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Fintech and Market Infrastructure

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In 2009, Bitcoin, the virtual currency, made global headlines. Speculation followed, and in fact continues unabated, about the ways in which the technology underpinning Bitcoin, i.e., blockchain, would revolutionise the financial markets. Two divergent points of view were quickly articulated: first, that blockchain and tokens like bitcoin represent an exciting future in which payments, capital markets transactions and other common market activities are revolutionised, decentralised, and democratised. The second narrative was more cautionary, focusing on the higher potential for crime, money laundering and tax evasion offered by the decentralised nature of blockchain networks and its anonymous users.

In reality, neither point of view has been substantiated fully.

While the potential of blockchain to transform the financial services landscape is recognised commonly, it is yet to be realised. Meanwhile, although anonymous tokens can be used for illicit activity, the overall impact of bitcoin and other so-called cryptocurrencies on money laundering and other crimes remains small. Crypto compliance software firm Elliptic estimates that, as of 2019, only 0.5% of all bitcoin transactions take place on the dark web.

No aspect of financial services demonstrates the dichotomy presented by these technological advances as well as the vast technological platforms and pipelines that are used for large-scale financial trading. Institutions like stock exchanges, clearing houses, settlement systems and securities depositories are commonly and collectively known as "financial markets infrastructure" ("**FMI**"). They are responsible for providing support to essential market activities like payments, securities trades, and derivatives deals. These behemoths that provide a conduit for trillions of dollars-worth of financial transactions around the world have the potential to revolutionise their operations by means of the new technologies. But if it all goes wrong, they also have the potential to expose the world to financial scandals and crises on an unprecedented scale.

In these remarks, I will explore the potential of blockchain technology to revolutionise the architecture of the financial markets and I will examine some of the legal and regulatory challenges that will entail.

Blockchain is a specific application of a technology known as Distributed Ledger Technology ("**DLT**")—a virtual system that relies on peer-to-peer networking, distributed data storage, and cryptography. The technology records transactions with an immutable cryptographic signature called a hash. (A hash is like a one-way algorithm which encodes a message in an output of pre-determined and unvarying size). Non-technical commentators usually prefer to focus on the "distributed" and the "ledger" aspects of DLT because these describe its revolutionary benefits. DLT allows different participants in geographically unconnected locations to view and update a record simultaneously. This means that an immutable and trustworthy record of, say, a transaction can be produced, updated, and maintained without the need for a central entity.

Although bitcoin was the first well-known, ground-breaking DLT application, involving the issue of a virtual currency on the blockchain, DLT can be used to process information without the production of coins--or tokens, as they are now more commonly called.

Similarly, tokens or coins can be produced by an electronic network without employing all the features of DLT.

DLT arrangements have the potential to facilitate certain FMI processes in ways that are less expensive and possibly more resilient than the existing highly centralised processes. Efficiencies are presumed to be achievable because the process of transmitting, reconciling, and confirming orders for payment or for financial instruments can be either eliminated or condensed and can occur without the aid of financial intermediaries that provide services under the existing systems. As a result, benefits can be expected particularly for complex, labour-sharing processes.

While DLT systems offer significant opportunities for trading venues, clearing houses and settlement agents simply as distributed networks of information, it is in combination with other technological features and protocols that they promise the most radical innovation. One advantage of DLT is that it permits the automation of transactions via so-called "smart contracts", i.e. protocols or code that self-execute when certain conditions are met. For example, smart contracts can be used to execute agreements between two parties without the customary need for third-party validation, such as trading in over-the-counter derivatives, and for the execution of contracts when the triggering event can be measured digitally—such as digital payments, changes in public registries and weather information published by an official source[1]

Another feature which is likely to introduce significant changes where FMI is concerned, is "real world tokenisation" or the issuance of tokens representing real world money and real-world assets. Using tokens in place of pounds, dollars and euros is a development which is already being implemented in various projects such as the Canadian CAD-Coin, or Canadian Dollar Coin, project, with the support of the Canadian central bank.

Using tokens in place of traditionally-issued bonds and shares is also the subject of a number of pilot schemes but faces greater practical limitations and challenges. Nevertheless, incumbent financial institutions as well as new entrants are investing heavily in the pilot schemes and projects seeking to transform securities into digital tokens. The current transaction costs of trade processing act as a significant incentive. The most exciting opportunity afforded by virtual financial instruments is that the settlement cycle—which is the time taken actually to deliver shares and other securities which have been purchased in the market, currently standing at 1-3 days--might be wholly eliminated with wallet-to-wallet transfers of virtual assets.

