



CRYPTOCURRENCY AND TECHNOLOGY: COULD IT REVOLUTIONIZE THE ECONOMIC PROSPERITY?

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Abstract

Cryptocurrency has been one of the most revolutionizing financial innovation of the 21st century. Cryptocurrency, led by bitcoin and Ethereum has shown promising potential to solve the global financial and economic problems and barriers. The journey of the cryptocurrency, from \$0.000 to \$27334 (Bitcoin) has also been no less than a charm. The cryptocurrency has seen equally dramatic and polarizing responses as well, from being called the latest gold to being dismissed as another hawala technique, the cryptocurrencies remained hugely debated and controversial financial technology of the second decade of the 21st century. Cryptocurrency evoked emotional responses and hysteria from the governments across the globe and received extreme reactions from being declared as the legal tender in some countries to being completely outlawed in another. A set of financial pundits are lauding the promises the latest innovation hold while another is busy calling it a bubble and have written obituaries, in advance. Whatever may be the ultimate fate of the cryptocurrency such as bitcoin or Ethereum but it is a sure thing that the technology would stay and would be used by various countries for tailor made financial schemes as all nations and financial institutions such as IMF and World Bank have expressed keen interest in appreciating and evaluating the potentials of technology underpinning the cryptocurrencies.

But does the cryptocurrency hold any real potential or is it a mere farce? This research article sprang up from the curiosity set up by this question and in this article the researcher shall make an honest attempt to answer many of the potentials of the cryptocurrency and its underlying technologies, more particularly, blockchain. Researchers would also ultimately delve into the million dollar question, How could cryptocurrency revolutionise the economic prosperity.

Keywords: Cryptocurrency, Financial Inclusion, Blockchain, decentralization, remittance.

PURPOSE STATEMENT

The researchers are equally intrigued as well as perplexed by the opportunities and potentials offered by the latest FinTech. And therefore, this article shall delve upon the following problems.

1. What is cryptocurrency?
2. How cryptocurrency operates?
3. Why do we need cryptocurrency?

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1. Cryptocurrency: The origin.

It was during the last decade of the 20th century that the technology called ‘Internet’ made its mark on the world platform¹. The advent of the computer and internet era brought along a Tsunami of technological shifts in the global commerce industry.² The internet provided a newly found opportunity to the world to enter into trade and commerce without the need of actual physical markets³. Previously, the regular physical trade and commerce activities required a deep assistance and reliance upon the banking instruments such as Letters of Credit or undertaking by banks⁴, but this all got a dramatic shift with the advent of internet and different means of payment settlement such as Paypal, Visa, Master Card, Western Union came up. These technologies had promising potential and were thus welcomed by the trade and financial sector with widely opened arms⁵.

However, the first decade of the 21st century was an eye opener for the world as it displayed the large interconnectivity of the global financial sector and the risk of a massive catastrophe upon fall of the weakest link in the chain. The 2008 was a remarkable year, it made the world realise how vulnerable the banking and financial sector could be and that the phrase ‘*to big to fail*’ was just an empty vessel as the biggest banks on the planet, often stated to be fall proof, crumbled down like a house of cards. Lehman Brothers, Bank of America, Bank of New England and Washington Mutual were all such banks which felt the domino effect of the real estate bubble and busted out to the massive financial irregularities often known as ‘*Alt A lending*’⁶.

These banks fell and led to the failure of various economies and industries along with them which culminated into a long spree of global recession and job losses. But why is a bank, as a financial institution, so crucial? The simple answer is that it holds the public money. Banks act as depository of general public money and use them for advances in order to gain earning, but when the lending are not well scrutinized by these financial institutions, it fails to repay the money owed to the general public, the depositors, thereby eroding the wealth of the common man as well as it erodes the general confidence in the economy and the market. Therefore, 2008 made banks appear as a necessary social evil, *necessary but evil*. It was necessary because banks act as a payment settlement mechanism as well, evil as it was susceptible to fail and prone to maladministration because of the poor policy governance.

Governmental interference in the administration of banks and lending activity has also been another key indicator leading to the failure of banks as the whole real estate bubble of 2008 was an offshoot of the American Government’s agenda of ‘American Dream’ about each American owning a house and agencies like Freddie Mac and Fannie Mae overseeing the real estate lending⁷, paving way for the Alt A lending. India too has seen massive policy governance and excessive financial interference by the governments in the banking operations which has resulted in many banks being declared defunct, latest being the Yes Bank, Lakshmi Vilas Bank, Diwan Housing Financial Corporation, Industrial Development Bank of India and Punjab & Maharashtra Co-Operative banks to name a few⁸.

