



BANKING SECTOR, DISRUPTIVE TECHNOLOGY AND THE BLOCK CHAIN

Dr. W A Wijewardena

Former Deputy Governor
Central Bank of Sri Lanka

Mankind has progressed by shedding old methods and adopting new ones¹. When these new methods – also called new technologies – disrupt the way in which people had been doing their chores, they are known as disruptive technologies. Since they destroy the old methods, the Austrian-American economist Joseph Schumpeter called them ‘creative destructions’², a necessity if a society seeks to move forward. A cruel irony about disruptive technologies is that they distribute rewards and punishments objectively to winners and losers, respectively. Thus, winners survive and succeed; losers fail and perish. Hence, what entrepreneurs fear most is the possibility of a disruptive technology emerging and displacing them from business. This fear is equally relevant to bankers as well.

The blockchain that was developed as a digital ledger sheet to record transactions relating to the cryptocurrency, Bitcoin, has been one such disruptive technology³. It was developed to facilitate peer to peer transactions of Bitcoins without the use of a central authority like a bank, but still ensuring safety, accuracy and disclosure to those involved in the transaction. This is completely different from the way in which banks have been effecting such transactions among different parties. Banks, though they use the modern high technology available to them for providing such financial services, have to function as a central authority guaranteeing the transaction to relevant parties at a fee. In contrast, blockchain does not involve payment of a fee; it is effected by the parties concerned directly by using the Internet facilities. Because of its superiority, it has now been recommended to governments for use in providing government services to citizens. A new blockchain, codenamed govchain has now been developed for this purpose. Govchain is simply a decentralized blockchain-backed platform for the public sector that allows to create forms and simplify procedures related with citizens and businesses⁴. As such, the application of blockchain technology in banking, financial service, government and so on is limitless.

Given the superiority of blockchain technology, it serves as a disruptive technology to bankers. This is specifically challenging to banks since the future customers of banks are tech-

¹See, for details how mankind progressed by adopting new methods, Yuval Noah Harari, (2011), Sapiens: A Brief History of Humankind, London: Vintage Books.

²Schumpeter, Joseph, (1950), Capitalism, Socialism and Democracy, 3rd Edition, New York: Harper Collins.

³Patrick Eha, Brian, (2017), How Money Got Free: Bitcoin and the Fight for the Future of Finance, London: One World.

⁴See: <http://www.hackathon.io/govchain> , Accessed on 18.10.2017.



savvy Generation 3 or 3.0 customers⁵. These customers demand that the bankers they deal with are equally tech-savvy or 3.0 bankers. If bankers are unable to deliver what they demand, there is nothing that would prevent them from moving to tech-savvy financial services. Since the modern world is a demand driven world, nothing can be done by banking regulators to halt a mass exodus of banking customers from traditional banking to tech-savvy modern financial services. Even some central banks like the Bank of England and Sweden's Svergis Riksbank are seriously considering to replicate the revolution which bitcoins and other cryptocurrencies have brought into the modern financial services landscape⁶. Positively noting the emerging crypto trend in financial services, IMF's Managing Director, Christine Lagarde, is reported to have warned that blockchain would be a massive disruption to the financial world and, to be on the trend, it also proposes to issue its own crypto coin by using blockchain technology⁷. At the same time, many leading banks like Citibank and Bank of America have proposed to introduce their own cryptocurrencies⁸. Hence, both cryptocurrencies and blockchain technology are to dictate terms to bankers in the future. They would deliver a massive disruption to traditional banking and it is wise for bankers to get ready for the eventuality not only for survival but also for success.

This paper will examine how the banking sector should change its strategies and business methods to cope with the emerging disruptive technology posed by the blockchain technology. In Part 1, it will discuss the blockchain, its history, its potential and weaknesses. In Part 2, it will analyse how the blockchain technology would affect the banking sector in the future. Part 3 will be devoted to a summary and conclusions.

