

MANCHESTER
1824

The University of Manchester

Law and regulation for a crypto-market: perpetuation or innovation?

Free paper

By Dr. Joseph Lee, Senior Lecturer

www.manchester.ac.uk/techlaw

Law and regulation for a crypto-market: perpetuation or innovation?

Dr Joseph Lee, Senior lecturer in Law, Law School, University of Exeter, UK

j.lee@exeter.ac.uk

Abstract

This paper looks at the importance of the law in a crypto-market and recognises that the market is a legal construct and so is the crypto-market. Private law matters as it provides legal certainty for market transactions. Regulatory intervention is required for a market as it can enhance legal certainty, mitigate legal and market risks, and address market failure. Currently there are different types of cryptoasset on the market. There are also several possible cryptoassets that are currently been imagined and could in the future enter the market. This phenomenon has created confusion. Cryptoassets keep developing alongside law and regulation. Using the existing private law concepts to engage in legal taxonomy exercises for these cryptoassets can lead to unsatisfactory results. Equally, applying the current regulatory ethos and framework to them has a significant risk of stifling financial innovation in the crypto-market. A new type of social contract is required to define the stakeholders and their relationships with law and regulation. This new social contract should reflect the desire to cross or even transcend national boundaries, the mistrust in the current centralised and intermediated market structure, the needs of the currently excluded, and a reformed power structure of global financial regulation.

Introduction

Discussion about the way in which crypto-assets can or should be classified in law, otherwise known as legal taxonomy (LT),¹ has made a significant contribution to the development of an infrastructure for crypto-finance and of its regulation.² Legal taxonomy clarifies what crypto-

¹ Emily Sherwin, 'Legal Taxonomy', 2009 (15) *Legal Theory* 25, 54; Jens Lausen, 'Regulating Initial Coin Offerings? A Taxonomy of Crypto-Assets', (Research Paper, Association for Information Systems, Stockholm & Uppsala, Sweden, 2019), <http://aisel.aisnet.org/ecis2019_rp/26>; Rafael Delfin, 'A General Taxonomy for Cryptographic Assets', <https://assets.ctfassets.net/sdIntm3tthp6/6mq1HTdBKG46Q6iqa26uE/df09eaf16935053c99c8fcdce658c7ae/General_Taxonomy_for_Cryptographic_Assets.pdf> accessed 05 July 2020.

² 'Cryptoasset Promotions: Consultation', (HM Treasury, July 2020) <<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment>

assets are in law so that stakeholders and participants in this developing system can understand how to use them to catalyse socio-economic transformation,³ how to monetise them,⁴ how to mitigate risks,⁵ and how to regulate the way the system is used.⁶

[data/file/902891/Cryptoasset_promotions_consultation.pdf](#)> accessed 22 July 2020; Lin Lin and Dora Neo, 'Alternative Investments in the Tech Era' 2020 (1) Singapore Journal of Legal Studies 1,3. Apolline Balndin et al., 'Global Cryptoasset Regulatory Landscape Study', (Research Paper, Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf>; 'Global Digital Finance: Code of Conduct – Taxonomy for Cryptographic Assets', <https://www.gdf.io/wp-content/uploads/2018/10/0010_GDF_Taxonomy-for-Cryptographic-Assets_Proof-V2-260719.pdf> accessed on 05 July 2020.

³ Robby Houben et al., 'Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion', (Research Paper, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, 2018).

⁴ Edmund Mokhtarian, Alexander Lindgren 'Rise of the Crypto Hedge Fund: Operational Issues and Best Practices for an Emergent Investment Industry' 2018 (23) Stanford Journal of Law, Business & Finance 112, 158; Money's Past and Fintech's Future: Wildcat Crypto, the Digital Dollar, and Citizen Central 2019 (2) Banking Stanford Journal of Blockchain Law & Policy 1, 11

⁵ 'Regulatory Challenges and Risks for Central Bank Digital Currency', (Regulatory Requirements and Economic Impact Working Group, International Telecommunication Union, 2019), <https://www.itu.int/en/ITU-T/focusgroups/dfc/Documents/DFC-O-006_Report%20on%20Regulatory%20Challenges%20and%20Risks%20for%20Central%20Bank%20Digital%20Currency.pdf> accessed 05 July 2020.

⁶ 'Cryptoassets Taskforce: Final Report' (UK HM Treasury et al., 2018), <<https://assets.publishing>

[service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf)>; 'Guidance of Cryptoassets', (FCA Consultation Paper 19/3, 2019); 'Report with Advice for the European Commission on Crypto-Assets', (European Banking Authority, 2019), <[https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493d-aa-85a8-4429-aa91-](https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493d-aa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1)

[e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1](https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493d-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1)>; Norman Chan, 'Keynote Speech at Treasury Markets Summit 2018 on Crypto-assets and Money' (Hong Kong Monetary Authority 2018) <<https://www.hkma.gov.hk/eng/news-and-media/speeches/2018/09/20180921-1/>>; 'Conceptual Framework for the Potential Regulation of Virtual Asset Trading Platform Operates' (Securities and Futures Commission of Hong Kong, 2018) <<https://www.sfc.hk/web/EN/files/ER/PDF/App%20%20Conceptual%20framework%20for%20VA%20tra>>; 'Notice on Precautions Against the Risks of Bitcoins', (People's Bank of China, 2013) <<http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757016/c3762245/content.html>> accessed on 10 July 2020.

Previous research has shown that lack of either legal certainty or regulatory intervention can lead to the downfall of a sector,⁷ whether mature or developing. The fall of unstable coins markets, such as the Bitcoin market, demonstrates that both legal certainty and regulatory intervention are needed for stable market construction.⁸ As supervision has been developed sector by sector in most jurisdictions,⁹ legal taxonomy also helps determine which regulator has oversight over dealings in any particular asset.¹⁰ The regulator applies existing laws or develops new ones to bring the asset in question under its regulatory purview.¹¹ In private law, legal taxonomy directs how parties negotiate contracts for transactions and how lawyers draft documents to provide evidence of their negotiations.¹² Their subsequent actions, including execution, reporting, registration, and compliance, will depend on terms embedded in the contract, and these are based on the legal taxonomy of the assets and the regulatory framework that applies to them¹³. For insolvency practitioners and creditors, the legal taxonomy of assets will determine how to safeguard their interest (*ex ante* protection), and also how to assert claims in assets during reorganisation and insolvency proceedings (*ex post* protection).¹⁴

As new concepts of law and regulation have emerged in this area, software developers have begun to work with lawyers to create smart technologies that link the different functions.¹⁵ Automation can increase the efficiency of the crypto-market as well as monetising new

⁷ Tara Mandjee, 'Bitcoin, its Legal Classification and its Regulatory Framework', 2016 (15) *Journal of Business and Securities Law* 158, 211.

⁸ Joseph Lee and Lheureux Florian, 'A Regulatory Framework for Cryptocurrency' 2020 *European Business Law Review*.

⁹ 'Evaluating Financial Sector Supervision: Banking, Insurance and Securities Markets', in 'Financial Sector Assessment: A Handbook', (International Monetary Fund, 2005).

¹⁰ Iris H-Y Chiu, 'Pathways to European Policy and Regulation in the Crypto-Economy' 2019 (4) *European Journal of Risk Regulation* 738, 765.

¹¹ Johannes Ehrentraud et al., 'Policy Responses to Fintech: A Cross-Country Overview', (Financial Stability Institute on Policy Implementation No. 23, 2020); 'Hong Kong: A New Regulatory Approach for Cryptocurrencies', <<https://www.dataguidance.com/opinion/hong-kong-new-regulatory-approach-cryptocurrencies>>; David Lee et al., 'Handbook of Blockchain, Digital Finance, and Inclusion', (Volume 1: Cryptocurrency, Fintech, Insur Tech, and Regulation & Volume 2: ChinaTech, Mobile Security, and Distributed Ledger), (1st edn, Elsevier, 2018).

¹² Carol Goforth, 'The Lawyer's Cryptionary: A Resource for Talking to Clients about Crypto-transactions' 2019 (1) *Campbell Law Review* 47, 122; Rainer Kulms, 'Blockchain: Private Law Matters' 2020 *Singapore Journal of Legal Studies* 63, 89.

¹³ Carla Reyes, '(Un)Corporate Crypto-Governance' 2020 (88) *Fordham Law Review* 1875, 1922.

¹⁴ Janis Sarra, Louise Gullifer, 'Crypto-Claimants and Bitcoin Bankruptcy: Challenges for Recognition and Realization' 2019 (2) *International Insolvency Review* 233, 272.

¹⁵ O Bolotaeva et al., 'The Legal Nature of Cryptocurrency', (IOP Conference Series: Earth and Environmental Science, 2019), <<https://iopscience.iop.org/article/10.1088/1755-1315/272/3/032166/pdf>> accessed on 05 July 2020.

products and services¹⁶ that are generated by, for example, big data.¹⁷ Legal taxonomy provides the ground rules within which IT engineers and lawyers design new hardware and software systems. If the market is recognized as a legal construct¹⁸, legal taxonomy will also determine how stakeholders congregate to create a market for assets, whether physically in a place such as Lloyd's in London¹⁹, digitally such as on the London Stock Exchange²⁰, or virtually such as on blockchain for crypto-currency²¹. As a consequence, there are legal implications for the way the market is defined in financial law as well as in competition.

Crypto systems are aimed at creating a boundary-free²² regional and global space where stakeholders can benefit from the Internet's high speed transmission of data;²³ in other words, a virtual world.²⁴ Crypto-finance facilitates the creation of this universal Crypto-Republic.²⁵ Under the 'law matters' theory,²⁶ an international standard for the legal taxonomy of crypto-assets can reduce confusion and conflict,²⁷ and increase competition by developing a rule-

¹⁶ Emmanuelle Ganne, 'Can Blockchain Revolutionise International Trade?', (World Trade Organisation 2018), <https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf> accessed 05 July 2020.

¹⁷ Albert Opher et al., 'The Rise of the Data Economy: Driving Value through Internet of Things Data Monetisation'

¹⁸ Justin Desautels-Stein, 'The Market as a Legal Concept' (2012) 60 Buffalo Law Review 387, 492.

¹⁹ Frederick Martin, *The History of Lloyd's and of Marine Insurance in Great Britain* (London: MacMillan, 2004).

²⁰ Ranald Michie, *The London Stock Exchange: A History*, (Oxford, OUP, 2003).

²¹ Joseph Lee and Florian Lheureux, 'A Regulatory Framework for Cryptocurrency' 2020 European Law Review.

