di Giuseppe Grosso Bd 1, 383 <www.worldcat.org/title/contributi-alla-storia-della-societas-universorum-quae-ex-quaestu-veniunt-in-diritto-romano/oclc/610802915>.

[81] Paul Davies & Sarah Worthington, *Principles of Modern Company Law* (9th edn, Sweet & Maxwell 2012), 4.

[82] However, it is possible that a small company may be found to constitute a *quasi-partnership*, see *Wootliff v Rushton-Turner* [2017] EWHC 3129 (Ch). In that case, the court did not find that a company constituted a quasi-partnership, as the judge noted at [86] that 'there is no evidence to support that Mr Wootliff and the respondents to the petition enjoyed a relationship of a personal character sufficient to overlay the Company's constitution and governing documents with equitable considerations'.

[83] *Salomon v A Salomon & Co Ltd* [1897] AC 22.

[84] PA1890, s 4(2). See also The Law Commission and the Scottish Law Commission's combined report on partnership law, 'Report on Reference under Section 3(1)(e) of the Law Commissions Act 1965' (November 2003) (Law Com No 283; Scot Law Com No 192) www.scotlawcom.gov.uk/files/3812/7989/6640/rep192.pdf.

[85] Limited Liability Partnership Act 2000, s 1(2).

[86] *ITC v Gibbs* [1942] AC 402, 414 (Viscount Simon LC); *Sadler v Whiteman* [1910] 1 KB 868, 889; *Re Vagliano Anthracite Collieries Ltd* (1910) 103 LT 211; *Re Barnard* [1932] 1 Ch 269, 272. In some cases, partnerships can possess sufficient legal personality, see *Pooley v Driver* (1876) 5 Ch D 458, 476; *EETPU v Times Newspapers Ltd* [1980] 3 WLR 98, 101 (O'Connor J in obiter dictum).

[87] In contrast to Companies Act 1985, s 716(1), re-enacted from the Joint Stock Companies Act 1844, CA06 does not contain any statutory cap on the number of partners in a partnership.

[88] PA1890, s 1. See Geoffrey Morse, *Partnership and LLP Law* (8th edn, OUP 2015).

[89] *Greville v Venables* [2007] EWCA Civ 878.

[90] In accordance with English contract law this requires (i) an offer; (ii) acceptance; and (iii) some form of consideration made by the partners, for example, investment of money, skill (labour) or assumption of liability, *Williams v Roffey Bros & Nicholls (Contractors) Ltd* [1989] EWCA Civ 5 (Glidewell LJ).

[91] In *Bruce v Clapham* 1982 SLT 386 (Lord Grieve) no partnership existed due to non-liability.

[92] *Dollar Land (Cumbernauld) Ltd v CIN Properties Ltd* 1996 SLT 186, 195 (Lord Coulsfield).

[93] *Goddard v Mills* (1929), The Times, 16 February 1929; *Newstead v Frost* [1980] 1 WLR 135 (HL); *Norton Warburg Holdings Ltd v Perera* (1982) 132 NLJ 296.

[94] *Cox v Hickman* (1860) 8 HLC 11 ER 431, 446. See also *Bullen v Sharp* (1865) LR 1 CP 86; *Mollvo, March & Co v Court of Wards* (1872) LR 4 PC 419.

[95] *Walker v Hirsch* (1884) 27 Ch D 460, 464.

[97] *Carlill v Carbolic Smoke Ball Co* [1893] 1 QB 256.

[96] Christoph Jentsch, 'Slock.it DAO demo at Devcon1: IoT + Blockchain' (*YouTube*, 13 November 2015) <www.youtube.com/watch?v=49wHQofxYPo>.

[98] *Cox v Hickman* (1860) 8 HLC 11 ER 431, 446. See also *Bullen v Sharp* (1865) LR 1 CP 86; *Mollvo, March & Co v Court of Wards* (1872) LR 4 PC 419; *Walker v Hirsch* (1884) 27 Ch D 460, 464.

[99] See Shawn Bayern, 'Dynamic Common Law and Technological Change: The Classification of Bitcoin' (2014) 71 Wash & Lee L Rev Online 22, 30.

