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The Economic Impact of Digital Fiat Currency (DFC): Opportunities and Challenges

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1. Introduction

The huge rapid growth of using internet and technology has been affecting all economies whether emerging or developed across the world. The financial sector is one of the sectors that has been directly influenced by technology due to the growth of electronic commerce and electronic payments. The emergence of digital currencies such as Bitcoin and the underlying blockchain as well as the distribution ledger technology have attracted significant interest. These developments have raised the possibility of considerable impacts on the financial system and perhaps the wider economy. The huge price leaps that happened to Bitcoin towards the end of 2017 until it reached its highest ever price, (19000 USD) since the beginning of its trading, followed by the significant fall that took place afterwards till it fell under the level of 4000 USD in 2018, made the Central banks more worried about the future of this market.

In addition to that, the increase of developing new cryptocurrencies as well as the lack of control over it, made the central banks very alert to the futuristic view of this sector keeping their eyes wide open to this rapid growth.

As a result, over the past few years, public authorities and central banks around the world have been monitoring developments of digital currencies and studying their implications. A question that has been raised frequently is whether central banks themselves should issue digital currency that could be used by the general public or not. The legal status of cryptocurrencies was always in question. Some administrations have banned them and other had implicit bans. In many other countries they are still under study and only official warnings from using and investing in cryptocurrencies were announced.

The idea of issuing the central bank cryptocurrencies or Digital Fiat currencies has been studied by central banks in order to offer a formal/legal substitute for the consumer that is trusted and protected by central banks. Transitioning from private Cryptocurrencies to a legally issued digital currency will enhance the suite of financial inclusion tools that are already in place, offer “cash”-only households a leap into digital transactions, and increase the consumer choices of how to manage their household income and expenditures.

2. Literature Review:

A monetary system is a set of mechanisms and entities by which a government can provide money to the economy of a country. Usually the entities involved in this process are National treasuries, Central banks and the mint. The national treasury is the entity that is responsible for the financial management and expenditure of a country alongside with the ministry of finance if exists.

The central bank is the institution that manages the country's currency and money supply. It also manages the interest rates and regulates the commercial banking activities within a country. As for the mint, it is the entity that has an approval for the government to produce and manufacture it's coins in order to be used as the official currency.

As per Dharmapalan & McMalon 2016, Citizens, worldwide, need access to safe, affordable means by which to manage their financial lives and thrive. Despite innovations in banking and financial technology, the prevalence of and preference for cash transactions remains high. By "cash", we mean physical manifestations of legal tender, paper currency and coin currency.

Approximately 85% of all global consumer transactions are conducted in paper-based currency. In emerging economies, the ratio of cash to other forms of transactions skews higher still, 98% for India and nearly 100% for Indonesia. In developed economies, despite the wide choices of debit, credit and stored-value solutions, cash transactions remain high: 48% in the United Kingdom, 55% in the United States, and 67% in Germany. Heaviest users of cash may be emerging economies, still, in developed economies, despite wide choices of debit, credit and stored-value solutions, cash transactions remain high.

With the rapid development of technology during the past 10 years and with the evolution of the Internet and the online applications, a need has been raised to digital & online payments. The online credit cards payments and paypal like solutions were not satisfying to all consumer needs. This evolution along with the needs, has led to the development of what is called Bitcoin, which is the first decentralized cryptocurrency that was based on blockchain technology.

As per Wikipedia, cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange that uses strong cryptography to secure financial transactions, control the creation of additional units, and verify the transfer of assets.

According to Jan lansky (2016), a cryptocurrency is a system that meets six conditions:

1. The system does not require a central authority; its state is maintained through distributed consensus.
2. The system keeps an overview of cryptocurrency units and their ownership.
3. The system defines whether new cryptocurrency units can be created. If new cryptocurrency units can be created, the system defines the circumstances of their origin and how to determine the ownership of these new units.
4. Ownership of cryptocurrency units can be proved exclusively cryptographically.

5. The system allows transactions to be performed in which ownership of the cryptographic units is changed. A transaction statement can only be issued by an entity proving the current ownership of these units.
6. If two different instructions for changing the ownership of the same cryptographic units are simultaneously entered, the system performs at most one of them.

