UNIVERSITY OF CAMBRIDGE 3CL Centre for Corporate and Commercial Law

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THE FUTURE OF THE FIRM

The Impact of Technology, Innovation and Industrial Change

Conference Report

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Introduction

As Delaware Chancellor William Chandler III pointed out, '[l]aw is, in many ways, a backwards-looking field. We litigate over facts that have already occurred, challenge deals that have already been signed, and apply rules of decision based on previously-established precedent or statutes already enacted'.[1] The academic study of the modern business firm has likewise generally been an exercise in looking back. The 'sacred texts' – mainly economic in their approach – were written throughout the twentieth century, and have constituted a departure point from which commentators have, oftentimes vigorously, both contemplated and disputed the purported nature, structure and purpose of the company.[2] However, much like the discovery of the mysterious black monolith in the classic film 2001: A Space Odyssey, new technological innovations are occasioning scholars to gaze beyond the existing paradigm. What is the current relationship between 'man and machine'? What could the relationship look like down the line? What does this mean for the future of the firm?

These (and similar) questions were the collective foundation for a recent conference[3] – co-hosted by the European Corporate Governance Institute, University College London and Cambridge University's Centre for Corporate and Commercial Law – entitled The Future of the Firm: The Impact of Technology, Innovation and Industrial Change. The conference took place on 5 July 2019 and was co-organised by **Dr Felix Steffek** (Faculty of Law, Cambridge University), **Dr Martin Petrin** (Faculty of Laws, University College London), **Professor Carsten Gerner-Beuerle** (Faculty of Laws, University College London) and **Dr Marc Moore** (Faculty of Law, Cambridge University). The conference was organised thematically around (i) firm governance and purpose; (ii) management and employment; (iii) the law-technology cycle; (iv) capital and regulation; and finally (v) technology and insolvency.

[1] Chancellor William B Chandler III, 'Opening Remarks – 6 November 2009' 33(4) Seattle University Law Review (2010), 781.
[2] See generally, e.g., R H Coase, 'The Nature of the Firm' 4(16) Economica (1937) 386; Adolf A Berle and Gardiner C Means, The Modern Corporation & Private Property (1932); Oliver E Williamson, 'The Economics of Organization: The Transaction Cost Approach' 87(3) American Journal of Sociology (1981) 548; Michael C Jensen and William H Meckling, 'Theory of the firm: Managing behavior, agency costs and ownership structure' 3(4) Journal of Financial Economics (1976) 305; E Merrick Dodd, Jr, 'For Whom Are Corporate Managers Trustees?' 45(7) Harvard Law Review (1932) 1145; Henry Manne, 'Mergers and the Market for Corporate Control' 73(2) Journal of Political Economy (1965) 110; Frank H Easterbrook and Daniel R Fischel, The Economic Structure of Corporate Law (1996).
[3] Another recent conference held on 23 March 2018 – The Transformation of Finance and Investment: Information and Technology Revolutions – dealt with the related topic of how technological innovation has, is and could impact the sphere of financial intermediation and what this might mean for financial market integrity. Selected papers from the conference appeared in a special issue of the European Business Organization Law Review. See generally the editorial for more information – Emilios Avgouleas, Iris H-Y Chui and Pierre Schammo, 'Editorial' 20(1) European Business Organization Law Review (2019) 1.

Professor Colin Mayer (Saïd Business School, University of Oxford) opened by situating the conference within the British Academy's current research programme on the Future of the Corporation. Led by Mayer, the research programme principally highlights a perceived mismatch between (i) how markets and regulators presently view the nature and purpose of the firm (and capitalism more generally); and (ii) the wider sustainability concerns of people and planet in the face of, for example, growing socio-economic inequality and climate change.[4] Inter alia, Mayer stressed that existing regulatory frameworks and techniques cannot keep pace with technological developments in Big Data, machine learning, artificial intelligence ('AI') and blockchain. Especially in a globalised marketplace, in the wrong hands these novel technologies could, for example, facilitate a move towards larger monopolies, undermine employment security and (perhaps further) erode trust between companies and society. The erosion of trust is particularly problematic, and Mayer argued that the law ought to reconceptualise the purpose of business as providing profitable solutions to the problems of people and planet. Technology is at the heart of this argument and should be harnessed as a tool to enhance collective human and environmental wellbeing, rather than the private interests of shareholders and other corporate insiders.


FIRM GOVERNANCE AND PURPOSE

Professor John Armour (Faculty of Law, University of Oxford) was the first to present under the 'firm governance and purpose' thematic category. In his presentation – *Self-Driving Corporations?* – Armour initially considered the current implications of AI-assisted and AI-augmented decision-taking processes for corporate governance and corporate law.[5] In the present corporate context, the application of AI within the firm could lead to productivity gains and a significant source of competitive advantage. However, Armour noted that there are a number of corporate governance oversight challenges that he collectively described under the umbrella of 'data governance'. Inter alia, data governance will present business executives with challenges in the alignment of machine learning results or predictions with key human goals and values that transcend shareholder wealth maximisation. In terms of the implications for corporate law, there is an expectation that traditional coordination and agency costs would be reduced: augmented human decision-taking means that fewer people would be required to deliver similar results. However, Armour suggested that a new species of agency cost might appear that centres on discretionary decision-taking linked to establishing and testing the AI systems themselves. This new agency cost paradigm could occasion a change to corporate law in which directors would be expected to: (i) have an understanding of AI applications and their risks; and (ii) exercise a modified version of due care in the selection, instruction (including task-delegation) and monitoring of management.

