An Overview of Alternative Currency : The Bitcoin

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Abstract

The financial market is based on the currency and the volume of trade between different individuals, groups, or organizations. This trade is ruled or governed by several protocols, which limits the over flooding or inappropriations in the exchange markets. One such virtual currency that is becoming popular among users is Bitcoin. In this paper, we discussed the evolution of Bitcoin as a currency, situations preceding and aftermath, as well as its consequences and effects on the present economy. We also discussed its growth, transaction volumes, currency acceptability, and factors involved. In this paper, we have tried to ensemble related thoughts for seeking new ideas for developing an alternative financial system. The results attained thereof could give new hopes to both consumers and markets seeking more freedom in terms of volume, payment methods, anonymity, and so forth.

Keywords: **Bitcoin, currency, transaction volume, volatility, dollar**

JEL Classification: F330, F650,G150

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Before understanding Bitcoins, we must try to uncover the market in which it was previously operated. The virtual market Silk Road was an online marketplace which provided virtual infrastructure for sellers and buyers to exchange or buy/sell over the Internet. It was comparable to eBay, but with two major differences: the majority of the items ordered for sale were illegal, and there was great stress on trying to ensure, as much as possible, the anonymity of both sellers and buyers. In particular, all the communication between buyers and sellers on the website was carried out through TOR (The Onion Router), in order to hide the true IP addresses and the identities of the network's users (Yermack, 2013).

The one and only form of payment system used on the Silk Road was Bitcoins. This is a decentralized form of electronic currency invented in 2008 by Satoshi Nakamoto (Nakamoto, 2008), whose actual identity still remains a major mystery. In this system, all the transactions of the users are publicly accessible (for instance via the so called block explorer), but in an anonymous way (Shamir, 2013). Silk Road's payment scheme essentially included an internal Bitcoin bank, where every Silk Road user, that is, buyer or seller, had to possess at least one individual account in order to carry out transactions on the given site. These accounts were stored in the form of wallets maintained on servers controlled by Silk Road. Each individual user needed to accumulate or purchase Bitcoins to advance into his Silk Road account, and then he/she could use them to buy multiple items on Silk Road. When a purchase was made, the appropriate and quoted number of Bitcoins agreed was moved from the buyer account to the seller account, both maintained by Silk Road. Silk Road also used a so-called tumbler which, as the site termed it, sent all payments through a very complex, semi-random series of dummy transactions, making it nearly impossible to link your payment with any coins leaving the site (The United States Attorney's Office, Southern District of New York, 2014).

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Literature Review

The Bitcoin first appeared in January 2009, the creation of a computer programmer using the pseudonym Satoshi Nakamoto. Elwell, Murphy, and Seitzinger (2015) discussed his invention as an open source (its controlling computer code is open to public view), peer to peer (transactions do not require a third-party intermediary such as PayPal or Visa), digital currency (being electronic with no physical manifestation). The Bitcoin system is private, but with no traditional financial institutions involved in transactions. Unlike earlier digital currencies that had some central controlling person or entity, the Bitcoin network is completely decentralized, with all parts of the transactions performed by the users of the system.

Brito and Castillo (2013) highlighted the issues of apprehension for policymakers, consumers, and regulators, and also discussed the benefits of a Bitcoin network, its properties, and operations. They also emphasized on the current regulatory aspect and the potential regulatory framework for Bitcoins. The revolutionary invention - Bitcoin may succeed in solving the problem of double spending without the interference of a third party. Usage of Bitcoins helps to mitigate the transaction cost and is faster than the traditional avenues of payments. Access to the financial services in developing countries can be augmented by using Bitcoins. Bitcoins have the potential to improve the quality of life of poor people in the countries with strict capital control. Apart from the benefits they provide, Bitcoins also have threats - fluctuation in value, security concerns, and laundering money for financing illegal trafficking of goods. Considering the regulatory aspect of Bitcoins, there is a huge uncertainty regarding the application of law because it does not fit into the existing statutory definition. Existing laws and directives did not envisage a technology like the Bitcoin. Bitcoin being an electronic payment system, is likely to be scrutinized by different regulators, who may confront questions like legality of online currency, licensing of money transmission, consideration of Bitcoins as currency or commodities, and so forth. The paper concluded with some suggestions for the policymakers to minimize the negative consequences of Bitcoins.

