Banking Systems in an Economy Dominated by Cryptocurrencies

Hegadekatti, Kartik and S G, Yatish

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Dr.Kartik H & Dr.Yatish S.G

Authors' Email: dr.kartik.h@gmail.com; dryatish.blr@gmail.com

ABSTRACT

In this paper, we analyse the workings of commercial banks in a scenario where crypto-currencies are the mainstream bills of exchange. We start by explaining the concept of cryptocurrencies (also referred to as cryptocoins in this paper). Then we discuss the concept of Regulated and Sovereign Backed Cryptocurrencies (RSBCs). Later on, we envisage a scenario where cryptocoins are the main media of exchange. The banking aspects of Paper money, Bitcoins and RSBCs are then deliberated. We analyse the interplays between Banking and various currency formats. Finally, the paper concludes as to which currency is best suited to be the mainstream bill of exchange.

INTRODUCTION

A cryptocurrency is a medium of exchange using cryptographic techniques to safeguard transactions and also manage the formation of additional units of the currency.

A BlockChain is a widely disseminated archive of data that maintains a continually-expanding register of records fully and reliably protected from any alteration or modification. Each block has a timestamp and link to the preceding block.

A Crypto wallet is an encrypted electronic device that allows an individual to make electronic cryptocurrency transactions. Each wallet will have a public key visible to anyone. But it can be operated by only a person who has a private key. Transactions on the cryptocoin network are usually anonymous.

When people send cryptocoins to each other, someone has to keep account of who spent how much at what time. In case of fiat money (or paper money) it is done by banks (known as Trusted Third Parties, for which they charge a commission).But in case of Cryptocoins, it is registered on a ledger called BlockChain (with nil or minimal fees).

The cryptocoin network makes this possible by detailing all the transactions made during a certain timeframe into a list. This list is known as a block. A certain set of people called 'miners' verify these transactions mathematically and register them on the BlockChain. Those bona-fide miners who have

successfully verified the transactions are paid freshly created Cryptocoins. This is how miners are rewarded, and new cryptocoins are generated. This is also the reason why no transaction costs are levied, as the network (in the form of miners) verifies the transactions.

Bitcoin is a peer-to-peer based cryptocoin which is not backed by any commodity and (unlike fiat money) carries no sovereign guarantee whatsoever.

Regulated and Sovereign Backed Cryptocurrencies (RSBC), on the other hand are government backed cryptocurrency akin to paper currency, but in digital form. In this system, the cryptocoins (known as NationCoins) are backed by Sovereign Guarantee.

They are run on a highly secure Controlled BlockChain(CBC) in which Sovereign backed Cryptocurrencies will be transacted without any hassles. NationCoins are completely managed by the Sovereign Authority i.e the Government.

This system is based on the K-Y Protocol [1]. The K-Y Protocol is a set of rules and instructions to implement the Regulated and Sovereign Backed Cryptocurrency (RSBC) system.

BANKING

A bank is a financial institution that accepts deposits from the public and creates credit [2].

One of the important ways by which banks help create money is through the Fractional Reserve Banking system.

It plays out in the following manner.

Joe deposits $1,000 in the TOWN BANK. Now this $1,000 is a liability for the bank. Why? Because it has to return this $1,000 to Joe any time he demands. Moreover, the bank has to bear the cost of holding $1,000. From this $1,000, the bank takes $200 and sets it aside as a reserve (to use if needed immediately). The rest $800, it lends out to Bob, who needs a loan to start a business.

Now the TOWN BANK charges interest on the loan it gives to Bob. If Joe checks his account, he will find $1,000 written in his account book. If Bob checks his account, he will find $800 in it. Now, there appears to be a total of $1000+$800=$1800 in the system, but in reality, there is only $1000.

It is because of a book-keeping technique that banks use. The bank has created a debt instrument called IOU

(short for- I Owe yoU). What Joe will find in his account is only $200 in cash plus an $800 worth of promissory note that when given to the CENTRAL BANK (of that country) will provide that money to the TOWN BANK.

Bob spends the $800 to buy some stuff from Alice. Alice deposits $800 in the CITY BANK. CITY BANK sets aside 20%, i.e. $160 as reserve and then loans out $640 to Robert who needs the money (on interest). Here whatever money is lent is actually created. This process goes on until the total amount of reserve in the system is equal to $1,000 (original amount deposited by Joe). At 20% reserve rate, $1,000 can create $4,000 of additional money.

This creation of money where a bank takes deposits, provides loans, but holds reserves that are a fraction of its liabilities is known as Fractional Reserve Banking.

The process is not as simple as it seems. The Central Banks tightly control this creation of money by several direct and indirect regulations. This Fractional Reserve Banking was borne out of a unique observation made by medieval bankers.