²² Garrick Hileman and Michel Rauchs, 'Global Cryptocurrency Benchmarking Study', (Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-04-20-global-cryptocurrency-benchmarking-study.pdf> accessed 06 July 2020.

²³ Marco Iansiti and Karim Lakhani, 'The Truth about Blockchain', 2017 (2) Harvard Business Review, <<https://hbr.org/2017/01/the-truth-about-blockchain>> accessed 06 July 2020.

²⁴ Robert Hoogendoorn, 'Virtual Worlds: The Next Frontier for Businesses', <<https://dappradar.com/blog/virtual-worlds-the-next-frontier-for-businesses>>, accessed 06 July 2020.

²⁵ Thad Kousser and Matthew McCubbins, 'Social Choice, Crypto-Initiatives, and Policymaking by Direct Democracy' 2005 (78) Southern California Law Review 949, 984.

²⁶ Michael Gilbert, 'Does Law Matter? Theory and Evidence from Single-Subject Adjudication', 2011 (40) Journal of Legal Studies 333, 365.

²⁷ OECD, 'The Tokenisation of Assets and Potential Implications for Financial Markets', (OECD Blockchain Policy Series, 2020), <<https://www.oecd.org/finance/The-Tokenisation-of-Assets-and-Potential-Implications-for-Financial-Markets.pdf>> accessed 06 July 2020; Michael Ng, 'Choice of Law for Property Issues regarding Bitcoin under English Law' 2019 (15) Journal of Private International Law 315, 338.

based level playing field.²⁸ Taking current legal and regulatory rules and using them by analogy and extension to support the construction of the crypto-market can be efficient, but to do so without considering the targeted functions and operational matters will stifle development.²⁹ The rules that are currently in place were not originally designed to regulate crypto-functions.

This paper will assess the functions and operation of some crypto-assets that are either already on the market³⁰ or have been proposed,³¹ by looking at attempts to regulate them and discussing regulatory attitudes and policy directions. The main crypto-assets to be analysed against both laws and regulations include: exchange tokens (payment tokens), security tokens (asset tokens), utility tokens, fund tokens, commodity tokens, title tokens, and hybrid tokens.³² There are also variations within a single token class. For instance, while share tokens and debt tokens are subsets of security tokens, they should not be treated in the same way, using the same rules, in contexts such as issuance or insolvency. The overall aim is to discover whether legal taxonomy and regulatory intervention can help in the construction of the emerging crypto-asset market with the goal of creating a boundary-free virtual Crypto-Republic.

Payment tokens

²⁸ 'Investigating the Impact of Global Stablecoins', (G7 Working Group on Stablecoins, October 2019), <<https://www.bis.org/cpmi/publ/d187.pdf>> accessed 06 July 2020.

²⁹ Apolline Balandin et al., 'Global Cryptoasset Regulatory Landscape Study', (Research Paper, Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf> accessed 06 July 2020.

³⁰ Apolline Balandin et al., 'Global Cryptoasset Regulatory Landscape Study', (University of Cambridge Faculty of Law Research Paper No. 23/2019); Brianne Smith, 'The Life-Cycle and Character of Crypto-Assets: A Framework for Regulation and Investor Protection', 2019 (19) *Journal of Accounting and Finance* 156, 168.

³¹ Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System', <<https://www.bitcoin.com/bitcoin.pdf>> accessed 06 July 2020; Dominic Worner et al., 'The Bitcoin Ecosystem: Disruption Beyond Financial Services?', (European Conference on Information Systems, 2016); FCA, 'Guidance on Cryptoassets', (Consultation Paper 19/3, January 2019).

³² Robby Houben and Alexander Snyers, 'Crypto-Assets: Key Developments, Regulatory Concerns and Responses', (Study requested by the ECON Committee, European Parliament), <[https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL_STU\(2020\)648779_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL_STU(2020)648779_EN.pdf)> accessed on 06 July 2020; 'Own Initiative Report on Initial Coin Offerings and Crypto-Assets', (Securities and Markets Stakeholder Group, European Securities and Markets Authority 2018), <https://www.esma.europa.eu/sites/default/files/library/esma22-106-1338_smsg_advice_-_report_on_icos_and_crypto-assets.pdf> accessed on 06 July 2020.

Payment tokens such as Bitcoin and Ether, also termed exchange tokens, are used as a method of payment, and may be either unstable or stable.³³ Unstable tokens are not linked to any particular asset class recognised by the law and are created through the protocols of the ‘mining’ process.³⁴ An unstable token is intangible, a virtual object that can be used for payment as were gold or silver in the past.³⁵ There is no specific value affixed to this intangible object,³⁶ unlike fiat money or digital money, both of which have a set value. The value of a payment token is determined by supply and demand in the market and as a result its price is variable with no stable benchmark to measure its intrinsic value.³⁷ As payment tokens are not issued by a central bank or a central authority, and there is no defined measure to stabilise their intrinsic value, stabilisation depends on what the participants in the consensus system (the nodes) decide.³⁸ This can include revision of the original protocols used to create the tokens which leads to the problem of ‘forking’ with the opportunity for market manipulation at the expense of anybody unable to participate meaningfully in the revision of the original protocols.³⁹ To counter the instability of unstable payment tokens, some stable coins have emerged, notable among them being LIBRA which intends to issue tokens linked to underlying assets that can be used for payment within the network.⁴⁰ The aim is to stabilise the value of the issued tokens, possibly with a fixed price, so that people who purchase them with fiat currencies, use them as payment, or receive them as payments or gifts, would have some protection against fluctuations in value. However, as in other fiat currencies, payment tokens can also be used for purposes other than payment. They can be purchased as an investment, expecting the value to go up or to earn interest/dividends when in the custody of intermediaries such as exchanges or banks. They can also be used as a method of transmitting value, though not in retail payment transactions by consumers, for large payments between

³³ ‘Investing the Impact of Global Stablecoins’, (G7 Working Group on Stablecoins, 2019), <<https://www.bis.org/cpmi/publ/d187.pdf>> accessed 07 July 2020.

³⁴ Joseph Lee and Florian Lheureux, ‘A Regulatory Framework for Cryptocurrency’, 2020 European Law Review.

³⁵ Chia Ling Koh, ‘The Rise of e-Money and Virtual Currencies: Re-discovering the Meaning of Money from a Legal Perspective’ (Osborne Clarke, 2018) <<https://www.osborneclarke.com/wp-content/uploads/2018/07/The-rise-of-e-Money-and-virtual-currencies.pdf>> accessed 07 July 2020.

³⁶ PWC, ‘Cryptographic Assets and Related Transactions: Accounting Considerations under IFRS’ (Research Report, 2019).

³⁷ EY, ‘The Valuation of Crypto-Assets: Minds Made for Shaping Financial Services’ (2018) <https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/emeia-financial-services/ey-the-valuation-of-crypto-assets.pdf> accessed 07 July 2020.

³⁸ ‘Investing the Impact of Global Stablecoins’, (G7 Working Group on Stablecoins, 2019), <<https://www.bis.org/cpmi/publ/d187.pdf>> accessed 07 July 2020.

³⁹ Vitalik Buterin, ‘Decentralised Protocol Monetisation and Forks’ (2014) <<https://blog.ethereum.org/2014/04/30/decentralized-protocol-monetization-and-forks/>> accessed 07 July 2020.

⁴⁰ The Libra Association Members, ‘Libra White Paper’ (2020) <<https://libra.org/en-US/white-paper/>> accessed 07 July 2020.

entities, or in investment. This ability is most likely to be used to facilitate exchanges in criminal activity, particularly if the tokens and the trading space are ungoverned.⁴¹

Current legal taxonomy and regulatory approaches to payment tokens remain sectoral rather than systematic. They are a taxable asset recognised as a 'unit of account' by the UK tax authority.⁴² However, it is not clear how the UK tax authority intends to treat in law, for instance, whether payment tokens can be held in trust and are capable of being passed down from the settler to the ultimate beneficiaries, or how tax rates can be applied to payment tokens that have no face value and a fluctuating intrinsic value.⁴³ A decision is needed on how legal taxonomy applies to crypto-assets, and whatever that decision is, the revenue authorities will have a keen interest in levying taxes on them, as a receipt of payment, an investment, or a gift, either legal or illegal.⁴⁴ The tax authorities can levy taxes on gains that originate from money laundering, market abuse, insider dealing, or bribes.

As payment tokens have been used to facilitate exchanges associated with crime, money laundering laws are necessary in order to cut off financing channels for activities such as the drug trade along the Silk Road.⁴⁵ In this context, money laundering law has been the first set of laws to recognise the legal status of crypto-assets as money.⁴⁶ However, payment tokens are still not systematically recognised as money; Bitcoin, for instance, is not considered to be money in the Sale of Goods Act 1979.⁴⁷ When Bitcoin and similar tokens are treated as money, there are two implications. Firstly, since the law is targeted at money laundering, Bitcoin and other similar tokens are included within the parameters of anti-money laundering regulations.⁴⁸ Secondly, it implies that the definition of money used by the anti-money

⁴¹ Public-Private Analytic Exchange Programme, 'Risk and Vulnerabilities of Virtual Currency: Cryptocurrency as a Payment Method' (2017) <https://www.dni.gov/files/PE/Documents/9--2017-AEP_Risks-and-Vulnerabilities-of-Virtual-Currency.pdf> accessed 07 July 2020.

⁴² 'Cryptoassets: Tax for Individuals' (Policy Paper of HM Revenue & Customs, 2019) <<https://www.gov.uk/government/publications/tax-on-cryptoassets/cryptoassets-for-individuals>> accessed on 07 July 2020.

⁴³ Ibid.

⁴⁴ Peter Chapman and Laura Douglas, 'The Virtual Currency Regulation in the United Kingdom' in Michael Sackheim and Nathan Howell (eds), 'The Virtual Currency Regulation Review' (The Law Reviews, 2018) 310, 329.

⁴⁵ David Adler, 'Silk Road: The Dark Side of Cryptocurrency' 2018 Fordham Journal of Corporate and Financial Law, <<https://news.law.fordham.edu/jcfl/2018/02/21/silk-road-the-dark-side-of-cryptocurrency/>> accessed on 07 July 2020.

⁴⁶ Peter Chapman and Laura Douglas, 'The Virtual Currency Regulation in the United Kingdom' in Michael Sackheim and Nathan Howell (eds), 'The Virtual Currency Regulation Review' (The Law Reviews, 2018) 310, 329.

⁴⁷ Laurie Korpi and Yasmine Dong, 'Unrivalled Insight into Global Digital Payments Regulation' (2015) <<https://gamblingcompliance.com/sites/gamblingcompliance.com/files/attachments/page/PaymentsCompliance%20-%20Payments%20Lawyer%20June%202015.pdf>> accessed 06 July 2020.