Yermack (2013) observed the legitimacy of Bitcoins as a currency. The author disagreed that the Bitcoin can be established as a bonafide currency, rather it behaves more like a speculative instrument. The classical properties of a typical currency are : (a) it acts as a medium of exchange, (b) unit of account, (c) and store of value. The Bitcoin seems to satisfy the first criterion because an increasing number of online merchants have acknowledged it as a medium of payment, but it has failed to satisfy the other two criteria. Exchange rate volatility of Bitcoins is higher as compared to the fluctuations in other currencies and has revealed zero correlation with other currencies, which undermines its usage as a unit of account and store value.

Market volatility of Bitcoin in the year 2013 was 133%, which is far more than the volatility of other currencies, which usually falls in the range of 8% - 12%. Gold exhibits volatility of 22%, and even the most risky stocks exhibit volatility of 100%, which makes the Bitcoin incompatible and risky for the investors. Moreover, all multinational companies that deal in multiple currencies endeavor to hedge themselves against the risk arising from the fluctuations in currencies. However, having a zero correlation with other currencies makes the Bitcoin useless for the purpose of risk management. For the Bitcoin to be established as a justifiable currency, its value needs to be more stable (Foundation for Economic Education, n.d.).

Sablik (2013) conversed about the potentials and threats of private currencies like the Bitcoin. In the wake of the financial crisis in 2008, the merchants who were looking at an alternative to the government issued currencies accepted Bitcoins as a medium of exchange. However, on the darker side, the author was concerned about the security and regulatory issues of Bitcoins. Bitcoin, being a digital currency, is virtually unspecified and is increasingly being used to finance illegal activities. Moreover, the magnitude of variation in its daily value is very high as compared to other hard currencies. The value of a single Bitcoin rose from approximately $13 in January 2013 to $1,200 in November 2013, a rise of more than 9,000% , which discourages its use as a unit of account and store value.

Elwell et al. (2015) were concerned about the legal and regulatory issues raised by Bitcoins, and also talked about the various factors that may deter the growth of Bitcoins. The potential benefits offered by Bitcoins are: lower transaction costs, better privacy, and no corrosion of purchasing power due to inflation. But certain factors

like : (a) unattractive avenue for holding wealth, because it is associated with a complex computer program, which many merchants are unable to understand, (b) lack of controlling authority, (c) daily volatility in the value of Bitcoins, (d) widespread use of Bitcoins will lead to increased demand compared to supply that can cause a fall in the Bitcoin price of goods and services, causing deflation, (e) and uncertain network security. Legal issues concerning the virtual currency is that no laws and regulations describe the duties and responsibilities of parties, provide for decisiveness of settlement, resolution of argument, or regulation of services provided.

Grinberg (2011) was attentively optimistic about the prospect of Bitcoins. With the Internet becoming an integral part of our society and economy, there is a witnessed increase in the variety of goods and services that can be procured with the Bitcoins. However, the author was also concerned about the security aspect of the Bitcoin. The security of the system depends upon the inconceivable amount of computational power required to avert a forgery. Any individual, corporation, or government entity can attack the network's security for a high incentive. Furthermore, there is no straightforward way for the owners to securely store the Bitcoins, and storing them on one's system can surely be risky. The paper also highlighted the speculative vulnerability of the crypto currency.

Shamir (2013) attempted to provide answers to various questions regarding the Bitcoin - like number of users in the system and their behavior, how the Bitcoins are acquired, spent ?, the variation of balance in the account, are the Bitcoins kept in the savings account or are they spent immediately ?, movement of Bitcoins between various accounts and distribution size of Bitcoins.

For the purpose of isolating all the large transactions in the system and the means of spending the amount, the full details of a Bitcoin transaction available on the Internet was downloaded and processed. In order to have a correct depiction of financial activity of each user, a graph of Bitcoin addresses and transactions was constructed, the addresses having the same entity were identified, and the information was used to contract the graph by integrating such addresses. It was discovered that all the large transactions were offsprings of a single transaction conceded in November 2010 consisting of 90,000 Bitcoins. It was discovered that the majority of the Bitcoins stayed inactive in addresses which had never contributed in any transactions. It was established that there was an enormous quantity of tiny transactions moving only a minute fraction of a single Bitcoin, but there were also hundreds of transactions moving more than 50,000 Bitcoins (Shamir, 2013).

