

## **Digital currency: is blockchain the future of finance for start-ups?**

**By Susan Rosser (Partner) and Chris Roberts (Senior Associate) of Mayer Brown International LLP**

Digital currency and blockchain technology are capturing the imagination of the financial services industry. A recent report by Santander<sup>1</sup> concluded that blockchain technology has the potential to reduce banks' infrastructure costs by \$15-20 billion per annum by 2022.<sup>2</sup> It is not surprising then that financial services companies, from start-ups to household names, are investigating how they can harness this new technology.

### **Blockchain**

A blockchain is an electronic ledger of transactions, recorded as blocks of data in a chain, built up using mathematical algorithms. Each block of data records a separate transaction and the chain can go back to the first ever transaction. A blockchain ledger can be restricted to a private network of users or it could be made available publicly. To add a new transaction to the ledger, participants in the network must verify the transaction. Blockchain was originally designed to be fully peer-to-peer: thus historically every participant in the network has access to and visibility of the whole of the blockchain ledger and can thus see all the transactions previously made using it.

Because blockchain technology offers a platform for users to transact directly rather than through a traditional clearing system, it can potentially reduce settlement time and clearing fees. It also offers security because the blockchain cannot be altered except by a consensus of users of the network. However, for the same reason, visibility of transactions to all participants creates concerns about privacy, although user identities may be encrypted.

### **Bitcoin**

Bitcoin is the best known (some might say notorious) and most widely used digital currency which works with blockchain technology. Each "coin" is just an entry in the blockchain ledger. However, there are a number of limitations on the expansion of bitcoin as a payment mechanism. The number of bitcoins that can be created is finite: the code behind bitcoin is designed to produce only 21 million bitcoins and as time goes on each bitcoin becomes

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<sup>1</sup> "Fintech 2.0" by Santander Innoventures, 2015.

<sup>2</sup> See page 15 of the report.

increasingly more difficult to produce. Further, the speed at which bitcoin transactions can be processed remains slow compared with today's mainstream payment technology, at only seven transactions per second compared with thousands of transactions per second on the Visa platform.

There is also the problem of how to convert bitcoin to regular currencies, assuming we live in a world where this is still how the majority of people are paid. To do this you effectively need an intermediary. Exchange rates are far from stable and conversion of digital currency to real-world currency is also an area where there is potential for cyber fraud. Thus two advantages of blockchain technology – security and not requiring an intermediary to process the transactions – are lost in the currency conversion process.

## **RSCoin**

The latest development in blockchain technology is RSCoin, a digital currency developed by the Bank of England in conjunction with University College London. The key difference between RSCoin and other digital currencies is that the ledger is centralised rather than being controlled by and visible to participants. This means that transactions can remain private as between the parties to the transaction and the entity holding the ledger. This would require the party with the ledger to be trusted to maintain confidentiality, as is currently the case with banks and other financial institutions.

In theory a system such as RSCoin could allow all customers to record transactions directly with the central bank, making the role of traditional clearing houses redundant. However, there are many obstacles to the success of such a blockchain payment system, including the question of whether the public will trust in a purely electronic currency. An alternative view is that by demonstrating blockchain technology can be used with a centralised ledger, RSCoin can be seen as a potential method of 'mapping' blockchain technology onto the current framework for financial transactions. In this scenario the current customer interface could remain but financial institutions would use blockchain technology for their customers to transact directly, rendering these transactions faster, cheaper and more secure.

It seems more likely than not that blockchain technology in some form will be adopted by the financial services industry and become incorporated in mainstream payment systems in the near future. However, it is unclear at this stage who would be liable for any error in the way the transaction as reported by the customer to the bank was then recorded in the blockchain.

It is also unclear what recourse banks would have to other participants in a peer-to-peer blockchain network. These are the kind of issues that would have to be addressed before customers and regulators would have confidence in this new way of doing business.