[4] 31 academics from the humanities and social sciences participated in the first stage of the research programme, which began in January 2018. Thirteen research projects were selected to look at different aspects of the future of the corporation. These papers were completed in September 2018 and were published in a supplementary issue of the Journal of the British Academy, available at ttps://www.thebritishacademy.ac.uk/publications/journal-british-academy/6s1. See also the British Academy report that synthesises and draws together the main themes of the research, available at https://www.thebritishacademy.ac.uk/future-corporation-research-summaries.
[5] This presentation was modeled off an unpublished working paper of the same name, co-written with Professor Horst Eidenmüller (Faculty of Law, University of Oxford)(on file withthe authors).

In the latter portion of his presentation, Armour shifted attention to speculatively consider the future of the firm with increased AI operability ('autonomous intelligence') and argued that, with further advances in technology, the function of corporate law in AI-controlled corporations will change. Armour then conducted a thought experiment in which he considered a 'self-driving' subsidiary firm with a wholly algorithmic, non-human board. A self-driving subsidiary could be used as a device to further externalise liability risks for entrepreneurs. Beyond the self-driving subsidiary model (and the current agency costs framework), the correlative to increased AI functionality is likely a shift from corporate law's current private and facilitative character to a more public and restrictive conception of the laws governing business firms. The calibration of firm purpose in AI-controlled companies will become a central regulatory focus. Such firms should be required to act within a publicly prescribed range of permissible corporate objectives and goal functions. In order to prevent, or temper, 'algorithmic failure' Armour reasoned that self-driving corporations ought to be legally required to purchase some form of liability insurance, and unlimited pro rata shareholders' liability for self-driving companies' corporate debts ought to also be considered. With respect to private international law considerations, the advent of fully self-driving corporations could usher in a new era of competition with a tendency towards the formulation and exportation of lax AI regulations, i.e., a ('tech') race to the bottom.

Professor Christopher Bruner (School of Law, University of Georgia) followed with his presentation; *Distributed Ledgers, Artificial Intelligence, and the Purpose of the Corporation*.[6] Bruner's presentation was divided into two parts. The first part provided an overview of emerging technologies that could have a profound impact on corporate governance. In particular, Bruner touched on distributed ledgers, blockchain and AI. Distributed ledgers and blockchain could fundamentally alter the landscape of shareholder voting and trade clearance. The present system is cumbersome: it largely relies upon an array of intermediaries and is criticised for lacking accuracy and transparency. Distributed ledgers, blockchain and so-called 'smart contracts' built upon this technology could enable more direct shareholder involvement in corporate governance by facilitating coordination and reducing costs associated with voting. Likewise, AI could diminish the need for human directors. Bruner highlighted the potential for various functions of the board of directors – such as monitoring and advising on strategy – to become automated. However, Bruner reasoned that 'soft' skills requiring social and emotional sensitivities and judgment in the face of radical uncertainty would likely remain the province of human decision-makers. Consequently, there is reason to doubt that companies governed solely and directly by algorithms would prove attractive to the general investing public in the near future. Bruner proceeded to emphasise that the line between what is (or may be) technologically possible and how these technologies ought to be used is often blurred. He therefore devoted the second part of his presentation to assessing the evolving technological landscape through the familiar normative lens of corporate purpose debates, arguing that key choices must be grounded in a normative analysis external to the technology itself. Such choices typically concern how much governance power shareholders should have and the degree to which boards of directors should be required to focus on shareholders' (as opposed to other stakeholders') interests. By way of conclusion Bruner noted that distributed ledgers, blockchain and AI could all be used in ways that are amenable to any range of normative visions for corporate governance.

[6] This presentation was based on an unpublished working paper of the same name (on file with the authors).