¹When was the Internet invented?, Insight, Prysmian Group. As available at <https://www.prysmiangroup.com/en/insight/telecoms/when-was-the-internet-invented>

²Digital Connectivity, E-Commerce and Sustainable Trade, Aid for Trade Global Review 2022, WTO, 2021, pp. 90-121. As available at https://www.wto.org/english/res_e/booksp_e/aid4trade22_chap3_e.pdf

³Terziaa N, The impact of e-commerce on international trade and employment, 7th International Strategic Management Conference, Procedia Social and Behavioral Sciences 24 (2011)745-753

⁴Crozet M, Demir Banu & et al., International Trade and Letters of Credit: A Double Edged Sword in Times of Crisis, European Bank, July 2021.

⁵Perset K, The Economic And Social Role Of Internet Intermediaries, OECD, Apr 2010. As available at <https://www.oecd.org/digital/ieconomy/44949023.pdf>

⁶Sengupta R, Alt-A: The Forgotten Segment of the Mortgage Market, Federal Reserve Bank of St. Louis Review, Jan-Feb 2010, pp 55-72.

⁷Rajan R, Fault Lines, Collis Business, 2010, pp.20-21.

⁸PMC Bank Collapse: We Lost Our Money and Then Our Son, BBC, 25th Sept 2020.



Therefore, a section, a large section, of the society started harbouring disbelief into the banking sector and the governmental control over it. It was in this backdrop that a white paper⁹ came to be published by a pseudonym ‘Satoshi Nakamoto¹⁰’, detailing about a latest financial technology which was completely decentralised and immune from the governmental interference or poor governance by the banks management. There could not have been a more opportune moment for the launch of a cryptocurrency which was ultimately a challenge to the present financial system. Today, cryptocurrency boasts of a collective market capitalisation of more than \$1 Trillion,¹¹ with more than 21000¹² variants of cryptocurrencies available across the globe having more than 420 million users. Further, the numbers of users have seen a staggering growth of more than 180% in preceding years¹³. Further, the bitcoin public ledger which initially started with 0.0 KB of space has today reached a massive 440 GB¹⁴ of space, holding records of more than a Billion transactions, all publicly, with no reported cases of temper. Therefore, it would only be a foolhardiness to dismiss the whole cryptocurrency ecosystem by calling it merely a bubble.

2. How does cryptocurrency work?

Cryptocurrency is thus a name given to a form of currency which is cryptic in nature, ie, which does not exist in physical form like a traditional fiat money does and does not bear any uniform identifiable features like denomination notes, hence cryptic and performs functions of a currency, cryptocurrency. Cryptocurrency is a class of financial instrument having more than 21000 subsets of it. therefore in order to appreciate the technology and the working principles of the cryptocurrency, researcher has decided to pick Bitcoin as a representative of the whole cryptocurrency. Bitcoin can be a suitable representative of the whole class as it is the first of the cryptocurrency which reached such scales and became popular thereby leading to the birth of many other cryptocurrencies working on the duplicated patterns. Hence, brief understanding of the fundamentals of the bitcoin would provide sufficient insight to an informed reader about the cryptocurrency technology and its working.

Bitcoin employs several key technologies in its operations. Peer to peer transaction, bloc chain, decentralisation, public ledger, open source software, nodes, mining, cross border operations and anonymity are the benchmarks of the bitcoin ecosystem. Bitcoin is completely paperless and direct transaction from one account holder to another account holder and does not rely upon an intermediary, like bank or government, to verify or process the transactions. Bitcoin, a cryptocurrency, works on the principles of the peer to peer transaction settlement wherein two interested parties deal and transact directly without any intervention of a central authority like government or financial institutions¹⁵. The transaction between two bitcoin users or transactors depend upon the nodes, which are the participants in the open software system, a system which anyone can access from any place in the world and is thus not controlled by any authority or the government, hence decentralisation. This decentralisation of the bitcoin system makes it immune from any hacking, though there is a study which suggests that 51% of the nodes coming together and forming a group could control the bitcoin protocol¹⁶, however looking at the modalities in the

⁹Nakamoto S, Bitcoin: A Peer-to-Peer Electronic Cash System. www.bitcoin.org

¹⁰It is not known who this Satoshi Nakamoto is, whether its an individual, collection of individual or an organization.

¹¹Total Cryptocurrency Market Cap, CoinMarketCap. As available at <https://coinmarketcap.com/charts/>

¹²Nearly 5,000 New Cryptocurrencies Emerged in 2022 Despite Harsh Winter, The Economic Times, 1st Dec 2022.

¹³Best D R, Number of identity-verified cryptoasset users from 2016 to November 2022, Statista, Dec 2022. As available at <https://www.statista.com/statistics/1202503/global-cryptocurrency-user-base/>

¹⁴Bitcoin Blockchain Size, Dec 2022. As available at https://ycharts.com/indicators/bitcoin_blockchain_size

¹⁵Supra 11.