Also According to CoinMarketCap (<https://coinmarketcap.com>), there are more than 2,000 active cryptocurrencies right now such as Ethereum, Litecoin, Ripple, Dash, Monero, Zcash, and more. Despite this amount of cryptocurrencies, many countries are still not legally comfortable with cryptocurrencies.

The legal status of cryptocurrencies varies substantially from country to another and is still undefined or changing in many of them. While some countries have explicitly allowed their use and trade, others have banned or restricted them.

According to the Library of Congress, an "absolute ban" on trading or using cryptocurrencies applies in eight countries: Algeria, Bolivia, Egypt, Iraq, Morocco, Nepal, Pakistan, and the United Arab Emirates. The Central Bank of Egypt issued a warning in January 2018 against the trading of cryptocurrencies, such as bitcoin, due to the extremely high risk associated with such currencies. The Central Bank also asserted that commerce within the Arab Republic of Egypt is confined only to the official paper currencies approved by the Bank.

In Pakistan, currently there does not appear to be any specific law that regulates cryptocurrencies or the trade in cryptocurrencies. In May 2017, the State Bank of Pakistan (SBP) stated that it does not recognize digital currencies. On April 6, 2018, the SBP issued a press release warning the general public from the risk of virtual currencies: "The General Public is advised that Virtual Currencies/Coins/Tokens (like Bitcoin, Litecoin, Pakcoin, OneCoin, DasCoin, Pay Diamond etc.) are neither recognized as a Legal Tender nor has SBP authorized or licensed any individual or entity for the issuance, sale, purchase, exchange or investment in any such Virtual Currencies/Coins/Tokens in Pakistan. Furthermore, Banks/ DFIs/ Microfinance Banks and Payment System Operators (PSOs)/ Payment Service Providers (PSPs) have been advised not to facilitate their customers/account holders to transact in Virtual Currencies/ Initial Coin Offerings (ICOs) /Tokens vide BPRD's Circular No. 03 of 2018."

In UAE and Under article D.7.3 of the Regulatory Framework for Stored Values and an Electronic Payment System, issued by the Central Bank of the United Arab Emirates in January 2017, all transactions in "virtual currencies" (encompassing cryptocurrencies in Arabic) are prohibited. In January 2018, the UAE Central Bank, reiterated a warning against trading in cryptocurrencies. According to news reports, when the central bank governor was asked about his views concerning cryptocurrencies, he said that citizens should avoid these types of currencies because they are not approved by the Central Bank. Previously, in October 2017, The UAE central bank issued a warning pertaining to cryptocurrencies, which said that such currencies were susceptible to use in money laundering or terrorism funding.

He also added that cryptocurrencies such as Bitcoin cannot be monitored by any legitimate financial authority.

An "implicit ban" applies in another 15 countries, which include Bahrain, Bangladesh, Colombia, the Dominican Republic, Indonesia, Iran, Kuwait, Lesotho, Lithuania, Macau, Oman, Qatar, Saudi Arabia and Taiwan.

The Central Bank of Bahrain has issued a warning against cryptocurrencies, especially bitcoin. During a parliamentary session that took place in the Shura Council, the governor declared that the Bitcoin is not recognized by any financial institution. He also mentioned that using Bitcoin in Bahrain is illegal; however, Bahraini citizens have the right to invest in cryptocurrencies outside Bahrain.

In Indonesia the central bank published a statement about cryptocurrency as follows: Bank Indonesia affirms that virtual currencies, including Bitcoin, are not recognized as legitimate instrument of payment, therefore not allowed to be used for payment in Indonesia. This is in line with Act No. 7/2011 on The Currency, 666 which states that currency shall be money of which issued by the Republic of Indonesia and every transaction that has the purpose of payment, or other obligations which need to be fulfilled with money, or other financial transactions conducted within the territory of the Republic of Indonesia, has to be fulfilled with Rupiah.

