Technology in Finance, Law and Regulation
London School of Economics and Political Science
Conference Report

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On 16 May 2019 the Systemic Risk Centre at the London School of Economics hosted a conference entitled, 'Technology in Law, Finance and Regulation'. The conference was funded by a grant awarded by the EPSRC.

Technology has been said to have the potential to fundamentally change the financial system. This claim has emerged after the financial crisis of 2008. It has now firmly established itself as a point of discussion and analysis in the fields of finance, law and regulation.

The aim of the conference was to take stock on the current thinking in relation to four key themes:

- Money
- Fintech (the use of technology for the provision of financial services)
- Regtech (the use of technology for the purposes of regulating the financial system)
- Artificial Intelligence

## 1 Money

**Francisco Rivadeneyra** spoke on accounts, tokens and e-money. A distinction needs to be drawn between account-based from token-based payment systems. At the moment payment systems are account-based. Retail customers have accounts with banks. These have accounts with a central bank. The central bank is not directly involved in assisting retail customers. New technologies such DLT and mobile computing have not significantly changed the established wisdom that central banks should not offer accounts to the public.

These technologies have, however, effected the trade-offs in relation to the provision of token-based systems by central banks. In such a system the central bank would issue tokens. Transfers would occur following a verification process. The collapse of Mt Gox and other cryptocurrency exchanges has shown that policy intervention is required to address liability for security breaches in token-based systems. There exists a trade-off between the security and convenience of such a system.

The new technologies might allow central banks or regulators to increase the competition in the market for payments services at the wholesale and retail levels. By offering a token-based system to a wider set of participants, which could include individuals but most likely new financial firms, central banks could increase competition and spur innovation. Although this could have been done before by opening the high-value payments systems to non-traditional

financial institutions, the new technologies make access of alternative service providers to the central bank a real possibility.

The paper is available from https://www.bankofcanada.ca/2018/12/staff-working-paper-2018-58/

**Priscilla Toffano** spoke on a potential use case for distributed ledger system in settling cross-border payments between Israel and the West Bank.

At present payments between the two regions are settled through correspondence banking. Recent years have seen an increased focus on rules designed to prevent money laundering and terrorist financing. The participants of the current system are very concerned to comply with these and have found it difficult to continue their involvement in correspondence banking.

Distributed ledger technology could be used as a basis for a new system for the settlement of payments between Israel and the West Bank. The system would consist of a private permissioned ledger, owned and supervised by the Palestine Monetary Authority and the Bank of Israel, where some Israeli and Palestinian banks could clear and settle payments with a central bank issued digital currency (e-shekel). A consensus mechanism would be designed in a way that reflects the level of trust the respective participants are comfortable with. Strong AML/CFT controls would have to be in place. This new payment system would provide the following direct advantages over correspondence banking: reduction of any single point of failure, higher speed and lower cost of transactions, elimination of credit risk, better supervision and auditing of transactions, reduction of physical barriers to transactions and increase in some banks' profitability.

The paper is available from http://eprints.lse.ac.uk/100470/3/E_Shekels_Across_Borders.pdf

**David Fox** spoke about cryptocurrencies in the common law of property. A crypto-coin is a piece of electronic information. It is both identifiable and exclusive, and so lends itself well to a property regime. The common law will adapt to accommodate cryptocurrencies and it is possible to conclude that they are property and subject to the private law of money.

The paper is available from David Fox, 'Cryptocurrencies in the Common Law of Property' ch 6 in David Fox and Sarah Green (eds), *Cryptocurrencies in Public and Private Law* (OUP 2019).

**Matteo Solinas** examined the use of online wallets for crypto-assets, highlighting the distance between the conventional perception of ownership rights over bitcoins and the developments in market practice. The reality today is that bitcoins are held and traded on exchanges on terms inconsistent with the original techno-utopian belief that trust in a central authority could be replaced with trust in computer code and mathematics. The inquiry focused on the legal characterisation, challenges and risks posed by the intermediation of bitcoin exchanges.

The paper is available from: Matteo Solinas "Bitcoiners in Wonderland: lessons from the Cheshire Cat" (2019) Lloyd's Maritime and Commercial Law Quarterly (forthcoming August 2019)

## 2   Fintech

**Philipp Paech** spoke on regulatory obstacles to financial innovation – the view from the EU. Regulation needs to strike a balance between safety and efficiency. There are similarities between the risks associated with incumbent and new technologies. It may be necessary to clarify how existing rules apply in a new technological environment, but similar activity and similar risk should be regulated in the same way. New risks arise in relation to data protection and 'intransparent' decision-making.

Philipp Paech is the chair of the European Expert Group advising the Commission on Regulatory Obstacles to Financial Innovation. More information on the work of the group is available from http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3586&news=1

**Iris Chiu** spoke on the regulation of tokens – opportunities and risks. Different jurisdictions have adopted different approaches to the regulation of cryptocurrencies. China has banned them. Thailand facilitates them. The US has adopted a mixed model with standardised registration requirements and compliance for cryptocurrency firms emerging. Tokenisation raises not only question for financial regulation but broader questions regarding new forms of economic organisations and their developmental needs. There is a need for an integrated holistic agenda and regulatory policy to promote innovation for economic development and mobilization. This also means building frameworks to facilitate economic and commercial activity while providing governance and order, counterbalanced against disruptive risks that self-regulation may bring.