¹⁶Frankenfield J, 51% Attack: Definition, Who Is At Risk, Example, and Cost, Investopedia, 28th Sep 2022. As available at <https://www.investopedia.com/terms/1/51-attack.asp>



system, spread of the nodes across different locations in the world, anonymity of the nodes, its almost impossible that an event like this could occur in practical sense.

Therefore, bitcoin system is bereft of any intermediary or central issuing authority and thus completely immune from the ills the financial industry has been struggling from since inception i.e poor governance, governmental interference and deficit financing to name a few. Further, the issuance of the new bitcoins is dependent upon the active participation of the nodes and transactions in the protocol, every time a transaction between two participants takes place, it needs to be independently verified by the nodes available upon the system, the verification involves a process of solving arithmetical and mathematical equations in order to authenticate the transaction. This authentication then gets registered in the ledger which is available in the public domain and hence known as a public ledger¹⁷, therefore, it eliminates the possibility of the double spending of the bitcoin, a problem which had never been solved by any of the early proponents of the internet currencies and was a main source of the failure of previous versions of the cryptocurrencies. Further, this authentication exercise serves twin purposes, validates a transaction and the node gets rewarded with freshly minted bitcoins thereby serving as the incentive for the participants to stay in the field.

Further, the bitcoin employs another fundamental technology known as the blockchain, this blockchain¹⁸ is a public ledger in which the each authenticated transaction is registered with its unique hash value which cannot be altered later on and thus lends credibility to the system as well as keeps a track of the movement of the each individual bitcoin. Each time a new transaction takes place, it is registered in the public ledger and a block is created, each block has its own unique hash value and it cannot be changed. Thus blocks keep adding and higher the number of blocks more the level of security to the chain, hence the name, blockchain. The transaction involving bitcoin could be accessed only through using the private and public key system where the public key is the address of the sender or receiver and the private keys are the individual passwords to authenticate the transaction. This key chain system is based upon 256 bit hash value function which is almost impossible to crack in the real time and therefore highly secure, so secure that if the private key is lost or forgotten by the user, the bitcoins will become redundant and could ever be retrieved.

The bitcoin also ensures a level of anonymity to the users, though this anonymity is not a perfect one and could be pierced through by the law enforcement agencies in case of any deviation from legal principles, still largely it is an anonymous system, thus anonymity is one of the chief source of popularity as well as notoriety of the bitcoin. Since the bitcoin is not controlled by any central authority, it can be easily transacted cross jurisdictions and borders, therefore, holds the potential of becoming a truly global currency as well as for various illegal uses such as money laundering and terror financing, however, as per the research conducted by the Europol, use of bitcoin in illegal activities have been very less as compared to the regular financial channels and traditional money¹⁹.

3. Why world needs cryptocurrency?

Cryptocurrencies operate on a massive platform, having a global reach, and there is a staggering rise in the demand for cryptocurrencies. The current market capitalisation of the cryptocurrencies stand at whopping \$1 Trillion, despite all the turbulations the market went through and all the obituaries written for it. If the current market capitalisation of the cryptocurrency is gathered in

¹⁷Seth S, What Is a Cryptocurrency Public Ledger, How It Works, Risks, Investopedia, 26th Aug 2021. As available at <https://www.investopedia.com/tech/what-cryptocurrency-public-ledger/>

¹⁸Shekhar Gehlot, D. and Dhall, A., 2022. Evaluating the sustainability of Bitcoin. *Mathematical Statistician and Engineering Applications*, 71(3), pp.139-151. As available at <https://www.philstat.org/index.php/MSEA/article/view/120>

¹⁹Europol Report Says Cryptos Used Less Than Fiat Money For Illegal Transactions; BTC, ETH Fall, Outlook, 31st Jan 2022. As available at <https://www.outlookindia.com/business/europol-report-says-cryptos-used-less-than-fiat-money-for-illegal-transactions-btc-eth-fall-news-51365>

terms of Gross Domestic Produce (GDP), it stands taller than the GDP of various countries such as Greece, Italy, Qatar, Middle east, Denmark, Israel, Czeck republic, Portugal, Finland, South Africa, Ukraine, Lithuania, New Zealand etc combined in one²⁰. Cryptocurrencies have lost almost 50% value during the previous 2 years²¹, however, it is a common phenomenon with the shares, scrips and even the currencies, though, in order to establish cryptocurrency as a parallel money or the currency, it must ensure that volatility in the valuation is controlled to a greater extent. However, since it is a developing market and technology, it is expected that future tweaks in technology holds huge promises and technologies employed by cryptocurrencies such as Stablecoin could be examined in this direction.