[100] *Goddard v Mills* (1929), The Times, 16 February 1929; *Newstead v Frost* [1980] 1 WLR 135 (HL); *Norton Warburg Holdings Ltd v Perera* (1982) 132 NLJ 296.

[101] Harold G Hanbury, *The Law of Partnership* (6th edn, Sweet & Maxwell 1944) 11-12.

[102] 645 F2d 404, [76] (5th Cir 1981).

[103] *ibid*, [44] and [79], *Williams v Roffey Bros* (n123).

[104] *Smith v Anderson* (1880) 15 Ch D 247, 284, PA 1890, s 5.

[105] English courts do not have the right to expulse an offending partner. Instead, under PA1890, s 35, the courts' option is limited to dissolving a partnership in its entirety.

[106] See Thomas Schultz, 'Carving up the Internet: Jurisdiction, Legal Orders, and the Private/Public International Law Interface' 19 EJITL 799.

[107] 15 USC § 77b(1), as amended.

[108] 15 USC § 78c(a)(10), as amended.

[109] The definition of a security in SEA1934, s 3(a)(10) largely corresponds to that found in SA1933, s 2(1). The former differs from the latter in its added exception, whereby '[The term 'security'] shall not include currency or any note, draft, bill of exchange, or banker's acceptance which has a maturity at the time of issuance of not exceeding nine months, exclusive of days of grace, or any renewal thereof the maturity of which is likewise limited'.

[110] The Acts s 2(a) and s 3(a)(10).

[111] 328 US 293 (1946).

[112] *ibid.*

[113] Money can be divided into primary money (cash) and secondary money (e-money).

[114] 940 F.2d 564, 574 (10th Cir 1991).

[115] *SEC v Friendly*, 49 F. Supp. 2d 1363, 1368-9 (S.D. Fla. 1999).

[116] Ryan Borneman, 'Why the Common Enterprise Test Lacks a Common Definition: A Look Into the Supreme Court's Decision of SEC v. Edwards' (2005) 5 UC Davis Bus LJ 16 <<https://blj.ucdavis.edu/archives/vol-5-no-2/why-the-common-enterprise-test.html>>. See Rodney Moore, 'Defining An "Investment Contract": The Commonality Requirement Of The Howey Test' (1986) 43 Wash & Lee L Rev 1057; Shawn Crook, 'What Is a Common Enterprise – Horizontal and Vertical Commonality in an Investment Contract Analysis' (1989) 19 Cumb L Rev 323; Stephen Maloney, 'What is a Common Enterprise – A Question of Legislative Intent' (1990) 11 Miss C L Rev 125; Maura Monaghan, 'An Uncommon State of Confusion: The Common Enterprise Element of Investment Contract Analysis' (1995) 63 Fordham L Rev 2135; James Gordon III, 'Defining a Common Enterprise in Investment Contracts' (2011) 72 Ohio State LJ 59.

[117] *SEC v ETS Payphones, Inc*, 300 F.3d 1281 (11th Cir 2002).

[118] Ryan Borneman, 'Why the Common Enterprise Test Lacks a Common Definition: A Look Into the Supreme Court's Decision of SEC v. Edwards' (2005) 5 UC Davis Bus LJ 16 <<https://blj.ucdavis.edu/archives/vol-5-no-2/why-the-common-enterprise-test.html>> .

[119] *ETS Payphones, Inc* (n160), 1284.

[120] Marc Alcser, 'Comment, The Howey Test: A Common Ground for the Common Enterprise Theory' 29 UC Davis L Rev 1217, 1226.

[121] Ryan Borneman, 'Why the Common Enterprise Test Lacks a Common Definition: A Look Into the Supreme Court's Decision of SEC v. Edwards' (2005) 5 UC Davis Bus LJ 16 <<https://blj.ucdavis.edu/archives/vol-5-no-2/why-the-common-enterprise-test.html>> .

[122] *ibid.*

[123] Marc Alcser, 'Comment, The Howey Test: A Common Ground for the Common Enterprise Theory' 29 UC Davis L Rev 1230.