Barber, Boyen, Shi, and Uzun (2012) conducted a detailed study to analyze the reasons behind the success of Bitcoins. The study investigated and identified that the appeal of the Bitcoin lies in its unfussiness, elasticity, and decentralization, making it simple to understand, but tough to challenge. The paper examined the design of the Bitcoin and focused on its strengths and weaknesses in order the identify the potential threats to the system and also suggested various techniques like fail-safe mixer protocol which requires no interference of third party and system modification in order to improve the same. Inventively designed, the Bitcoin system provides an economic incentive to the users to participate in the system, which is the key factor to the success of the Bitcoin against other e-cash systems.

Babaioff, Dobzinski, Oren, and Zohar (2012) stressed on the problem of composition of incentives in the Bitcoin system. For successful authorization of the transactions, the nodes are offered incentives in the form of predetermined Bitcoins. This gradually builds the supply of Bitcoins. However, the Bitcoin protocol states a declining pace of money creation that, in effect, puts a cap on the total circulated number of Bitcoins. As this compensation to nodes is gradually phased out, Bitcoin owners are required to pay an amount to the authorizing nodes for the approval of transactions. Here, the incentive problem becomes visible. To eliminate the problem, the authors proposed a variation to the protocol with a method that recompenses information propagation. The paper emphasized that each variation in the Bitcoin protocol has to pass through Sybil attacks.

The Bitcoin protocol is designed to ensure that if a greater part of processing power, rather than declared identities, trail the protocol, it will be difficult to influence authorized transactions history. With iterated elimination of dominated strategies, the proposed model succeeds in setting the right incentives and requires a diminutive overhead payment, which is also Sybil proof.

Research Objectives

Some of the research objectives which need to be discussed and fulfilled are :

(1) To understand the performance of the alternative currency, that is, Bitcoin as compared to similar currencies.

(2) To compare the trade value of Bitcoin with other major currencies.

(3) To identify major currencies which are involved in the exchange volume of Bitcoin in recent years.

(4) To understand the current volatility of Bitcoin with that of the US dollar.

(5) To identify the future trend of availability of Bitcoins for trade activities.

(6) To identify the prospects of Bitcoin and future application possibilities.

In this paper, we used the exploratory research method to collect data from various secondary sources such as websites, journals, and published information from other sources.

Assumption

The current research paper has been evaluated on the basis of the following assumption:

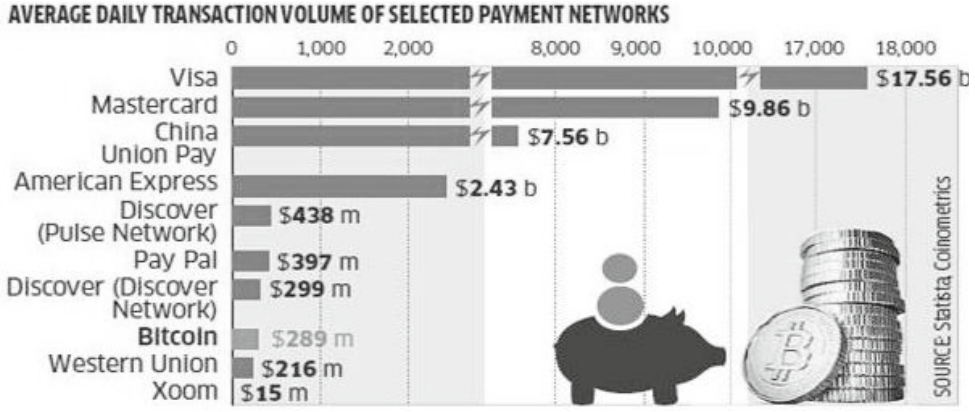
➔ Bitcoin currency value is dependent upon the growth of transaction volume and customer acceptability.

Analysis and Discussion

The relevant data were collected from different websites and other reliable sources. Data pertaining to other currencies in comparison to the Bitcoin were also collected to understand the performance of the Bitcoin since its inception and its functioning in the global financial market.