There is hardly any corner left on the planet where cryptocurrency has not left its mark. Further, owing to the huge potentials in the global market and the wave of global inclusion in terms of market, produce, finance and tech, the present scenario offers an excellent opportunity to explore the idea of a medium which is as fluidic as cryptocurrency, though it may change some forms and some of its features slightly, but the core fundamentals are definitely a giant leap. Further, the continued failure of massive banks constraining the US Federal Reserves to spare a massive grant of running into Billion of dollars, has again opened the debate over viability and utility of cryptocurrencies. An appreciation of the treatment of cryptocurrency would also make a strong case for phase wise exploration of the cryptocurrencies.

Strong developed countries like Japan have come out as crypto havens and have supported the technology in its infancy, housing one of the world's biggest cryptocurrency Exchange²². Japan has not stopped at merely providing avenues for development of cryptocurrency ecosystem, rather, it has been one of the first nations which has successfully incorporated the cryptocurrency in its system and has made thoughtful enactments over it. Further, the developed nations and the supposed financial hubs of the world US & UK have also adopted a positive approach towards the cryptocurrency. Therefore, it would be germane to explore the legality of cryptocurrency around some of the countries of the world. The table no.1 below explains the present status of the cryptocurrency and its treatment around some of the major countries in the world.

Nation	Legal status	Whether Legal Tender?
Russia ²³	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity. Move to induct Bitcoin and ether as legal tender for gas and oil payment I international market on cards.
Ukraine ²⁴	Legal	Legal tender (Bitcoin and Ether)
El Salvador ²⁵	Legal	Legal tender(Bitcoin)

²⁰GDP Ranking 2019, Data Catalog, The World Bank. As Available at <https://databank.worldbank.org/data/download/GDP.pdf>

²¹Reinicke C, Bitcoin has lost more than 50% of its value this year. Here's what you need to know, CNBC, 15th Jun 2020. As available at <https://www.cnbc.com/2022/06/15/bitcoin-has-lost-more-than-50percent-of-its-value-this-year-what-to-know.html>

²²Nakamura Y, While the World Cracks Down, Japan Emerges as a Crypto Haven, Bloomberg, 10th Apr 2018. As available at <https://www.bloomberg.com/news/articles/2018-04-10/while-the-world-cracks-down-japan-emerges-as-a-crypto-haven#xj4y7vzkg>

²³Bank of Russia agrees to legalise crypto for cross-border payments, Financial Express, 6th Sep 2022. As available at <https://www.financialexpress.com/blockchain/bank-of-russia-agrees-to-legalise-crypto-for-cross-border-payments/2656076/>

²⁴Walsh D, Ukraine officially legalises Bitcoin and other cryptos after Zelenskyy signs new law, EuroNews, 17th Mar 2022. As available at <https://www.euronews.com/next/2022/03/17/ukraine-war-zelenskyy-signs-a-new-law-officially-legalising-bitcoin-and-other-cryptos>

²⁵Renteria N, In a world first, El Salvador makes bitcoin legal tender, Reuters, 10th Jun 2021. As available at <https://www.reuters.com/world/americas/el-salvador-approves-first-law-bitcoin-legal-tender-2021-06-09/>

Central African Republic ²⁶	Legal	Legal tender(Bitcoin)
Switzerland ²⁷	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Poland ²⁸	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Japan ²⁹	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Hungry ³⁰	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
United States ³¹	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Britain ³²	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Canada ³³	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Ukraine ³⁴	Legal	Legal Tender
Denmark ³⁵	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Austria ³⁶	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
Germany ³⁷	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
France ³⁸	Legal	Not legal tender but still legally used as both ways i.e money and/or commodity.
India ³⁹	Legal	Not legal tender but still legally used as

²⁶Bitcoin becomes official currency in Central African Republic, BBC, 27th Apr 2022. As available at <https://www.bbc.com/news/world-africa-61248809>

²⁷Merchant M, An overview of the cryptocurrency regulations in Switzerland, Cointelegraph. As available at <https://cointelegraph.com/cryptocurrency-regulation-for-beginners/an-overview-of-the-cryptocurrency-regulations-in-switzerland>

²⁸Putyra P, Cryptocurrency license and business in Poland, Dudkowiak. As available at <https://www.dudkowiak.com/fintech-in-poland/crypto-license-poland/>

²⁹Japan Passes Law On Stablecoin To Protect Crypto Investors, Bitcoin Falls, Outlook, 3rd Jun 2022. As available at <https://www.outlookindia.com/business/japan-passes-law-on-stablecoin-to-protect-crypto-investors-bitcoin-falls-news-200204>

