

# Blocking the blockchain

## Should regulations be extended to cover shared-ledger technology or is a new, bespoke regime a better option?

In 2013, the British media reported the story of an IT consultant who, against his better instincts, had thrown away an old computer hard drive. He told reporters that, as he discarded it, he had a vague sense that it might have had something important on it. It was only when he saw that a new form of virtual currency called Bitcoin was trading on a Japanese exchange for over \$1,000 each that he remembered the hard drive held a digital wallet, containing 7,500 Bitcoins that he had mined (at no cost other than the expenditure of a little computing power) in 2009. That old piece of computer hardware, which had been languishing in a desk draw for years and was now buried in a Welsh landfill site, was worth well over \$7.5 million.

This story captured the public imagination and was probably the first time, in the UK at least, that the concept of virtual currencies entered the public consciousness. Bitcoin has not – as some of the more fanciful reports suggested – replaced existing national currencies. Nevertheless, in the three years since that hard disk was discarded, entrepreneurs, financial institutions and now central banks and financial regulators have recognised that virtual currencies and, even more so, the distributed ledger technology – or blockchain – that makes them possible have the potential to revolutionise the world of finance.

The significant developments in European financial regulation over recent years do not contemplate the emergence of blockchain-style technology. Instead, regulators have rearmed themselves to fight the last war. Financial regulation, consequently, risks either impeding the development and deployment of blockchain technology in the financial markets, or being circumvented altogether and becoming unfit to prevent or address the next financial crisis.

### A natural progression

Bitcoin is generally understood and described as a virtual currency, which suggests both that it is intangible and

futuristic. However, it might be better understood as a return to the very earliest days of money in that it is really no more than a valuable commodity, which can be exchanged for a good or service.

Human commerce has evolved over the past millennia from direct bartering (swapping one good or service for another), through indirect bartering or exchange (swapping for a scarce and valuable intermediate commodity which could then in turn be exchanged for a good or service); to standardised coinage (where metal coins with an inherent value could be exchanged for goods or services); and finally to fiat money, which is not backed by any physical commodity and which has no inherent value other than that it having been declared by a government to be legal tender. Today the overwhelming majority of fiat money is not represented by metal coins or even paper banknotes, but is no more than electronic entries on banks' ledgers. Banks or other payment service providers are therefore necessary to intermediate payments by debiting book entries on one account and crediting another. Vitally, these intermediaries are also trusted to ensure that a credit on a ledger cannot be debited more than once, thereby preventing money from being double-spent.

Bitcoin, along with other virtual currencies, are simply a means of indirect exchange and in that sense resemble the shells, obsidian, gold or other commodities used for indirect bartering many years ago. Bitcoin is valued by its users as a medium of exchange because it is scarce, and because it can only be spent once. It is scarce because the computer protocol that created the currency governs both the rate at which it is produced and the total number that can ever be produced. The principal breakthrough of Bitcoin, however, was the use of cryptographic technology to ensure that no coin can be transferred by its owner more than once. If the Bitcoin was simply a piece of computer code sitting on a hard drive, it could be

sent by its owner to multiple recipients thereby immediately diminishing both its value and utility. Instead, attached to each Bitcoin is a record of each instance in which it has been transferred. Anybody can use Bitcoin software to look at this record – the blockchain – and to verify that the person transferring a coin to them actually possesses that coin and has not previously transferred it to somebody else.

Distributed ledger technology therefore allows a valuable economic commodity to be stored electronically, and transferred without the intermediation of a bank or other third party. Just as a nugget of gold can only be exchanged for a good or service once, blockchain technology ensures that a person holding a Bitcoin can only transfer it once without having to rely on a third party intermediary – such as a bank – to guarantee that this is the case.

There is no reason why this technology could not be used to create code that documents and represents the obligations of the issuer, and which could then be exchanged and transferred electronically. For example, the blockchain could be used to create bits of code that had the characteristics of shares, bonds (and particularly bearer bonds) or financial derivatives.

### Regulatory catch-up

Blockchain technology remains in its infancy, but financial institutions, financial regulators and central banks are beginning to recognise the technology's possible implications for the financial markets. In a paper published in 2014 the Bank of England acknowledged that:

‘The majority of financial assets – such as loans, bonds, stocks and derivatives – now exist only in electronic form, meaning that the financial system itself is already simply a set of digital records. These records are currently held in a tiered structure (that is, with records of individuals' accounts stored centrally at their bank, and banks' reserves accounts held centrally at the central bank), but it may be possible in the future – in theory, at least – for the existing infrastructure of the financial system to be gradually replaced by a variety of distributed [ledger] systems.’