⁴⁸ Ibid.

laundering law is not limited to payment tokens and may be extended to other tokens such as hybrid tokens.

The UK Payment Systems Regulator (PSR), which regulates credit card payments and digital third party payment providers, does not issue guidance on how payment tokens are to be treated and recognised.⁴⁹ There is no reason why payment systems should not have the ability to process payment tokens and be subject to the oversight of the PSR. Although the market operations of payment tokens are different from those of fiat currency and e-money,⁵⁰ bringing processing payment tokens under the PSR would enhance the ability of operators to manage risk and promote innovation.⁵¹

The Information Commissioner's Office, the UK's data protection regulator, also has jurisdiction over payment tokens when they contain personal information. The software design of payment tokens contains information about their origination in blocks on the DLT system which means that personal information could be revealed.⁵² Current encryption technology may not be effective in preventing violations of data protection and privacy.⁵³

The discussion above shows that although regulators have begun to exert jurisdiction over payment tokens, they do not take a common approach to LT. The way they share or divide their regulatory oversight largely relies on Memoranda of Understanding to avoid potential legal, organisational or operational conflicts in this sectoral regulatory sphere.⁵⁴ It is likely that payment tokens will continue to be regulated in this way and that a single regulator will not be able to determine the legal status of payment tokens and claim exclusive oversight. The way in which international regulators will co-coordinate will depend on how assets are legally classified (LT).⁵⁵

⁴⁹ Chapter 15, 'Guidance on the Scope of the Payment Services Regulations' of PERG Handbook (2017) <<https://www.handbook.fca.org.uk/handbook/PERG/15.pdf>> accessed 07 July 2020.

⁵⁰ Cryptocurrencies (2020) <<https://dig.watch/issues/cryptocurrencies>> accessed 07 July 2020.

⁵¹ FCA, 'Innovation in UK Consumer Electronic Payments: A Collaborative Study by Ofcom and the Payment Systems Regulator' (2014) <<https://www.fca.org.uk/publication/research/ofcom-psr-joint-study.pdf>> accessed 07 July 2020.

⁵² thinkBLOCKtank, 'The Regulation of Token in Europe: National Legal & Regulatory Frameworks in Select European Countries', (2019) <<http://thinkblocktank.org/wp-content/uploads/2019/08/thinkBLOCKtank-Token-Regulation-Paper-v1.0-Part-C.pdf>> accessed 06 July 2020.

⁵³ PrivSec Report, 'Preventing Data Breaches and Assisting GDPR Compliance Using Encryption', (2017) <<https://gdpr.report/news/2017/12/21/preventing-data-breaches-assisting-gdpr-compliance-using-encryption/>> accessed 06 July 2020.

⁵⁴ Dax Hansen and Sarah Howland, 'Digital Currencies: International Actions and Regulations' (2020) <<https://www.perkinscoie.com/en/news-insights/digital-currencies-international-actions-and-regulations.html>> accessed 06 July 2020.

⁵⁵ Apolline Blandin et al., 'Global Cryptoasset Regulatory Landscape Study', (University of Cambridge Faculty of Law Research Paper No. 23/2019).

Utility tokens

Utility tokens allow their holders to access products and services either currently or in the future.⁵⁶ They are issued by an individual, an entity, or an association and in this they differ from payment tokens that have their origin in the 'mining' process according to a pre-designed protocol. Payment tokens have no fixed face value, but utility tokens have a value that is linked to particular products (two meals or three smart technology applications, for example) or services (three hours of legal services, a training course, or purchase of clean energy). They are similar to vouchers or membership cards. A voucher can be redeemed for goods (a book), for services (seeing a film or using the gym facility). The terms and conditions of these vouchers usually make their transferability restricted and time limited.⁵⁷ When issuers become defunct due to bankruptcy, insolvency or project failure, voucher holders do not have access to asset pools and are unlikely to have any significant monetary claim.⁵⁸ However, some vouchers can be transferable,⁵⁹ lack a time limit, and are even redeemable for multiple goods and services provided by concerns other than the issuers. If such vouchers are tokenised, they are then similar to payment tokens.

Some membership cards allow their holders to access goods and services.⁶⁰ For example, members might access unlimited film viewings at home, gym facilities, or benefits provided by golf clubs. When these membership cards are tokenised, they become utility tokens that enable the token holders – individuals or entities - to have access to the utilities provided by the issuer or other third party partners. Some systems allow membership cards to be sold, even on the open market, and some even allow participation in the decision-making process of the associated business, e.g. a golf club.⁶¹ Some membership cards only allow membership to pass to the next-of-kin, others give card-holders priority in the purchase of goods or services at favourable rates, and with further cumulative benefits (the more you use the more benefits you get).

Because of this variety, defining the legal taxonomy of utility tokens is problematic. They can be a transferable or non-transferable voucher (contract), a payment method, a negotiable instrument (a forward contract for commodities or services), or a unit of investment. They can be taxable assets, be used for facilitating criminal proceeds, or be used by financial services and other sectors to provide advice. They can also contain personal information. A regulatory model that is built on Memoranda of Understanding between the various regulatory bodies can assist regulation and avoid conflict. However, if utility tokens become

⁵⁶ 'Guidance on Cryptoassets', (FCA Consultation Paper 19/3, 2019).

⁵⁷ Ibid.

⁵⁸ Gareth Malna and Sarah Kenshall, Chapter 25, in Thomas Frick (ed), 'The Financial Technology Law Review' (2nd edn, The LawReviews, 2019).

⁵⁹ Michael Junemann and Johannes Wirtz, 'ICO: Legal Classification of Tokens: Part 4 – Utility Tokens' (2019) <<https://www.twobirds.com/en/news/articles/2019/global/ico-legal-classification-of-tokens-utility-token>> accessed on 07 July 2020.

⁶⁰ 'Guidance on Cryptoassets', (FCA Consultation Paper 19/3, 2019).

⁶¹ Ibid.

redeemable for multiple goods and services, and there are entities managing these tokens as well as facilitating the redeeming services, such as loyalty points, a regulatory task force is needed to consider consumer protection since there is no specific regulatory entity with responsibility for consumer protection in access to utilities.⁶²

Asset tokens

Asset tokens, also known as security tokens, represent underlying assets such as shares, bonds (debt), commodities, units of investment and rights to deal in those assets, such as options and futures.⁶³ They are issued by entities such as companies, but also by an individual or an association of individuals or entities.⁶⁴ If security tokens were treated as securities, it would bring them into the current legal and regulatory framework and securities law would apply to the whole security trading cycle: issuing, trading, clearing and settlement. The current securities law covers the operations of the securities market. It recognizes primary and secondary markets, and divides market players into infrastructure providers, issuers, intermediaries, institutional and retail investors, domestic and foreign participants.⁶⁵ Securities law broadly divides into the prudential aspect of regulation with a focus on systemic issues, and the conduct aspect with a focus on market integrity, investor protection, consumer protection, and market competitiveness.⁶⁶

In addition to securities law, company law governs the internal affairs of a corporate organisation.⁶⁷ The major issues arising are: capital maintenance for investor protection, particularly minority shareholders and outside creditors, governance of the organisation such as the decision-making process and the right to obtain redress, re-organisation and dissolution of the organisation, and dispute resolution.⁶⁸ Modern company law

⁶² Deloitte, 'Making Blockchain Real for Customer Loyalty Rewards Programmes', <<https://www.finextra.com/finextra-downloads/newsdocs/us-fsi-making-blockchain-real-for-loyalty-rewards-programs.pdf>> accessed 07 July 2020.

⁶³ Deloitte, 'Are Token Assets the Securities Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 08 July 2020.

⁶⁴ Ibid.

⁶⁵ Baker McKenzie, 'Global Financial Services Regulatory Guide', (2016) <https://www.bakermckenzie.com/-/media/files/insight/publications/2016/07/guide_global_fsrguide_2017.pdf?la=en> accessed 07 July 2020.

⁶⁶ Ibid.

⁶⁷ Deborah Demott, 'Perspectives on Choice of Law for Corporate Internal Affairs', 1985 (45) Law and Contemporary Problems 161, 198.

⁶⁸ Neal Watson and Beliz McKenzie, 'Shareholders' Right in Private and Public Companies in the UK (England and Wales)' (2019) <[https://uk.practicallaw.thomsonreuters.com/5-613-3685?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/5-613-3685?transitionType=Default&contextData=(sc.Default)&firstPage=true)> accessed 07 July 2020.

accommodates various types of companies, from closely-held companies to publicly-listed companies. Specific regimes have been created within the company law framework to service companies with different objectives and functions.⁶⁹ The aim is to ensure, on the one hand, that capital can continue to be aggregated efficiently through the collective effort of promoters, directors, shareholders, employees and creditors, and, on the other hand, that benefits can be shared equitably among them.⁷⁰ New methods, processes, and markets, have been developed to facilitate the aggregation of capital, including private placement,⁷¹ direct listing,⁷² initial public offering,⁷³ private equity,⁷⁴ and the newly emerged securities token offering (STO).⁷⁵ To ensure that benefits are shared equitably, various mechanisms have been introduced such as minority shareholder protection in closely-held companies to corporate governance of listed and quoted companies. Beside these mechanisms, the takeover market has been developed as a way to monitor corporate performance rather than as a way to share the benefits of the company, mainly through the sale of the control premium to the bidders.⁷⁶

Including security tokens under the company law framework poses a manageable legal risk for uncertainty but the problem is whether it would defeat the purpose of issuing asset tokens,⁷⁷ namely to ensure efficient capital aggregation and equitable sharing of benefits. In many STO projects, security tokens are offered on the open market to anyone who can access

⁶⁹ 'Principles of Corporate Governance' (Harvard Law School Forum on Corporate Governance, 2016) <<https://corpgov.law.harvard.edu/2016/09/08/principles-of-corporate-governance/>> accessed 07 July 2020.

⁷⁰ Paul Davies, 'The Board of Directors: Composition, Structure, Duties and Powers' (Company Law Reform in OECD Countries: A Comparative Outlook of Current Trends, 2000).

⁷¹ Andrew Baum, 'The Future of Real Estate Initiative', (Said Business School, University of Oxford 2020) <<https://www.sbs.ox.ac.uk/sites/default/files/2020-01/Tokenisation%20Report.pdf>> accessed 07 July 2020.

⁷² Ran Ben-Tzur and James Evans, 'The Rise of Direct Listings: Understanding the Trend, Separating Fact from Fiction' (2019) <<https://ncfacanada.org/the-rise-of-direct-listings-understanding-the-trend-separating-fact-from-fiction/>> accessed 07 July 2020.