Part 1

Blockchain, History, Operational Procedure and Potential Scope and Weaknesses

Governments have taken over the monopoly power of money issue of all nations today. It is not surprising because money issue generates a sizeable income for governments known to economists as 'seigniorage'⁹. Societies have given this power to governments in the hope that they use it responsibly without allowing the money they issue to lose in value. However,

⁵See, Wijewardena, W A (2014), 'The Changing Landscape of Retail Banking: Challenge Now-Adapt or Perish' in Reshaping Banking for Changing Times, Colombo: Association of Professional Bankers of Sri Lanka.

⁶See, for Bank of England, <http://www.telegraph.co.uk/business/2017/03/17/bank-england-trials-artificial-intelligence-blockchain-bid-stay/>; for Svergis Riksbank, <http://nordic.businessinsider.com/sweden-could-become-the-first-major-country-to-issue-a-national-digital-currency-2016-11/>; accessed on 18.10.2017.

⁷See, <https://www.cointelegraph.com/news/why-imf-wants-to-enter-crypto-market-with-its-own-coin>; accessed on 18.10.2017.

⁸See, for Citibank's move: <https://techcrunch.com/2015/07/07/citibank-is-working-on-its-own-digital-currency-citicoi/>; for Bank of America, <https://www.coindesk.com/bank-of-america-cryptocurrency-wire-transfer-patent/>; accessed on 18.10.2017.

⁹Seigniorage is derived from old French word 'seigneur' which means the Lord who has power to mint coins. See: <https://www.ecb.europa.eu/explainers/tell-me/html/seigniorage.en.html>; accessed on 19.10.2017.



it is this value which they have over the years caused to erode through irresponsible issue of money to society. This led Friedrich A Hayek to publicly condemn the governments for misusing their power and propose to withdraw that power and allow society to issue its own money in a competitive environment¹⁰. At that time, it was thought that it was only a pipe dream of an economist since it was incomprehensible that moneys could be issued by private parties without the guarantee from governments¹¹. With the advancement of information and communication technology and algorithmic applications, this myth was broken by a computer nerd or a group of nerds who chose to go by a pseudonym, Satoshi Nakamoto, by coming up with a blueprint for issuing a cryptocurrency called Bitcoin¹².

Nakamoto's system is complex but its operational mechanism is easy to understand. The purpose of the electronic cash system proposed was to allow online payments from one party to another without going through a financial institution. Hence, the costs to be incurred by parties involved by way of commissions or fees could be brought to zero. The payments would be authorised through a system of digital signatures. The need for having a banking institution to prevent 'double-spending' by the parties involved would be obviated by establishing a network system. So, the trust to be established by the presence of a financial institution would be built through a cryptographic proof.

Nakamoto has provided in his paper what later has become the fundamentals of the blockchain technology. Transactions are grouped into blocks and timestamped so that the verification of the payment becomes easy, double payment prevented through timestamping, peers are organised as networks avoiding third party intervention, and facilities are provided to combine or split payments¹³. An electronic coin, according to Nakamoto, is a chain of digital signatures. Each owner possesses two keys, a public key that can be seen by others and a private key known only to him, generated by the computer system. Coins are transferred by the present owner to another by signing a hash – an authentication that it is a genuine transfer from the previous owner – and the public key of the next owner, while simultaneously authorising the transfer by signing his private key. Bitcoins are stored in a digital wallet and the use of the public key and private key will enable the new owner to open his wallet and release the coins stored therein. Thus, there is a chain of all the transfers made and they are all connected through a node – a point at which two digital signatures meet. The new owner can verify the authenticity of the transfer by looking into the public keys of all the previous transfers.

This system is nothing but the digital reproduction of the manual or electronic systems presently practiced by financial institutions. In a financial institution, physical currencies are

¹⁰Hayek, Friedrich A, (1978), Denationalisation of Money, London: Hobart Paperback, No 70.

¹¹However, both in ancient India and Sri Lanka, coins have been issued by private parties in competition with those issued by kings. See, Kautilya, The Arthashastra, L N Rangarajan translation, 1987, Penguin Books and Osmund Boppearachchi and Rajah M Wickremasinghe, (1999), Ruhuna: An Ancient Civilisation Re-visited, Colombo: R M Wickremasinghe.

¹²Nakamoto, Satoshi, 'Bitcoin: A Peer to Peer Electronic Cash System, available at: <https://bitcoin.org/bitcoin.pdf> ; accessed on 18.10.2017.