As discussed, medieval age bankers used to accept gold deposits and issue promissory notes to be redeemed later. The people started using these promissory notes

as currency notes. The bankers observed that if they had 100 Kg of gold and issued 100 promissory notes, not all 100 notes would be redeemed at the same time. It meant that there was a certain amount of gold that lay unused. The bankers then loaned this unused gold to those who would pay interest. Thus, the bankers got interest on depositors' unused gold.

Banks lend money not only to private borrowers but also to governments. Governments borrow money from the banks; to be repaid later with interest. To record the borrowing, the government issues Treasury Bonds. These Treasury Bonds can be redeemed later by the banks for a stipulated amount.

Banks, apart from holding depositors' money and lending loans to borrowers fulfil several other functions.

One of the most crucial functions of a bank is that of a verifier. A transaction done through a bank is also supervised and recorded by the bank.

John has an account containing $10,000 in the TOWN BANK. Joseph has an account containing $100 in CITY BANK. John has to pay $2,000 to Joseph. He writes a check to Joseph transferring $2,000. Joseph takes the

check and gives it to his CITY BANK. CITY BANK gives the check to TOWN BANK. TOWN BANK verifies that

(a) John indeed holds an account with them.

(b) The account has adequate money to be transferred.

(c) The check is genuine, and the signature belongs to John only.

After all this is verified, they pay CITY BANK $2,000. Similarly, CITY BANK verifies Joseph's credentials and deposits the money in his account.

This payment service with verified authentication and confirmation is done by banks. So banks act as a Trusted Third Party (TTP) between the transactor and the transacted. Here both John and Joseph trust a third party, i.e. the bank to complete their transaction. And this role of a TTP does not come for free. There is an inbuilt transaction cost, deducted by the banks for their service as a TTP and verifier.

Basically, the TTP certifies that the transaction is authentic.

The present day financial system has evolved so much so that hitherto important functions like holding deposits and issuing checks have been relegated to the background. The most vital role of a bank now-a-days

is to act as a Trusted Third Party (TTP). Banks act as TTPs in settlements, loan lending, project financing, issuing of banknotes (printed by Central Banks), credit mediation and creating money (through the Fractional Reserve Banking).

Trading and business interaction in our society is based on transactions. And to safely and authentically conduct a transaction, there needs to be a supervisor, trusted by both the transacting parties. Banks have thus evolved to fulfil the role of a Trusted Third Party.

The introduction of the Bitcoin concept brings about a paradigm shift in the way money supply system works. Imagine a scenario where Bitcoin is a world-wide accepted currency. It is a decentralized and peer-to-peer based currency. Bitcoin usage needs no intermediaries. As such, banks will be completely bypassed. Loans and mortgages will become personal and customized. Anyone willing to loan will become a money lender. There will be no “Double Accounting”, which is the basis for Fractional Reserve Banking. People will no longer keep money in banks (or prefer to keep) as they will have a competitive market for interest rates throughout the world.

Joe can lend his money to Kate at 10% interest rate, wherein his banks provide only 5% on savings. Kate, on the other hand will get money at 10% (from Joe) interest rate instead of 14-18% interest rate loans offered by banks.

Thus, Kate would rather take loan from Joe than from banks. And Joe would give loans to Kate, rather than keep it in the bank. [But amidst of all this, comes the issue of trust. All is well, as long as there is a guarantee that Kate will return the money back to Joe. But that seldom happens. The network thus will verify the transaction and guarantee its integrity].

But who will enforce a contract in the absence of an authority like a Bank? If a bank does not get back its loans, it will classify them as Non–Performing Assets (NPAs) and may be getting some relief from the government, the market or from the insurers. But if Kate does not return Joe's money, that may spell doom for Joe financially.

In the age of Bitcoin, credit–worthiness will become an important issue. In a scenario where Bitcoin becomes a major currency of exchange, each individual will need to have a credit–rating. And for that to happen, credit–rating agencies will start to take centre stage. The

banking system will be all but extinguished. Probably banks will take on new roles as credit–rating agencies.

But unlike the banking sector, the Credit– Rating Market cannot have too many players. You cannot have 100 judges in the same court, it will be chaotic. The market itself is like that. Because, just like money, trust is limited. And one cannot trust everyone with it. Over a period of time, only a few Credit–Rating agencies will have to emerge. So, a few banks may successfully transform into Credit-Rating Agencies whereas others may have to bite the dust. It is therefore important to realize that Bitcoin–like currencies (decentralized, unregulated ones) are heavily disruptive.

Lending money without supervision or control becomes very easy. But so will cheating. People may lose their lifetime savings to unscrupulous elements with doubtful credentials. In such a situation, Credit–Rating Agency data may themselves be manipulated. Cartelization and insider trading may go on unabated. This system will quickly deteriorate to a point where nobody can trust anybody.