[124] See *SEC v Unique*, 196 F.3d, [1199] (citing *Villeneuve v Advanced Bus Concepts Corp*, 698 F.2d 1121, 1124 (11th Cir 1990); *Eberhardt v Waters*, 901 F.2d 1578, 1580-1 (11th Cir 1990).

[125] 540 US 389 (2004).

[126] See *United Housing Foundation, Inc v Forman*, 421 US 837, 848 (1975).

[127] *Williamson v Tucker*, 645 F.2d 404, [76] (5th Cir 1981), [51].

[128] *ibid.*

[129] 474 F.2d 476 (9th Cir 1973).

[130] *Long v Shultz*, 881 F.2d 129, 137 (5th Cir 1989). See also *SEC v Merchant Capital, LLC*, 483 F.3d 747 (11th Cir 2007).

[131] *Bamert v Pulte Home Corp*, 445 Fed. App'x 256, 262 (11th Cir 2011). See *SEC v Merchant Capital, LLC*, 483 F.3d 747, 755 (11th Cir 2007).

[132] Securities and Exchange Commission (SEC), 'Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO' (25 July 2017) No 81207, 5 <www.sec.gov/litigation/investreport/34-81207.pdf>, 13.

[133] *Ibid.* 12-13.

[134] *Ibid.* 13.

[135] See *Steak, Inc v River City Steak, Inc*, 460 F.2d 666 (10th Cir 1972); *Ballard & Cordell Corp V Zoller & Danneberg Exploration, Ltd*, 544 F.2d 1059 (10th Cir 1976); *Fargo Partners v Dain Corp*, 540 F.2d 912 (8th Cir 1976).

[136] The first UCITS Directive ('UCITSD'), Council Directive (EEC) 85/611, was adopted on 20 December 1985; two new Directives were adopted on 21 January 2002, Council Directive (EC) 2001/107 and Council Directive (EC) 2001/108 (i.e. UCITS III package); significant changes to the UCITS legislation were made by Council Directive (EC) 2009/65 (ie UCITSD IV); on 28 August 2014, a Directive aiming at introducing further amendments to the UCITSD, commonly referred to as UCITS V Directive, Council Directive (EU) 2014/91, was published in the official journal of the EU.

[137] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011.

[138] UCITSD, art 5(1).

[139] UCITSD, art 19(3).

[140] UCITSD, art 1(2)(b).

[141] UCITSD, art 5(2), articles 2(1)(a) and 2(1)(b).

[142] Under UCITSD, art 3(a), closed-ended investment companies are not subject to UCITSD.

[143] Christoph Jentzsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <<https://download.slock.it/public/DAO/WhitePaper.pdf>>.

[144] AIFMD, Art 4(1)(a).

[145] Bodellini, 'Does it still make sense, from the E.U. perspective, to distinguish between UCITS and non-UCITS schemes?' (2016) *Capital Markets Law Journal*, 528-539.

[146] See Article 4(1)(w) of the AIFMD which states that managing AIFs means performing for one or more AIFs at least the investment management functions referred to in Annex 1, i.e., (i) portfolio management and (ii) risk management.

[147] Marketing of AIFs units or shares is considered as a non-core service under Annex 1 of AIFMD, and in accordance with Art 4(1)(x) of the AIFMD it means 'a direct or indirect offering or placement at the initiative of the AIFM or on behalf of the AIFM of units or shares of an AIF it manages to or with investors domiciled or with a registered office in the Union'.

[148] Financial Services and Markets Act 2000 (Regulated Activities) Order 2001, SI 2001/544 (RAO), as amended, Part III, s 81.

[149] FSMA, s 238(1). See the FSMA 2000 (Financial Promotion) Order 2005, SI 2001/1335, the FSMA 2000 (Promotion of Collective Investment Schemes (Exemptions) Order 2001, SI 2005/1529.

[150] FSMA, s 23.

[151] FSMA, s 26.

[152] The maximum statutory fine under the Criminal Justice Act 1982, s 37 is GBP5,000. The Legal Aid, Sentencing and Punishment of Offenders Act 2012 (Fines on Summary Conviction) Regulations 2015, SI 2015/664 did not change this.

