



# THRIVING IN DIGITAL AGE: DIGITAL CURRENCIES POSE THE BIGGEST CHALLENGE FOR BANKS

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Digital age is not new or alien to the financial services industry. When the new breakthroughs of information and communication technology (ICT) hit the world in early 1960s, it was the financial services industry that embraced them before any other industry. It was done as a necessity rather than as a passion or fashion. The necessity arose from having to cope with the strict competition that engulfed financial services institutions cutting into the thin profit margins and thereby threatening their long run survival. At the same time, objectives like inclusive financing needed them to have a wider outreach without increasing costs. The industry could not do so relying on the prevailing production model. That model had been based on having a larger geographical coverage with a wide branch network. However, such a branch network required these institutions to employ more people at increasing costs. Thus, the embracing of ICT breakthroughs helped the industry to cut costs, provide better and more efficient services to customers and have a wider outreach without increasing costs. Empirical studies have found that application of ICT have had a positive impact on banks' profitability<sup>1</sup>. The improvement in profitability should come from the benefits which the customers, banks and employees should receive from the application of ICT as an integral part of the operation of banks<sup>2</sup>. The McKinsey Global Institute, in a report published in September 2016, has highlighted that digital finance could serve the down-trodden in society by providing access to credit and savings products<sup>3</sup>. Thus, digital technology is not only for the higher ups in the social stratum; it is for all, helping societies make their financial services inclusive.

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<sup>1</sup> For instance, see, OK Agbolade's paper on Information and Communication Technology and Banks' Profitability in Nigeria; can be accessed at [www.ajbmr.com/articlepdf/ajbmr01n0411.pdf](http://www.ajbmr.com/articlepdf/ajbmr01n0411.pdf) ;

<sup>2</sup> A detailed list of the applications which each of these categories have been using in banks have been documented by Hassan Ghaziri in 'Information Technology in the Banking Sector: Opportunities, Threats and Strategies' (available at: <http://ddc.aub.edu.lb/projects/business/it-banking.html> )

<sup>3</sup> Manyika, James et al, (2016), Digital Finance for All: Powering Inclusive Growth in Emerging Economies,



## **Sri Lankan banks have embraced advancing ICT after liberalisation of the business in 1977**

After the liberalisation of the banking system in 1977, banks in Sri Lanka too embraced digital technology, albeit in a slower pace. It is the foreign banks which provided the digital services to their customers in the initial stage. They were soon followed by private commercial banks which too invested heavily in ICT infrastructure as well as in ICT based human capital. The state banks were the last to enter the field but managed to accomplish the task within a few years. As a result, all commercial banks in Sri Lanka today are unibanks providing services to their customers from any of their branches located throughout the country and offering a gamut of internet banking services to them from any part of the world. Starting from basic automated teller machines or ATMs which functioned as cash dispensers and cash deposit accepting devices, Sri Lanka's ICT based banking is now providing to their customers all the advanced services which banks in the developed world are providing to their customers. Yet, ICT does not stay in a single place and is subject to constant evolution and improvement. In this sense, banks are lagging behind in the application of ICT compared to other industries like healthcare services or defence services. The challenge for banks today is to narrow this gap by catching up with other fast ICT users.

### **Challenges faced by Sri Lankan banks**

The challenge faced by Sri Lankan banks was discussed by Wijewardena in three previous papers on the subject<sup>4</sup>. In the first paper in 2013, it was argued that the banks should take cognizance of the emerging technological advancements not only in ICT but also in other area. Technologies such as nanotechnology and 3D Print Manufacturing have changed the production bases in economies worldwide. On top of them, the developments in distributed artificial intelligence or DAI in ICT field have posed the problem of choosing between machines and men for providing the services. It was pointed out that DAI will force banks to replace human capital with digital capital. Such a policy would be necessitated by the emergence of a new customer base consisting of the tech savvy young generation called Generation Y or e-Generation. The paper concluded that banks have to modernise their services with appropriate technology and it required them to think beyond economic growth.