¹³Ibid.



stored in a vault and the opening of the door of the vault is controlled by a dual key operating system. Unless both keys are inserted to the respective keyholes of the vault, the door cannot be opened. With respect to money balances recorded digitally in a computer server, two authorised officers have to use their passwords to activate the system to give effect to a money transfer. It is a control method so that a hacker who enters the computer system is prevented from authorising transfers without logging into the system with both passwords simultaneously. In a common internet or mobile telephone banking system, once a customer logs into his account with one password, any transaction need be validated through another password. The public and private keys built into the bitcoin validation system is nothing but a digital replication of what banks are presently doing. Similarly, in the case of a cheque with the crossing 'not negotiable', only good titles are transferred from one person to another. What it means is that a person presently holding a cheque cannot get a better title than the title held by the previous owner and if the title is defective, he too comes to own a defective title. In the case of Bitcoins, the verification of the authenticity of the previous transfers by logging into the public keys is a system that would validate only authorised transfers. The beauty of the system is that the two parties would know it instantly and can cancel the transfer if the previous ownership is defective. In the present case, such information has to be notified to the parties involved by their bankers. The delay or the negligence of the bankers in communicating the defect would make both transactors vulnerable to the risk of the theft of the moneys being transferred for goods already delivered or moneys already paid. In this sense, the instant online digital verification available to parties in a transaction is better than the third-party guarantee presently provided by financial institutions.

There is still a problem involving double-selling (also it can be multiple selling) as in the case of a bank which buys a bond or a security on behalf of a customer but sells it to another or many others without delivering or before delivering the security for which money has been paid by the customer. Such a practice amounts to fraud. Such multiple selling is common in the government securities market. A prospective investor in a government Treasury bond or a bill may request his or her primary dealer to buy a bond or a bill by paying its value in advance. The primary dealer may actually buy the bond or the bill but without delivering it to the owner may sell it to another person. Or, before delivering it to the correct owner may sell it in a REPO transaction and acquire temporary liquidity to do further business. In this latter case, the primary dealer takes advantage of the delay in recording the transaction in the name of the correct buyer of the bond or the bill. Both are frauds and have to be legally dealt with.

In the case of a digital currency, such double selling or even multiple selling can take place if the seller of the digital currency reverses the transaction before it is actually credited to the buyer. The buyer has already paid value for the digital currencies he has bought but no delivery of the purchase has taken place. The seller is now in a position to sell it to another party (double selling) or many other parties (multiple selling) and defraud all those involved in the chain. Since the computer system is unable to identify whether there had been previous sales, it would authorise all the subsequent sales having cancelled the one before it at each stage. This is a serious threat to peer to peer payment of digital currencies¹⁴.



Nakamoto's solution is to block transactions into a group and timestamp them¹⁵. Thus, the time log of each block will mark them one after the other like a chain. The term blockchain has been derived by its developers by using this property of the technology¹⁶. According to Nakamoto, "a timestamp server works by taking a hash of a block of items to be timestamped and widely publishing the hash, such as in a newspaper or Usenet post". Hence, it is public rather than private. It is then a proof that the data had existed before and users can verify its authenticity by logging into the hash which marks each timestamp of the block involved. Hence, no possibility of double selling since the computer identifies transactions arranged in a time log visible to each party to transaction. What has been sold is recorded as sold and cannot be resold again. If this technology is adopted in the government securities market which depends on the trust of each party, the fraudulent hazard known as the double selling or multiple selling could be eliminated altogether.

Blockchain is a distributed network where all parties will participate in the process simultaneously. There is no need for one person to complete his work for another to begin. How a distributed ledger works has been explained by William Mougayar by comparing it to a Google Doc and contrasting it from the traditional Microsoft Word document¹⁷. The present way of group editing a document is to produce it first as Word document, send it to each party as an attachment through email and get them to open, edit and send back to originator of the document. Till it is sent back, no party in the group can know what the other party is doing to the document and how he is editing it. There is not only a time lag, but also a dark cloud of ignorance separating them from each other. This is how banks at present complete transactions with two customers. Suppose customer A wants his bank to deduct a certain amount of money from his account and pay to customer B. The bank after receiving the instructions blocks both accounts to the parties concerned. It deducts money from A and pays B and opens the system for the two customers after the whole transaction has been accomplished. Until the bank opens the system, both customers are in the dark and do not know what is happening to their transaction. Any inquiry from the banker would be responded by a 'work in progress message'.