In Colombia, The Superintendencia Financiera (SF) (Financial Superintendency) of Colombia warned in a June 2017 circular that Bitcoin is not a currency in Colombia and therefore may not be considered legal tender susceptible of cancelling debts.

In the United States and Canada, state and provincial securities regulators, coordinated through the North American Securities Administrators Association, are investigating "Bitcoin scams" and ICOs in 40 jurisdictions.

Various government agencies, departments, and courts have classified Bitcoin differently. China Central Bank banned the handling of bitcoins by financial institutions in China in early 2014. In Russia, though cryptocurrencies are legal, it is illegal to actually purchase goods with any currency other than the Russian ruble. Regulations and bans that apply to Bitcoin probably extend to similar cryptocurrency systems.

From All what we see, different countries deal with cryptocurrencies differently, but mostly the ban whether absolute or implicit is widely used in emerging economies so here comes the real need for government issued cryptocurrency or what we can call digital fiat currency (DFC). Digital Fiat Currency has other terminologies such as Central Bank Digital Currencies (CBDC). Until now there is no one official definition for DFC or CBDC, only the same concept that is unified which is an electronic currency, issued and controlled by the central banks. Some countries are now studying the issuance of Digital Fiat currencies. Some other countries have already taken a further step and produced their own DFC like Philippine who has introduced their digital currency the ePiso in 2018.

With DFC, Citizens will enjoy the universality of legal tender with the added fluidity of electronic transactions. They will pay and be paid with confidence in their central bank-backed digital currency, imbued with the same secure, trusted characteristics as the coins

they have long stowed in jars and pockets. With a digital form of currency and acceptance of it in digital form, a citizen need not “cash out” into paper currency form unless that citizen so desires. They can receive, store, then transact in the digital form without interruption. (*Jonathon Dharmapalan and Carolyn McMahan. 2016*)

3. Discussion:

Since the beginning of crypto currencies, there is a debate going on about the disadvantages and problems it brings to the financial regulators. The concerns of the central banks are always the same, since this currency is not issued, regulated and monitored by a trusted, legal and formal entity then there is a big risk in using it and it could be also mean for creating some disturbance for the formal economy and assist illegal activities.

Many believe that cryptocurrencies could be used for international money laundering. The world's central banks have been skeptical of Bitcoin for example because it can't be monitored, predicted, or tracked. Cryptocurrency has become a power in and of itself, because it's **keeping governments' and banks' financial power in check**. Cryptocurrencies like Bitcoin have created a new market where, unlike the present financial system, no one entity has total control. Cyberspace is set to become the manager of this disruptive market, and the near-zero transaction cost makes cryptocurrency superior to traditional currencies in many ways.

As the use of crypto currencies is increased, the dark web transactions are made easier. The dark web is the part of the Internet that's not found in search engine results. It's only accessible through software, such as the Tor browser & freenet, which allows users to search the internet anonymously. The dark web is the place to find illegal activities such as buying weapons, assassins, ...etc. By using a cryptocurrency like Bitcoin, a person can complete an **illicit transaction without revealing any identifying information**.

Cryptocurrencies make these transactions easier, which may increase cybercrime. Even if we have the right regulations, latest technology and got rid of all the problems listed above, until the technology is adopted by governments and is well regulated, there will be an increased risk of investing in this technology. In addition to that, since all cryptocurrencies transactions are not officially monitored by a regulatory body, (i.e. central banks) it creates a pleasant medium for the increase of the informal market which may lead to the disturbance of the economy causing issues that may affect the monetary policy negatively.

4. Transition to Digital Fiat Currency, Opportunities and Challenges

One possible way to address the issues raised in the discussion section, is the Digital Fiat Currency (DFC). It is a technically innovative instrument that can be designed to serve as a mean of settlement across electronic/digital payment systems.

There are two approaches to implement Digital Fiat Currency, a direct access approach through the central banks and an indirect access through the DFC accounts.

