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Bitcoin in the BRICS: A Decade of Adoption and Economic Impact

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Abstract

The Bitcoin market has expanded its wings and overshadowed the globe at a remarkable speed over its short span of time. Introduced in 2008, this financial innovation possesses properties of both, a currency as well as an asset. Over the past decade, BRICS i.e. Brazil, Russia, India, China and South Africa is playing an increasingly important role in the global economy. Seeking the growing prominence of Bitcoin, the present study aims at exploring its status of Bitcoin in the BRICS nations. Using the secondary data of Google Trend time series, Google Trend country interest point and Bitcoin core software download, its status in BRICS nations is analysed. The findings imply that amongst the BRICS, China and Russia are the economies which are highly embracing this new fintech innovation. This financial mechanism can facilitate increased free flow of capital and international trade, thus, integrating the international financial market to ensure sustainable development of BRICS.

Keywords: Bitcoin, BRICS, Adoption rate, Google Trend

1. Introduction

Innovations around the globe are taking the world by storm and becoming an important factor for economic development of the countries. In this digital era, innovations have become a thing of internet. One such descendent of internet is Bitcoin. The Bitcoin market has expanded its wings and overshadowed the globe at a

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remarkable speed over its short lifespan. The wide acceptability of Bitcoin is also attributable to the economic crisis of 2008. Post the economic crisis, the virtual currency has been looked upon as an alternative to the existing bank, credit and other payment system-based infrastructure (Nair & Motwani, 2018). This technological progress in payment system will lead to decreased transaction and information cost promoting viability of digital currency.

On 31st October 2008, the mysterious and so-called '*Satoshi Nakamoto*' designed and published a white paper titled, 'Bitcoin: A Peer-to-Peer Electronic Cash System' which kick started the whole game. It was a discovery which many failed to achieve and lead to the emergence of Bitcoin as the first decentralized electronic payment system or the Bitcoin. This fintech innovation relies on the technique of cryptography (or encryption) which makes the transactions secure. The underlying technology avoids a third party intervention and keeps the records of all the transactions bundled into a block, chronologically. This underlying technology is known as Block Chain System. It is BCS that ensures the safety and security of all the transactions, and ones the transaction is recorded in the system, it cannot be tampered. This work introduced Bitcoin as the first and original Bitcoin. But over a decade, more than 1000 digital currencies have emerged and actively circulating in the financial market. Thus, like the stock market, the global financial system now also has a Bitcoin market. There are *n* number of cryptocurrencies other than Bitcoin such as Litecoin, Ethereum, Dogecoin, Ripple, Dash, Peercoin, Titcoin, and Verge to name a few.

Bitcoin gained popularity worldwide rapidly as it possesses properties of any currency as a medium of exchange as well as that of an investable asset which has a store value. As reported by the Cambridge Centre for Alternative Finance 2017, more than three million people globally are estimated to be actively using cryptocurrencies. And today, Bitcoin has surfaced as a stand-in for traditional fiat currency and even challenged the standards of the Dollar ($), thus, greatly changing the dynamics of foreign relations and international trade.

In this new era, global integration is occurring at a rate faster than the eye can see. The world is becoming interconnected culturally, politically, militarily and economically (An & Brown,

2010). One such international economic alliance is BRICS, acronym for Brazil, Russia, India, China and South Africa. Over the past decade, BRICS i.e. Brazil, Russia, India, China and South Africa is playing an increasingly important role in the global economy. As per the Goldman Sachs report, BRICS will grow as the largest international economic integration by 2050. It is the belief that BRICS will become the backbone of the global economy and catalyze the development of lagging economies (Morzan et. al., 2012).

Even though economic globalization is thriving exceedingly, but financial global system is still disintegrated. Bitcoin and its underlying technology of blockchain system have the potential to standardize the financial system globally and catalyze the process of integration between the financial markets of the nations. Bitcoin can act as a mechanism of cooperation between the BRICS countries in the field of financial technology. It can pave the way to an integrated development that will facilitate opportunities using financial technology to ensure sustainable development of the BRICS countries, and at the same time averting potential threats, and also handle potential negative outcomes that arise due to the use of new financial technologies (Albekov & Lakhno, 2018).