³⁰Bitcoin and Crypto Taxation in Hungary - the Ultimate Guide, Bitcoinbазis, 23 Sep 2022. As available at <https://www.bitcoinbазis.hu/english/bitcoin-and-crypto-taxation-in-hungary-the-ultimate-guide/>

³¹Bitcoin Regulation: Is Bitcoin Legal in the United States?, Titan, 4th May 2022. As available at <https://www.titan.com/articles/is-bitcoin-legal>

³²United Kingdom Cryptocurrency Laws, Freeman Law. As available at <https://freemanlaw.com/cryptocurrency/united-kingdom/>

³³Digital Currency, Government of Canada. As available at <https://www.canada.ca/en/financial-consumer-agency/services/payment/digital-currency.html>


³⁴Supra 26

³⁵Denmark Cryptocurrency Laws. Freeman Law. As available at <https://freemanlaw.com/cryptocurrency/denmark/>

³⁶McGimpsey P, Austria Crypto Tax Guide 2023, Crypto Tax, 9th Dec 2022. As available at <https://cryptotaxcalculator.io/country-guides/crypto-tax-austria/>

³⁷Legge M, Crypto Tax Guide Germany 2023, Koinly, 2022. As available at <https://koinly.io/guides/crypto-tax-germany/>

³⁸How cryptocurrencies and digital assets are regulated in France in 2023 ? Beaubourg Advocates. As available at <https://beaubourg-avocats.fr/en/cryptocurrency-laws-regulations-france/>



		both ways i.e money and/or commodity.
China ⁴⁰	Banned	Banned
Nepal ⁴¹	Banned	Banned
Qatar ⁴²	Banned	Banned
Pakistan ⁴³	Hostile	Hostile
Bangladesh ⁴⁴	Hostile	Hostile

Table No. 1

Therefore, the current pattern of the adoption of cryptocurrency points out towards a steady adoption at the global level, some countries have even gone to the extremes of declaring cryptocurrency, bitcoin, as is legal tender while some are at other extreme and have completely written off the cryptocurrency off its soil. However, if we carefully look at the majority group of countries falling in the middle section of both extreme, it would present a promising picture towards the more fine-tuned and upgraded embracing of the technology by a host of new world order countries. Therefore it could be safely said that the coming generations would use more and more of cryptocurrency or the currency based upon the modified platform of cryptocurrency such as stablecoins⁴⁵. However, in order to better appreciate how could cryptocurrency and underpinning technologies be the new saviour, we must examine its impact upon the consumer demand as well as it one of the most key indicator in the market forces.

3.1 Cryptocurrency and its relation with Consumer Demand.

As per the consumer economics, the purchasing power parity has a direct co-relation with the consumer demand, higher the purchasing power, greater the demand⁴⁶. A measured increase in the consumer demand is always a substantial indicator of the economic well being a prosperity of the country. In this section, researchers shall make an attempt to appreciate the impact of the cryptocurrency upon the consumer demand. This section would examine the documented impact of the cryptocurrency upon the economy of country.

There could be no better country, than Japan, to examine in this section as Japan has been the harbinger of the latest technology and land of rising sun is also known as land of cryptocurrency, more so, because Satoshi Nakamoto, the developer of bitcoin protocol, is believed to be a Japanese, not only this, the Japan also hosts the largest cryptocurrency exchange as well, Mt. Goax. Japan has led the way, in not only adopting the cryptocurrency, but to regulate it as well and cryptocurrency can be freely used as a medium of payment settlement in Japan⁴⁷. As per the

³⁹Marshal K, With The Latest Move, Brazil and India Embrace Cryptocurrency, Investopedia, 30th Nov 2022. As available at <https://www.investopedia.com/brazil-and-india-embrace-crypto-6834123>

⁴⁰Shin F, What's Behind China's Cryptocurrency Ban?, World Economic Forum, 31st Jan 2022. As available at <https://www.weforum.org/agenda/2022/01/what-s-behind-china-s-cryptocurrency-ban/>

⁴¹Nepal's Telco Regulator Orders ISPs to Block Crypto Websites or Face Legal Action, India Today, 10th Jan 2023. As available at <https://www.indiatoday.in/cryptocurrency/story/nepal-telecom-regulators-order-internet-providers-to-ban-crypto-websites-2319616-2023-01-10>

⁴²Qatar Cryptocurrency Laws, Freeman Law. As available at <https://freemanlaw.com/cryptocurrency/qatar-2/>

⁴³Hasan R, Pakistan's Central Bank Tells Court Cryptocurrency Should Be Banned, Reuters, 13th Jan 2022. As available at <https://www.reuters.com/article/fintech-crypto-pakistan-idUSL1N2TTOQT>

⁴⁴Bangladesh Cryptocurrency Laws, Freeman Laws. As available at <https://freemanlaw.com/cryptocurrency/bangladesh-and-cryptocurrency/>

⁴⁵Ebner R, Stablecoins: What They Mean For The Future of Money, Schroders, 19th Jul 2022. As available at <https://www.schroders.com/en-us/us/individual/insights/stablecoins--what-they-mean-for-the-future-of-money/>

⁴⁶Menggen Chen & Xuemei Hu (2018) Linkage between consumer price index and purchasing power parity: Theoretic and empirical study, The Journal of International Trade & Economic Development, 27:7, 729-760, DOI: 10.1080/09638199.2018.1430164.