But in the case of a Google Doc, everyone in the group knows what other persons are doing and they are in contact with each other simultaneously on a real-time basis. Each person in the group has now access to a single version of the document. It is a shared document. It is called a distributed document because a large number of people get involved in producing, improving, editing and fine-polishing the document. In the case of blockchain, the shared document is a distributed ledger which can publicly be updated by all parties after they have verified the authenticity of the transactions involved.

¹⁴A study done by Karame et al shows that the fast payment feature of Bitcoin enables the user to resort to double-spending. See, Karame, Ghassan O et al, (2012), 'Two Bitcoins at the price of one: Double Payment Attacks on Fast Payment of Bitcoin' (available at: <https://eprint.iacr.org/2012/248.pdf> ; accessed on 20.10.2017).

¹⁵Nakamoto, op.cit, p 2.

¹⁶See: <http://www.blockchaintechnologies.com/blockchain-definition> ; accessed on 20.10.2017.

¹⁷See: <https://blockgeeks.com/guides/what-is-blockchain-technology/> ; accessed on 20.10.2017.



All transactions in blockchain are publicly announced and therefore, all those operating in the chain are privy to that information. It thus takes away from customers the veil of privacy which is provided to them by the traditional banking system. This is a weakness of the blockchain. To resolve the issue, Nakamoto suggests that the public key through which the transaction is publicly announced should be kept anonymous¹⁸. In that way, though the public can see that someone is sending money to another, without knowing the identity of the parties, they cannot point it to anyone. In the stock exchanges, a similar practice is followed. Accordingly, though the stock exchange releases the data on the value and the quantity of a trade, it does not release the identity of the transactors. Nakamoto says that this anonymity could be strengthened by having a system where transactors could have different blocks for different transactions. Therefore, for each block, there would be separate public and private keys. Since the public keys through which the announcements are made are different, it is difficult to trace a transaction to any particular party or a group of parties.

The blockchain has brought in a revolution in the use of internet. Hence, sometimes it is referred to as the Website 3.0 where there is connectivity with a number of parties and forward and backward interaction with them¹⁹. A number of business applications have been developed by using the blockchain, according to website BlockGeeks²⁰:

a) Introduction of smart contracts in which performance criteria are coded through distributed ledgers so that delivery of obligations could be linked to the satisfaction of designated requirements.

b) Blockchain can promote peer to peer transactions so that the intervention of a third party could be eliminated, thereby establishing a true sharing economy.

c) It can also increase crowd funding by enlisting the support of many parties at a relatively low cost and enhanced convenience.

d) Blockchain is fully transparent and publicly available so that it could improve the governance of society and could be used in elections or public polls.

e) Supply chain auditing, a must for ensuring quality and timely delivery, could be introduced through transparent distributed ledgers.

f) Safety of file storage can be assured by distributing the data to many points in a network making it less remunerative for hackers to hack.

g) By digitising personal documents and information, distributed ledgers can help better identity management.

¹⁸Nakamoto, op cit. p 6.

¹⁹See: <https://blockgeeks.com/guides/what-is-blockchain-technology/> ; accessed on 19.10.2017.

²⁰Ibid



Blockchain is a revolution in the application of internet today. While internet transfers information, blockchain transfers value. Hence, it is sometimes referred to as internet of value²¹. When someone sends an attachment like a document or power point presentation via email, he sends only a copy. The original is still retained by the sender. However, in the case of the blockchain, it is the real things that are transferred. For instance, if someone makes a digital currency payment, he uses the original and not a copy to make the payment. When the originals are paid via the blockchain, there is the possibility of hackers intercepting them in the cyberspace and changing the direction of payment to someone else. The blockchain has introduced safety measures to prevent such midway hacking. Those safety measures have been successful in limiting the incidence of hacking virtually to a zero level.