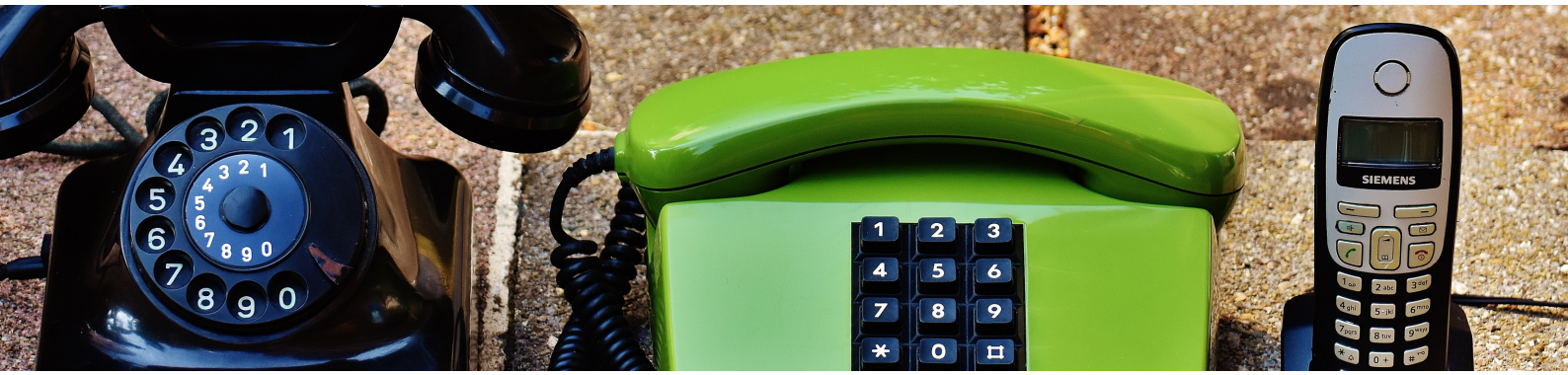
In *Corporate Technologies and the Tech Nirvana Fallacy* **Professor Luca Enriques** (Faculty of Law, University of Oxford) sought to highlight the technology and corporate governance features of today, and that, in the absence of technological developments that cannot be anticipated, it is unrealistic to consider a scenario in which human corporate boards become redundant.[7] First, Enriques discussed what he termed 'CorpTech', otherwise understood as the use of distributed ledgers, blockchain, smart contracts, Big Data and AI to perform corporate governance-related tasks (e.g., setting executive compensation, identifying candidates for top positions, facilitating investor relations and voting, and enhancing risk management and compliance functions). Second, he explained tech proponents' view of CorpTech's impact on corporate boards. Importantly, tech proponents argue that CorpTech will eventually displace the monitoring board, and that, through CorpTech, shareholders' direct involvement will relegate the mediating board to the 'scrapheap' of the past. However, in the third part of his presentation, Enriques submitted that the fundamental issues underpinning corporate governance are unlikely to change, even with the potential influence of CorpTech. Specifically, conflicts of interest and information asymmetries will remain central problems, and the allocation of power over the selection of a particular CorpTech solution will determine the degree to which control is exercised by any constituency over the rest of the firm. That is, whoever selects the CorpTech for the firm will dictate whose interests – among the many interests that conflict within a firm – CorpTech products will prioritise. In such an environment, it will be necessary for firms to retain human-populated boards that continue to perform their core monitoring and mediating functions. Yet, Enriques acknowledged that CorpTech is increasingly attractive to boards, and concluded his presentation by reflecting on whether and how corporate law and corporate governance practices ought to be adapted in response to these new technologies. On that basis, he laid out some thoughts on the governance framework for the CorpTech age, which includes broadened board oversight of CorpTech and mandatory disclosure of CorpTech-related corporate governance arrangements.

MANAGEMENT AND EMPLOYMENT

Dr Martin Petrin (Faculty of Laws, University College London) opened the thematic category of 'management and employment'. His presentation – *Corporate Management and AI* – explored the fundamental question of whether and to what extent AI can take over the management of business organisations.[8] Petrin began by outlining the corporate leadership tasks traditionally carried out by directors and management. These tasks were then separated into 'administrative' and 'non-administrative' tasks (the latter of which was also referred to as 'judgment work'). Petrin argued that AI seems likely to take over completely in the area of administrative tasks. However, he drew attention to divergent opinions on the probable role AI will play in non-administrative tasks, which includes corporate leadership tasks related to strategy, innovation, creative thinking and interpersonal skills. Some commentators see a limited role for AI in non-administrative tasks, imagining a future where AI and human managers would necessarily work together. Others envision super-intelligent AI that will ultimately surpass human

[7] Professor Enriques' presentation was mirrored off an ECGI working paper of the same name he co-wrote with Professor Dirk Zetzsche (University of Luxembourg; Heinrich Heine University Dusseldorf), available at https://ecgi.global/sites/default/files/working_papers/documents/finalenriqueszetzsche.pdf.
[8] This presentation was based on a paper of the same name, which is forthcoming in the Columbia Business Law Review, available at https://ssrn.com/abstract=3346722.





judgment and replace management entirely. In the latter part of his presentation, Petrin posed a hypothetical for discussing the potential consequences for corporate law and corporate governance assuming that AI does take over in the future. Here, he focused particularly on firm leadership and corporate governance structures in companies, as well as the impact on directors' and officers' personal liability. For example, he suggested that boards could ultimately be 'fused', since AI software could notionally be able to replicate the benefits of group decision-making by humans and exceed both the speed and quality of decisions made by human teams. He also drew attention to the difficult legal questions surrounding directors' and officers' liability, especially in the scenario where AI finally replaces human decision-makers. Petrin concluded with five predictions: (i) 'management by machine' will come sooner than we think; (ii) corporate management will change drastically; (iii) the corporate governance focus will shift from agency costs to the study of ex ante standards for directing and controlling software; (iv) management will be (even) more intertwined with business analytics, Big Data, and IT programming; and (v) technology will improve management, not lead to its demise – 'leaderless entities' will not prevail.