⁴⁷Supra 31.

latest stats published by the Statista, there are around 6.4 million users of the Bitcoin⁴⁸ in Japan. The research reported in 2018, by Yoshiyuki Suimon and Kazuki Miyamoto, has displayed a positive equation between the cryptocurrency and the consumer demand pattern within Japan, though the study focused only upon the impact of Bitcoin rather than the whole cryptocurrency class, but the data could be standardised to include all the major cryptocurrency in vogue in Japan. As per the research, the bitcoin alone added more than \$30 Billion towards the GDP of Japan and led to an addition of 0.3% in the Japanese GDP⁴⁹.

If we take a look at the another research published by Statista, it would reveal that there has been a staggering \$10 Billion⁵⁰ revenue generated, exclusively through bitcoin mining alone, while the generational costs stood at around \$2.5 Billion, indicating a 400% margin. No data is available presently to examine the revenue generation created by the whole cryptocurrency class, but given the generation of bitcoin alone, it could not be denied that the mining sector has remained profitable. Therefore, the cryptocurrency sector presents an excellent hope for generating a positive growth in the economy and thus could result in the enhanced consumer demand and purchase power parity as well.

3.2 Reduced Remittance Cost.

Asia, as a continent, has come to be associated with its migrating population. India and China occupy the top spots in the global migrant population index, as per UN reports. As per the latest report by the UN on international migrants, India and China adds upto 28 Million of migrant workforce throughout the world, Russia is not far behind with another 8 million population being Russian⁵¹. This data places all these three country in the favourable spot vis-à-vis the inflow of the remittances. As per another report, India earned around \$80 Billion in remittances while China received around \$67 Billion, annually⁵². As per the World Bank estimates, around 7% of the value is lost as remittance charges,⁵³ while another comprehensive study, conducted in year 2009, pointed out towards upto 15% transaction charges for remittance suggests that Indians are paying around 10-15% of the principal amount as a transaction fee for remittances. This sum is exorbitant and significantly reduces the wealth for remittance receiving country. Further, the increased costs of the remittance acts as a barrier in remittance and a section of people look towards unofficial channels for routing back the funds and others lose interest in remittances at all. Further, it cannot be expected that the remittance charges would come down any lower as its an oligopoly of banking intermediaries like Visa and MasterCard⁵⁴. However, if the developing countries and the remittance receiving nations adopt the cryptocurrency or a financial arrangement working on similar pattern, it would end up bringing down the remittance cost by huge margin⁵⁵.

⁴⁸Number of crypto asset accounts set up in Japan from 2018 to 2022. Statista, Statista Research Department, Dec 2022. As available at <https://www.statista.com/statistics/1301107/japan-number-crypto-asset-accounts/>

⁴⁹Cheng E, Bitcoin could boost Japan's GDP, Nomura analysts say, CNBC, JAN 2 2018, 8:24 PM.

⁵⁰Best R, Total revenue raised from Bitcoin mining worldwide from 2010 to 2019, Statista, Nov 25, 2020. As At <https://www.statista.com/statistics/731383/bitcoin-mining-revenue/>

⁵¹World Migration Report, IOM, 2020. As available at <https://worldmigrationreport.iom.int/wmr-2020-interactive/>

⁵²Record High Remittances Sent Globally in 2018, The World Bank, PRESS RELEASE NO: 2019/148, APRIL 8, 2019. as at <https://www.worldbank.org/en/news/press-release/2019/04/08/record-high-remittances-sent-globally-in-2018>

⁵³Remittance Prices World Wide, WB, Sept. 2020. As available at <https://remittanceprices.worldbank.org>

⁵⁴Perkins D.W, Cryptocurrency: The Economics of Money and Selected Policy Issues, Congressional Research Service, R45427, pp.11, April 9, 2020. As on <https://fas.org/sgp/crs/misc/R45427.pdf>

⁵⁵Carare A & Franco L Et Al, Digital Money and Digital Money and Remittances Costs in Central America, Panama and the Donican Republic, Dec 2022. At <https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&ved=0CAQQw7AJahcKEwil07ftqf9AhUAAAAHQAAAAQAw&url=https%3A%2F%2Fwww.imf.org%2F->