In the second paper in 2014, it was argued that the retail banking landscape has been changing beyond comprehension. In delivering retail banking services to customers, the traditional bank branch has now become irrelevant; instead, branchless banking has come to the fore. With the whole society becoming digital, banks would not be able to remain oblivious to digital banking. Customers in Generation-Y are now called 3.0 customers demanding all banking services through

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<sup>4</sup> Wijewardena, W A (2013), 'Beyond Growth: Modernisation of Banks is Imperative' APB, 25<sup>th</sup> Anniversary Convention; Wijewardena, W A (2014) 'Changing Landscape of Retail Banking: Challenge Now-Adapt or Perish' APB, 26<sup>th</sup> Anniversary Convention; Wijewardena, W A (2015) 'Innovation and Creativity: A Must not only for Survival but also Prosperity', APB 27<sup>th</sup> Anniversary Convention, Colombo.



digital technology based banking. Hence, it is imperative for banks to become 3.0 banks with facilities for interacting with customers through the cyberspace. It was argued that banks should use their data bases of customers proactively to promote business and provide a better service to them. It required banks to invest heavily for making their personnel ICT literate and help them to update their skills on a continuous basis.

The third paper published in 2015 argued that innovation and creativity in banks are a must for both survival and future prosperity. New knowledge is created through inventions but they should be followed by innovation – the process of converting inventions into commercial production. The whole process goes through four stages: invention, innovation, diffusion and imitation. A proactive government should facilitate these four stages by creating an environment conducive for innovations to sustain themselves. Spending more on Research and Development, protection of property rights, observance of the Rule of Law and maintenance of law and order are some such requirements. It was also argued that researchers should be linked to industry in order for innovation to take place. Sri Lanka has been successful in creating a literate society compared to its peers. But what is needed is not mere human capital but creative capital for the country to harness the best results out of new innovations.

## **Digital age offers opportunities as well as threats**

The digital age has offered opportunities to financial institutions. At the same time, they have posed threats and challenges too. One such challenge is the emergence of digital currencies, known as cryptocurrencies, that threaten to displace banks as institutions with monopoly power to make payments within as well as across national borders. This paper will examine the evolution and economic rationale of digital currencies, their potential and weaknesses and finally how banks could cope with the challenge. In the discussion, a special attention will be paid to Bitcoins, a cryptocurrency that has invaded the payments systems throughout the globe, while functioning as a speculative investment instrument. Part I of the paper will review the failure of the currencies issued by governments and the demand for alternative currencies. Part II will examine the development of Bitcoins as a new alternative currency and its merits and weaknesses. Part III will be devoted to way out for banks to cope with the problem of becoming irrelevant as payment system managers. Part IV will present a summary of the paper and the main conclusions drawn from its analysis.

### **Part I**

## **The Demand for Alternative Currencies**



## **The abuse of power by the creator of paper money**

The physical coins used in transactions have a long history dating back to some 10,000 years. Yet, the paper currency as we know today was a creation by the Chinese in the 12<sup>th</sup> century CE<sup>5</sup>. It soon spread to the rest of the world because it was economical, convenient and carried value through king's fiat. However, since the production cost was low and kings' ability to create paper currency was unrestrained, the power to create paper money was abused by kings themselves. The result was the decline in the value of the currency notes over the time eroding the real value of wealth held by people. The first evidence supporting this proposition came from the creators of paper money themselves, namely, China. As reported by Kenneth Rogoff, quoting Gordon Tullock and historical price data relating to China, between 1260 and 1330 CE, the stock of paper money in China has increased from 0.36 million ounces to 116.4 million ounces. During this period, the price of rice in China has increased from 600 ounces of paper money per unit to 34000 ounces per unit<sup>6</sup>. This trend has confirmed the mainstream economists' view that there is a direct link between money in the hands of the public and the inflation rate. The long term link between inflation and money led the Nobel Prize winning economist, Milton Friedman, to pronounce that 'Inflation is always and everywhere a monetary phenomenon'<sup>7</sup>. It is needless to say that when prices go up, the real wealth held by people get eroded.