⁷³ Ryan Zullo, 'Can Tokenisation Fix the Secondary IPO Market?' (2020) <<https://www.eisneramper.com/tokenization-secondary-ipo-catalyst-0420/>> accessed 07 July 2020.

⁷⁴ 'The Tokenisation of Financial Market Securities – What's Next?', (in Research Report by Greenwich Associates: "Security Tokens: Cryptonite for Stock Certificates" 2019) <<https://www.r3.com/wp-content/uploads/2019/10/R3.Tokenization.Financial.Market.Securities.Oct2019.pdf>> accessed 07 July 2020.

⁷⁵ Deloitte, 'Are Token Assets the Securities of Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 07 July 2020.

⁷⁶ David Kershaw, Principles of Takeover Regulation (1st edn, Oxford University Press 2018) 44.

⁷⁷ 'Initial Coin Offerings: Issues of Legal Uncertainty Report' (2019) <<https://www.comsuregroup.com/news/initial-coin-offerings-issues-of-legal-uncertainty-report-initial-coin-offerings-30-july-2019/>> accessed 09 July 2020; Ross Buckley et al., 'TechRisk' 2020 (1) Singapore Journal of Legal Studies 35.

the internet; issue and purchase do not need the traditional financial intermediaries.⁷⁸ However, under the current company law framework, only certain companies can issue securities to the general public,⁷⁹ needing, for example, a clean three-year trading record.⁸⁰ Furthermore, the corporate governance rules in company law and the Corporate Governance Code place significant burdens on issuers who are often not able to afford the expense of governance services such as legal, compliance and auditing costs.⁸¹ Although 'Code as law' seems to be able to mitigate some of these costs through automation,⁸² many areas would still require human intervention, especially where cognitive judgement is required to interpret rules that are based on policy objectives or where there are different acts to be balanced against one another.⁸³ The reason that STO is attractive to legitimate businesses is its ability to reach the entire internet community without infrastructure obstacles or national boundaries.⁸⁴ Bringing them under the current company law framework would compromise this benefit. As an example, the US's Howey test when, applied to DAO (an STO project), would prevent development in security token finance, and encourage underground STO markets.⁸⁵ While many countries have created a specific legal and regulatory regime for STO and have provided trading platforms for the investment community, none has been successful.

It is time to reconsider the current legal, regulatory and market infrastructures for security tokens. How do they function? Can they change as required by developments in the market? Who has authority to create the law and to control its development? In particular, since the current legal and regulatory framework is the result of regulatory capture, to what extent are participants in today's security tokens market able to influence the law?

⁷⁸ Jovan Ilic, 'Security Token Offerings: What are They, and where are They Going in 2019?' (2019) <<https://medium.com/mvp-workshop/security-token-offerings-sto-what-are-they-and-where-are-they-going-in-2019-cc075aea6313>> accessed 07 July 2020.

⁷⁹ S 755 of Companies Act 2006 provides that 'a private company limited by shares or limited by guarantee and having a share capital must not; (a) offer to the public any securities of the company, or (b) allot or agree to allot any securities of the company with a view to their being offered to the public.'

⁸⁰ LR 6.3.1R, FCA.

⁸¹ OECD, 'Risk Management and Corporate Governance' (2014) <<http://www.oecd.org/daf/ca/risk-management-corporate-governance.pdf>> accessed 07 July 2020.

⁸² Gabrielle Patrick and Anurag Bana, 'Rule of Law Versus Rule of Code: A Blockchain-Driven Legal World', (IBA Legal Policy & Research Unit Legal Paper, 2017).

⁸³ 'Smart Contracts: Is the Law Ready?' (Smart Contract Whitepaper, Smart Contract Alliance, 2018) <<https://lowellmilkeninstitute.law.ucla.edu/wp-content/uploads/2018/08/Smart-Contracts-Whitepaper.pdf>> accessed 07 July 2020.

⁸⁴ Deloitte, 'Are Token Assets the Securities of Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 07 July 2020.

⁸⁵ Lennart Ante and Ingo Fiedler, 'Cheap Signals in Security Token Offerings' (Blockchain Research Lab Working Paper Series No. 1, 2019) <<https://www.blockchainresearchlab.org/wp-content/uploads/2019/07/Cheap-Signals-in-Security-Token-Offerings-BRL-Series-No.-1-update3.pdf>> accessed 07 July 2020.

Title tokens

There are legal and evidential documents that represent or certify an underlying asset or class of assets.⁸⁶ When they are tokenised, they become title tokens. What differentiates them from security tokens is that the title is not recognised as a security such as a land title,⁸⁷ documentary title (e.g. a bill of lading),⁸⁸ or the title to an art work. There are also intra-organisational titles that represent workload (hours of work), entitlements (right to receive skill training courses), or the right to inherent contractual relationships (leader in a direct selling group). Some of these titles can easily be brought into the current legal framework without the need to introduce a new regime; an example of this is the land title in real property law. Tokenising land titles and moving conveyance on to a DLT platform can improve the transparency of land ownership and its history,⁸⁹ and can reduce intermediary fees such as estate agency and legal fees. It can also improve the efficiency of tax collection by the revenue authorities in levying stamp duty.

Documentary titles such as bills of lading can be accommodated in the sale of goods and carriage of goods laws.⁹⁰ This can improve transparency, reduce fraud, and remove the legal uncertainty of goods in transit. It can also increase the ability of traders to obtain finance from banks through letters of credit.⁹¹ The legal certainty provided by tokenised documentary titles in goods can increase the willingness of banks to remit finance more quickly, and the fees charged by banks can be lower since the risk of legal uncertainty is reduced. Tokenising legal or documentary titles would not pose technical problems in either a centralised or a partly decentralised system, but there would be issues of data protection, privacy protection (including financial privacy), and commercial secrecy protection.⁹² The biggest legal challenge is how to transfer the legal interest in the underlying assets of title tokens. The transfer of security tokens, which are recognised as assets, involves registration of interest in distributed ledgers through crediting and debiting, while effecting registration relies on using public and

⁸⁶ 'Electronic Execution of Documents', (Policy Paper of the Law Commission No. 386, 2019) <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2019/09/Electronic-Execution-Report.pdf>> accessed 07 July 2020.

⁸⁷ Michael Junemann and Johannes Wirtz, 'ICO: Legal Classification of Tokens: Part 2 – Security Token' (2019) <<https://www.twobirds.com/en/news/articles/2019/global/ico-legal-classification-of-tokens-2>> accessed 09 July 2020.

⁸⁸ Marek Dubovec, 'The Problems and Possibilities for Using Electronic Bill of Lading as Collateral' 2006 (23) *Arizona Journal of International and Comparative Law*.

⁸⁹ Nan Liu et al., 'A Critical Review of Distributed Ledger Technology and Its Applications in Real Estate' (2020) <<https://www.rics.org/globalassets/rics-website/media/knowledge/research/research-reports/rics0077-001-distributed-ledger-technology-review-report--final.pdf>> accessed 08 July 2020.

⁹⁰ Caslav Pejovic, 'Documents of Title in Carriage of Goods by Sea' 2001 (461) *Journal of Business Law*.

⁹¹ Friederike Niepmann and Tim Schmidt-Eisenlohr, 'International Trade, Risk, and the Role of Banks', (Federal Reserve Bank of New York Staff Reports No. 633, 2014).

⁹² ICO, 'Anonymisation: Managing Data Protection Risk – Code of Practice', <<https://ico.org.uk/media/1061/anonymisation-code.pdf>> accessed on 08 July 2020.

private keys. However, for documentary title transactions, the possession of the titles may or may not be evidence of ownership in the underlying property. For instance, in an international contract for the sale of goods, property passes to the seller from the buyer irrespective of the possession of the bill of lading (the documentary title) if it is a free-on-board contract.⁹³ In a cost-insurance-freight contract,⁹⁴ the transfer of title tokens to a bank (providing the letter of credit) would be necessary for the bank to remit finance, but the bank does not own the goods despite holding the title tokens. The critical question is how transfer of interest in goods can be effected within trade finance market practice, while decoupling it from possession of the title. Market structure and practice may need to be rebuilt if trades based on title tokens are to be made on a DLT network.

For title tokens to represent goods in bulk is legally problematic. Goods in bulk are likely to be split up as they are sold, thus passing from single to multiple ownership with the implication that the tokens need to be similarly subdivided or reissued in order that the new owners can demonstrate their ownership of a component of the original bulk.⁹⁵ Without such evidence of a property interest, the buyers may not be able to sell on their new acquisition or to make a claim in insolvency proceedings.

Even for specific goods,⁹⁶ tokenised titles can represent a challenge to the market. In the art market where goods are individual and often unique, there is no single legal registration system to evidence ownership. Tokenised titles representing art works would mean that possession of the art work itself, such as a painting, is not *prime face* evidence of owning the property. A good-faith purchaser may not acquire the legal title in the painting without showing possession of the tokenised title, and, unlike land registration, the purchaser may not know where to find the token holder if there is no centralised system.⁹⁷ Furthermore, market practices in the sale of art work would also need to change, because the shaking of hands in the gallery or the fall of the hammer at an auction would not enable the proprietary interest in the art work to pass to the buyer because only the transfer of the tokenised title would amount to *prima facie* evidence of such a transfer.

Within an organisation or an association, there may be rules designed to allocate workload and control, and this allocation can be assignable and transferable within the organisation or association. Assigned work and its ownership can be further assigned to others, as in industry's practice of outsourcing. In work that is shared between organisations, a tokenised title representing hours of work (a utility) can demonstrate how the total working hours in a

⁹³ Martin Davis, 'Delivery and the Passing of Risk', (Oxford Scholarship Online, 2014).

⁹⁴ Ibid.

⁹⁵ 'Sale of Goods Forming Part of a Bulk' (The Law Commission and The Scottish Law Commission No. 215/145, 1965).

⁹⁶ Vlad Burilov, 'Regulation of Crypto Tokens and Initial Coin Offerings in the EU', 2019 (6) European Journal of Comparative Law and Governance 146, 186.

⁹⁷ Josias Dewey et al., 'Blockchain & Cryptocurrency Regulation', (1edn, Global Legal Insights, 2019)

<https://www.acc.com/sites/default/files/resources/vl/membersonly/Article/1489775_1.pdf> accessed 08 July 2020.

project will be distributed and the hours can be traded among the organisations.⁹⁸ The control relationship, if control is to be recognised as a valuable thing or asset, can also be tokenised and assigned. For instance, shareholder agreement on how control is to be exercised or membership agreement on who will be the next controller within the group, can be tokenised to show how the control title will be passed. This will doubtless raise further legal questions on the transferability, assignability and the ability to delegate these controls (rights and/or duties) as well as public policy issues that give rise to issues of morality, utility, and freedom.⁹⁹

It is unlikely a single regulator will be given complete oversight of tokenised titles as they are components of totally different markets ranging from the sale of crude oil to modern art work, and from shareholders' to workers' agreements on control.