Also, the process involved in securing these remittance is convoluted and unduly long. The whole transaction involves around 5-8 intermediaries and a complex process. This time could be substantially reduced using the cryptocurrency. As per the study conducted by PwC, El Salvador's 50% population is regularly transaction through Bitcoin and it receives around \$2 Million worth of remittance, in bitcoin, each day⁵⁶. However, as per the Central Reserve Bank, only around 2% of the remittance received is through bitcoin mode⁵⁷. Further, there have been a spurt in the number of cryptocurrency based remittance intermediaries across the globe. Abra, a company having presence in more than 150 countries, has emerged as a forerunner remittance service provider which operates upon direct phone to phone remittance in US Dollars.⁵⁸ The company has received generous funding from industry giants like Ratan Tata and American Express.⁵⁹ BitPesa, an African Startup has also upped the ante within African Nations and have been successfully providing cryptocurrency backed remittance services.⁶⁰

Therefore cryptocurrency backed remittance services could emerge as a potential tool to wriggle out of the complex web of intermediaries in international remittances market and countries like India, China, Russia and Mexico are set to make definite gains.

3.3 Banking the Unbanked.

As per data collected in 2022, there stood around 1.7 Billion unbanked population in the world. Access to banking system is one of the key pillars of independence of an individual and a family. Its through only banking channels that a person gets access to services like debit card, credit card, mortgages, loans, advances, overdraft etc to name a few. Further many developing nations such as India are now relying upon direct to bank subsidy schemes in order to remove pilferage and to reduce the role of middleman and to ensure that the benefit reaches to the eligible person appropriately. Therefore an unbanked person is not only cut out from the regular financial services but also from the direct government subsidies. Can cryptocurrency and its underlying technologies help in solving these problems and make world more financially inclusive?

As per a survey conducted by Federal Deposit Insurance Corporation, US, in 2019, around 30% respondents cited inability to meet the requirements of minimum balance as a key indicator for not having an account, another 16% cited trust issues with the prevalent banking system and scams and over 7% stayed away from banks due to high bank service costs⁶¹. While US is a highly developed state so such kind of reasons are more significant. While in a less developed economy like India, as pointed out by a letter issued by Reserve Bank of India in 2019⁶², other chief reason in developing nation is non presence of the commercial banks in the far flung rural areas. As per a report by

%2Fmedia%2Ffiles%2Fpublications%2Fwp%2F2022%2FEnglish%2Fwpiea2022238-print-pdf.ashx&psig=AOvVaw2fibGMgqosWzSTvRvJC-Cc&ust=1679292675838114

⁵⁶Arslanian H, Donovan R & et al., El Salvador's law: a meaningful test for Bitcoin, PwC, 2021. As available at <https://www.pwc.com/gx/en/financial-services/pdf/el-salvadors-law-a-meaningful-test-for-bitcoin.pdf>

⁵⁷Cryptocurrency Makes up Just 1.9 pct. of Remittances in El Salvador, Laprensalatina, 25th May 2022. As available at <https://www.laprensalatina.com/cryptocurrency-makes-up-just-1-9-pct-of-remittances-in-el-salvador/>

⁵⁸Soufaih A, Revolutionizing International Remittance Payments Using Cryptocurrency and Blockchain- based Technology, Social Impact Research Experience (SIRE), Jan 2020. As at <https://repository.upenn.edu/cgi/viewcontent.cgi?article=1085&context=sire>

⁵⁹Ratan Tata Invests in Virtual Cash Start Up-Abra, Business Standard, 24th Oct 2015.

⁶⁰Njuguna M, Adoption Of Bitcoin In Kenya, A Case Study Of Bitpesa, Master Thesis, OCTOBER 2014. As at http://erepository.uonbi.ac.ke/bitstream/handle/11295/74669/Mwangi_Adoption%20of%20Bitcoin%20in%20Kenya,%20a%20case%20study%20of%20Bitpesa.pdf?sequence=4

⁶¹Federal Deposit Insurance Corporation (FDIC), "How America Banks: Household Use of Banking and Financial Services," 2019 FDIC Survey, October 2020. https://economicinclusion.gov/downloads/2019_FDIC_Unbanked_HH_Survey_Report.pdf

⁶²Master Circular - Lead Bank Scheme, RBI/2019-20/10, FIDD.CO.LBS.BC.No.06/02.01.001/2019-20, 2nd Jul 2019. As available at https://www.rbi.org.in/scripts/FS_Notification.aspx?Id=11622&fn=2754&Mode=0

Index, in India, by 2021, almost 22% population was unbanked⁶³, this all despite a massive banking campaign launched by Indian PM Narendra Modi in year 2015 and almost 20% of these Jan Dhan Accounts are lying dormant⁶⁴.