4.1 Direct Access approach

Through this approach, the central bank will need to give every citizen a DFC account and this would also imply providing the citizens with sort codes, account numbers and payment cards so that the money in those accounts could be used. In addition, customers would need a way to check their balance and transactions, so internet or mobile banking would be a minimum requirement, and telephone banking would be necessary for some account holders. This approach has been taken by the central bank of Ecuador in the Digital currency implementation. This approach has been criticized for distracting central bank from its original role of regulating the banks and managing the monetary policy by taking this huge administrative tasks. Also in this approach the central banks will be seen as competitors to commercial banks in payment services which is not appropriate for a regulator.

4.2 Indirect Access Approach

In this approach DFC, units are issued by the central bank via a dedicated DFC payments platform, they can be converted into bank deposits and other forms of government-issued liabilities, including physical currency, central bank settlement balances (reserves), and interest-earning government securities. Transactions and cash storage are conducted via DFC wallets or applications, which are hosted and managed by licensed financial intermediaries (Banks), but remain to be the property of the wallet- or application-owner. Also all customer service activities are going to be handled by the banks. This approach is seen to have significant advantages, one of them is minimizing the burdens of the direct approach on the central banks and also enhancing competition in payment services between the intermediaries.

A proper designed DFC system should have at least the following characteristics:

- The central bank is the sole authorized party to issue DFC liabilities, with similar ownership restrictions and legal tender protections as physical currency.
- The central bank guarantees the convertibility of DFC to physical currency
- Private financial institutions (e.g. Commercial Banks) that meet basic criteria are eligible to apply for a special DFC intermediary license, and, upon receipt of such a license, are eligible to establish and maintain DFC wallets on behalf of retail customers, and to convert, upon demand, currency and/or government-guaranteed obligations, at face value, into DFC units.
- Any individual or entity can obtain a DFC wallet managed by a licensed DFC intermediary, and store funds in that wallet, without technical limit.
- Licensed DFC intermediaries can make payments from customers' DFC wallets, on their behalf, through a trusted DFC intermediary network, mediated and backed by the central bank.

4.3 Digital Fiat Currency Opportunities

Digital Fiat currency is, at its legal core the digital equivalent to physical currency. The opportunities and benefits that could be gained from implementing a DFC system is tremendous and could assist in accelerating the digital transformation plans that are currently on the agendas of many countries across the globe. Through exploring the opportunities and benefits of DFC, they can be summarized as follows:

1. Reduce the cost of Cash

The cost of physical money whether bank notes or coins is not only the cost of its producing and printing, there are other costs that are considered high. For example, the cost of moving physical money from one location to another and the security costs associated with it. Cost of handling physical money in general is also a burden, whereby the life span of the notes ranges from 1 year to 15 years and the coins around 30 years. When the life span reaches its end, the physical money will need to be destructed and re-produced and this is another cost. Digital fiat currency will eliminate all these costs associated by cash, however there will be another new cost that will be associated with DFC but still the new costs are little compared to the large operational costs associated with traditional physical currency.

2. Ease of flow of money between government and individuals

DFC will also enable ease in flow of money for subsidies, payment and taxes between government and individual or vice versa, improving the efficiency, blocking leakswith efficient administration.

3. More transparency for informal economy

DFC will also create more transparency and visibility for the informal economy, which currently poses as a big challenge in many emerging economies. DFC will help in getting in the informal markets to jump into the formal economy and start using the official financial means in their transaction, payments and commercial dealings.

4. Accelerate financial inclusion

As an important tool of transitioning the informal economy to formal, DFC is going to be an important tool that also accelerates financial inclusion between unbanked citizen. DFC will enhance the suite of financial inclusion tools that are already in place, offer "cash"-only households a leap into digital transactions, and increases consumer choices of managing their household income and expenditures.

5. Increase the use of E-commerce & Mobile financial services

While it is considered a good tool for financial inclusion, DFC could facilitate using the ecommerce services and make placing the orders and paying online much easier for the users.

6. Monetary policy assistance

DFC will allow the regulator to monitor the monetary system and the real time information that could assist in monetary policy management. The real-time information will help monitoring the changes to the velocity of money, impacts of changes in the monetary policy and currency management.

7. Solidifies central governance role as the sole issuer of DFC

DFC is considered a currency of sovereign domination within the country and accordingly the central bank is the sole issues of DFC.