The European Securities and Markets Authority (Esma) has also demonstrated an awareness of the technology by issuing a call for evidence in 2015 that shares its analysis of the potential benefits and risks of blockchain technology for investors, and sought further information from market participants. Esma recognised the

development of a market for traditional investment products, including investment funds and derivatives, which have virtual currency as an underlying. Investors who seek to participate in the performance in the virtual currency market without actually holding the currency themselves are able to do so through these products. They have the same risks as any other investment product, including market, counterparty, liquidity, fraud, legal and operational risks. Esma noted, without comment, that while some of these funds and the exchanges offering virtual currency derivatives had sought regulatory approval others had not.

Esma also recognised that blockchain technology could be used to buy, sell and own financial assets, meaning:

‘essentially that no third party like a regulated exchange, broker, central securities depository, custodian etc intermediates between the shareholder and the issuer of the security.’

Cutting out the middlemen in this way has obvious implications for the speed and cost of financial transactions. Rather than being settled over the course of two or three days and incurring brokerage, clearing and custody fees, they can be executed and settled in a matter of seconds or minutes at negligible cost.

It is reassuring that central banks and financial regulators are aware of, and at least considering the implications of blockchain technology. But it must be of concern that they do not appear – in public at least – to have considered the extent to which existing and planned financial legislation is suitable for regulating financial transactions that use the technology.

Following the 2008 financial crisis, the EU introduced a series of legislative measures which were intended to address the failings of the financial regulatory system. A particular concern was the need to introduce greater transparency into the equity, and especially financial derivative markets, to make it easier for regulators to identify the accumulation of systemic risk and the ‘complex web of interdependence’ between market participants.

The revised Markets in Financial Instruments Directive (Mifid II) establishes a regulatory framework for multilateral systems in which multiple buying and selling interests can interact in a way that results in binding contracts (securities exchanges). It defines organisational rules and functional requirements with which each of those exchanges must comply. Mifid II also requires, with only very limited exceptions,

any EU regulated financial institution to trade only shares (or equity-like instruments) that have been admitted to trading on an exchange subject to EU or any equivalent third country regulation only on a regulated exchange (effectively prohibiting over-the-counter (OTC) transactions).

Similarly, certain EU-domiciled counterparties (in general terms, regulated financial institutions and non-regulated entities with very large derivative exposures) are required to trade standardised forms of derivatives only on a regulated market. To the extent that an EU counterparty is permitted to trade a derivative OTC (because it is not a standardised derivative subject to the trading obligation), the European Markets and Infrastructure Regulation (Emir)

watch the flow of transactions recorded on the ledger, and to understand the risk within it (even if it may not necessarily be possible to identify exactly who is transacting with each other). It would not be necessary for these transactions to be cleared (therefore avoiding inadvertently accumulating risk in a central counterparty). If the Emir clearing obligation were applied to blockchain derivatives, the advantages of the technology – speed, cost, transparency – would be immediately cancelled out. If blockchain derivatives are somehow considered out of the scope of the Emir clearing obligation, it is entirely possible that a significant portion of the market would move to blockchain transactions and the regulation itself would become redundant.

## Regulators do not appear to have considered the extent to which existing legislation is suitable for regulating transactions using blockchain

requires the counterparty to ensure the transaction is reported to a trade depository and cleared through a central clearing counterparty.

The Bank of England, Esma and many others, have foreseen that companies might issue blockchain shares or bonds. It is likely that such blockchain securities could be offered either on a private placement basis or even to the public in a way that is consistent with existing company and contractual law. However, it may be possible for a secondary market in those blockchain securities to develop which – by using the distributed ledger to facilitate and record transactions – avoids the need to list on a formal exchange and thus entirely circumvents the principal elements of Mifid II.

In the derivatives context, it is not difficult to imagine blockchain technology being used to develop so-called smart contracts, which replicate the features of financial derivatives. It is even possible that such contracts could automatically settle obligations between parties when due, and impose agreed penalties on any party who failed to uphold their side of the bargain. The public nature of the distributed ledger attached to the contracts would increase transparency by allowing any market participant or regulator to

It has recently been reported that a group of financial institutions have successfully conducted transactions in prototype blockchain securities. The market is incentivised to, and rapidly is, developing financial blockchain technology. It is welcome that the Bank of England, Esma and other regulators have recognised this development, but they must now also recognise that technology is greatly outpacing the rulebook. Regulators should urgently consider whether they are actually able to require blockchain financial transactions to be conducted in accordance with the requirements of existing legislation such as Mifid II and Emir, and whether this would provide sufficient investor and economic stability protection to justify the potential inhibition of the benefits of blockchain technology. It’s possible that a better option would be for regulators to develop a bespoke regime designed to facilitate the development of an advanced blockchain-based financial economy, while maintaining their regulatory objectives.

Creating a bespoke regime would no doubt be difficult, but no more so than trying to find a discarded hard drive in a landfill.

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