[153] FSMA 2000, ss 23, 380, and 382; FCA Handbook, Decision Procedure and Penalties Manual (DEPP).

[154] Insolvency Act 1986, s 124A. See also *Re Sky Land Consultants plc* [2010] EWHC 399 (Ch).

[155] FSMA, s 235(3).

[156] The FSMA 2000 (Collective Investment Schemes) (Amendment) Order 2008, SI 2008/1641 amended the CIS Order Sch para 9 to also exempt arrangements carried out in relation to new special purpose vehicles.

[157] Alastair Hudson, *The Law of Finance* (2nd edn, Sweet & Maxwell 2013), 23.

[158] Eva Lomnicka, 'Collective Investment Schemes' in George Walker, Robert Purves & Michael Blair (eds), *Financial Services Law* (3rd edn, OUP 2005), 851-2.

[159] Non-profit DAOs are exempt from being CISs under exemption 4 of the CIS order as schemes not operated by way of business.

[160] *Basic British Slag's Application* [1963] 1 WKR 727. See also *Russell-Cooke Trust Co v Prentis* [2002] EWHC 2227 (Ch); *FSA v Fradley and Woodward* [2005] EWCA Civ 1183; *Office of Fair Trading v Lloyds TSB Bank plc* [2006] EWCA 268.

[161] *Re Duckwari plc* [1999] Ch 253, 260 (Nourse LJ), cf FMLC, 11. This was confirmed in *Russell-Cooke Trust Co v Prentis* [2002] EWHC 2227 (Ch).

[162] FMLC, 11.

[163] FSMA does not contain the territorial scope provision of the Financial Services Act 1986, s 1 which establishes when a regulated business is carried out in the UK.

[164] [1965] AC 1175, 1247-8 (Lord Wilberforce).

[165] [2007] UKHL 21; [2008] 1 AC 66, [309].

[166] See George Walker, 'Financial Technology Law' (2017) 50 TIL, 204.

[167] *FSA v Fradley and Woodward* [2004] EWHC 3008 (Ch) (John Martin QC).

[168] *ibid*, [21]-[22]. This point was not appealed.

[169] On a more technical level, it is unclear whether cryptoassets constitute choses in action or choses in possession, as 'The law knows no *tertium quid* between the two', *Colonial Bank v Whinney* (1885) 30 Ch D 261, 285 (Fry CJ). Arguments have been made in favour of both views and the subject is still debated, see Joanna Perkins & Jennifer Enwezor, 'The Legal Aspect of Virtual Currencies' (2016) 31 JIBFL 569, 570. See also Marcus Smith & Nico Leslie, *The Law of Assignment* (2nd edn, OUP 2013) 28-29.

[170] Alastair Hudson, *The Law and Regulation of Finance* (2nd edn, Sweet & Maxwell 2013), 1452.

[171] *Russell-Cooke Trust Co v Elliott* [2000] All ER (D) 197 (Laddie J); with regard to 'effect', see also *FSA v Asset Land Investment Inc* [2013] EWHC 178 (Ch).

[172] *FCA v Asset LI Inc* [2016] UKSC 17, [91] (Lord Sumption JSC).

[173] FMLC, 11.

[174] *SEC v Edwards*, 540 US 389 (2004) 394.

[175] Securities and Exchange Commission (SEC), 'Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO' (25 July 2017) No 81207, 5 <www.sec.gov/litigation/investreport/34-81207.pdf>, 12.

[176] For the fluctuations in 'The DAO' tokens' value see <<https://coinmarketcap.com/currencies/the-dao/>>.

[177] Chris Burniske & Jack Tatar, *Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond* (McGraw-Hill 2018), 253.

[178] *Russell-Cooke Trust Co v Elliott* [2000] All ER (D) 197, [20]-[21] (Laddie J).

[179] FSMA, s 235(2).

[180] [2005] EWCA Civ 1183, [46].

[181] *ibid.*

[182] Don Tapscott & Alex Tapscott, *Blockchain Revolution How the Technology behind Bitcoin is Changing Money, Business and the World* (Penguin Random House 2016), 88.

