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# A Study on the Inefficiencies of Bitcoin and its Future Adoption

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**Abstract:**

This study aims at assessing how the current state of Bitcoin in terms of its security protocol, volatility, deflationary behaviour, and unstandardized regulations influence the future adoption of Bitcoin. This research uses two sample group, Bitcoin Public sample and focused target group. The data groups are evaluated through reliability test, correlation, and linear regression analysis following to assessment of the four linear-model assumptions. The main findings exhibit a considerable gap between the opinions of Bitcoin Public and Bitcoin Experts sample groups. The prime study inference explicates on the speculative tendencies of the respondents from the Bitcoin Public sample, who are hopeful regarding the promising future adoption of Bitcoin. On the other hand, the Bitcoin Experts sample elaborates on the risk-averse behaviour of the respondents, who are explained to be more sceptical regarding the future adoption of Bitcoin given the alarming inefficiencies of Bitcoin.

**Index Terms:** Bitcoin, Cryptocurrencies, Future of Bitcoin,Security Protocol

## I. INTRODUCTION

Over the past decade, fiat currencies, being bound to a country's or region's economic health and backed up by their respective governmental authorities, have faced severe financial recessions and meltdowns due to poor financial decisions by regulatory and monetary bodies [1]. The global financial crisis in 2008, triggered by the collapse of the housing market and the crash of the credit bubble in the United States, and the European financial crisis in 2011, caused by the failure of some members of the European Union, including Greece, Portugal, Spain and Italy, led to the distrust of citizens towards their government and their decline in faith towards traditional financial institutions [2]. The integration of Bitcoin in January 2009 was well-perceived, given its promising revolutionised features of occurring on a decentralised platform, with no governmental and regulatory controls. Moreover, the transactions, being cryptographically encrypted, imply that the privacy and anonymity of Bitcoin holders are the pillars of the Bitcoin ideology [3].

With a global reputation of being an innovative disruption for the traditional financial entities, the seismic upsurge of Bitcoin has been one with uncountable incidences, mainly comprising security breaches and the occurrence of illicit activities [4]. The alarming rise in the sophistication of cybercrime has exposed the Bitcoin network and exchanges to damaging risks, making the security measures vulnerable and an easy target to hackers [5]. Unceasing wrongdoings with the use of Bitcoin, mainly due to the transactions being encrypted hence making it impossible to trace back the transaction parties, have been an ongoing nightmare to the governments and regulatory authorities, who have been devising policies to control the Bitcoin hype [4]. Classified as the most volatile currency, with tremendous rises and cataclysmic drops in its price, uncertainty among academicians has been reported as whether Bitcoin should be viewed as an alternative to fiat currencies or a speculative asset. Given that the



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Bitcoin price has been vulnerable to the market sentiments and excessive boom-and-bust events which signify the repetitive bubble-crash effect submerging the Bitcoin price; and concerns on the future of Bitcoin have arisen as the exorbitant risk-and-return level of Bitcoin may lead to Bitcoin participants to withdraw from the Bitcoin market [2],[6],[7]. Moreover, the fixed supply of Bitcoin, capped at 21 million Bitcoins has triggered concerns on whether in the long term, Bitcoin users would rather hold their Bitcoins, given its restricted amount and considerable worthiness, which may cause the uncertainty in the Bitcoin market [8]. Reference [9] highlights on the theoretical concept of deflationary spiral which may occur to the Bitcoin currency given the current issue of inclining demand for Bitcoins against the limited Bitcoin supply. As demand overpowers the capped supply of Bitcoins, the price of the virtual currency inclines accordingly, which may lead to the occurrence of severe deflationary spiral on the currency as Bitcoin investors hoard their Bitcoins instead of spending them.

The incline of debates concerning the present flaws of Bitcoin has led to the research study to assess how the current state of Bitcoin in terms of its security flaws, volatility, deflationary behaviour, and unstandardized regulations influence the future adoption of Bitcoin. This research work differs from the past studies as it assesses the current inefficiencies surrounding Bitcoin and how they may affect the future adoption of Bitcoin. Recommendations on the existing flaws are thoroughly advised to alleviate these flaws for a better adoption of Bitcoin in the near future.

This study aims at gathering the views of present and potential Bitcoin users as well as Bitcoin enthusiasts, by mentioning the current problems evolved in the Bitcoinnetwork and evaluating their perception on the future of Bitcoin. Future implications of this research work are mainly to assess the present loopholes in the Bitcoin security protocol, consistent volatility, deflationary aspect, and minimal regulatory measures and to evaluate their impact on the future adoption of Bitcoin. Based on the research findings, adequate recommendations are derived to considerably improve the current inadequacies on Bitcoin which may also be reflected through other cryptocurrencies such as Litecoin and Ethereum. The present work also aims at targeting the minimal regulatory regimes surrounding Bitcoin and provides ground to concerning authorities to tighten the regulatory protocol surrounding Bitcoin. Moreover, this research work delivers adequate awareness regarding the consistent inefficiencies faced with Bitcoin to financial and non-financial institutions as well as central banks, which are planning to implement their built-in virtual currencies.