Professor Elizabeth Pollman (Loyola Law School, Los Angeles) followed with her presentation – *The Working Investor* – which focused on current US developments that may shape the future of worker participation in firms' equity and corporate governance structures. She started by situating these developments amidst larger debates concerning private versus public markets in the US and whether capitalism is working for society. She then made three observations that point to a possibility that worker ownership and voice could begin to look different than the 20th century pension fund paradigm. First, she noted that tech-based 'unicorn' start-up firms that feature venture capital ownership and governance are increasingly dominating the US socio-economic landscape. One concomitant effect of this growth-oriented business model is that employees are being invited to participate in equity arrangements and often represent part of the essential value of a company and influence its decision-making.[9] This shift to employee-investor status means that employees as residual claimants are no longer a 'non-shareholder' constituency and will, at least theoretically, enjoy the state corporate law protections that are typically accorded to shareholders in the normal way, especially in Delaware. Second, Pollman discussed the current debate regarding whether the US Securities and Exchange Commission ought to allow non-reporting 'gig economy' companies to issue compensatory stock options to workers in reliance on Rule 701 of the Securities Act 1933. Rule 701 is an exemption that enables companies to issue stock to employees, consultants and advisers as compensation without having to submit detailed financial disclosures. Pollman pointed out that expanding Rule 701 would allow more workers to share in the gains of private companies, but noted that it might aggravate an existing problem that workers must make investment-like decisions in the absence of necessary information. Therefore, an incongruity exists between state corporate law(s) and federal securities regulation. The former has taken a protective stance to employee-shareholders by requiring fiduciary duties to be owed to them as common shareholders, whereas federal securities laws have treated employees under a compensatory framework (which does not factor in that they are investors in need of information and protection). This discrepancy in legal treatment ought to be reconciled.

[9] This part of Professor Pollman's presentation was based on her forthcoming paper in the University of Pennsylvania Law Review, available at https://ssrn.com/abstract=3352203.

Third, Pollman emphasised the contemporary contours of employee activism. In addition to employees, such activism now often occurs in the context of contingent workers forming pressure groups. The focus of this labour activism has grown well beyond the traditional boundary issues that employees advocated for in the past. Labour activism now involves public confrontations with respect to workplace practices and societal issues. Tech industry workers in particular have significant power: they have leveraged corporate cultural principles and codes of conduct (e.g., Google's 'Don't be evil' motto) as a platform for worker voice against management decisions and behaviour. Pollman discussed various high-profile examples of this, including: (i) protests against Google's involvement in a controversial US defence department programme; (ii) objections to Microsoft's multi-million dollar cloud-computing contracts with US immigration and customs enforcement authorities (which faces criticisms for its role in separating families at the US-Mexican border); and (iii) the global walkout at Google in protest of its handling of sexual harassment cases (which led to Google, and other tech companies such as Facebook, Airbnb and eBay removing mandatory arbitration clauses from employment contracts). Finally, returning to the concept of employees as shareholders, Pollman drew attention to employee-shareholder proposals in companies such as Amazon, where 'Amazon Employees for Climate Justice' released an open letter regarding climate change that was signed by roughly 12 per cent of its tech employees. The associated shareholder proposal received significant support, including endorsements from ISS and Glass Lewis. Pollman concluded by noting that employee activism is spreading beyond technology companies, and emphasised that the lines between (i) public and private and (ii) employee and casual worker are becoming increasingly blurred in the US.

Dr Marc Moore (Faculty of Law, Cambridge University) concluded the thematic category of 'management and employment' with his presentation – *Flexible Work: A Theory of the Firm Perspective* – which adopted an alternative perspective on flexible work inspired by Coase's theory of the firm.[10] Moore's analysis concentrated on the implications of flexible work in terms of the relative allocation of control, risk and reward within the firm. He began by describing the attributes of task-oriented ('gig') and on-demand ('casual') work arrangements. Both are hybridised quasi-employment forms that typically entail workers assuming most of the positional disadvantages associated with orthodox employment and self-employed entrepreneurship, while enjoying none, or few, of the corresponding advantages. For example, workers assume a significant degree of residual economic exposure to product market uncertainty and other exogenous shocks, absent any corresponding compensation in the form of enhanced contractual, proprietary or governance entitlements. He then proceeded to develop a hypothetical bargaining model to analyse the ideal means of compensating flexible workers for their assumption of residual business risk exposure and associated positional costs. In this regard, he drew a structural comparison between, on the one hand, key forms of flexible or non-standard work, and, on the other, 'at risk' or unsecured financial investments in business firms. Moore concluded by emphasising that many of the core arguments and insights from law and economics which are familiar to corporate law scholars are applicable just as readily to the employment law and industrial relations context – especially in terms of flexible or non-standard work practices.