Commodity tokens

Commodity tokens represent underlying commodities, such as raw materials, agricultural products, or clean energy.¹⁰⁰ In some commodity trades the underlying commodities are securitised with the securities mostly being options and futures - contractual instruments that represent a right to purchase or sell the underlying commodities at a pre-determined price and at a specific time in the future. They do not involve directly securitising a particular asset or an identifiable quantity of asset.¹⁰¹ Trade in other types of commodity involve setting up funds such as Exchange-Traded-Funds,¹⁰² Hedge Funds, or Private Equity Funds.¹⁰³ When tokenised, the units of investment in these funds can be classified as asset tokens which may be traded in the same way as other security tokens.¹⁰⁴ This means that commodity tokens are not tokenised titles in the underlying asset or commodity and do not represent the title in the goods for both the market and in law. Currently, commodity markets are organised as multilateral trading platforms with their own specific market rules.¹⁰⁵ They are only accessible

⁹⁸ Dachs Bernhard, 'The Impact of New Technologies on the Labour Market and the Social Economy', (MPRA Paper 90519, University of Munich 2017).

⁹⁹ Josias Dewey et al., 'Blockchain & Cryptocurrency Regulation', (1edn, Global Legal Insights, 2019).

¹⁰⁰ 'Tokenising Commodities: It's Possible, But Should we?', (2020) <<https://academy.aax.com/en/tokenizing-commodities-its-possible-but-should-we/>> accessed 08 July 2020.

¹⁰¹ OECD, 'The Tokenisation of Assets and Potential Implications for Financial Markets', (2020) <<http://www.oecd.org/finance/The-Tokenisation-of-Assets-and-Potential-Implications-for-Financial-Markets.pdf>> accessed 08 July 2020.

¹⁰² Adam Marszk and Ewa Lechman, 'Exchange-Traded Funds in Europe', (1st edn, Academic Press 2019).

¹⁰³ Anne Jansen et al., 'Hedge Funds and Financial Market Dynamics' (Occasional Papers of the IMF, 1998).

¹⁰⁴ Deloitte, 'Are Token Assets the Securities Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 08 July 2020.

¹⁰⁵ 'Review of the Markets in Financial Instruments Directive', (European Commission, 2011) <https://ec.europa.eu/commission/presscorner/detail/en/MEMO_11_716> accessed 08 July 2020.

to institutional investors through trading market members; retail investors do not participate directly. Commodity trades are used not only to purchase the underlying commodity goods but also to hedge against the risk of market volatility.¹⁰⁶ In addition, traders, clearing houses, and settlement entities may be involved in trading in order to mitigate default risk, enhance legal certainty, and provide liquidity. For instance, default in a settlement would be covered by clearing houses.¹⁰⁷ The types of market described above for trading title tokens are mostly bilateral rather than multilateral and even an auction house, which could be seen as an organised market, is not a multilateral trading platform in the way that commodity markets operate. Failure to deliver goods could result in the award of damages or other remedies by a court or by some other dispute settlement mechanisms.

In law, commodity tokens do not represent the specific titles of goods nor a specifically defined bulk of goods, unlike title tokens. Commodity tokens do not confer ownership of goods or goods in bulk to their holders. This affects contractual claims where there has been default in the delivery of the underlying goods, and also claims in priority in insolvency proceedings,¹⁰⁸ as well as other market rules attached to the tokens. The current commodity trades regulators are likely to continue to oversee tokenised commodity trades, but whether the commodity markets regulator should also have jurisdiction over inter-exchangeable tokenised commodities such as computing power or electricity should be examined further.

Hybrid tokens and convertible tokens

Using current legal taxonomy to define the nature of a token may mean that some elements in the token are not covered by conventional legal definitions, and they may also limit its true functionality. The issuers of a token can design it in a way that includes a number of functions and create, for example, a hybrid token that acts both as a payment token and as a utility token.¹⁰⁹ One of the functions of the token might be convertibility – its conversion to another type of token. For instance, a share token issued by a company might be converted into a bond token, or a payment token into a utility token that can then be converted back to a payment token, or a title token could be converted to a payment token, such as Token Equity Convertible (TEC). For example, *SynchroLife Limited*, a subsidiary of Japanese restaurant *SNS Ginkan*, fundraised by offering convertible equities which allow investors to exchange the

¹⁰⁶ Deloitte, 'Commodity Price Risk Management: A Manual of Helping Commodity Price Risk for Corporates' (2018) <<https://www2.deloitte.com/content/dam/Deloitte/in/Documents/risk/in-risk-overview-of-commodity-noexp.PDF>> accessed 08 July 2020.

¹⁰⁷ Ibid.

¹⁰⁸ INSOL International, 'Cryptocurrency and Its Impact on Insolvency and Restructuring', (INSOL Special Report, 2019).

¹⁰⁹ Thijs Maas, 'Why Hybrid Tokens are Superior to Utility Tokens: Comparing Utility Tokens, Security Tokens and Hybrid Tokens' (2019) <<https://medium.com/hackernoon/hybrid-tokens-are-superior-to-utility-tokens-heres-why-3bec287c465>> accessed 09 July 2020.

equities for their tokens named SynchroGoin in the future.¹¹⁰ This means that there is a difference between a hybrid token and a convertible token. The former entitles its holders to a specific range of benefits and rights, and also confers liabilities. The latter turns one type of token into another without renegotiating the terms attached to it, without going through an exchange, and without receiving it as a result of a dispute resolution mechanism. Convertibility is embedded in the original design,¹¹¹ so when it could be converted, as well as how and what it might be converted into, would need to be pre-agreed by the parties and pre-determined in the design. This is not the same as the concept of automation in a smart contract which enables issuers to buy back tokenised shares when a certain condition has been triggered,¹¹² resulting in the tokenised shares being returned to the issuing companies, and payment (or payment tokens) remitted to the original share token holders. Convertibility is something quite different.

There are several benefits associated with convertible tokens. For instance, an insurance token¹¹³ might be converted into a utility voucher, such as a medical voucher or a hotel voucher, when a flight is delayed. A title token representing a worker's hours of work in an organisation might be converted into a utility voucher for clean energy electricity, or a tokenised green bond. Such convertibility can bypass the need to convert tokens into fiat money through a currency exchange, hence saving costs, and also avoid the need to convert them into payment tokens. Yet, if different token operators were to be linked, the degree of convertibility could be enhanced, thereby bypassing the need to trade them in an open market for the purpose of converting them and eliminating the cost of using intermediaries. The legal imperative is to ensure that all the parties understand convertibility as set out in the contract, and that the event triggering convertibility can be accurately defined in law.¹¹⁴

No regulator has yet devised a plan to supervise hybrid tokens or considered the possibility of accepting convertible tokens on the markets. The more likely scenario is that regulators will assert jurisdiction when they perceive that a token contains an element that falls under its regulatory parameter. This situation is likely to create regulatory conflict and

¹¹⁰ S. Nishimura, 'A New Way to Fundraise? – Token Equity Convertible' (2018) <<https://medium.com/@vcinsights/a-new-way-to-fundraise-token-equity-convertible-tec-7d3c987e520e>> accessed 09 July 2020.

¹¹¹ PwC, 'Cryptographic Assets and Related Transactions: Accounting Considerations under IFRS' (2019) <<https://www.pwc.com/gx/en/audit-services/ifrs/publications/ifrs-16/cryptographic-assets-related-transactions-accounting-considerations-ifrs-pwc-in-depth.pdf>> accessed 09 July 2020.

¹¹² Joseph Lee, 'Smart Contracts for Securities Transaction on the DLT Platform (Blockchain): Legal Obstacles and Regulatory Challenges', (2020) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3523317> accessed 09 July 2020.

¹¹³ Peter Temperley, 'Using Crypto Tokens in Insurance' (2018) <<https://medium.com/@peter.temperley/using-crypto-tokens-in-insurance-7125ccb090eb>> accessed 09 July 2020.

¹¹⁴ Robby Houben et al., 'Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion', (Research Paper, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, 2018).

competition and it may be that in certain areas, regulators lack the capacity to understand the markets or the ability to resolve disputes.

Innovation

Law and regulation are critical elements in the development of a market. A mature market is a legal construct but also has a heavily embedded regulatory system. The law defines the products and services that the market is constructed on, for instance the stock market, the insurance market, the commodity market, or the energy trading market. Often the markets are supported by technical systems and processes, they have physical buildings and legally defined participants such as issuers, traders, institutional investors, and consumers. Regulations can bridge legal gaps, enhance enforcement, or even foreclose the market in the case of protectionist regulations. In a developing market which is not yet saturated, there are many competing interests and potential markets. Law can help categorise the market, define the scope of private behaviours, and provide the basis for evolution either through doctrinal development that gives legal status to market elements, or through legal transplant to replicate an existing market structure.¹¹⁵ In a where mature market with their own legal and regulatory infrastructures already exist, developing markets need to select appropriate legal and regulatory systems that both suit their intended function and confer competitive advantage.¹¹⁶ For example, stock markets compete with bond markets and tech companies compete with other retail companies. Newcomers need to differentiate themselves from existing markets in order to compete with them, and their participants must engage in regulatory capture¹¹⁷ in order to break away, grow and eventually compete successfully. To win the hearts and minds of current participants in the market, they must demonstrate the benefits of engagement in their new market and win on efficiency (more economical) and efficacy (better results). They will need to create a space for regulatory arbitrage¹¹⁸ where activities prohibited in existing markets can be launched in a new space. New and old markets will engage in regulatory competition at sectoral, regional or international levels, and such competition can result in a race to either the top or the bottom.¹¹⁹

¹¹⁵ Alan Watson, 'Legal Transplants and European Private Law' 2000 (44) IUS Commune Lectures on European Private Law; Rainer Kulms, 'Blockchain: Private Law Matters' 2020 Singapore Journal of Legal Studies 63, 89.

¹¹⁶ 'Regulation and Competition: A Review of the Evidence', (Competition & Market Authority, 2020)

<[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857024/Regulation and Competition report - web version.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857024/Regulation_and_Competition_report_-_web_version.pdf)> accessed on 09 July 2020.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ OECD, 'Striking the Right Balance between Competition and Regulation: The Key is Learning from Our Mistakes' (APEC-OECD Co-operative Initiative on Regulatory Reform: Third Workshop Jeju Island, Korea 16-17, 2002) <<https://www.oecd.org/regreform/2503205.pdf>> accessed 09 July 2020.