## II. LITERATURE REVIEW

### A. *Bitcoin Security Protocol*

Reference [10] enlightens on the uncertainty of security measures surrounding Bitcoin by stressing on the inclining security breaches faced by Bitcoin exchanges and digital wallet service providers. An early study investigates on the risk of failure among 40 Bitcoin exchanges worldwide within the period April 2010 to January 2013, whereby 18 exchanges subsequently shut down by end of 2012. Among the 40 exchanges, nine suffered from security breaches, which led to the closure of five exchanges while the remaining four exchanges, namely Mt. Gox, btc-e.com, Bitfloor and Vircurex, survived till January 2013[11]. A mixed-method study investigates on the impactful factors affecting the future of Bitcoin and Ethereum. The findings, explained through the five-ranking scale from “Very Low” to “Very High”, clarify that major hacking activities have a high negative impact on the future of Bitcoin, given that a considerable amount of trust will be lost in the cryptocurrency[12].

### B. *Volatility of Bitcoin*

The speculative bubble reigning in the Bitcoin market has led to the uncertainty in the Bitcoin valuation and can cause the market to crash in the near future, which may lead to a drastic decline in the



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future adoption of Bitcoin as Bitcoin participants cash-out from the market. Nonetheless, some studies explain that although the thriving rises and dramatic falls in the Bitcoin price, the virtual currency is expected to stabilise as the Bitcoin network grows and the customer base widens, which will subsequently trigger a boost in the future adoption of Bitcoin[4],[13]. Moreover, reference [14] infers from the findings of the interview survey that although there is a sceptical opinion of Bitcoin academicians on the future adoption of Bitcoin,given the extremely volatile behaviour of Bitcoin, the cryptocurrency is expected to stabilize in the near future, since it is a fresh technology.

### C. *Deflationary Aspect of Bitcoin*

The gradual boost in the Bitcoin economy is solely due to the appreciation of the virtual currency, which is observed to have a restricted monetary supply, and this may possibly lead to a "severe deflationary spiral" [9]. Reference [9] highlightsthat prospective occurrence is one of the greatest weakness in the virtual currency and emphasises that the hoarding of Bitcoins as the currency appreciates is explained as a moral hazard. As the worthiness of Bitcoin steadily inclines, investors will be more willing to hoard their Bitcoins instead of spending them, which will cause a reduction in the transaction volume with Bitcoins and the creation of new blocks becomes less profitable by the miners as less transaction fees are collected. Reference [9] alsoemphasises that if Bitcoin circulation drops too much, it can precipitate a loss of interest in the system, resulting in "bit rot" and verifier dearth, until such point that the system has become too weak to heal and defend itself which will lead to the collapse in the Bitcoin currency. It also highpoints that significant overall number of Bitcoins stolen and lost on the network substantially declines the supply of Bitcoins, contributing to an important deflationary-spiral impact on Bitcoin. This infers that the adoption of Bitcoin will subsequently face a sharp drop as the cryptocurrency becomes worthless.

### D. *Bitcoin Regulations*

The unstandardized and limited regulations surrounding Bitcoin has triggered uncertainty within the Bitcoin market. The occurrences of high volumes of wrongdoings with the use of Bitcoin has led to several discussions on the weaknesses of the unregularized Bitcoin transactions. Governments and regulatory authorities have taken separate actions given the unregularized state of Bitcoin. Reference [4]shows that the acceptability of Bitcoin usage as a legal financial instrument diverges from one country to another. Different regulatory protocols have been taken by governments and regulatory bodies to evaluate measures to either regulate Bitcoin and other cryptocurrencies and formulate adequate laws towards the instrument and consumer protection, allow the cryptocurrencies to proliferate with no regulations, or ban the usage of cryptocurrencies in the country. Reference [5] mentions on the complexity of the legal status of cryptocurrencies worldwide, whereby in 2014, no official positions were taken by governments to implement concrete regulatory policies regarding the Bitcoinrevolution. It emphasises that *"most governments have taken a watch-and-see approach to Bitcoin"*. Nonetheless, the author explains that in 2014, countries such as Iceland, Vietnam and China have undertaken severe measures to ban Bitcoin while some governments, namely Finland, Poland and Singapore have reviewed their monetary policies to legalise transactions in Bitcoins, with the inclusion of taxing the cryptocurrency.

### E. *Theoretical Framework*

References [13], [14] adapt the Austrian monetary theory to the concept of Bitcoin. Reference [14] extends the Austrian monetary theory to the Bitcoin concept by highlighting on the upgraded money functions of Bitcoin. Based on the medium-of-exchange function of money, Bitcoin is explained to outperform this function based on several criteria. Transactions in Bitcoins have exponentially inclined over the past year, from payments through online portals and peer-to-peer



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transactions through mobile applications, to payment of receipt in restaurants. Moreover, Bitcointransactions are significantly cheaper compared to transactions through financial institutions. Furthermore, given that Bitcoin is based on a cryptographic concept, exchanges in Bitcoins are considerably secured; thus enhancing the medium-of-exchange money function of Bitcoin.