The present study focuses on the adoption and status of Bitcoin by the world's largest international economic integration BRICS. To analyse the Bitcoin adoption, surrogate data of Google Trend country interest point for terms 'Bitcoin' and 'Bitcoin', Google Trend interest over time time-series for term 'Bitcoin' and Bitcoin core software download trend of the five countries is considered. The study gives out that among the BRICS, China and Russia are the economies which are highly embracing this new fintech innovation. Though, in China the trading of cryptocurrencies is restricted by the government, the number of Bitcoin core software download is the highest implying that people of China are accepting this innovation with open arms. Bitcoin and its technology are in rise in the other three nations, Brazil, India and South Africa as well. Globally, the adoption of Bitcoin is in rising trend and more so among the developed, wealthy and tech-savvy economies. The Bitcoin market is estimated to globally grow at a compounded annual growth rate (CAGR) of 36.5 per cent from 2017 to 2025 (Tmr, 2018).

2. Related Studies

Bitcoin has gained popularity in a very short span of time and also attracted significant scholarly attention. The game was set to pace by the anonymous Satoshi Nakamoto in 2008 when he published a white paper proposing an electronic transaction system that was decentralized relying on the blockchain system which creates a chronological record of all the transactions in bundles or blocks and is computationally impossible for an attacker to tamper or revise the recorded transaction. Since then, many research attempts have been made globally to analyse and evaluate the adoption of Bitcoin by various economies. In many research papers on factors affecting Bitcoin prices, investors' attractiveness to Bitcoin and its adoption was identified as one of the primary factors. Kristoufek (2013) connected Bitcoin and search queries on Google and found that there exists a dynamic relationship between prices of Bitcoin currency and search queries on Google by Bitcoin. Darlington (2014) examined if Bitcoin adoption provides a distant advantage to people living in underdeveloped and struggling economies and proposed three factors that obstruct the widespread adoption of Bitcoin in the underdeveloped economies. Those three factors are lack of infrastructure, unrealized problems with the bitcoin network itself and fears of unknown among the population of the underdeveloped economies. Gracia et al. (2014) have empirically proved that social media attention increases search volume, which consequently increases the Bitcoin trading activity. Yalowitz & Wilson (2015) examined determinants of interest in Bitcoin and based on previous eventual evidences, four proxies were constructed for four possible clientele: Computer programming enthusiasts, speculative investors, libertarians and criminals. Google trend data was used to study the varied clientele interest in bitcoin. The findings gave strong evidences that computer programming enthusiasts and illegal activity drove interest in bitcoin and found minimal to no evidence for political or investment motive. Puri (2016) analysed the adoption rate at a global and national level and further analysed if adoption rate determines the price of Bitcoin. To evaluate public interest, Google search for the keyword "bitcoin" was used as proxy. Also, bitcoin desktop client downloads per country was also explored as proxy for adoption rate. Findings suggested that public interest had statistically significant positive impact on Bitcoin prices.

It was also found that search volumes had significant impact on number of downloads of Bitcoin Desktop client software downloads at national level. Parino, Beiró & Gauvin (2018) characterizes adoption of Bitcoin Block Chain by the developed and developing countries. Data set related to general statistics of Bitcoin was collected. Data sets such as number of blocks, number of transactions and number of unique Bitcoin addresses i.e. IP addresses, bitcoin clients downloads, Google trends and country specific socio economic indexes of developed and developing countries such as US, Australia, Brazil, Vienna, Vietnam, Venezuela and India were collected and analysed to draw conclusion about the adoption of Bitcoin. It was confirmed that Bitcoin adoption was not homogenous around the globe. In developing countries, adoption of Bitcoin was increasing, but at a slower pace. Sovbetov (2018) examined the factors that influenced the price of five most common cryptocurrencies such as Bitcoin, Ethereum, dash, Litecoin and Monero over 2010-2018. Attractiveness and adoption of Bitcoin was found to be one of the important factors that affected the prices of Bitcoin. Google trend and Twitter sentiment analysis were used as proxy variables to study the attractiveness and adoption of cryptocurrencies.

In this study, we intend to extend the literature and penetrate the adoption of Bitcoin by the BRICS economies. No study relating to the adoption of Bitcoin by BRICS countries was found in the literature reviewed. Thus, present study intends to fill that research gap. As Bitcoin is at a nascent stage, not many dimensions are available to affirm the exact adoption rate. Thus, this study adopts surrogate data of Google trend time series, Google trend country interest point, and Bitcoin core software download quantity, to analyse the adoption of Bitcoin by BRICS.