What we have witnessed in the development of crypto-asset markets is a breaking away from the traditional thinking that a market is a legal construct in which the aim of regulation is to promote the market.¹²⁰ Participants of the crypto-market do not want to be constrained by traditional norms of the main legal systems (either common law or civil law) and do not wish the state to continue acting as a regulator.¹²¹ The borderless nature of the internet and the appeal of anonymity allow a new 'legal and regulatory escape'.¹²² The hope is that a space which is not held back by existing legal doctrines and regulatory ethos can increase access to goods and services. This explains why it is difficult to capture the nature of a crypto-currency such as Bitcoin while there is an apparent parallel between an initial public offering and an initial coin offering.¹²³ When traditional legal doctrines prove unable to capture the essence of a new type of token it is termed a hybrid token and the existence of hybrid tokens challenges conventional legal thinking on the definition of goods, securities, ownership titles, and other intangibles such as intellectual property.

The nature of the DLT as a consensus network challenges conventional legal doctrines on contract law and the public law concept of social contract.¹²⁴ The way the current global regulatory system has developed is the result of activity over many years by the more advanced economies, and it operates to their agenda and in their self-interest. This has led to mistrust by those who feel that 'the establishment' is holding back development and preventing innovation. The regulatory ethos of the crypto-market as a decentralised, consensual, and constantly evolving system is seen as a more desirable space for new ways of exchange, communication, and living (a virtual life). It is not hard to understand why critics, including myself,¹²⁵ immediately cast doubt on the legitimacy, legality, morality, and governance of this new form of republic with its promises of total democracy, transparency, and freedom. In political terms, the new republic is a response to the frustration of current global governance in the hands of major international powers.¹²⁶ One of the results of such global governance is the concentration of resources in the hands of a few powerful nations

¹²⁰ 'Guidance on Cryptoassets: Feedback and Final Guidance to CP 19/3', (Policy Statement 19/22, 2019) <<https://www.fca.org.uk/publication/policy/ps19-22.pdf>> accessed 09 July 2020.

¹²¹ Rain Xie, 'Why China Had to Ban Cryptocurrency but the U.S. Did Not: A Comparative Analysis of Regulations on Crypto-Markets between the U.S. and China' Washington University Global Studies Law Review 2019 (2) 457, 492; Emmanuelle Ganne, 'Can Blockchain Revolutionise International Trade?', (World Trade Organisation 2018), <https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf> accessed 05 July 2020.

¹²² Sophia Qasir, 'Anonymity in Cyberspace: Judicial and Legislative Regulations', 2013 (81) Fordham Law Review 3651, 3691.

¹²³ Barbara Jones et al., 'The Evolution of Token Offerings and Regulation: From ICO to STO' (Westlaw 2019).

¹²⁴ 'Distributed Ledger Technology Regulatory Framework', (Telecommunication Standardisation Sector of ITU, Technical Report 2019).

¹²⁵ Joseph Lee and Lheureux Florian, 'A Regulatory Framework for Cryptocurrency' 2020 European Business Law Review.

¹²⁶ Kelly Buckley, 'Crypto Revolution: Bitcoin, Cryptocurrency and the Future of Money' (Southbank Investment Research, 2019).

and entities.¹²⁷ This also includes a concentration of capital through globalised financial systems that are furthered by major central banks, by financial exchanges, by circles of institutional investors, and the regulatory powers they have taken upon themselves.¹²⁸ Placing this Crypto-Republic under the current system of global governance would reduce citizens' ability to innovate, grow, and eventually compete.

The emerging tool of code as law¹²⁹ is not an attempt to break away from conventional law and regulation, instead it incorporates laws into smart technologies and uses those technologies to police the market in a system of surveillance capitalism. Experimenting with new regulatory systems as an innovative tool is aimed neither at displacing the current regulatory framework nor at substituting for current legal doctrines. This code as law innovation is more likely to affect organisational structures by moving from human intervention to machine learning and execution.¹³⁰ A new form of social contract is required. That social contract should be the basis for the creation of a new Crypto-Republic where assets are created, owned, and shared differently from the way they are in 'our world'.

Conclusion

This article has discussed how current legal taxonomy (classification) can help define crypto-assets by looking at the function, participants, and operation of market structures. The way in which tokens are named can be very different from the way that the law defines them now or in the future, and the way they are regulated can help to clarify their legal status. However, a token's definition that is recognised by one regulator is not necessarily shared by other regulatory agencies or by the courts. The legal fluidity of crypto-assets creates legal confusion. As a result, creating a coherent legal and regulatory framework, either through the application of legal analogy or by extending the current regulatory framework, becomes a challenging task.

The current classification of crypto-assets into payment, utility, security, title, commodity and hybrid tokens is based on their function, the perceptions of market participants, and regulatory attitudes towards them. Legal doctrines such as contract and property can help define, or provide a basis for clarification of, rights and obligations as well as the methods of and implications for their transfer and assignment. Statutory definitions of money, insurance, security, and units of investment can also provide such a basis. Some crypto-assets are hard to define, so new approaches need to be created to support their development.

¹²⁷ Emmanuelle Ganne, 'Can Blockchain Revolutionise International Trade?', (World Trade Organisation 2018), <https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf> accessed 05 July 2020.

¹²⁸ Ibid.

¹²⁹ Primavera De Filippi and Samer Hassan, 'Blockchain Technology as a Regulatory Technology: From Code is Law to Law is Code' (2016) <<https://firstmonday.org/ojs/index.php/fm/article/view/7113/5657>> accessed 09 July 2020.

¹³⁰ Darrell West and John Allen, 'How Artificial Intelligence is Transforming the World' (2018) <<https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>> accessed 09 July 2020.

Using current legal and regulatory frameworks for crypto-finance will not transform the economy or the market because they have evolved as mechanisms to support the *status quo* in the current financial markets. Extending existing systems to include crypto-assets would merely perpetuate the dominance of existing interests by another form of regulatory capture. A new crypto-asset market structure cannot be created without introducing new laws and rules and this requires the establishment of a social contract for governance based on new legal doctrines that transcend 'contract' and 'property'. A new regulatory form and ethos should be devised because code as law, regtech, or legaltech indoctrinated by the current legal and regulatory frameworks are unlikely to generate a true transformation of the market.

Bibliography

- Adam Marszk and Ewa Lechman, 'Exchange-Traded Funds in Europe', (1st edn, Academic Press 2019).
- Alan Watson, 'Legal Transplants and European Private Law' 2000 (44) IUS Commune Lectures on European Private Law; Rainer Kulms, 'Blockchain: Private Law Matters' 2020 Singapore Journal of Legal Studies 63, 89.
- Albert Opher et al., 'The Rise of the Data Economy: Driving Value through Internet of Things Data Monetisation'
- Andrew Baum, 'The Future of Real Estate Initiative', (Said Business School, University of Oxford 2020) <<https://www.sbs.ox.ac.uk/sites/default/files/2020-01/Tokenisation%20Report.pdf>> accessed 07 July 2020.
- Anne Jansen et al., 'Hedge Funds and Financial Market Dynamics' (Occasional Papers of the IMF, 1998).
- Apolline Balandin et al., 'Global Cryptoasset Regulatory Landscape Study', (Research Paper, Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf> accessed 09 July 2020.
- Apolline Balandin et al., 'Global Cryptoasset Regulatory Landscape Study', (Research Paper, Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf> accessed 06 July 2020.
- Apolline Balandin et al., 'Global Cryptoasset Regulatory Landscape Study', (University of Cambridge Faculty of Law Research Paper No. 23/2019); Brianne Smith, 'The Life-Cycle and Character of Crypto-Assets: A Framework for Regulation and Investor Protection', 2019 (19) Journal of Accounting and Finance 156, 168.
- Baker McKenzie, 'Global Financial Services Regulatory Guide', (2016) <https://www.bakermckenzie.com/-/media/files/insight/publications/2016/07/guide_global_fsrguide_2017.pdf?la=en> accessed 07 July 2020.
- Barbara Jones et al., 'The Evolution of Token Offerings and Regulation: From ICO to STO' (Westlaw 2019).
- Carla Reyes, '(Un)Corporate Crypto-Governance' 2020 (88) Fordham Law Review 1875,1922.
- Carol Goforth, 'The Lawyer's Cryptionary: A Resource for Talking to Clients about Crypto-transactions', 2019 (1) Campbell Law Review 47, 122; Rainer Kulms, 'Blockchain: Private Law Matters' 2020 Singapore Journal of Legal Studies 63, 89.
- Caslav Pejovic, 'Documents of Title in Carriage of Goods by Sea' 2001 (461) Journal of Business Law.
- Chapter 15, 'Guidance on the Scope of the Payment Services Regulations' of PERG Handbook (2017) <<https://www.handbook.fca.org.uk/handbook/PERG/15.pdf>> accessed 07 July 2020.
- Chia Ling Koh, 'The Rise of e-Money and Virtual Currencies: Re-discovering the Meaning of Money from a Legal Perspective' (Osborne Clarke, 2018) <<https://www.osborneclarke.com/wp-content/uploads/2018/07/The-rise-of-e-Money-and-virtual-currencies.pdf>> accessed 07 July 2020.