8. Provide highest degree of security to enhance trust in digital ecosystem

The issuance of DFC by central banks is in itself a guarantee and enhances the trust that these digital currencies are official and have the needed legal features to be used with confidence in payments.

4.3 Digital Fiat Currency Challenges

In spite of all those opportunities and benefits listed above, there are challenges that really need to be considered. These challenges can be summarized as follows:

1. Regulations

A major Challenge here in the transition is the regulations, and the need to fine tune the current regulations in order to suite the newly introduced DFC. In this case there might be a need for new regulations that might be different from the current ones.

2. Consumer protection and trust

The issue of trust is very important and is one of the major challenges. Trying to convince citizens to switch to digital currencies and discard the current physical money is a hard process. Although issuing the DFC from local central banks should give confidence to using them, the cash societies that are used to physical money for example in The Middle East & Africa are a big challenge. In Egypt, the number of credit cards issued by banks were 200,000 cards in year 2000. After 18 years and with efforts from the government and the banks, the number of credit card issued until 2018 were 4.35 million cards which is less than 5% of the penetration rate. This is because Egyptians prefer using physical money in their daily transactions rather than using cards. However, the government is working hard to change this perception in the communities and has already started local initiatives regarding electronic payments in order to serve the financial inclusion objective. One famous initiative is unifying all government payroll to be using ATM cards.

3. Awareness

The issue of awareness is the most important factor affecting the digital financial services in the emerging economies. In general, there are 3 levels of awareness issues, first level when the citizen doesn't know that digital financial services exist. The second level is when the citizen knows about the service and doesn't know how to use it. The third level is the trust, where the user knows about the service and knows how to use it but doesn't trust it and this level was discussed in point no.5

4. Cost of transition

The cost of transitioning from the physical money to digital money is also to be considered as a challenge. Cost of installing the supporting the issuance systems and their ongoing support along with the qualified human resources that will be running it, is a matter to be studied before taking the decision. All CAPEX and OPEX should be analyzed in order to get the most benefit from DFC so that the new overheads doesn't exceed the physical system.

5. Interoperability

Interoperability of the DFC network and the existing bank-based payments system is a challenge that needs to be considered carefully before taking the decision of implementing a DFC system.

5. Conclusion and further research

DFC could be a solution to the rapid issuance of crypto currencies and could also offer many opportunities for governments to attain their financial inclusion goals. On the other hand, DFC may also help Government in their efforts of cutting cost and following up on financial transactions with citizens (e.g. taxes, subsidies, ...etc.).

With all the opportunities DFC could bring to the governments, still there are some areas that will need further research to attain the goal of this transition. Security is one of the main important areas that will need further research in order to reach the maximum security for DFC transaction and ensure that it is protected against fraud and cyber-attacks. Another area for further studying is the regulatory framework and the ecosystem of DFC. New regulations different from the physical cash or not is a question that needs to be answered. Also the stake holders that should be involved in DFC ecosystem and the involvement of other regulatory bodies such as Telecom Regulators is also another question that needs an answer.

6. References

1. *Global Legal Research Center. Regulations of Crypto currencies around the world, The Law Library of Congress. June 2018.*
2. *Jonathon Dharmapalan and Carolyn McMahan. The Case of Legal Tender: Central bank issued Digitalcurrency and its Impact on Financial Inclusion, eCurrency. 2016*
3. *Jan Lansky. Possible state approaches to cryptocurrencies, journal of system integration, university of finance and administration in Prague. 2016*
4. *Ben Dyson & Graham Hodgson. Digital Cash: Why Central Banks Should Start Issuing Electronic Money, Positive Money(positivemoney.com). January 2016.*
5. *Committee on payment and market infrastructure. Central Bank Digital Currencies, Bank of International Settlements. March 2018*
6. *Banking Supervision Department. Report on Number of Debit and credit cards in Egypt, Central Bank of Egypt. 2018*
7. *ITU-T Focus Group on Digital Fiat Currency, ITU. 2017*
8. *Wikipedia*
9. *Coincapmarket website (www.coincapmarket.com)*