Contrast this with a scenario where RSBCs will be the norm. In case of RSBCs, Along with sovereign backing,

there will be a regulated market. Banks can then act as a Trusted Fourth Party (TFP) instead of a TTP (which is the network itself, in case of Cryptocoins). TFPs will regulate crypto currency instruments. This is different from the government directly supervising markets. TFPs will function as a quasi–autonomous free market regulator of the crypto currency sector. They can underwrite or guarantee credit–worthiness of investors, money lenders and loan takers. They will be regulators and insurers merged into one. They in turn will be audited by government agencies so as to maintain integrity of the financial system.

Smart Contracts and RSBCs

What if we can program the money so that after a certain time, it automatically reverts from Kate to Joe (with certain conditions)? That is what smart contract is all about. In smart contracts, the contract itself is the guarantee that it will execute itself. In case of unregulated cryptocoins where smart contracts are enabled (e.g-Ethereum) there will still be the trust issue as Ethers (or Bitcoins) are not backed by any Sovereign Authority. But in case of RSBCs, Contracts will be automatically executed, with full faith that the Sovereign Authority backs it. Thus, prices of NationCoins (the medium of exchange in the RSBC

system) as well as its functioning will be fully guaranteed by the Sovereign Authority.

What about Fractional Reserve Banking (FRB) in case of RSBCs?

FRB's role in the money supply will be greatly diminished in case of RSBCs.

In case of Unregulated Cryptocoins like Bitcoin, FRB is totally eliminated. Governments will no longer have control over money supply. In fact, money supply will be decided by market forces. This provides a fertile ground for manipulation by cartels and interest groups.

A constricted money supply regime (as seen in Bitcoin- 21 Million units only) will only lead to a deflationary spiral. This is detrimental to the world economy as a whole.

In case of RSBCs, governments will have control over the money supply. The role of FRB will indeed be greatly reduced. Banks can still use FRB to increase money supply. But money supply can be more closely controlled by Central Banks than it is now. A built–in inflation rate will ensure that a constant inflationary situation is maintained. Economic expansion is thus ensured.

Governments can directly borrow from the people at competitive rates. Banks will still exist as TFPs, albeit with a more sophisticated role. In fact, banks can transform themselves into VOFR (Verifier of First Resort) in contrast to government which will be VOLAR (Verifier of Last Resort). Banks can charge a small fee for their role as TFP. One can thus see that Bitcoin–like currencies are heavily disruptive. They have the potential to destroy FRB, eliminate banks resulting in a deflationary economic outlook.

The final result will be that the total amount of trust in the system will go down. And an untrustworthy economic system is not good for business or individual growth. The role of government as the sole issuer of currency will also be side-lined. This is akin to a government surrendering its sovereign authority to the network. The problem is that, if the network goes down, the economy goes down with it.

On the other hand is RSBC. It is also equally disruptive. But its disruptive power can be controlled. Role of FRB in money supply will be greatly reduced. But banks will still have an important role in the economy as a Trusted Fourth Party (TFP). The economy, as usual will continue on an expansionary trajectory.

The trust in the system will increase as credential verification will become faster and cheaper. And a trustworthy economic system is good for business. The role of the government as the sole issuer of currency will continue. Even if the network goes down, the government has to restore it or provide an alternate economic system (i.e. paper currency system). So, the economy will not go down with the network.

There is also another upside for Central Banks and Governments. Nations today pay a high price run a paper currency based economy due to substantial cost of effort, resources, time, maintaining and operating paper money infrastructure, high fees for cash withdrawals, moving and managing cost of paper money etc. Imagine all the money saved by shifting to a cashless economy. It is estimated that India alone - a $2 Trillion economy now- could save close to $70 Billion by 2025 if it shifts to a cashless economy [3].The savings world-wide by introduction of RSBCs will be enormous, probably running into hundreds of billions of dollars by 2025. All those savings can be utilised for poverty alleviation or managing the ill-effects of climate change.

CONCLUSION

We see that Banks, through Fractional Reserve Banking (FRB) help to expand the money supply in the economy. FRB is in fact an indirect way of exerting control over money supply by the Central Banks. At the same time, FRBs may pose a risk to the economy if it goes out of control. If Bitcoins and similar cryptocurrencies become mainstream media of exchange, there will be heavy disruption of the present economic order. Banks will lose their primacy in the economy; there will be large flight of capital from the Banking system. FRB will be in eliminated. The Money supply will purely be determined by market forces. This may give scope for manipulation and cartelization by unscrupulous elements. Money itself may be monopolized. RSBCs on the other hand reduce the role of FRB to a minimum. Banks will still have a role in the economy, albeit a different one. Banks will be transformed into Trusted Fourth Parties (TFPs) which will have the responsibility of certifying credit-worthiness of individuals and other legal entities in a Crypto-currency dominated economy. One can observe that RSBCs allow for introduction of crypto-currencies into the mainstream economy in a controlled manner. Moreover the savings of shifting from a cash-based to

digital economy is also substantial. This is akin to harnessing the destructive power of the atom albeit for peaceful purposes. Thus RSBCs are better suited than Bitcoin-like cryptocoins to become mainstream digital bills of exchange.

REFERENCES

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