For a financially free and independent world it is a key indicator that largely the population is banked and has access to banking channels and other financial services. Cryptocurrencies and the underpinning technologies such as blockchain and public ledger could play a pivotal role in providing this coveted last mile connectivity, more so because out of these 1.7 Billion unbanked individuals, almost 1.1 Billion hold a smartphone⁶⁵. Further, the decentralized Finance Technology, more popularly known as Defi, has today appeared as a billion dollar industry with reaching an all-time high of \$180 Billion worth of finance⁶⁶. Another survey conducted by the US based surveying agency returned that around 12% of the whole unbanked population in America had access to cryptocurrency⁶⁷. Therefore, this technology could be perused in order to examine how non custodial wallets could be used to bank the unbanked, as of today, there various service providers which provide access to financial services without any intermediary and without use of any custody wallet such as GoodDollar and Impact Market. Further, there are millions of the merchants cross the globe today which are willing to accept payment in cryptos and without any banking channel, more popular being PayPal, Tesla, Yahoo, Microsoft and Amazon etc⁶⁸. Further the blockchain technology could be successfully used and demonstrated to allude any trust issues prevalent in present times. Also, the use of public ledger in a controlled manner could significantly reduce the intermediaries costs and charges, therefore could allure more users towards banking sector. However, it is still too early to predict that the cryptocurrency could be a magical shift in banking the unbanked yet its true potential is still unknown and the volume of transactions it conducts on daily basis shows that a wide number of people are willing to repose faith in this new technology, yet the numbers are insignificant as compared to regular banking transactions, but, active participation by financial players, governments and technology sector could go long way in reducing the gap between banked and unbanked.

3.4 Global Trade

International trade is one such emerging market area where both cryptocurrency and blockchain could play an active role. Blockchain is a disrupting technology and has an huge impact in the international trade, the impact blockchain technology as on the international trade is comparable to the impact the introduction of computer had on international commerce. The smart contract technology which works upon blockchain platform are technologies which would empower the future trades and automatic payment settlement. While the RFID technologies, another subset of the blockchain principle goes to the last mile in ensuring the tracking and movement of the goods right from the factory till it is delivered to the end user. This blockchain technology could further be strengthened and modified in a manner that agencies like customs and insurance also rely upon it. further, this blockchain technology would go a long way in establishing the trust between the

⁶³The Global Index Database 2021, World Bank, 2021. As available at <https://www.worldbank.org/en/publication/globalindex/Report>

⁶⁴Almost every fifth Jan Dhan account 'inoperative', Business Line, 6th feb 2020. As available at <https://www.thehindubusinessline.com/money-and-banking/almost-every-fifth-jan-dhan-account-inoperative/article30754738.ece>

⁶⁵Stone A, Why decentralized finance is a leapfrog technology for the 1.1 billion people who are unbanked, World Economic Forum, 16th Sep 2022. As available at <https://www.weforum.org/agenda/2022/09/decentralized-finance-a-leapfrog-technology-for-the-unbanked/>

⁶⁶Supra 67

⁶⁷Hoover A, Is crypto a solution for America's unbanked?, Morning Brew, 28th Feb 2022. As available at <https://www.morningbrew.com/daily/stories/2022/02/25/crypto-solution-for-unbanked>

⁶⁸PayPal and Microsoft Adopt Cryptocurrencies: What This Means for the Future, Nasdaq, 7th Jul 2022. As available at <https://www.nasdaq.com/articles/paypal-and-microsoft-adopt-cryptocurrencies%3A-what-this-means-for-the-future>



parties and thereby reducing the need for intermediaries as well as reducing the delays and transportation and logistics costs. Further, the blockchain boasts of a host of advanced features such as being temper proof and cyber attacks proof, minute modification in these technologies would make the international trade more swift, smooth and secure, thereby opening up the markets to the new parties more particularly from the underdeveloped and developing economies where trades settlements are marred by opaqueness, middleman, corruption and distrust.

4. Conclusion

Cryptocurrency and its underlying technologies such as blockchain do hold a promising potential to transform, rather, revolutionize the global advancement. However, there remains concerns regarding the safety and viability of the technology, especially regarding the decentralization and lack of governmental control. It is difficult to expect the self sustaining system to grow tall and old without requiring support from governments and institutions. Further, the anti money laundering aspects also needs to be taken care of while adopting such technologies in full blown mode. However, despite these concerns, It could very safely be stated that the cryptocurrency and blockchain technology are here to stay and the world must find out more and more ways to incorporate these afresh technologies for better advancement of the global trade, peace and prosperity. It is not a moment to sit back and watch, rather, to act, experiment and excel.