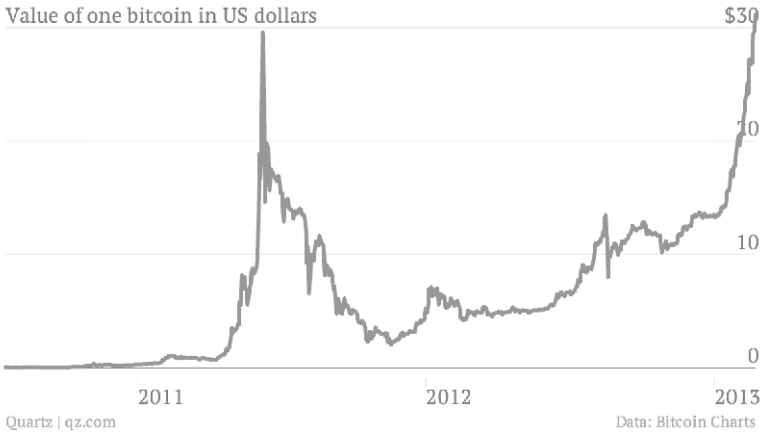
(1) Bitcoin Payment Network : As can be inferred from the Figure 1, Bitcoin's payment network's average daily transaction volume ($289m) performed better than Western Union ($216 m) and Xoom ($ 15m). The rate at which Bitcoin showed growth is phenomenal as compared to the establishment of Western Union and Xoom.

Figure 1. Average Daily Transaction Volume of Bitcoins



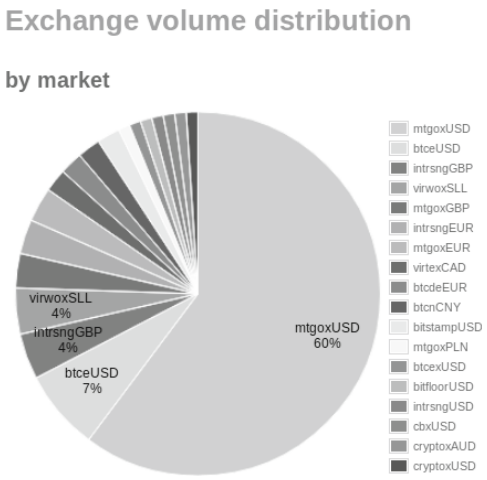
Source: Reproduced from Bitcoin and payments network (n.d.) [image].

Figure 2. Value of Bitcoin (in US$ During 2011 - 2013)



Source: Reproduced from Value of one bitcoin in US dollars (n.d.) [image].

Figure 3. Bitcoin Exchange Volume Information : Market Wise (2011 -2013)



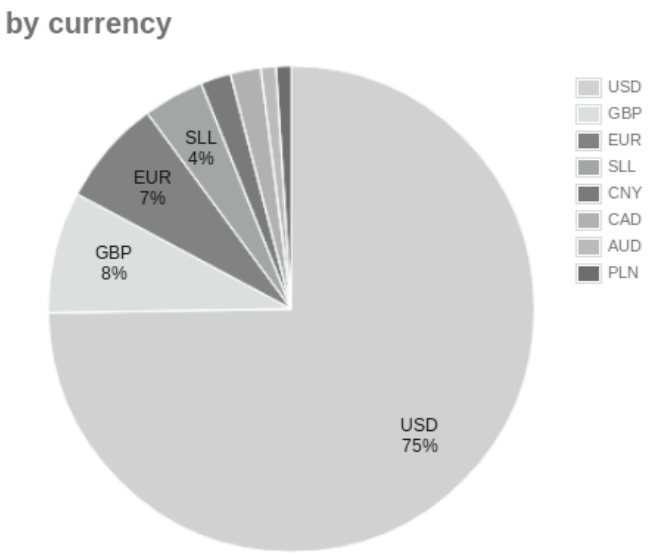
Source: Reproduced from Bitcorati (2015)

Circulation of Bitcoins without immediate conversion into US dollars and provision of liberty to trade freely promotes its acceptability among the traders globally.

(2) Bitcoin Value (in US $) : As can be seen from the Figure 2, the value of one Bitcoin was slightly greater than $1, which jumped to around US$30 in mid 2011-2012, decreased to around US $ 5 in the beginning of 2012-2013, and then rose to around the US$30 mark at the end of 2012-2013. This shows more signs of future growth in terms of Bitcoin earnings in US dollars. There will be an increased demand for Bitcoins in the future (as is evident from the Figure 6), which may lead to an increase in its value as compared to US dollars. Furthermore, the growing popularity of Bitcoins in US dollars (as is evident from the Figure 4) shows higher prospects of enhancement in Bitcoin value.