- 'Conceptual Framework for the Potential Regulation of Virtual Asset Trading Platform Operates' (Securities and Futures Commission of Hong Kong, 2018) <https://www.sfc.hk/web/EN/files/ER/PDF/App%20_%20Conceptual%20framewor k%20for%20VA%20tra> accessed on 09 July 2020.
- Cryptocurrencies (2020) <<https://dig.watch/issues/cryptocurrencies>> accessed 07 July 2020.
- 'Cryptoasset Promotions: Consultation', (HM Treasury, July 2020) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/902891/Cryptoasset_promotions_consultation.pdf> accessed 22 July 2020
- 'Cryptoassets Taskforce: Final Report' (UK HM Treasury et al., 2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf> accessed 09 July 2020.
- 'Cryptoassets: Tax for Individuals' (Policy Paper of HM Revenue & Customs, 2019) <<https://www.gov.uk/government/publications/tax-on-cryptoassets/cryptoassets-for-individuals>> accessed 09 July 2020.
- Dachs Bernhard, 'The Impact of New Technologies on the Labour Market and the Social Economy', (MPRA Paper 90519, University of Munich 2017).
- Darrell West and John Allen, 'How Artificial Intelligence is Transforming the World' (2018) <<https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>> accessed 09 July 2020.
- David Adler, 'Silk Road: The Dark Side of Cryptocurrency' 2018 Fordham Journal of Corporate and Financial Law, <<https://news.law.fordham.edu/jcfl/2018/02/21/silk-road-the-dark-side-of-cryptocurrency/>> accessed on 07 July 2020.
- David Kershaw, Principles of Takeover Regulation (1st edn, Oxford University Press 2018) 44.
- David Lee et al., 'Handbook of Blockchain, Digital Finance, and Inclusion', (Volume 1: Cryptocurrency, Fintech, Insur Tech, and Regulation & Volume 2: ChinaTech, Mobile Security, and Distributed Ledger), (1st edn, Elsevier, 2018).
- Dax Hansen and Sarah Howland, 'Digital Currencies: International Actions and Regulations' (2020) <<https://www.perkinscoie.com/en/news-insights/digital-currencies-international-actions-and-regulations.html>> accessed 06 July 2020.
- Deborah Demott, 'Perspectives on Choice of Law for Corporate Internal Affairs', 1985 (45) Law and Contemporary Problems 161, 198.
- Deloitte, 'Are Token Assets the Securities of Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 07 July 2020.
- Deloitte, 'Are Token Assets the Securities Tomorrow?' (2019) <<https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/technology/lu-token-assets-securities-tomorrow.pdf>> accessed 08 July 2020.
- Deloitte, 'Commodity Price Risk Management: A Manual of Helping Commodity Price Risk for Corporates' (2018) <<https://www2.deloitte.com/content/dam/Deloitte/in/Documents/risk/in-risk-overview-of-commodity-noexp.PDF>> accessed 08 July 2020.
- Deloitte, 'Making Blockchain Real for Customer Loyalty Rewards Programmes', <<https://www.finextra.com/finextra-downloads/newsdocs/us-fsi-making-blockchain-real-for-loyalty-rewards-programs.pdf>> accessed 07 July 2020.
- 'Distributed Ledger Technology Regulatory Framework', (Telecommunication Standardisation Sector of ITU, Technical Report 2019).

- Dominic Worner et al., 'The Bitcoin Ecosystem: Disruption Beyond Financial Services?', (European Conference on Information Systems, 2016); FCA, 'Guidance on Cryptoassets', (Consultation Paper 19/3, January 2019).
- Edmund Mokhtarian, Alexander Lindgren 'Rise of the Crypto Hedge Fund: Operational Issues and Best Practices for an Emergent Investment Industry' 2018 (23) Stanford Journal of Law, Business & Finance 112, 158.
- 'Electronic Execution of Documents', (Policy Paper of the Law Commission No. 386, 2019) <<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2019/09/Electronic-Execution-Report.pdf>> accessed 09 July 2020.
- Emily Sherwin, 'Legal Taxonomy', 2009 (15) Legal Theory 25, 54.
- Emmanuelle Ganne, 'Can Blockchain Revolutionise International Trade?', (World Trade Organisation 2018), <https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf> accessed 05 July 2020.
- Emmanuelle Ganne, 'Can Blockchain Revolutionise International Trade?', (World Trade Organisation 2018), <https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf> accessed 05 July 2020.
- 'Evaluating Financial Sector Supervision: Banking, Insurance and Securities Markets', in 'Financial Sector Assessment: A Handbook', (International Monetary Fund, 2005).
- EY, 'The Valuation of Crypto-Assets: Minds Made for Shaping Financial Services' (2018) <https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/emeia-financial-services/ey-the-valuation-of-crypto-assets.pdf> accessed 07 July 2020.
- FCA, 'Innovation in UK Consumer Electronic Payments: A Collaborative Study by Ofcom and the Payment Systems Regulator' (2014) <<https://www.fca.org.uk/publication/research/ofcom-psr-joint-study.pdf>> accessed 07 July 2020.
- Frederick Martin, *The History of Lloyd's and of Marine Insurance in Great Britain* (London: MacMillan, 2004).
- Friederike Niepmann and Tim Schmidt-Eisenlohr, 'International Trade, Risk, and the Role of Banks', (Federal Reserve Bank of New York Staff Reports No. 633, 2014).
- Gabrielle Patrick and Anurag Bana, 'Rule of Law Versus Rule of Code: A Blockchain-Driven Legal World', (IBA Legal Policy & Research Unit Legal Paper, 2017).
- Gareth Malna and Sarah Kenshall, Chapter 25, in Thomas Frick (ed), 'The Financial Technology Law Review' (2nd edn, The LawReviews, 2019).
- Garrick Hileman and Michel Rauchs, 'Global Cryptocurrency Benchmarking Study', (Cambridge Centre for Alternative Finance, 2019), <https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-04-20-global-cryptocurrency-benchmarking-study.pdf> accessed 06 July 2020.
- 'Global Digital Finance: Code of Conduct – Taxonomy for Cryptographic Assets', <https://www.gdf.io/wp-content/uploads/2018/10/0010_GDF_Taxonomy-for-Cryptographic-Assets_Proof-V2-260719.pdf> accessed 09 July 2020.
- 'Guidance of Cryptoassets', (FCA Consultation Paper 19/3, 2019).

- 'Guidance on Cryptoassets: Feedback and Final Guidance to CP 19/3', (Policy Statement 19/22, 2019) <<https://www.fca.org.uk/publication/policy/ps19-22.pdf>> accessed 09 July 2020.
- 'Hong Kong: A New Regulatory Approach for Cryptocurrencies, <<https://www.dataguidance.com/opinion/hong-kong-new-regulatory-approach-cryptocurrencies>> accessed 09 July 2020.
- ICO, 'Anonymisation: Managing Data Protection Risk – Code of Practice', <<https://ico.org.uk/media/1061/anonymisation-code.pdf>> accessed on 08 July 2020.
- INSOL International, 'Cryptocurrency and Its Impact on Insolvency and Restructuring', (INSOL Special Report, 2019).
- 'Initial Coin Offerings: Issues of Legal Uncertainty Report' (2019) <<https://www.comsuregroup.com/news/initial-coin-offerings-issues-of-legal-uncertainty-report-initial-coin-offerings-30-july-2019/>> accessed 09 July 2020.
- 'Investigating the Impact of Global Stablecoins', (G7 Working Group on Stablecoins, October 2019), <<https://www.bis.org/cpmi/publ/d187.pdf>> accessed 06 July 2020.
- Iris H-Y Chiu, 'Pathways to European Policy and Regulation in the Crypto-Economy' (2019) 10(4) European Journal of Risk Regulation 738, 765.
- Janis Sarra, Louise Gullifer, 'Crypto-Claimants and Bitcoin Bankruptcy: Challenges for Recognition and Realization' 2019 (2) International Insolvency Review, 233, 272.
- Jens Lausen, 'Regulating Initial Coin Offerings? A Taxonomy of Crypto-Assets', (Research Paper, Association for Information Systems, Stockholm & Uppsala, Sweden, 2019), <http://aisel.aisnet.org/ecis2019_rp/26> accessed 09 July 2020.
- Johannes Ehrentraud et al., 'Policy Responses to Fintech: A Cross-Country Overview', (Financial Stability Institute on Policy Implementation No. 23, 2020);
- Joseph Lee and Florian Lheureux, 'A Regulatory Framework for Cryptocurrency', 2020 European Law Review.
- Joseph Lee, 'Smart Contracts for Securities Transaction on the DLT Platform (Blockchain): Legal Obstacles and Regulatory Challenges', (2020) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3523317> accessed 09 July 2020.
- Josias Dewey et al., 'Blockchain & Cryptocurrency Regulation', (1edn, Global Legal Insights, 2019) <https://www.acc.com/sites/default/files/resources/vl/membersonly/Article/1489775_1.pdf> accessed 08 July 2020.
- Jovan Ilic, 'Security Token Offerings: What are They, and where are They Going in 2019?' (2019) <<https://medium.com/mvp-workshop/security-token-offerings-sto-what-are-they-and-where-are-they-going-in-2019-cc075aea6313>> accessed 07 July 2020.
- Justin Desautels-Stein, 'The Market as a Legal Concept' 2012 (60) Buffalo Law Review 387, 492.
- Kelly Buckley, 'Crypto Revolution: Bitcoin, Cryptocurrency and the Future of Money' (Southbank Investment Research, 2019).
- Laurie Korpi and Yasmine Dong, 'Unrivalled Insight into Global Digital Payments Regulation' (2015) <<https://gamblingcompliance.com/sites/gamblingcompliance.com/files/attachments/page/PaymentsCompliance%20-%20Payments%20Lawyer%20June%202015.pdf>> accessed 06 July 2020.

- Lennart Ante and Ingo Fiedler, 'Cheap Signals in Security Token Offerings' (Blockchain Research Lab Working Paper Series No. 1, 2019) <<https://www.blockchainresearchlab.org/wp-content/uploads/2019/07/Cheap-Signals-in-Security-Token-Offerings-BRL-Series-No.-1-update3.pdf>> accessed 07 July 2020.
- Lin Lin and Dora Neo, 'Alternative Investments in the Tech Era' 2020 (1) Singapore Journal of Legal Studies 1,3.
- Marco Iansiti and Karim Lakhani, 'The Truth about Blockchain', 2017 (2) Harvard Business Review, < <https://hbr.org/2017/01/the-truth-about-blockchain>> accessed 06 July 2020.
- Marek Dubovec, 'The Problems and Possibilities for Using Electronic Bill of Lading as Collateral' 2006 (23) Arizona Journal of International and Comparative Law.
- Martin Davis, 'Delivery and the Passing of Risk', (Oxford Scholarship Online, 2014).
- Michael Gilbert, 'Does Law Matter? Theory and Evidence from Single-Subject Adjudication', 2011 (40) Journal of Legal Studies 333, 365.
- Michael Junemann and Johannes Wirtz, 'ICO: Legal Classification of Tokens: Part 4 – Utility Tokens' (2019) <<https://www.twobirds.com/en/news/articles/2019/global/ico-legal-classification-of-tokens-utility-token>> accessed on 07 July 2020.
- Michael Junemann and Johannes Wirtz, 'ICO: Legal Classification of Tokens: Part 2 – Security Token' (2019) <<https://www.twobirds.com/en/news/articles/2019/global/ico-legal-classification-of-tokens-2>> accessed 09 July 2020.
- Michael Ng, 'Choice of Law for Property Issues regarding Bitcoin under English Law' 2019 (15) Journal of Private International Law 315, 338.
- Money's Past and Fintech's Future: Wildcat Crypto, the Digital Dollar, and Citizen Central 2019 (2) Banking Stanford Journal of Blockchain Law & Policy 1, 11.
- Nan Liu et al., 'A Critical Review of Distributed Ledger Technology and Its Applications in Real Estate' (2020) <<https://www.rics.org/globalassets/rics-website/media/knowledge/research/research-reports/rics0077-001-distributed-ledger-technology-review-report--final.pdf>> accessed 08 July 2020.
- Neal Watson and Beliz McKenzie, 'Shareholders' Right in Private and Public Companies in the UK (England and Wales)' (2019) <[https://uk.practicallaw.thomsonreuters.com/5-613-3685?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/5-613-3685?transitionType=Default&contextData=(sc.Default)&firstPage=true)> accessed 07 July 2020.
- Norman Chan, 'Keynote Speech at Treasury Markets Summit 2018 on Crypto-assets and Money' (Hong Kong Monetary Authority 2018) <<https://www.hkma.gov.hk/eng/news-and-media/speeches/2018/09/20180921-1/>>;
- 'Notice on Precautions Against the Risks of Bitcoins', (People's Bank of China, 2013) <<http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757016/c3762245/content.html>> accessed on 10 July 2020.
- 'Own Initiative Report on Initial Coin Offerings and Crypto-Assets', (Securities and Markets Stakeholder Group, European Securities and Markets Authority 2018), <https://www.esma.europa.eu/sites/default/files/library/esma22-106-1338_msg_advice_report_on_icos_and_crypto-assets.pdf> accessed on 06 July 2020.
- O Bolotaeva et al., 'The Legal Nature of Cryptocurrency', (IOP Conference Series: Earth and Environmental Science, 2019), <<https://iopscience.iop.org/article/10.1088/1755-1315/272/3/032166/pdf>> accessed on 05 July 2020.