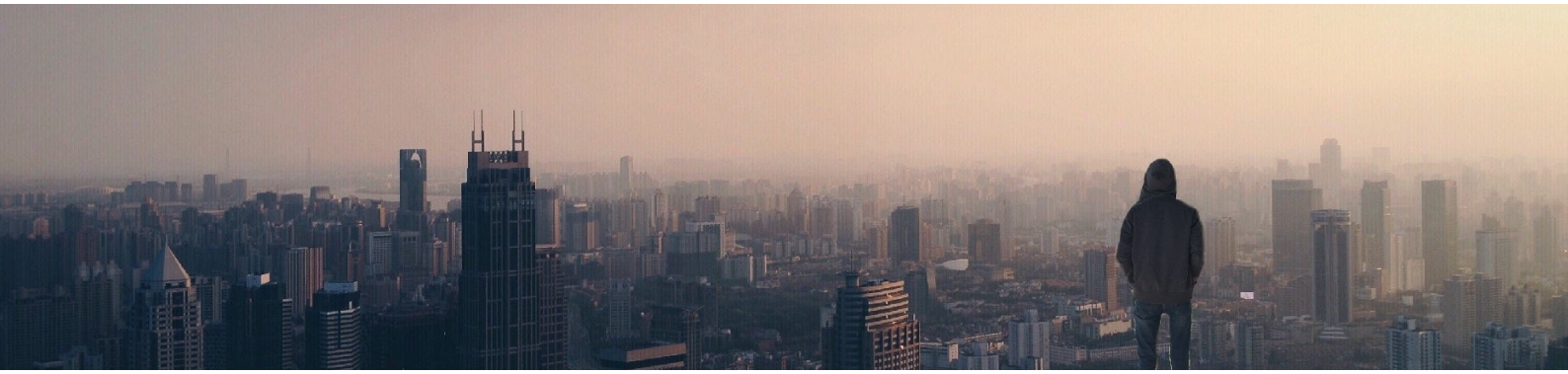
[10] This presentation was based on 'The gig economy: a hypothetical contract analysis' Legal Studies (2019), available at https://www.cambridge.org/core/journals/legal-studies/article/gig-economy-a-hypothetical-contract-nalysis/AB7780DDB39C3630E8A9AA7D5F3BEAF4.


THE LAW-TECHNOLOGY CYCLE

Professor Simon Deakin (Faculty of Law, Cambridge University) presented within the 'law-technology cycle' thematic category. The title of his presentation was *Corporate Governance and the Law-Technology Cycle*, which covered two areas: (i) the co-evolution of law and technology; and (ii) how digitisation and knowledge capture could affect both the firm and the law. The notion that law and technology co-evolve derives from Niklas Luhmann's theory on systems.[11] As a distinct social system (similar to law), technology reproduces and adheres to its own internal logics. However, technology remains socially embedded and legally mediated. In one sense, law can facilitate technological change through, for example, company law. Under other conditions law can also diffuse the undesirable social effects that derive from technology by imposing, for example, labour standards and social security regimes. Additionally, from time to time there could be a 'lag effect', which means that law may be out of sync with technological change, but at points in the cycle a legal response will be engendered. Bitcoin was used to illustrate this point. Bitcoin can be manipulated for criminal activity (e.g., 'ransomware' or drug trafficking), and appears to be problematic for states. Does this mean that Bitcoin cannot be regulated? Not necessarily – in the same way that existing legal technology (e.g., confidentiality clauses and intellectual property law) was used to protect the underlying software and code, even old case law can be deployed to track the illegal use of Bitcoin (Devaynes v Noble (1816) 1 Merivale 529). Similarly, many people regard Bitcoin as an object of ownership, but it only has value through legal recognition. Recently a Japanese judge refused to regard Bitcoin as an asset.[12] In short, law is important.

Deakin then turned to digitisation and knowledge capture. He noted that some of the features of 'industry 4.0' – e.g., platforms, apps and machine learning – may seem to signal a drastic shift from existing technologies. However, patterns are very important in technological development. Through an historical analysis of the first industrial revolution, it was shown that this view of industry 4.0 is 'superficial' and its professed impact is difficult to prove. In reality, AI is not new. Just like the Jacquard Loom, AI is the application of binary coding to knowledge; it is a mathematical representation of things that already exist. Herbert Simon, an economist who pioneered AI, based his conception of the technology on similar grounds – the corporation. The corporation is an artificial entity that produces outputs that do not depend upon one single person. AI does the same, only in mathematical form. Consequently, Deakin doubted whether there would be a fundamental revolution to the way in which humans view the corporation – as well as the attendant agency costs concerns – because of AI.

[11] Professor Deakin's treatment of law and technology as social systems is explored further in a paper that he co-wrote with Dr Christopher Markou (Centre for Business Research, Cambridge University). A version of the paper appeared in Giornale di Diritto del Lavoro e di Relazioni Industriali (Journal of Labour Law and Industrial Relations), available at, e.g., https://www.repository.cam.ac.uk/handle/1810/278520
[12] The judgment of the Tokyo District Court has been translated into English; available at https://www.law.ox.ac.uk/sites/files/oxlaw/mtgox_judgment_final.pdf. For a short primer, see, e.g., Louise Gullifer, Megumi Hara and Charles W Mooney, Jr., 'English translation of the Mt Gox judgment on the legal status of Bitcoin prepared by the Digital Assets Project' Oxford Business Law Blog (11 February 2019), available at https://www.law.ox.ac.uk/business-law-blog/blog/2019/02/english-translation-mt-gox-judgment-legal-status-bitcoin-prepared).