Yet, there are instances of companies dealing in Bitcoins and exchanges that facilitate Bitcoin exchange being hacked from time to time²². All these instances relate to hacking of central data bases and not the distributed data base involved in the blockchain. It is like when a large number of people converge in a central square, it is easy to slaughter them. But if they are dispersed over a large landscape, it is still easy to slaughter one or two, but not all. The fate of the blockchain also rests on this possibility. As long as it is distributed over millions of individual computers, the hacking is isolated and its costs are negligible. Hence, the blockchain still provides a safe method of dealing in digital currencies and facilitating many other applications involved in peer to peer transactions.

Also, the blockchain reduces the governmental power over citizens. Some view it as a merit, while others caution its impending dangers. The merit arises from its ability to free citizens from excessive governmental controls, regulations and interventions. For instance, consider the restrictions imposed by governments over cross-border capital transfers by individuals. The implementation of such capital transfer restrictions is easy as long as people use the conventional banking system to do so. Governments can require banks to adhere to their policy and see that the regulations imposed by them are not violated. Sri Lanka's new Foreign Exchange Act is based on this premise²³.

In the new law, it is the responsibility of the authorised dealers in foreign exchange to see that its provisions are not violated by citizens. However, these formal cross-border capital transfer restrictions are already violated by informal money transfer systems like Havala or Hundi²⁴. But they can be followed, tracked and apprehended by governmental authorities. However, the blockchain poses the newest challenge to governments. As Naval Ravikant, Founder and CEO of AngelList – a website for startups – has remarked, 'capital controls are difficult in a

²¹See: <https://www.youtube.com/watch?v=Pl8OIkkwRpc> ; accessed on 19.10.2017.

²²See, for details of such hacking up to 2014: <https://www.theguardian.com/technology/2014/mar/18/history-of-bitcoin-hacks-alternative-currency> ; accessed on 20.10.2017.

²³See, for details, Wijewardena, W A (2017) 'Reform of Exchange Controls-Part III: Proposed Foreign Exchange Act is an improvement on many count', Available at: <http://www.ft.lk/columns/reform-of-exchange-controls-part-iii-proposed-foreign-exchange-act-an-improvement-on-many-counts-but/4-613690> ; accessed on 20.10.2017.

²⁴See, <http://www.acfe.com/fraudnews-uk.aspx?id=4294974048> ; accessed on 20.10.2017.



world where I can cross a border with a million dollars in my brain²⁵. What it means is that the blockchain information is in the cloud and the password to access it is stored in the memory of the individual. The governmental regulators cannot control it unless he voluntarily discloses his intention to pay money across the border. In any country in the world where there are internet facilities, he could make payments amounting to millions of funds within the country or outside by accessing the system. Thus, billions of dollars can move out of a country without the knowledge of its exchange control authorities.

However, the blockchain is not without weaknesses as revealed by a number of experts in the industry. Emin Gün Sirer of Cornell University, addressing a conference at MIT on Business of Blockchain drew the attention to the use of the same code by all the clients of the blockchain making them vulnerable to any mishap that may happen in the process²⁶. It is similar to a domino of cards and if one card falls, it would take the whole domino down. This is not different from the modern banking system in which all banks are linked to each other and if one bank fails, it would lead to the failure of all banks in the system. In the case of the banking system, there is the banking regulator and the government of the country behind it to keep the banking firms afloat. Governments keep banking firms stable as a public good since the failure of any bank may cause the failure of the system leading to the total disruption of the entire economic system. But if the blockchain fails there is no such a helping hand to rescue it and all clients have to bear the full cost of the failure. Since the blockchain and the digital currency behind it are systemically important today, any failure would mean a global failure today.