3. Data & Methodology

As the present study intends to study the adoption of Bitcoin by the BRICS, we gathered data from three surrogate measures i.e., Google trend country interest point for search terms 'Bitcoin' and 'Bitcoin', Google trend query traffic time series for search term 'Bitcoin' and a number of Bitcoin Core i.e., number of Bitcoin client software downloads (Sharma, Verma & Sam 2021). Data is collected for a time span of 10 years i.e., 1st April 2009 to 31st March 2019. Data from all

the three above-mentioned surrogate measures is collected pertaining to Brazil, Russia, India, China, and South Africa (BRICS). The details of the data measures collected are as follows:

a. Google Trend Country Interest Point

Google Trend Country Interest Point accredits a score to countries based on relative in-country queries. Country Interest points of the five BRICS countries are collected for the search query "Bitcoin" and "Bitcoin" for 10 years covering a period from 1st April, 2009 to 31st March 2019. The data are normalized between 0 and 100. (Source: https://trends.google.com/trends/)

b. Google Trend Query Traffic Point Time Series

Google trend Search Traffic Point time series depicts the number of queries related to a search term, per country with a month's resolution. For the present study, Google trend time series is collected for search terms 'Bitcoin' of five BRICS countries. Data is collected for a period of 10 years, from 1st April 2009 to 31st March 2019. Data is normalized for each country between 0 and 100. (Source: https://trends.google.com/trends/)

c. Bitcoin Core (Bitcoin Client)

Bitcoin Client is basically Bitcoin core software. This proxy data gives the number of Bitcoin core software downloads across all operating systems platforms such as android, Macintosh, Mac, Windows, etc., per country for the five BRICS countries, aggregated daily for 10 years from 1st April 2009 to 31st March 2019. (Source: https://sourceforge.net/)

Other secondary data are collected from websites such as Wikipedia, Blockchain.info and previous research articles and journals.

4. Analysis & Discussion

Bitcoin surfaced just a decade back and instantly took the world by storm. There is a growing consensus that Bitcoin will change the face of the global financial system and play a crucial role in the way money is dealt. Across the globe, the terminology used for Bitcoin is varied, for example, in Brazil and India it is a virtual currency, in China, it is referred to as a virtual commodity, a crypto-token in

Germany, etc. (Loc.gov, 2019). Many countries are adopting Bitcoin and giving it a legal status under different heads of classification such as Currency, commodity, and property for tax purposes. For example, in Switzerland it is taxed as foreign currency, in Argentina and Spain Bitcoin is taxed under provisions of income tax. On the other hand, there are some countries such as China, India, Morocco, etc., who have yet not accepted and regulated Bitcoin in their financial system. Recently, central banks of many countries across the globe have started exploring and researching the prospects of the adoption of Bitcoin into their regulatory financial framework. Irrespective of the fact that Bitcoin is not regulated in many countries, there are huge numbers of Bitcoin exchanges operating across the globe providing active trading services to their clients. It is widely reported that Bitcoin as an asset will outpace all other asset classes in relative growth.

Table 1: Bitcoin And BRICS

S. No.	Country	Legality	Classification	No. of Bitcoin Exchange
1	Brazil	Legal	Commodity	11
2	Russia	Illegal	Currency	25
3	India	Neutral	Commodity	11
4	China	Restricted	Commodity	17
5	South Africa	Legal	Currency	11

Source: Compiled by the Author

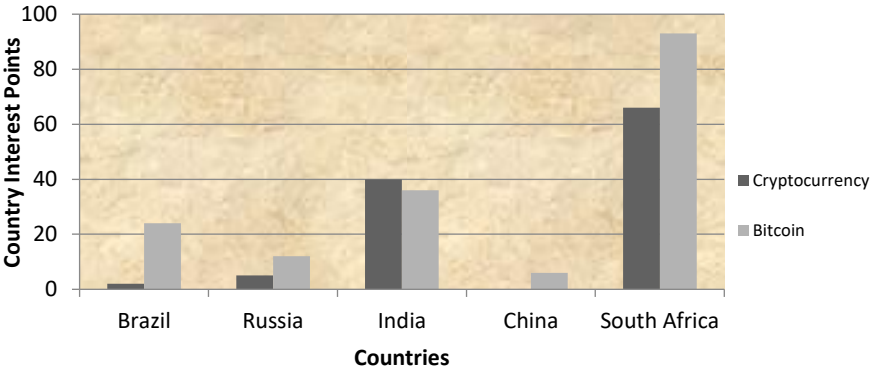
Table 1 shows the legal status of Bitcoin in the BRICS countries. It also shows the classification is Bitcoin being traded and the numbers of Bitcoin exchanges are actively operating in these countries. It can be seen that even though Bitcoin is casted as illegal in Russia, it still has the highest number of Bitcoin exchanges operating amongst the BRICS nations. Though Bitcoin is strongly restricted by Chinese government, there are still 17 exchanges for Bitcoin. In Brazil and South Africa Bitcoin enjoys a legal status of commodity and currency respectively. In India, Bitcoin has a neutral

status but its central bank Reserve bank of India (RBI) has issued notice to its commercial banks to prohibit trading in Bitcoin.