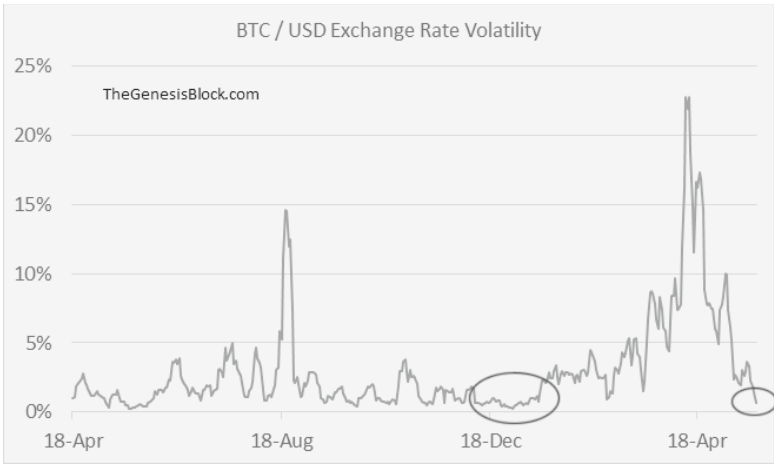
(3) Bitcoin Exchange Volume Distribution : As depicted in the Figure 3, in terms of market share of exchange of currency volume for Bitcoins, a huge surge was observed, and most of the currencies traded were in US dollars

Figure 4. Bitcoin Currency Trade (2011 - 2013)



Source: Reproduced from By currency [n.d.] [image]

Figure 5. Bitcoin Volatility Rates (2012-2013)

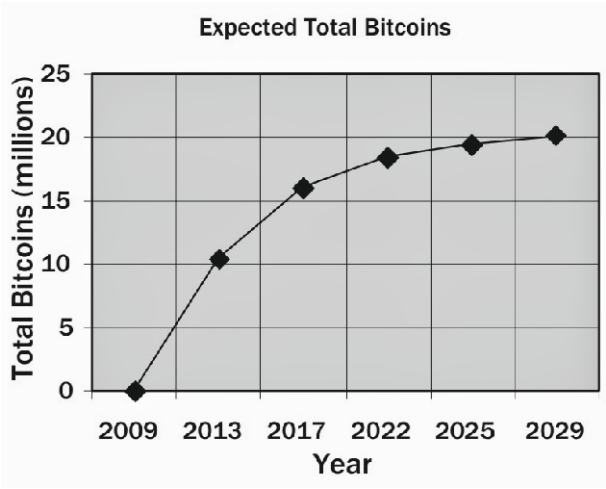


Source: Reproduced from BTC/USD exchange rate volatility (n.d.) [image].

(60% + 7% = 67%). The Great Britain Pound (GBP) currency exchange followed with 4% exchange with Bitcoins. There is mounting evidence of investments by major corporate houses who are acquiring a large number of Bitcoins and are making it public (for e.g., Chamath Palihapitiya, ex-Facebook executive and early employee who has invested $ US 5 million into Bitcoins and is planning to invest $ US 10 million more in the future) (Yermack, 2013).

(4) Bitcoins with Currency Trade : As indicated in the Figure 4, the highest currency that was traded for Bitcoins was the US dollar (75%), followed by Great British pound (8%), and EURO (7%). This shows that the US dollar is still the highest currency amount that is being traded for Bitcoins. The chart evidences the acceptability of virtualization of currencies in the mentioned countries. The growing interest of dollar and pound users in the U.S.,

Figure 6. Expected Future Bitcoin Supply



Source: Reproduced from Figure 1. Expected bitcoin supply over time [image].

Great Britain, and European nations in Bitcoins has paved the way for decentralized virtual crypto currencies that can also be trumpeted as an alternative payment system in the future.

(5) Bitcoin's Volatility w.r.t Dollar : As observed in the Figure 5, Bitcoin's volatility rate in 2012-2013 showed high volatility on August 18, 2012, and the same was much higher on April 18, 2013. That is, in every alternate quarter, the volatility picks up for the Bitcoin. Such volatility can be attributed to the factors like regulatory uncertainty caused by the vague statements issued by the market regulators, fluctuations in the demand of Bitcoins due to emergence of new apps like Bitcloud or Toroken, lack of reliability and trust among the new users, and rapid conversion of Bitcoins into flat currency in order to avert currency risk.