Disagreeing with the claim that the blockchain is a disruptive technology, Marco Lansiti and Karim R Lakhani, in a recent article published in the Harvard Business Review, have termed it a foundational technology²⁷. Hence, it will take many more years for the blockchain to get seamlessly merged with the rest of the system, namely, the legal system, government, banking system etc. Since the blockchain is in its early stage of development, it will take decades for it to reach its full potential. There are two aspects of technology that will affect its successful integration with the economic system. One is novelty requiring extra efforts to make it popular among the would-be users. The other is complexity making it necessary for diverse parties to collaborate with each other to bring it to a successful completion. The blockchain is novel and therefore making it popular across the globe is a serious challenge. It is also complex and it dissuades many in attempting to use it. An experiment done in 2014 at MIT with 4,494 undergraduates who were supplied with \$ 100 in Bitcoin showed that 30% of the students did not want to participate in the experiment and of those who participated, 20% converted their Bitcoins to dollars within weeks. It was also found that even the tech savvy undergraduates had difficulty in understanding how the blockchain operated²⁸. Another survey done in 2014 has

²⁵Quoted by Patrick Eha, (2017), op cit., p 213.

²⁶See, <https://www.technologyreview.com/s/604219/blockchains-weak-spots-pose-a-hidden-danger-to-users/> ; accessed on 20.10.2017.

²⁷Lansiti, Marco and Lakhani, Karim R (2017) 'The Truth about Blockchain', HBR, Jan-Feb 2017 (available at: <https://hbr.org/2017/01/the-truth-about-blockchain> ; accessed on 20.10.2017)

²⁸Ibid.



revealed that only 24% of US adults had had familiarity with Bitcoin²⁹. Hence, for the blockchain to become universal it will take years.

Overall, the blockchain has become a hype and that is its main weakness. A hype has many followers who would do so without knowing what it is. Halfway through, they get themselves dropped out when they find what they get is not what they had expected. Any new thing will rule the world until a better thing appears to take its place. The same fate may befall the blockchain too. But the chances are that it will go through a transformation making it still useful for society to harness.

Part 2

The blockchain and the financial services sector

If the blockchain is a disruptive technology, its main casualty will be the financial services industry. It is intuitively understandable since it has been developed to support the peer to peer payments using the digital currency – Bitcoin – without the intervention of the traditional third party, namely, a bank or a financial institution. As such, the mission of the master of the blockchain, Bitcoin, is to displace financial institutions from doing what they do now. It is thus like a killer virus that would penetrate the thick skin of the financial services industry and eliminate it totally over a period. When an industry is faced with such a threat, it behaves the industry to make an assessment of the nature and the magnitude of the risk it faces in order to survive in the system.

A mistake being made by any industry faced with the threat of a disruptive technology is continuing with the assumption that technology does not matter. As Joichi Ito, Neha Narula and Robleh Ali have shown, this was the mistake made by media companies when the internet showed the initial promise that the future media distribution will be through the internet and not through the traditional method of print or electronic media³⁰. The American astronomer, author and teacher, Clifford Stoll mockingly said that the web would not be Nirvana³¹.

But 20 years later, Stoll admitted to Los Angeles Times columnist Michael Hitzik that the internet had left him behind³². What it means is that it is dangerous to underestimate the power of new technologies which at that point in time may still be in a nascent stage.

If the financial services industry ignores the threat posed to it by the blockchain, it

²⁹See, <https://www.statista.com/statistics/291373/us-adults-who-are-familiar-with-bitcoin/> ; accessed on 20.10.2017.

³⁰Ito, Joichi, Narula, Neha and Ali, Robleh, (2017) 'The Blockchain will do to the finance system what the internet did to the media', HBR, March, 2017 (available at: https://hbr.org/2017/03/the-blockchain-will-do-to-banks-and-law-firms-what-the-internet-did-to-media?referral=03759andcm_vc=rr_item_page.bottom ; accessed on 20.10.2017).

³¹Clifford Stoll, (1995), 'Why the Web won't be Nirvana', Newsweek, (available at: <http://www.newsweek.com/clifford-stoll-why-web-wont-be-nirvana-185306> ; accessed on 20.10.2017).



will live to regret one day. The blockchain can be viewed as a ‘microcosm’ of how a new decentralised, automated financial system could work³³. Its application in making payment is still limited with only a fraction of the total global payments being made by using it. As at end of September 2017, there were only 16.6 million Bitcoin in circulation throughout the globe³⁴. Its total market value has been less than US \$ 100 billion as against a global GDP of more than US \$ 80 trillion.