**Anna Donovan** spoke about smart contracts: risks, rewards and regulation. Smart contracts are a set of promises specified in digital form, including protocols within which the parties perform on those promises. They provide for a way to coordinate human activity and bring increased reliability and speed to the system. Applications include initial coin offerings, decentralised autonomous organisations, asset control functions, identity certification and ownership certification and registration.  Whilst the technology offers significant benefits, stakeholders (including policy makers) need to be aware of potential challenges and mindful of misleading narratives.  As such, knowledge of technical detail is key in order to evaluate risk and provide certainty from the perspective of consumers and other stakeholders.

**Dirk Zetzsche** spoke about FinTech, financial inclusion and sustainable finance. He argued that financial inclusion is necessary for sustainable development. FinTech is a key driver for

financial inclusion, hence FinTech can support the United Nation Sustainable Development Goals. A progressive approach is required for the full potential of FinTech to be realised. This approach should focus on four pillars. The first pillar requires the building of digital identity and simplified account opening and e-KYC systems. This should be supported by the second pillar of open interoperable electronic payments systems. The third pillar involves using the infrastructure of the first and second to underpin electronic provision of government services and payments. The fourth pillar – digital financial markets and systems – supports broader access to finance and investment. Implementing the four pillars is a major journey, but one with tremendous potential to transform financial inclusion and sustainable growth.

The paper is available from Ross P Buckley, Douglas W Arner and Dirk A Zetzsche, 'Sustainability, Fintech and Financial Inclusion' www.ssrn.com/abstract=3387359

## 3   RegTech

**Tomaso Aste** gave his view on the future of regulatory technology. He spoke about the use of distributed ledger technology for regulation and compliance. Technology is crucial to financial regulation at a time when services industry is increasingly automated and regulation can no longer be done manually. He highlighted the powerful tool of use of data for analytics that can be used by businesses and individuals. Artificial intelligence can provide automation of cognitive processes and therefore permeate in the services industry. Issues such as to privacy, biases, concentration, consistency and consensus are becoming of pivotal importance for regulators as well as industry and individuals. An example of automated credit scoring via artificial intelligence for peer to peer lending was presented.

References are available from
https://scholar.google.co.uk/citations?user=27pUbTUAAAAJ&hl=en.

**Jonathan Liebeneau** spoke about experiments in regulatory technologies. He analysed the example of DRR (Digital Regulatory Reporting) where the Financial Conduct Authority and the Bank of England are co-operating with regulated entities to experiment with ways of automating regulatory reporting. These experiments have shown that the technology is difficult to scale and that natural language programming is still at an early stage. Significant differences in data standards make the development of a standard model difficult. There are also questions in relation to the economic viability of an automated reporting system. The experiments have, nevertheless, shown a new way of collaboration between regulators and regulated entities where regulators together with regulated entities co-operate at an experimental operational level.

**Eva Micheler** spoke about regulatory technology from a legal perspective. She identified three forms of RegTech: DLT-inspired sharing of information with smart contracts harvesting data and transforming natural language, the use of natural language processing for the creation of regulatory technology and the use of machine learning for the analysis of risk. RegTech has been credited with many advantages. The programming of regulatory technology is not just an exercise in computer science. Creating regulatory technology

involves policy choices. Questions of democratic legitimacy and regulatory accountability arise. Those creating regulatory technology occupy a position similar to rating agencies and auditors. They should receive similar levels of oversight. Finally, regulatory technology is no reason to have more faith in the ability of regulated entities to align their business models with the public interest. There may be good reasons to reduce regulatory oversight. Technology is however no reason do so.

The paper is available from http://eprints.lse.ac.uk/89550/1/Micheler%20SSRN-id3210962.pdf

# 4   Artificial Intelligence

**Andrew Murray** spoke about artificial intelligence and the law. At present machine learning is used for pattern recognition in data using outcomes of initial learning process. It can be used in the legal sector for the analysis of contracts, for predictive analytics and in the form natural language processing. Limitations arise in the form of contextual errors and built-in bias. He also presented the calls for ethical guidelines for AI and warned that ethics have the potential to be used to escape from regulation. Companies often use ethics in order to side-line regulation. This is particularly substantial in the light of data protection and we may need to go beyond the data protection framework. He suggested that lawyers should be more robust with regards to regulation of AI and cannot allow the ethical debate to resist the regulatory debate.

For more see: https://www.youtube.com/watch?v=FsqEcEQ4e14

**Jon Danielsson** spoke about artificial intelligence, financial risk management and systemic risk. Computers have beaten human players at chess, GO and at computer games. But AI is unable to reason with things it has not seen and cannot apply experiences from one domain to another. It hence cannot understand a global problem in which a local issue is embedded. Systemic vulnerabilities tend to happen on the boundaries of areas of responsibilities and a machine cannot be trained on events that have not happened yet in a system that is endogenously complex. Further, he outlined problems of standardisation from a systemic perspective. Systemic increases when regulated entities operate similar business models. Standardisations reduces short-term volatility, may lead to long term stability but increases the risk of extreme shocks.

The paper is available from http://www.systemicrisk.ac.uk/publications/opinion-pieces/artificial-intelligence-and-stability-markets