(6) Expected Total Bitcoins : As indicated in the Figure 6, according to expert predictions, Bitcoin supply in the market is expected to rise to 20 million by 2025, almost double the amount of current number of 10 million (2012-2013 figures) . This shows the growing demand for Bitcoins in the currency market among the traders of various international products and services. The growth in the demand for Bitcoins can be accredited to growing interest of the developer community in bringing it out of its infancy and creating apps to popularize it. For instance, the number of Bitcoin-related projects rose from 700 at the beginning of 2013 to 2,500 at the beginning of 2014 on GitHub, the leading online hub for new programming projects (Böhme, Christin, Edelman, & Moore, 2014).

Findings

Some of the major research findings which have been drawn from the above analysis are as follows :

(1) In terms of currency growth, Bitcoin has shown potential growth in current years with average daily transaction volume touching US $ 289m as compared to other popular payment networks like Xoom and Western Union.

(2) The value of one Bitcoin in US$ touched the figure of US$ 30 in 2013, up from the value of US$1 , which shows its popularity in terms of users and preference for trade and transactions all over the world.

(3) In terms of exchange volume of Bitcoin, the US $ showed more exchange, thereby proving the trust of users shifting from US dollars to Bitcoin.

(4) In terms of the market, more US dollars were exchanged (75%) for Bitcoins as compared to other major currencies such as euro and British pounds.

(5) Bitcoin's volatility with respect to the dollar shows alternate quarterly rise and fall in exchange value, which may be due to dollar fluctuations or some other factors of the global financial market .

(6) The overall future prospect of Bitcoins seems to be very bright, with high expectations of the rise in the number of Bitcoins by 2029.

(7) Virtualization of currency encourages online trading and provides a solution for easy transferability of money without third party interference.

Suggestions

Some of the suggestions which can be implemented at different levels include:

(1) Making Bitcoin transactions more secure in terms of data exchange with use of better algorithms for security and safety of users and their data over the network.

(2) Creating policies to ensure that proper financial implementation is done with restrictions and restructuring to ensure hassle free movement of data and information.

(3) Making sure that legal products are traded between users located in different countries.

(4) Creating better political relations between various trading blocs such as the European Union, BRICS, MINT economies to further facilitate the smooth implementation of the Bitcoin framework.

(5) Bitcoins can be a better option for smaller economies like Vietnam, Somalia, or Zimbabwe because, due to their weaker economies, the currencies also get weaker with the passage of time, and the investors hesitate to trade in these local currencies.

(6) Developing special mechanisms for effective distribution of Bitcoins and standardizing the transaction fees, which may enhance the participation of prospective traders and users.

(7) Creating more web-based applets, which may provide an independent platform and may be easily accessed and are user savvy.

Conclusion

The Bitcoin is more algorithmic based, and thus is free from biasness in any form. It finally frees trade on the Internet from the old systems. Sending money is now as fundamental a part of the Internet as sending a message over email, and Bitcoins provide a solution for the easy transferability of money. From the above findings, we can conclude that if used in the right way, the Bitcoin currency has huge prospects in terms of popularity and usage for trade in the global market. The increasing popularity of the Bitcoins can be ascribed to the acceptance of the virtualization of currency among the developer community. Bitcoiners can now employ the currency of their choice for the procurement of food, alcohol, clothing, sporting equipment, tickets, real property as well as a legitimate profusion of services. Therefore, we accept the assumption that Bitcoin currency value is dependent upon the growth of transaction volume and customer acceptability.

Implications

Bitcoins have numerous implications mostly related to how global trade and financial transactions can be conducted efficiently and effectively in this current age of cut throat competition. Furthermore, the suggestions mentioned in the research paper can be incorporated in other domains of the economy without limiting the possibility of gaining higher demand in the market, higher growth in terms of market share, higher productivity, and improved overall performance for all the parties involved.

Limitations of the Study and Scope for Further Research

Our present work is limited to exploring the growth and future of the Bitcoin. Time and cost factors were also responsible for limiting the boundaries of the current research. Most of the data were collected from open ended secondary sources, which are freely available over the Internet.

Future studies can enhance the results of the current paper by studying more variables involved (by using quantitative and qualitative methods) and can study their interrelationships in the near future. The paper also gives certain insights on different inter-related factors which determine the levels of improvements that can be made for making the alternative currency, that is, the Bitcoin more hassle free for creating a stronger world economy and giving nations across the world, freedom of operating and interacting more conveniently.

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