But, as a regulatory, accounting and auditing system, it demonstrates a compelling promise for the future. The regulatory function performed by the blockchain is assured by its coding system. The compliance is met through the network that rejects any unauthorised instruction for payment. Even a restrictive monetary policy has been built into the master of the blockchain, Bitcoin, by limiting its supply; the computer programme that governs the issue of Bitcoins does not allow oversupply.

The present financial system is a centralised operation and all centralised operations are subject to risks on account of the excessive bureaucratic controls they have introduced. However, the blockchain is a decentralised operation. Hence, it commands superiority over financial institutions. The flexibility which the blockchain enjoys and the speed at which it could process and effect payments are some features demanded by customers. If banks do not take any action to meet them, it is inevitable that banking customers would move to systems that can satisfy their desires. In this sense, the blockchain will be a killer App for banks.

It would, therefore, be useful if banks adopt blockchain technology to improve their services to customers and establish governance standards. Customers could be served more efficiently by delivering a speedy and transparent service in financial services such as money transfers. With respect to remittances being made by migrant workers, a new App using the blockchain has been introduced by California based financial services and technology company Abra that provides peer to peer mobile phone money transfer services using Bitcoin³⁵. Abra has developed a Bitcoin wallet which customers could use for buying, selling, storing and paying through Bitcoin. Its operations are limited only to USA and the Philippines at present. The Abra wallet can be used to buy goods and services online in countries where Abra or Bitcoin is accepted. It also helps the customers to make payments in both directions, that is, from USA to the Philippines or from the Philippines to the USA. There is no charge if the payer does not use the credit card or the Abra tellers who are mostly pawnshop owners³⁶.

Money is sent instantaneously, but converting into other currencies and crediting to a bank account will take two business days³⁷. The cost to the customer is, therefore, the conversion

³²See, <http://www.latimes.com/business/hiltzik/la-fi-mh-actually-that-offbase-20150227-column.html> ; accessed on 20.10.2017.

³³Ito, Narula and Ali, op.cit.

³⁴See, <https://www.statista.com/statistics/247280/number-of-bitcoins-in-circulation/> ; accessed on 20.10.2017.

³⁵See, <https://www.abra.com/> ; accessed on 20.10.2017.

³⁶See, <http://calabazilla.com/2017/09/06/review-abra-money-transfer-app/> ; accessed on 20.10.2017.

³⁷Ibid.



rate, mobile phone charge, fee on the credit card if it is used and the commission paid to an Abra teller if the money is received through such party. However, these are minimal compared to bank charges or fees paid to PayPal or Western Union. The speed and the low cost of the money transfer services it provides will soon be a captivating factor for the massive migrant worker population in the globe today. This is a serious disruptive technology for banks.

The adoption of the blockchain can also improve the governance standards of financial institutions³⁸. The improvement comes from the full transparency of transactions that take place using the blockchain. The financial crises, brought about by frauds within individual banks which are systemically important could be avoided if the records of their transactions involving shares, stocks, acquisition, transfer and sale of assets are on a publicly available record system. It gives an opportunity for stakeholders, namely, depositors, shareholders, regulators, employees and the public, to learn on a real-time basis what is actually happening inside a bank and take instant action to prevent frauds. Most frauds occur due to underhand deals done by directors or employees working in banks. They resort to smart accounting, window dressing, account manipulations, insider dealing and various other accounting frauds that ultimately accumulate and make the financial institution sick and vulnerable to both internal and external shocks. Good governance practised by banks is expected to keep a check on these activities. However, in practice, governance codes are rarely followed³⁹ and there is no way for stakeholders to know of aberrations in time to halt them. Once it is out after a time lag, it is already too late to save the bank or the financial institution concerned.

Yermack has highlighted how the blockchain could prevent the occurrence of internal frauds by establishing transparency in the operations of companies.