As Bitcoin is at a nascent stage, not many dimensions are available to affirm the exact adoption rate. In order to estimate the usage of Bitcoin by the BRICS countries, we look at several metrics. One such initial source of data to measure global Bitcoin interest is through search volume. Using Google Trends, one can estimate the popularity of Bitcoin by country and consider it as a socio-economic factor for the adoption of Bitcoin (Darlington, 2014; Puri, 2016; Sovbetov, 2018; Parino et al., 2018). Another metric using which adoption can be estimated is Bitcoin Client (Bitcoin core) download quantity across different operating systems e.g., Microsoft Windows, Ubuntu, Linux, Macintosh, Android, Mac, etc.

Graph 1 depicts the Google trend country interest point, for the search terms 'Bitcoin' and 'Bitcoin' for the BRICS countries. It is clear from the graph that over the past 10 years, the attractiveness of this fin tech technology is highest in South Africa followed by India. Least country interest point has been assigned to China. This graph clearly puts forward that the term 'Bitcoin' is more famous or familiar among the people of the countries than the term 'Bitcoin'. Country interest point is higher for the term 'Bitcoin' in all the five BRICS countries.

Graph 1: Google Trend Country Interest Point

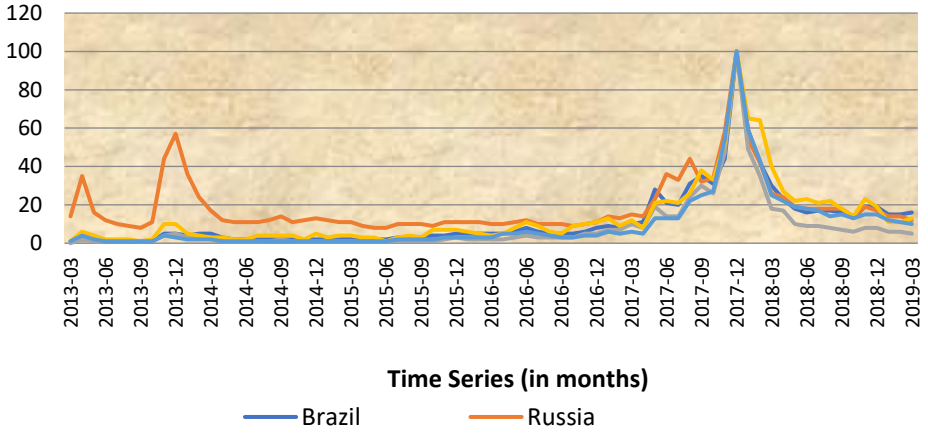


Note: (Time Period: 01-04-2009 TO 31-03-2019)
Source: Authors' Compilation

It is clear that the term 'Bitcoin' is more famous among the population of all the BRICS countries. Therefore, the search traffic

time series for BRICS countries is collected for the term 'Bitcoin' from the Google trend for a time span of 10 years i.e., from 1st April 2009 to 31st March 2019. Thus, Graph 2 represents the Google trend time series of the search traffic for the term 'Bitcoin'. In Graph 2, the timeline of search traffic for all five BRICS countries shows a similar trend of ups and downs, except for Russia.

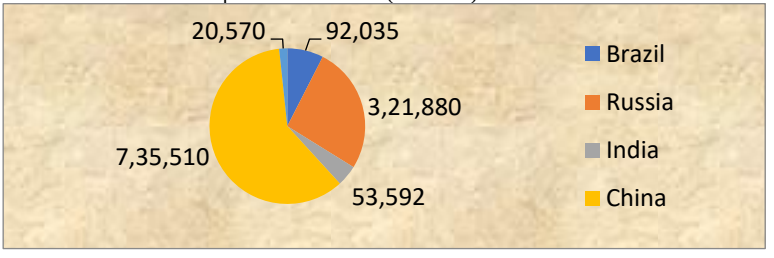
Graph 2: Google Trend Query Traffic Time Series



Note: (Time Period: 01-04-2009 TO 31-03-2019)
Source: Authors' Compilation

Graph 2 throws light on the fact that the people of Russia have been aware of the term 'Bitcoin' for all over the past 10 years and not just recently. Unlike Russia, in the remaining four countries of the economic integration BRICS, the term 'Bitcoin' has become a more searched term since 2017 onwards. This indicates that this financial innovation of Bitcoin has been adopted by Russia since its very inception and the other four countries have adopted it in the near recent times only.