In terms of the 'LegalTech' debate, Deakin suggested that the automation of law is very attractive to some scholars. This is the so-called 'legal singularity' position, i.e., where robots will have accumulated larger amounts of data, and improved various methods of inference to make legal uncertainty obsolete. That is, legal singularity contemplates 'complete law'. Could LegalTech mean a new path of law? Deakin cautioned that this question was the revival of an old debate – 'pancomputationalism' – where everything is reduced down to the simplest binary principles of '0' and '1'.[13] However, the universe is difficult to count. Attributed to Einstein, 'not everything that counts can be counted, and not everything that can be counted counts'. In other words, there are some aspects of human existence that cannot be reduced down to technical rules. Law is one such area. Law, as a system, is complex: it is self-organising, non-linear, adapts and co-evolves with other social systems and is path-dependent. Law is also fractal, in the sense that it consists of an infinite number of resemblances of itself, visualised at different levels of magnification, which stems from the doctrine of precedent. Furthermore, law is incomplete. This is a function of its boundary with other social systems. The data beyond law's boundaries is chaotic and unstructured, and law adjusts to this new data through experimentation and error correction. This adjustment and error correction utility is aided by the natural language used by humans, which is flexible and capable of evolving both itself and the law. Taking the employment relationship as an example, there are multiple indicators of employment status, and there is always the possibility that the indicators themselves could likewise evolve because of incoming data from other social systems. Depending on the facts of a particular case, different weight might be attached to only certain indicators in determining whether an employment relationship exists. These will not be the same in every case, and, therefore, the 'right' answer will not be the same each time. Said differently, there are many alternative answers that must be tested through a selected process, which centres on human creativity and normativity. Can AI behave in the same way?[14] AI can model much of what law does to a certain extent, but Deakin argued that this ultimately has limits. If the past and the future bear close relation to each other, AI would be good at predictive adjudication. However, machine learning is opaque and backward looking; it is only practical when applied to large data sets, which must be properly structured and labelled by humans. This does not square well with law's need to retain and adapt information inputs from other social systems and correct for error. Thus, law can benefit from AI, but this will not abolish the need for human agency.

CAPITAL AND REGULATION

The 'capital and regulation' thematic category commenced with a presentation by **Dr Aurelio Gurrea-Martínez** (School of Law, Singapore Management University) – *The Law and Finance of Initial Coin Offerings*.[15] Gurrea-Martínez began by examining the concept and features of a new source of finance – an initial coin offering ('ICO') – which involves the issuance of digital assets ('tokens') rather than shares, bonds or other traditional financial instruments. As issuers receive 'crypto-currencies' rather than cash or other financial instruments, and as blockchain is used for the issuance and trading of tokens, Gurrea-Martínez emphasised that ICOs raise challenging questions for authorities tasked with overseeing 'crypto-markets'. This is particularly the case because ICOs are not conducted through the traditional channel in which the regulator and relevant third parties – such as investment banks and other public gatekeepers – need to intermediate. Gurrea-Martínez noted that there is also no unified classification system of tokens across jurisdictions. Moreover, he suggested that many securities regulators – including the UK's Financial Conduct Authority – seem to conflate the legal classification of a token with its functionality. While a token can be classified in different ways depending on its functionality, from a legal (securities regulation) perspective, a token must either be classified as a security or not. With this in mind,

[13] See generally, e.g., Gottfried Wilhelm Leibniz, Explanation of Binary Arithmetic (1703).
[14] This question is further discussed in another paper co-written with Dr Markou, available at https://ssrn.com/abstract=3407856.
[15] This presentation was based on a working paper of the same name, which was co-authored with Nydia Remolina (Centre for Artificial Intelligence and Data Governance, Singapore Management University), available at: https://ssrn.com/abstract=3182261.

Gurrea-Martínez proposed classifying tokens by: (i) functionality of the token (which focuses on the function and economic substance of the token); (ii) the legal nature of the token (which is based on the definition of 'security' under a particular country's securities laws); and (iii) the nature of the token from an accounting and finance perspective. Gurrea-Martínez later progressed to consider the existing regulatory approaches to deal with ICOs and argued that none of these provide an efficient and effective response to the challenges raised. Accordingly, he proposed a series of reforms to enhance the existing regulatory models. First, disclosing to the regulator via a simple and harmonised electronic form. Second, prohibiting the pre-sale of tokens to certain entities such as commercial banks and pension funds. Third, warning and educating retail investors of the risks associated with the purchase of tokens. Fourth, increasing protection of non-security token-holders using tools developed to protect (financial) consumers, such as cooling off periods, prohibiting certain terms and products and imposing conduct obligations on the issuer. Gurrea-Martínez also analysed the corporate governance issues inherent in ICOs, primarily focusing on the agency problems that exist between issuers and token purchasers, as well as the 'horizontal' agency problems existing among investors. Purchasers of tokens are highly exposed to the risk of opportunism of ICO promoters. Therefore, Gurrea-Martínez advocated for a variety of legal and market devices to be used to minimise such agency problems. Finally, he concluded by analysing other legal and financial issues associated with ICOs, including token valuation, jurisdiction and applicable law.