“For shareholders, blockchains could offer lower costs of trading and more transparent ownership records, while permitting visible real-time observation of transfers of shares from one owner to another. For activists, the technology could allow for quicker, cheaper acquisitions of shares, but with possibly far less secrecy than under the current system. Activists could also liquidate their positions more easily and more transparently, which might make the “exit” channel of corporate governance increasingly attractive at the expense of the “voice” or intervention channel. Managerial ownership could become much more transparent, with insider buying and selling detected by the market in real time, and manipulations such as the backdating of stock compensation becoming much more difficult, if not impossible, since participants in certain blockchains are unable to “rewrite history” by changing its entries retroactively. Corporate voting could become more accurate, and strategies such as “empty voting” that are designed to separate voting rights from other aspects of share ownership could become more difficult to execute secretly. Any and all of these changes could dramatically affect the balance of power

³⁸See, Yermack, David (2016), ‘Corporate Governance and Blockchains’ National Bureau of Economic Research (available at: https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2700475 ; accessed on 20.10.2017.

³⁹See, Wijewardena, W A (2017), Central Banking: Challenges and Prospects, Colombo: BMS Publications, pp 101-9, for details of how the Central Bank of Sri Lanka, violating its governance code, made a profit transfer to the government when in fact it had made losses in 2013.



between directors, managers, and shareholders. However, their impact will depend importantly on the type of blockchain used, whether public and freely open to anyone, as is the case with bitcoin and other digital currencies, or restricted and “permissioned,” the model currently being tested by a number of established financial institutions and consortiums⁴⁰.

Six stock exchanges have either announced their intention to use the blockchain or have started using it as their transaction recording platform⁴¹. They are the Korea Exchange, NASDAQ, London Stock Exchange, Australia Securities Exchange, Tokyo Stock Exchange and Estonian Tallinn Stock Exchange. Of them, the Austria Securities Exchange has announced that it has made good progress with regard to the tests it has conducted in using the blockchain⁴². This is the beginning of the future of the use of the new technology in financial sector institutions and banks. Hence, it is a matter of time that others will follow suit.

Overall, the blockchain will be a disruptive technology to the banking firms since its purpose is to remove the financial institutions sitting in between the two parties involved in a transaction. So far, its application has been limited and therefore, it has not been disruptive enough to force banks to go for an immediate solution. Yet, in the period to come, it would be a major disruptive element that would perhaps make the banks irrelevant and species of a bygone era. It is in the interest of the banks to get ready for this eventuality in advance by adopting and adapting this new technology for their own benefit.

Part 3

A Summary and Conclusions

The blockchain has been the facilitating technology of transactions involving the digital currency, Bitcoin. Its purpose is to produce a peer to peer digital payment system without using a third party guarantor of payment such as a bank or a financial institution. It guarantees safety, accuracy, transparency and record keeping. The blockchain is a public ledger that is being maintained and updated by a number of participants on a real-time basis. The presence of a large number of participants using it for transactions makes it a distributed public ledger sheet. Compared to banks and other organisations which maintain records privately and without transparency, this is the future of public’s participation in conducting transactions directly. In that sense, it is a disruptive technology since it will replace the traditional private and opaque record keeping.

The banking sector will be the biggest casualty of the blockchain technology. It is because the present and future customers of financial services demand the use of high technology to deliver services to them speedily, efficiently and cheaply. The present systems followed by

⁴⁰Yermack, op.cit. p 3.

⁴¹See, <https://nexchange.com/article/8637> ; accessed on 20.10.2017.

⁴²See, <https://www.cryptocoinsnews.com/australian-securities-exchange-makes-progress-with-blockchain-tests/> ; accessed on 20.10.2017.



banks do not meet with these requirements. Hence, banks should seriously consider adopting blockchain technology in providing services to customers. By being flexible in their approach to new technology, the banks and other financial institutions can ensure sustained growth for them.

Already some central banks and large banks are planning to introduce their own digital currencies. IMF too is considering the issue of its own digital coin as revealed by its Managing Director recently. When a central bank chooses to issue its own digital currency, it has to change the entire central banking landscape to suit the issue. For instance, it has to maintain accounts for people who accept its digital currency and pay interest on them. This is a massive operation requiring high capacity computer servers and applications that guarantee safety, swiftness and low cost in concluding transactions. However, with modern ICT, this will not be a serious challenge as has been proved by social media like the Facebook.

The blockchain is still in a development stage when it comes to using it for other transactions in society. However, its superiority will make it a universal application. At that stage, it will really be a disruptive technology. Banks need not wait until that date to take action to cover themselves. Hence, it is useful if banks get themselves seamlessly integrated to this new technology right away.

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