## **The angry reaction of mainstream economists**

The historical evidence relating to abuse of money printing powers by governments prompted the Austrian-American economist Friedrich A Hayek to pronounce that the power to print money should be taken away from the kings and handed over to public<sup>8</sup>. Though Hayek's view on allowing the private sector to produce their own money was challenged by later day economists, the central idea he had presented that the governments tend to abuse this power had remained unchallenged. The Harvard economist Kenneth Rogoff has taken Hayek's central view to a logical conclusion in a book he published in 2016 under the title 'The Curse of Cash'<sup>9</sup>. In this book, Rogoff has proposed to phase out the high value paper currency because the high value currency notes have enabled the governments to earn unnecessary profits – known in economics as seigniorage or the profits earned by kings by issuing currency notes for a higher denomination than their production costs – and the underground economy to thrive in societies. This is evident from the high percentage of large value currency notes in the total currency issue across the world. In Sri Lanka, according to the data published by the Central Bank, about 50% of the total currency in the hands of the public consists of Rs 5000 notes. Currency notes of Rs 1000 and above have a

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<sup>5</sup> <http://afe.easia.columbia.edu/song/econ/money.htm>

<sup>6</sup> Rogoff A Kenneth, (2016) The Curse of Cash, Princeton University Press, Data for Figure 2.1.

<sup>7</sup> Friedman, Milton, (1963) Inflation: Causes and Consequences. New York: Asia Publishing House.

<sup>8</sup> Hayek, F A, (1976) The Denationalisation of Money, Hobart Paperback

<sup>9</sup> Rogoff A Kenneth, (2016) The Curse of Cash, Princeton University Press



share of over 85%<sup>10</sup>. This high percentage of large value notes, according to Rogoff, finances the underground economy, promotes money laundering and tax evasion and facilitates bribery and corruption. Hence, his prescription has been to allow digital currency to thrive and allow only the paper currency of small denominations in the initial stage but to be replaced by coins eventually. But digital currency would pose a challenge more as competitors to other financial instruments and institutions than to paper currency itself<sup>11</sup>.

Hence, it is the banks which are at the receiving end when digital currencies – also known as cryptocurrencies – take over the world.

### **India and Sri Lanka have had experience of privately produced coins**

The currency issue need not be a government monopoly as has been demonstrated by ancient Indian and Lankan practices. During the 4<sup>th</sup> century BCE in ancient India, there were private money producers who produced money along with the king. Kautilya, the ancient Guru on economics who wrote the first treatise on economics called The Arthashastra recommended to the king that he has to maintain the value standards of such private money subjecting them to prescribed quality standards. To ensure the prescribed standards in privately produced coins, he recommended the appointment of an examiner of coins<sup>11</sup>. This ancient Indian coinage practice would have been common in this part of the world since a large number of coins found in the Southern Kingdom of Ruhuna of Lanka belonging to the period from 3<sup>rd</sup> century BCE to 1<sup>st</sup> century CE carried the Brahmi inscriptions of private issuers, among many, like “Of Gutta”, “Of Pussa, Son of Householder Dutaka”, “Of Lady Sama”, “Of Municipal Officer Nakati” or “Of Lady Uttama, Householder” and so on<sup>12</sup>. Even in the modern period, before the governments took over the monopoly power of issuing currency, paper money was issued by banks or private parties in the form of monetary obligations written over pieces of paper.

## **Part II**

### **The Story of Bitcoins**

Today it being a digital world, there is no necessity for people to issue private money through endorsements on pieces of paper. They could be produced without physical form as cryptocurrencies. Accordingly, the mighty US dollar has been challenged by a digitally created currency – a currency that is there only in the cyberspace and not in the real world – called “Bitcoins” or BTC for short that came into existence only in 2009<sup>13</sup>. The creation of BTC is

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<sup>10</sup> Central Bank Annual Report 2015, Appendix Table 114 11

Rogoff, op cit. p 218

<sup>11</sup> Kautilya, The Arthashastra, L N Rangarajan translation, Penguin Books, p 327

<sup>12</sup> Boparachchi, Osmund and Wickremasinghe, Rajah M (1999), Ruhuna: An Ancient Civilisation Revisited, Publisher: R M Wickremasinghe

<sup>13</sup> This section heavily draws on Wijewardena, W A (2013) Bitcoins: Can it Challenge the Mighty Dollar? (available at: <http://www.ft.lk/article/148322/Bitcoins--Can-it-challenge-the-mighty-dollar?>)



considered a technological marvel by many because it was the first time a money substitute had been created by using digital apps.