Graph 3: Bitcoin Core (Software) Downloads



Note: (Time Period: 01-04-2009 TO 31-03-2019)
Source: Authors' Compilation

Graph 3 illustrates the metric that can be used as a sure proxy to analyse the adoption rate of Bitcoin. The metric of Bitcoin client or Bitcoin core software is of prominence to assess the increasing trend of Bitcoin by countries. Bitcoin client is software used to manage and store transactions made in the Bitcoin network. The official Bitcoin client is called Bitcoin Core and is available from sourceforge.net. From the above pie chart, it can be observed that the highest number of software downloads is in China i.e., 735,510 in total over the time span of the past 10 years followed by Russia. The lowest number of downloads is in South Africa i.e., 20,570.

From the above facts and figures, it can be concluded that Bitcoin resides in all five BRICS countries. Though the Chinese government has put up a restriction on the use of Bitcoin, it still is the country that embraces this technology the highest with the highest number of Bitcoin exchanges operating in the country as well as the highest number of software downloads to trade the Bitcoin. This means that the population of China has accepted and adopted this innovation, now only the government has to come forward and accept and regulate it. Similarly, Russia is another country amongst the BRICS where the financial innovation of Bitcoin is casted as illegal by its government, yet its people are actively using and trading Bitcoin. Followed by China, Russia has the highest number of Bitcoin exchanges and software downloads. The case is not the same in Brazil and South Africa. The two countries amongst the BRICS where Bitcoin has been cast a legal status by their respective governments, yet, Brazil and South Africa are moving slowly in the trend of increasing usage and adoption of Bitcoin. In India, Bitcoin is not yet regulated by the government. It is in an ambiguous situation, where the government has neither declared Bitcoin as legal nor illegal. Most recently, on April 6, 2018, the RBI issued a notification prohibiting banks, lenders, and other regulated financial institutions from dealing with virtual currencies (Loc.gov, 2019). But from the above depicted facts and figures it is clear that India being a tech-savvy country is not lagging much behind in awareness and adoption of Bitcoin compared to its BRICS counterparts.

5. Conclusion

Bitcoin captured the attention of the world in a very short time span. The Bitcoin market has expanded its wings and overshadowed the globe at a remarkable speed. From its emergence in 2008 to the present, the Bitcoin market has faced a lot of ups and downs, yet this financial innovation is here to stay. It was once said by Karl Marx that gold flows in the market because it has value as precious metal, but paper money has value in the market because it is adopted by people and circulates in the market. Similarly, in the future, Bitcoin will have value because of its growing adoption, trading, and circulation around the globe.

The present study analyses Brazil, Russia, India, China, and South African (BRICS) countries' public interest and adoption trend of Bitcoin. Data measures that can be used as a proxy for evaluating the adoption rate of Bitcoin were identified from the previous studies reviewed. The first dimension used to evaluate public interest and adoption rate is the Google search query. For extracting the data, Google Trend search queries for keywords "Bitcoin" and "Bitcoin" are looked into. Google Trend country interest point for both the keywords is collected, and Google Trend search traffic time series for only the "Bitcoin" keyword is collected, for the five BRICS countries. Bitcoin Client download quantity for all operating systems is also collected. It is found that the highest number of Bitcoin client downloads is for the Windows operating system. On analyzing the collected data, it was concluded that tech-savvy China ranks the topmost amongst its other BRICS counterpart irrespective of the fact that Chinese government has put a strong restrictions on the use and trade of Bitcoin. The people of China have adopted the new fintech innovation with open arms. Even in Russia, Bitcoin is cast an illegal status, but people of Russia have been actively searching about Bitcoin on the web and also downloading the software to trade Bitcoin. The public interest, attractiveness, and awareness about the concept of Bitcoin and the significance of Bitcoin are seen to be increasing at a decent rate amongst the population of India. Brazil and South Africa have accorded a legal status to Bitcoin in its financial system and using Bitcoin actively.

The Bitcoin market is reckoned to reach $6,428.0 million by 2025. It is estimated to grow at a compounded annual growth rate (CAGR)

of 36.5% from 2017 to 2025. It will change the dynamics of foreign relations and international trade. This financial mechanism can help facilitate increased free flow of capital and international trade, thus, integrating the international financial market and ensuring sustainable development of BRICS countries. Being the upcoming largest economic integration in the world, BRICS countries should adopt and regulate the mechanism of Bitcoin at their respective domestic levels and also come up with policies and procedures as a group to facilitate trade using cryptocurrencies at the international level. It can pave the way to joint development of measures that will facilitate all opportunities of using financial technology to ensure sustainable development of the BRICS countries, and at the same time averting potential threats, as well as deal with potential negative residuals which arise from the use of new financial technologies (Albekov & Lakhno, 2018).

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