Dr Elizabeth Howell (Faculty of Law, Cambridge University) continued the 'capital and regulation' thematic discussion. Her presentation – *Future Sources of Funding for the Firm: What are the Core Issues for Consideration?* – zoomed in on the growing range of innovative sources of capital. In the first part of her presentation, Howell discussed the potential demise of 'UK plc'. Concentrating on the UK and EU markets, she illustrated that there is a higher proportion of 'static' listed firms that do not grow or shrink in size as compared to the US. Moreover, although the UK may not have seen as dramatic a drop in listed firms as in the US, there has been stagnation in recent years. There has also been a decline in the supply of finance from the public markets to 'small cap' firms since the 2008 crisis. At the same time, many private firms are also performing well. Consequently, these private firms may choose to postpone an 'initial public offering' ('IPO'), in favour of alternative methods of finance. Turning to these alternative methods of finance, in the second half of her presentation, Howell analysed three mechanisms: (i) private equity-style funding (encompassing venture capital firms and a variety of other players); (ii) equity crowd-funding; and (iii) ICOs (taking the view that the developments so far pointed to these being supplementary to, rather than replacements for, public markets). When considering private equity, Howell observed that the UK may have a 'patient capital' gap in which it is difficult for promising start-ups to access long-term capital. For instance, relative to the US, UK investors may exit investments relatively early on and there may be fewer rounds of funding before an IPO or trade sale. Howell also discussed that private equity firms could now make much more use of data in taking their investment decisions, and that some forms of private equity are now debating whether the IPO could be eliminated in the future (e.g., via a 'reverse ICO'). Equity crowd-funding is also becoming more established as an early-stage source of financing, with 'bundling models' becoming more commonplace. Nonetheless, the model remains unattractive to entrepreneurs who are risk averse and who prefer to avoid the possibility of public failure. In relation to ICOs, Howell noted that it was difficult to obtain reliable data (the market is quickly developing, and issuers can remain anonymous) but ICOs appear (so far) to constitute a small amount of activity in the UK. Howell also questioned whether the current ICO market is here to stay: globally there was a dramatic reduction in ICOs in the third quarter of 2018 compared with 2017, which led some commentators to claim that ICOs are, potentially, a dangerous new 'bubble' rather than a valuable technological innovation. Howell discussed emerging challenges associated with ICOs (such as 'airdrops' and 'forks'), and whether there were any parallels with existing phenomena from which regulators could draw inspiration. She also noted that although ICOs may have benefits (such as democratising access to finance), ICOs pose acute challenges due to their cross-border and decentralised nature. While some argue that the crypto-community is adept at self-policing, real concerns remain regarding fraudulent ICOs (and other risks). To conclude, Howell underscored that 'FinTech' is not new and it is difficult to tell which of these technological innovations will persist in the future. She suggested that those technological changes that ease barriers to entry might be permanent, but that the notable power of industry leading firms could mean successful start-ups are then acquired (resulting in fewer, but larger, listed companies). Howell also emphasised that the developments of tomorrow will depend on the strength of incumbent firms, the quirks of the market and regulators' attitudes.

Professor Florian Möslein (Department of Law, Philipps University of Marburg) concluded the thematic category 'capital and regulation' with his presentation – *Regulatory Competition in the Digital Age: A Corporate Race to the Blockchain?* Möslein began by referring back to familiar debates of regulatory competition in corporate law, namely whether the race – ultimately won by the US state of Delaware – was really a 'race to the bottom' or a 'race to the top'. He then introduced a new tournament of regulatory competition for the digital age. The state of Wyoming – which was given the moniker the 'Delaware of Digital Assets Law' – was identified as an early contender for potential victory. However, the key question that Möslein explored was whether the rules of the new game are the same. He argued that the complexity of the technology itself leads to very different dynamics of regulatory competition. Most prominently, Möslein suggested that blockchain is effectively a regulatory technology, which means that there is a functional connection between the technology and the law – 'code is law'. This could impact on the supply-side of rule formulation since 'law' could be promulgated and executed within a given technology's own native environment, instead of externally by regulators. Möslein, therefore, framed this insight as a competition between national laws on the one hand, and technological rules and codes on the other hand. In this regard he drew attention to the appearance of digital platforms for establishing and operating business organisations, such as Aragon and dxDAO. Organisations like dxDAO consist only of computer code, which makes the respective blockchain platform (in this context) equivalent to the legal regime that underpins the traditional corporate form. In this way, the governance rules themselves are hardwired into the blockchain and are self-enforcing, customisable, bureaucracy-free and transparent. Thus, such organisations are not necessarily obliged to look at the incorporation question as a zero-sum game; rather, through the technology, they are in a position to transcend a physical state jurisdiction in favour of operating through a 'digital jurisdiction'.