[183] Securities and Exchange Commission (SEC), 'Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO' (25 July 2017) No 81207, 5 <www.sec.gov/litigation/investreport/34-81207.pdf>, 13-15. See *FSA v Asset Land Investment Inc* [2013] EWHC 178 (Ch).

[184] John Thompson, Jonathan Scott & Frank Martin, *Strategic Management* (8th edn, Cengage Learning 2017), 93.

[185] FCA, 'Unregulated collective investment schemes' (18 April 2016, updated 14 August 2017) <www.fca.org.uk/consumers/unregulated-collective-investment-schemes>.

[186] FSMA, s 238.

[187] David Johnson & David Post, 'Law and Borders—The Rise of Law in Cyberspace' (1996) 48 Stan L Rev 1367, 1370.

[188] *SEC v Levin*, No 12-cv-21917, 2013 WL 594736, [12] (S.D. Fla. February 14, 2013). See *United States v Hornaday*, 392 F.3d 1306, 1311 (11th Cir 2004).

[189] Sir Geoffrey Vos, 'Integrity and independence in the judiciary and the financial services industry: a comparative study' [Banking Standards Board Lecture, London, 20 March 2018], [11(5)] <www.judiciary.gov.uk/wp-content/uploads/2018/03/chc-speech-banking-standards-board-lecture.pdf>.

[190] Law Commission, 'Annual Report 2017-18' Law Com No 379 <https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jxou24uy7q/uploads/2015/05/6.4475_LC_Annual-ReportAccounts-201718_WEB.pdf>.

[191] Sir Geoffrey Vos, 'Integrity and independence in the judiciary and the financial services industry: a comparative study' [Banking Standards Board Lecture, London, 20 March 2018], [11(5)] <www.judiciary.gov.uk/wp-content/uploads/2018/03/chc-speech-banking-standards-board-lecture.pdf>.

[192] Indeed, this is also the reason why privatisation is widespread in terms of using special purpose vehicles (SPVs) in international finance.

[193] David Johnson & David Post, 'Law and Borders—The Rise of Law in Cyberspace' (1996) 48 Stan L Rev, 1378-81.

[194] *Ibid.*, 1389-90.

[195] See Lawrence Lessig, 'Code Is Law: On Liberty in Cyberspace' (*Harvard Magazine*, 1 January 2000) <<https://harvardmagazine.com/2000/01/code-is-law.html>>.

[196] Although in principle possible, it would require the assistance of lawyers as individuals' fundamental rights, such as human rights and property rights, must be observed and protected, see European Convention on Human Rights and Fundamental Freedoms, as amended.

[197] See <www.handbook.fca.org.uk/handbook/PRIN.pdf>. See also the PRA's Fundamental Rules <www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/new-bank/fundamentalruleprinciples>.

[198] BIS, 'History of the Basel Committee' (Updated 14 April 2018) <www.bis.org/bcbs/history.htm#basel_i>.

[199] <www.bis.org/bcbs/>.

[200] <www.bis.org/bcbs/implementation.htm?m=3%7C14%7C656>.

[201] *Royal Brunei Airlines Sdn Bhd v Tan* [1995] 2 AC 378, 389.

[202] Konstantinos Christidis & Michael Devetsikiotis, 'Blockchains and Smart Contracts for the Internet of Things' (2016) 4 IEEE Access 2292.

[203] Gustave Le Bon, *The Crowd: A Study of the Popular Mind* (1895), 56.

[204] Chris Burniske & Jack Tatar, *Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond* (McGraw-Hill 2018), 253.

[205] Christoph Jentzsch, 'Decentralized Autonomous Organization to Automate Governance' (*Slock.it*, 2016) (Whitepaper) <<https://download.slock.it/public/DAO/WhitePaper.pdf>>.

[206] The Rt Hon, Prime Minister, Theresa May MP, 'PM speech on our future economic partnership with the European Union' (2 March 2018) <www.gov.uk/government/speeches/pm-speech-on-our-future-economic-partnership-with-the-european-union>.

[207] *ibid.*

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