### **Pseudonymous Satoshi Nakamoto: Father of Bitcoins**

Bitcoins were created by an anonymous developer who took the pseudonym “Satoshi Nakamoto” and has chosen to remain in that way up to date. Therefore, the real people behind Bitcoins are still a mystery. Nakamoto expressed his desire to create the new digital currency in a paper he published in a website called listserv in 2008 under the title “Bitcoin: A Peer to Peer Electronic Cash System” without going through a financial institution and without relying on trust to make it acceptable<sup>14</sup>. Hence, all the problems involved in real money – the erosion of value due to inflation, frauds in the form of theft, multiple payments and dishonour of obligations and safe and costless delivery – are to be sorted through a foolproof computer programme that cannot be changed at will by those who participate in the system.

### **Digital coins: A chain of digital signatures**

This appears to be a pipedream of some weird person but it became a reality within months of his publishing the paper, the first 50 Bitcoins being produced – called being ‘mined’ in Bitcoin terminology – by Nakamoto himself. He has defined in his paper an electronic coin as a chain of digital signatures where each party digitally signs a computer message called an electronic coin and passes to the next owner so that there is a chain of signatures which can be verified again electronically<sup>15</sup>. In this sense, it is like a cheque of which ownership is transferred from person to person by endorsement and delivery showing on the reverse a list of endorsements indicating the passing-on of the ownership at every stage. The difference between a Bitcoin and a cheque is that in the case of a cheque the transfer takes place on trust and there is a bank that guarantees its payment if it is a good cheque. Any dispute can be resolved by resorting to the judicial system which is guided by laws passed by legislatures and case laws established by the judicial systems themselves. There is no such redress in Bitcoins and one has to rely on “the work of proof”, as Nakamoto called it, established by the computer programme governing its issue. But the computer programme is virtual, anonymous and unreachable in the event of a dispute. This should surely worry the users of Bitcoins.

### **Zero Tolerance of errors**

As Nakamoto has argued in his paper several foolproof safety measures with zero tolerance of errors have been incorporated in to the computer programme. Here, a zero tolerance is

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<sup>14</sup> <https://bitcoin.org/bitcoin.pdf>

<sup>15</sup> Ibid, p 2



important because in the case of normal real currencies, there is always room for errors inflicting costs on some and the system's goal is to maintain such errors at a minimum level.

## **Safety features of Bitcoins**

First, though it is an open source programme which can be used by everyone freely, it is based on a difficult cryptographic protocol – a system where security based functions are performed through the use of advanced algorithmic calculations to generate results. Thus, not everyone with a computer can mine Bitcoins but only those with sufficient computational capacity and knowledge.

Second, there is a built in mechanism in the programme to make it harder for subsequent participants called miners to mine Bitcoins by gradually reducing the number of coins that could be mined over time. Accordingly, in every four year period the number they could mine halves and by year 2140, the total number of Bitcoins that could have been mined by all is set at its peak level of 21 million. When plotted against time, this is similar to the total utility curve that increases at a decreasing rate or with diminishing marginal utility familiar to students of economics. So, coins cannot be produced at will by miners and there will not be an excess supply that leads to the erosion of its value through inflation like the real currencies of the world.

Third, double or multiple payments have been prevented by publicly announcing the chain of ownership change of each Bitcoin so that it is recognised by the system as paid conclusively. So, once an owner has placed his digital signature to a coin, even if he tries to sell it for a second time, the system does not authorise it thereby putting an effective stop to such attempts.

Thus, Bitcoins can pass on from hand to hand indefinitely settling payments in the process without the need for recalling and destroying if they have become unserviceable as in the case of real currencies. Thus, Bitcoins have a virtually zero maintenance and replacement cost.

The details of how Bitcoins are mined and used have been posted to a web portal<sup>16</sup>. Similar to Wikipedia which provides cyberspace information freely, there is a 'Bitcoin Wiki' too that provides information on coins to interested readers.