Möslein continued to analyse the demand-side incentives and deterrents of competition between national and technological 'laws'. He then examined the possibility of a two-tiered supply in which law and code were combined together into a hybrid form. Wyoming's thirteen blockchain laws were provided as a case study. Wyoming's digital framework is at the forefront of a race for new legal rules to host, for example, digital assets, ICOs and smart contracts. There have also been similar first proposals to provide rules for 'decentralised autonomous organisations' ('DAOs') in Germany. Möslein argued that the supply-side would likely develop on a two-tiered supply trajectory in which law and code are meshed, rather than outright competition between national law and technology. In an ideal theoretical scenario, 'crypto-friendly' jurisdictions would provide legal certainty, enable fully compliant DAOs (without limiting freedom to organise) and give DAOs access to legal protection (without reducing the effectiveness of claim enforcement). This potentially has global scope, and consideration ought not be confined to the territory of individual jurisdictions. Möslein concluded by acknowledging that both the supply-side incentives and the demand-side interests for national jurisdictions are similar to those in the conventional corporate law regulatory competition debate. However, the duplication of rule providers on the supply side – i.e., national jurisdictions and digital platforms – leads to additional challenges and different dynamics in comparison to conventional regulatory competition. Möslein closed by stating that 'triangular competition' – with two types of actors on the supply-side – is likely to result in a 'race to the blockchain' with crypto-friendly jurisdictions taking a leading, or otherwise dominant, position.

TECHNOLOGY AND INSOLVENCY

Dr Felix Steffek (Faculty of Law, Cambridge University) rounded out the conference with the thematic category of 'technology and insolvency'. His presentation – *Technology and Financial Distress: The End of Corporate Insolvency Law?* – considered the problem of insolvency costs and potential new technological solutions and their associated challenges. Steffek first outlined the direct and indirect costs of insolvency and the underlying causes. Insolvency costs arise due to both coordination and valuation deficits. For example, in a restructuring it is challenging to ex ante establish an accurate estimation of payouts, and different actors will reach equally legitimate, oftentimes conflicting, conclusions. Steffek proceeded to then discuss the existing range of solutions. Representation by an insolvency practitioner and majority decisions replacing unanimity are two current solutions to the coordination costs problem, but each 'solution' has its own associated costs. Some firms and creditors enter into creditor agreements whereby the parties attempt to develop an ex ante protocol for future financial distress; but, again, there are costs associated with negotiating such agreements and they are only efficient for specific firms (in particular larger enterprises). With respect to valuation, ex ante solutions include opting for complex financial structures, which allow creditors to maximise their perceived recoveries. In an ex post context, restructurings, in which investors receive non-cash entitlements, allow parties to continue to 'agree to disagree'

Steffek argued that technology could potentially advance many cost-minimisation solutions in the realm of insolvency. From the perspective of lessening coordination costs, Steffek outlined a number of possible ex ante technological solutions – e.g., (i) digitisation in the general sense which makes contracting cheaper; and (ii) smart contracts and blockchain which could reduce enforcement costs because third-party contract enforcers would no longer be required. In terms of reducing valuation deficits, Steffek suggested that (i) digitisation could facilitate auctions and (ii) AI products (similar to the ones already facilitating litigation funding) could accurately value claims. Overall, as the technology develops and becomes more industry-specific, the insolvency proceedings of today could be replaced by the technological contractual solutions of tomorrow. Allied to this, Steffek posited that, with further technological advancements, commentators' previously proposed solutions could become a reality. Three examples were provided. First, a regime in which each investor – from lowest to highest rank – would have a right to purchase the entire firm.[16] Second, ex ante firm-creditor contracts to plan for later financial distress.[17] Third, the replacement of insolvency proceedings with auctions.[18]

Whilst Steffek thought that technology could help to facilitate these (and other) solutions – thereby lowering investors' coordination and valuation deficits – technology also might create new challenges and negative externalities. In particular, the costs of administering blockchain-based smart contracts would have to be compared with the costs the technology would be attempting to reduce. Moreover, asymmetric information issues could arise, where different actors might have unequal access to superior AI products to value claims. This could widen the gap between strongly and weakly adjusting creditors (a conceivable solution for this is something analogous to consumer-protection law for weakly or non-adjusting creditors).

The key 'takeaway' from Steffek's presentation was that there could (potentially) be a general move from ex post to ex ante insolvency arrangements: rather than waiting until insolvency occurs, technology will allow creditors and firms to pre-plan. However, there may be conceptual and practical limits to ex ante insolvency planning, and some creditors may wish to retain the possibility of ex post discretion (similar to majority lenders in syndicated loans). Steffek concluded by also pointing out that the future may be a 'mixed bag': some firms may find that privatising insolvency through the use of relevant technologies works, whereas other firms will not.

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[16] Lucien Arye Bebchuk, 'A new approach to corporate reorganizations' 101(4) Harvard Law Review (1988) 775.
[17] Alan Schwartz, 'A Contract Theory Approach to Business Bankruptcy' 107(6) Yale Law Journal (1998) 1807.
[18] Douglas G Baird and Robert K Rasmussen, 'The End of Bankruptcy' 55(3) Stanford Law Review (2002) 751.

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