Radical innovation is only possible in the markets if there is a robust legal and regulatory framework to support transition. History is littered with examples of crises--small and large--caused by situations in which financial markets' practice outstripped the ability of law and regulation to keep pace. So, I am excited by this opportunity to enumerate some of the issues that face financial innovation today that require expert legal thinking. I hope that I can recruit a few better legal brains to the task of securing more reliable and cost-efficient markets in the future.

The first such issue is the question of legal classification. Sooner or later, legal systems will be required to answer questions regarding the legal—as well as the regulatory—classification of tokens. The questions may arise in the context of civil litigation about entitlements, or they may arise because identifying the legal nature of tokens can be an important part of determining the regulatory perimeter. The questions will likely be answered on a token-by-token basis. They include but are not limited to:

[1] C Clack, V Bakshi and Lee Braine, *Smart Contract Templates: foundations, design landscape and research directions* , (4 August 2016), available at https://arxiv.org/pdf/1608.00771.pdf

1. whether the token is constitutive of rights and obligations (for example, when it offers property rights) and when its use is merely evidentiary (in the same way as other systems of books and records wherein those books and records do not amount to regulated instruments).
2. whether the token is thing which can be vindicated merely by possession or one which must be enforced as a claim against the permissioning or validating entity; and
3. whether the token is a "thing" at all or merely reflects a licence, for the time being, to use a particular platform in a certain way.

At the heart of these issues is the question of how to allocate this new technology to the traditional categories of property and personal rights developed by the common law.

If tokens do not represent property but merely a licence afforded by a platform operator, it is unlikely that they are robust enough to make any kind of substitute for real world money or assets in the financial markets. So that is the first crucial question that the law must answer in the case of real-world tokenisation.

Another question of classification is whether payment tokens can qualify as "money". In the common law, this uncertainty partly manifests as a concern about whether tokens are a "Chose in action", i.e., a claim against a person; a "chose in possession", i.e. a thing which can be physically possessed; or whether they confer on the bearer the same rights as the strange hybrid category of negotiable instruments. It is unclear whether tokens fall into one or other of the categories but the question whether payment tokens qualify as money and how they behave, for example, when stolen are clearly very important in a financial markets' context.

Another large area of legal uncertainty arising in the context of DLT, and tokens concerns conflict of laws considerations. As many of you will know, the private international law rules for determining legal questions about property often refer to the location of the property in question. The concept of a single location or situs for an asset, however, is difficult to apply in the case of DLT systems and tokens--first, because they are intangible, second, because they are digitised and, third, because they are constituted on a distributed network which may span several different countries.

Another arena for debate among lawyers is the application of the existing regulatory rulebook for financial markets to these new processes and applications. EU legislation applying to financial markets infrastructure--which the UK has onshored as domestic legislation post-Brexit--is said to be "technology neutral". This means that the legislation does not mandate market participants to use a particular type of technology. Maintaining "technological neutrality" is an express policy of both the E.U. Commission and the U.K. government. The policy is, however, difficult to apply with regards to the legislative measures which specifically concern FMI all of which contemplate an existing market infrastructure, in which activities such as clearing and settlement and actors such as intermediaries play a key role. These texts use concepts which reflect the traditional market infrastructure, such as "central securities depository", "securities...in book-entry form", "transfer order" or "securities account", most, if not all, of which cannot readily be applied to a DLT context.

Other pieces of legislation which may apply to infrastructure providers are explicitly not "technology neutral". One example is anti-money laundering legislation. The EU has recently established new anti-money laundering requirements for cryptoasset exchanges and custodian wallet providers, but the definitions used by the legislators to identify these actors are already arguably out of date. This demonstrates some of the difficulties with regulating DLT arrangements and tokens in the fast-moving landscape of financial technology.

A final area in which legal expertise will be particularly relevant in future, is the potentially vast array of privacy concerns that will arise once large-scale data sharing on distributed networks becomes the norm. Many DLT systems allow anonymous participation but it is in the nature of a distributed ledger that everyone is registered, and everything is not only recorded but shared. Financial transaction data is in

many cases data that relates to a particular individual and thus falls within the concept of "personal data" for legal purposes.

In addition to concerns about personal information pertaining to end users and retail customers, questions remain about how different data protection laws will treat direct participants in the DLT system and nodes on a DLT platform.

In conclusion…

The potential impact of DLT technology remains unknown. Despite claims of "technological neutrality" existing regulation presents a key constraint to the wholesale incorporation of DLT technology in financial markets activities and legal uncertainty about rules and classification threaten to undermine trust in new processes as they emerge. Nevertheless, the opportunities for making markets more efficient, fair, and cost-effective that innovation affords means that society will continue to push at the door marked "Fintech" for the foreseeable future. Our job as lawyers is to see that, when the door finally opens, the path ahead is paved with robust legal steppingstones.