## **Mining of Bitcoins**

A producer of a Bitcoin is called a miner and anyone with a sufficient computer capacity to crunch through the difficult algorithms set in the programme can be a miner by acquiring the open-source software. The system has been set to produce blocks of Bitcoins at intervals of 10 minutes and miners like those prospecting gold can hit the Bitcoins that are being thrown out by the system. Since doing it alone gives only a very slim chance of success because the computer

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<sup>16</sup> [www.bitcoin.org](http://www.bitcoin.org)



capacity may not be sufficient, many have developed mining pools combining the processing power and sharing the profits among them as previously agreed. At the beginning, a block contained 50 Bitcoins and as the system has been set, at the production of each set of 21000 Bitcoins, the production is halved; accordingly, today, a block contains only 25 Bitcoins and has become more difficult to mine. A new user has to acquire a Bitcoin wallet which is simply a computer facility like the email account of a person. He has three choices to maintain his wallet containing Bitcoins: his mobile phone, his desktop or with a centralised service provider in the cloud. Non-miners can acquire Bitcoins by buying from the market at the prevailing market prices which are variable and subject to fluctuation. For instance, when the first block of 50 Bitcoins was mined in January 2009, a Bitcoin was priced at 10 US cents. By June 2011, it went up to \$ 32 but fell again to \$ 7 in January 2012. It recovered to \$ 15 again in August same year moving further to \$ 49 in March 2013. In early April 2013, it boomed to \$ 266 and then crashed to \$ 140 by the middle of the month. The value of Bitcoins has increased to \$ 600.79 in September, 2016 indicating that its value has increased 6000 times over its original value in 2009.

Thus, there are Bitcoin miners who are decentralised and make profits if they are lucky enough to mine sufficient quantities that are available in the original software package. But, their job is becoming increasingly difficult with a fewer Bitcoins being thrown out by the system as time passes. Then, there are others who acquire Bitcoins by paying in real currencies on the exchanges that function again in the cyberspace. Both parties can use Bitcoins for making payments to others who accept them in payment or sell them on the exchange and make capital gains or losses.

### **Paul Krugman: Mining of Bitcoins is a waste of resources**

There are several criticisms against Bitcoins. On economic grounds, Nobel Laureate Paul Krugman has commented in his New York Times regular column that even the use of computer time and energy to mine Bitcoins is a waste of resources because they do not serve any economic purpose like a real currency<sup>17</sup>. Krugman has a point here because real currencies facilitate trade and exchange in increasing volumes, provide international liquidity to conclude international transactions, serve as reserve currencies so that nations could maintain their excess wealth in those currencies and help develop financial and capital markets by creating new and smart financial instruments. Bitcoins are nothing of these. Krugman has even gone to the extent of stating that even Adam Smith about whom he has no particular liking would have scorned Bitcoins because the celebrated economist had as far back as 1776 downgraded both silver and gold currencies on account of the wastage of real resources tied up with money when the same money could have been produced cheaply with paper money.

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<sup>17</sup> [http://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?\\_r=0](http://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?_r=0)



## **Bitcoins are not environmentally costless**

Some have criticised Bitcoins on the ground of the environmental costs they have inflicted. For instance, Mark Gimein writing to the Bloomberg.com has argued that mining Bitcoins require huge computing power and the electricity consumed in mining in a single day has been around 982 megawatts hours sufficient to provide power to 31,000 homes a day. Thus, though it is a virtual currency that does not use paper, ink, printing machines, energy, packing and transport materials and storage, it also involves a huge amount of power that has to be produced by emitting greenhouse gases that contribute to global warming. Though this claim is a little exaggerated as argued by Tim Worstall, a Fellow of the Adam Smith Institute in London, what Mark has tried to present is that creating virtual coins is not totally environmentally friendly as some people have been claiming.

## **Bitcoins and Ponzi schemes**

Then, there is the criticism that it resembles the features of a pyramid scheme, better known as Ponzi schemes<sup>18</sup>. A Ponzi scheme is a financial scam where those who first join the scheme stand to gain at the expense of those who join it later. Similarly, those who have first joined the Bitcoin system have mined the coins easily and have acquired the coins relatively at a cheaper price. But since its supply is restricted, the late comers have to spend more resources to mine coins and have to acquire them at high prices. Their ability to make cash out of their investments depends on whether there are willing buyers of Bitcoins after them. If there are no such buyers, they have to lose the value of their investments whereas the early joiners have already made money and quitted the system.