- OECD, 'Risk Management and Corporate Governance' (2014) <<http://www.oecd.org/daf/ca/risk-management-corporate-governance.pdf>> accessed 07 July 2020.
- OECD, 'Striking the Right Balance between Competition and Regulation: The Key is Learning from Our Mistakes' (APEC-OECD Co-operative Initiative on Regulatory Reform: Third Workshop Jeju Island, Korea 16-17, 2002) <<https://www.oecd.org/regreform/2503205.pdf>> accessed 09 July 2020.
- OECD, 'The Tokenisation of Assets and Potential Implications for Financial Markets', (OECD Blockchain Policy Series, 2020), <<https://www.oecd.org/finance/The-Tokenisation-of-Assets-and-Potential-Implications-for-Financial-Markets.pdf>> accessed 06 July 2020;
- Paul Davies, 'The Board of Directors: Composition, Structure, Duties and Powers' (Company Law Reform in OECD Countries: A Comparative Outlook of Current Trends, 2000).
- Peter Chapman and Laura Douglas, 'The Virtual Currency Regulation in the United Kingdom' in Michael Sackheim and Nathan Howell (eds), 'The Virtual Currency Regulation Review' (The Law Reviews, 2018) 310, 329.
- Peter Temperley, 'Using Crypto Tokens in Insurance' (2018) <<https://medium.com/@peter.temperley/using-crypto-tokens-in-insurance-7125ccb090eb>> accessed 09 July 2020.
- Primavera De Filippi and Samer Hassan, 'Blockchain Technology as a Regulatory Technology: From Code is Law to Law is Code' (2016) <<https://firstmonday.org/ojs/index.php/fm/article/view/7113/5657>> accessed 09 July 2020.
- PrivSec Report, 'Preventing Data Breaches and Assisting GDPR Compliance Using Encryption', (2017) <<https://gdpr.report/news/2017/12/21/preventing-data-breaches-assisting-gdpr-compliance-using-encryption/>> accessed 06 July 2020.
- Public-Private Analytic Exchange Programme, 'Risk and Vulnerabilities of Virtual Currency: Cryptocurrency as a Payment Method' (2017) <https://www.dni.gov/files/PE/Documents/9---2017-AEP_Risks-and-Vulnerabilities-of-Virtual-Currency.pdf> accessed 07 July 2020.
- PwC, 'Cryptographic Assets and Related Transactions: Accounting Considerations under IFRS' (Research Report, 2019).
- PwC, 'Cryptographic Assets and Related Transactions: Accounting Considerations under IFRS' (2019) <<https://www.pwc.com/gx/en/audit-services/ifrs/publications/ifrs-16/cryptographic-assets-related-transactions-accounting-considerations-ifrs-pwc-in-depth.pdf>> accessed 09 July 2020.
- 'Principles of Corporate Governance' (Harvard Law School Forum on Corporate Governance, 2016) <<https://corpgov.law.harvard.edu/2016/09/08/principles-of-corporate-governance/>> accessed 07 July 2020.
- 'Regulation and Competition: A Review of the Evidence', (Competition & Market Authority, 2020) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857024/Regulation_and_Competition_report_-_web_version.pdf> accessed on 09 July 2020.
- 'Regulatory Challenges and Risks for Central Bank Digital Currency', (Regulatory Requirements and Economic Impact Working Group, International Telecommunication Union, 2019), <<https://www.itu.int/en/ITU-T/focusgroups/dfc/Documents/DFC-O->

[006_Report%20on%20Regulatory%20Challenges%20and%20Risks%20for%20Central%20Bank%20Digital%20Currency.pdf](#)> accessed 05 July 2020.

- 'Report with Advice for the European Commission on Crypto-Assets', (European Banking Authority, 2019), <<https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1>> accessed 09 July 2020.
- 'Review of the Markets in Financial Instruments Directive', (European Commission, 2011) <https://ec.europa.eu/commission/presscorner/detail/en/MEMO_11_716> accessed 08 July 2020.
- Rafael Delfin, 'A General Taxonomy for Cryptographic Assets', <https://assets.ctfassets.net/sdlnm3tthp6/6mq1HTdBKG46Q6iqa26uE/df09eaf16935053c99c8fcdce658c7ae/General_Taxonomy_for_Cryptographic_Assets.pdf> accessed 05 July 2020.
- Rain Xie, 'Why China Had to Ban Cryptocurrency but the U.S. Did Not: A Comparative Analysis of Regulations on Crypto-Markets between the U.S. and China' *Washington University Global Studies Law Review* 2019 (2) 457, 492;
- Ran Ben-Tzur and James Evans, 'The Rise of Direct Listings: Understanding the Trend, Separating Fact from Fiction' (2019) <<https://ncfacanada.org/the-rise-of-direct-listings-understanding-the-trend-separating-fact-from-fiction/>> accessed 07 July 2020.
- Ronald Michie, *The London Stock Exchange: A History*, (Oxford, OUP, 2003).
- Robby Houben and Alexander Snyers, 'Crypto-Assets: Key Developments, Regulatory Concerns and Responses', (Study requested by the ECON Committee, European Parliament), <[https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL_STU\(2020\)648779_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL_STU(2020)648779_EN.pdf)> accessed on 06 July 2020;
- Robby Houben et al., 'Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion', (Research Paper, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, 2018).
- Robert Hoogendoorn, 'Virtual Worlds: The Next Frontier for Businesses', <<https://dappradar.com/blog/virtual-worlds-the-next-frontier-for-businesses>>, accessed 06 July 2020.
- Ross Buckley et al., 'TechRisk' 2020 (1) *Singapore Journal of Legal Studies* 35.
- Ryan Zullo, 'Can Tokenisation Fix the Secondary IPO Market?' (2020) <<https://www.eisneramper.com/tokenization-secondary-ipo-catalyst-0420/>> accessed 07 July 2020.
- 'Sale of Goods Forming Part of a Bulk' (The Law Commission and The Scottish Law Commission No. 215/145, 1965). Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System', <<https://www.bitcoin.com/bitcoin.pdf>> accessed 06 July 2020.
- Sophia Qasir, 'Anonymity in Cyberspace: Judicial and Legislative Regulations', 2013 (81) *Fordham Law Review* 3651, 3691.
- 'Smart Contracts: Is the Law Ready?' (Smart Contract Whitepaper, Smart Contract Alliance, 2018) <<https://lowellmilkeninstitute.law.ucla.edu/wp-content/uploads/2018/08/Smart-Contracts-Whitepaper.pdf>> accessed 07 July 2020.

- S Nishimura, 'A New Way to Fundraise? – Token Equity Convertible' (2018) <<https://medium.com/@vcinsights/a-new-way-to-fundraise-token-equity-convertible-tec-7d3c987e520e>> accessed 09 July 2020.
- Tara Mandjee, 'Bitcoin, its Legal Classification and its Regulatory Framework', 2016 (15) *Journal of Business and Securities Law* 158, 211.
- Thad Kousser and Matthew McCubbins, 'Social Choice, Crypto-Initiatives, and Policymaking by Direct Democracy' 2005 (78) *Southern California Law Review* 949, 984.
- The Libra Association Members, 'Libra White Paper' (2020) <<https://libra.org/en-US/white-paper/>> accessed 07 July 2020.
- Thijs Maas, 'Why Hybrid Tokens are Superior to Utility Tokens: Comparing Utility Tokens, Security Tokens and Hybrid Tokens' (2019) <<https://medium.com/hackernoon/hybrid-tokens-are-superior-to-utility-tokens-heres-why-3bec287c465>> accessed 09 July 2020.
- thinkBLOCKtank, 'The Regulation of Token in Europe: National Legal & Regulatory Frameworks in Select European Countries', (2019) <<http://thinkblocktank.org/wp-content/uploads/2019/08/thinkBLOCKtank-Token-Regulation-Paper-v1.0-Part-C.pdf>> accessed 06 July 2020.
- 'The Tokenisation of Financial Market Securities – What's Next?', (in Research Report by Greenwich Associates: "Security Tokens: Cryptonite for Stock Certificates" 2019) <<https://www.r3.com/wp-content/uploads/2019/10/R3.Tokenization.Financial.Market.Securities.Oct2019.pdf>> accessed 07 July 2020.
- 'Tokenising Commodities: It's Possible, But Should we?', (2020) <<https://academy.aax.com/en/tokenizing-commodities-its-possible-but-should-we/>> accessed 08 July 2020.
- Vitalik Buterin, 'Decentralised Protocol Monetisation and Forks' (2014) <<https://blog.ethereum.org/2014/04/30/decentralized-protocol-monetization-and-forks/>> accessed 07 July 2020.
- Vlad Burilov, 'Regulation of Crypto Tokens and Initial Coin Offerings in the EU', 2019 (6) *European Journal of Comparative Law and Governance* 146, 186.

GET IN TOUCH

Contact us to arrange a personal consultation

Email: studyonline@manchester.ac.uk

www.manchester.ac.uk/techlaw