## **Invitation to hackers**

There is the possibility to lose Bitcoins held by people due to hacking and deliberately infected viruses. It already happened on several occasions in 2011 and 2012 and on one occasion in 2013. The worst incident in this connection was the hacking of the largest exchange on Bitcoins, namely, Mt Gox in June 2011 by a hacker and reducing the price of Bitcoins from \$ 13 a coin to pennies<sup>19</sup>. If the possibility of security breach is high, then, there is a high risk which the participants have to take. There are numerous instances where the Bitcoin security has been compromised by hackers or thieves<sup>20</sup>.

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<sup>18</sup> Details of the working of Ponzi schemes could be found at: <http://money.howstuffworks.com/ponzi-scheme.htm>

<sup>19</sup> <http://arstechnica.com/tech-policy/2011/06/bitcoin-price-plummets-on-compromised-exchange/>

<sup>20</sup> <https://bitcointalk.org/index.php?topic=83794.0>



## Financial bubbles in Bitcoins

The most damaging criticism against the Bitcoin system is the possibility of developing financial bubbles and their bursting eventually. Bitcoins have no intrinsic value and are not protected by national economies as in the case of real currencies. Since there is no regulatory authority, there is no one to protect the interests of innocent participants in the event of the bursting of the bubble. In September, 2016, Bitcoins priced at \$ 600.79<sup>21</sup> level is a bubble because it has no intrinsic value to push the price to that high level.

## The proliferation of blockchain technology

Bitcoins have also introduced other technological innovations which can be used by other digital currency developers as well. One such innovation is the introduction of blockchain technology – a system of public ledger for recording Bitcoin transactions<sup>22</sup>. Each transaction involving a Bitcoin is called a ‘block’ and once the transactions are completed, they are added to a ‘chain’ making it a permanent database of all transactions by using Bitcoins. Thus, a blockchain is similar to the full history of banking transactions; a block is similar to the individual bank statement. However, an issue relating to blockchain is the continuous growth of the chain raising problems of storage and synchronisation.

The blockchain technology will combine three aspects of a financial transaction which banks have been doing at great costs. They are the recording of transactions, establishing identity and establishing contracts<sup>23</sup>. Thus, it is expected to take over from banks the person to person transactions reducing costs and generating efficiencies. With the huge potential it is expected to have, leading ICT developers such as IBM, Infosys and Microsoft have ventured into developing alternative blockchain technology and support those who plan to introduce digital currencies. Since both Bitcoins and blockchain technology are a disruption to traditional financial services industry, it has become necessary for banks to develop measures to get out of the disruption successfully.

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<sup>21</sup> <http://www.coindesk.com/price/> (as at 24 Sep 2016)

<sup>22</sup> <http://www.investopedia.com/terms/b/blockchain.asp>

<sup>23</sup> <http://www.forbes.com/sites/bernardmarr/2016/05/27/how-blockchain-technology-could-change-the-world/#2c1e857049e0>



## Part III

### The Way-out for Banks

#### The demand for digital currencies

Though Bitcoins do not have a future, there is demand for alternative digital currencies mainly due to the desire of societies to have low cost swift transactions by cutting out banks which have increasingly become more expensive specifically for low value money payments. Therefore, some authorities believe that there is a growing demand for cryptocurrencies such as Bitcoins and technology would advance suitably for the proliferation of their use<sup>24</sup>. Writing on the merits of bitcoins which are equally relevant to any form digital currency, Harvey has highlighted a number of advantages which society would get by using them. The ability to conduct online transactions without compromising personal data, easy use through smart phones, low transaction costs and the absence of the inflation risks are some of those merits which digital currencies possess.

#### Digital currencies are a galore

The rise of the demand for alternative digital currencies, in place of Bitcoins, is a challenge which financial institutions cannot overlook. The market place has identified 12 such 'altcoins'<sup>25</sup>. They are 'Litecoins', 'Peercoins', 'Primecoins', 'Namecoins', 'Ripples', 'Sexcoins', 'Quarks', 'Freicoins', 'Mastercoins', 'Nxts', 'Auroracoins' and 'Dogecoins'. But there are more such digital currencies and Wikipedia has listed 24 such currencies<sup>27</sup>. These altcoins are directly in competition with banks and their payment instruments. Hence, unless banks get into the business of producing their own digital coins, they could be competed out by market developed alternative digital currencies. Though Kenneth Rogoff says that they are not competing with physical currencies produced by central banks, they do compete with them in the way they compete with financial instruments issued by banks. If societies go for such alternative digital currencies instead of using physical currencies, central banks would lose seigniorage, inability to cover their costs, fail to conduct monetary policy and maintain price stability, find financial system stability more complex and finally become irrelevant in society. Hence, central banks and commercial banks should get into the business of producing digital currencies before private party produced altcoins become a common place.

#### Citibank's Citicoin

To face the challenge, several leading banks have ventured into developing their own cryptocurrencies. One such move is by Citibank which is reported to have begun work on its altcoin

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<sup>24</sup> Chiefly Campbell R Harvey in an article in WSJ (available at: <http://www.wsj.com/articles/do-cryptocurrenciesuch-as-bitcoin-have-a-future-1425269375>)

<sup>25</sup> <http://www.bankrate.com/finance/investing/cryptocurrency-alternatives-to-bitcoin-1.aspx> 27  
[https://en.wikipedia.org/wiki/List\\_of\\_cryptocurrencies](https://en.wikipedia.org/wiki/List_of_cryptocurrencies)



called Citicoin<sup>26</sup>. The Citicoin is being developed by the bank's technological innovation subsidiary, Citi Innovation Labs and is being mined in the lab as an alternative to Bitcoins. It is the view of the Citibank that such digital currencies can cross the borders without time consuming regulatory hurdles<sup>27</sup>. Four other major banks also have entered the race to develop a digital currency of their own<sup>28</sup>. They are UBS, Deutsche Bank, Santander and Bank of New York Mellon. They have been prompted by the desire to cut costs and improve operations.

This emerging development is a real challenge for banks in the digital age. When societies demand for better services, banks should be ready to provide them. In the current payment system which is done through banks, the prohibitive commissions charged by them have been the main criticism against them. Hence, it is quite natural for technology to support individual customers who are desirous of transferring money from person to person swiftly, efficiently and cheaply. Such technology is a disruptive technology for banks; but they cannot avoid it since they have not gained capacity to serve their customers in a digital world. If they do not come up with alternative arrangements, banks as payment providers will become irrelevant pretty soon.

## Part IV

### Summary and Conclusions

Banks have been the first to embrace the advancements in ICT to cut costs, have a wider outreach and make banking services inclusive. The move was prompted by the need for sustaining their business in a world of thinning margins and fierce competition. However, though banks have moved along with the developments, they have been a little sluggish in capturing all the advancements compared to other industries that have been late adopters of advancing technology. Therefore, banks now have to compete with non-bank money transfer institutions which have been able to supply a better service to clients at a cheaper cost. It is therefore a matter of time that banks would completely be displaced as managers of money making transfers and payments in modern economies. Banks, therefore, have to modernise themselves to meet the challenging service requirements of the day. The problem has been complicated by the emergence of a new class of customers who are tech savvy – called Generation-Y or e-Generation – and, therefore, in the habit of demanding prompt banking services through advanced ICT. This has required banks to invest heavily in the digital infrastructure and digitally competent personnel.

The biggest challenge for banks today is the threat to displace them as the monopoly providers of national and across the border payments. This has been prompted by the loss of trust in national currencies issued by governments. Since the power to issue currency has been abused by governments by overproducing money and causing an erosion of the wealth of the people, there has been a growing demand for alternative currencies. The market is, therefore, in the

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<sup>26</sup> <http://truthinmedia.com/citibank-is-developing-citicoin-a-bitcoin-inspired-cryptocurrency/>

<sup>27</sup> Ibid

<sup>28</sup> As at August 2016. See: <https://sputniknews.com/business/20160826/1044672595/banks-cryptocurrencysystem.html>



business of producing digital currencies which are competing with both banks and national governments. Since the pressure is mounting and enabling technology is being developed, it will be a matter of time that banks would be fully displaced in their present role as payment system providers. The way out for banks is to produce their own digital currencies, as has been experimented by Citibank and others recently.