When adapting the unit-of-account function of money to Bitcoin, reference [14] shows that Bitcoin fulfils this money property, given the fact that Bitcoin is divisible up to eight decimal places while supporting all four mathematical principles. The most debatable facet of money relatable to Bitcoin is the store-of-value function. The recent fluctuations of the Bitcoin price explain the higher risk associated to the cryptocurrency as a store of value. The uncertainty in the future price of Bitcoin has led to the concern of Bitcoin participants and economists that the store-of-value money function may not be fulfilled due to the significant instability in the Bitcoin valuation. Nonetheless, this study emphasises that Bitcoin is a relatively new concept and given that adequate standardised regulations are implemented on the cryptocurrency, consistent Bitcoin valuation models are implemented to unwind the volatility of Bitcoin and lead to a stable cryptocurrency. In other words, the present fluctuations in the Bitcoin price will subsequently stabilise as the Bitcoin network and participants grow, thus stabilising the purchasing power of Bitcoin. As such, the stabilisation of the Bitcoin price in the near future supports the store of value money function of Bitcoin [13].

## III. METHOD

The Austrian monetary theory depicts the three functions of money namely as a medium of exchange, as a unit of account, and as a store of value. The framework of this study adapts the Austrian monetary theory to the Bitcoin concept, most specifically by linking the four independent variables – Bitcoin Security Protocol, Bitcoin Volatility, Deflationary aspect of Bitcoin, and Bitcoin Regulations to the dependent variable as Future of Bitcoin. The "medium of exchange" function of money includes all five variables under investigation. A fair assessment of this money function explains that adequate security measures surrounding Bitcoin, the limited volatility of Bitcoin, the sound deflationary behaviour of Bitcoin, and the suitable regulatory regimes surrounding Bitcoin boost the future adoption of Bitcoin resulting in the empowerment of the "medium of exchange" function of money adapted to Bitcoin. The second function of money as a unit of account explicates the eminent purpose of a currency as a benchmark to set the price of goods and services and to compare these prices [15]. When adapting this money function to the Bitcoin concept, two independent variables, namely the volatility of Bitcoin and the deflationary aspect of Bitcoin are considered to support the "unit of account" money function of Bitcoin. Reference [15] explains that the stability of a currency allows businesses to price their product in terms of that currency, and it helps individuals and businesses to evaluate the worthiness of their assets and liabilities with respect to the given currency. In this study, the stability of Bitcoin is assessed through the impact of Bitcoin volatility and deflationary aspect of Bitcoin on the future adoption of Bitcoin. The third function of money as a store of value explains the stable growth of a currency with time, conserving the value of the currency. Like the "unit of account" money function, this research study focuses on the impact of two independent variables: Volatility of Bitcoin and Deflationary aspect of Bitcoinon the future adoption of Bitcoin to assess whether Bitcoin possesses the store of value function of money.

This research work embodies an explanatory study which aims at investigating how the present inefficiencies surrounding Bitcoin influence the future adoption of Bitcoinbased on four criteria, namely the Bitcoin security protocol, the volatility of Bitcoin, the deflationary aspect of Bitcoin and the regulations surrounding Bitcoin. A quantitative



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research method based on primary data which is gathered through a close-ended questionnaire survey is utilised. The questionnaire designed is comprised of 31 questions and is divided into six sections. The variables being investigated in the current study are being rated with respect to the five-point Likert scale. Two sample groups are thoroughly analysed in this research study, namely the Bitcoin Public sample and the Bitcoin Experts sample. The first sample group is comprised of the Bitcoin Public sample which focuses on the opinions of Bitcoin participants and enthusiasts. Due to inconsistent findings generated from the first sample group, a second dataset is collected based on the same questionnaire, but with a more focused target group. The second sample group involves the Bitcoin Experts sample which is comprised of individuals who are well-versed on the Bitcoin ideology and who are well-aware of the present weaknesses of Bitcoin. No target region is being considered in this study as Bitcoin is transacted on an online platform and can be transacted on the Bitcoin network. Nonetheless, ten countries, namely Ecuador, Bolivia, Morocco, Algeria, Macedonia, Russia, Afghanistan, Bangladesh, Pakistan and Vanuatu, are omitted since at the time of the research the use of Bitcoin was considered as banned from these nations. This research work focuses on the cross-sectional approach whereby data has been collected over a period from March 2018 to July 2018 to reflect the appropriate sample size for the two sample groupswhich aims at including the overall population for the target groups. The sample size is reported as 382 for the Bitcoin Public sample and 123 for the Bitcoin Experts sample.

Several analyses are performed in this study. The first test evaluated is the reliability analysis which assesses the consistency of the questions in the questionnaire survey and is performed on the overall sample data as well as each study variables for the Bitcoin Public sample and the Bitcoin Experts sample. The second research analysis emphasises on the correlation analysis which involves both the Pearson correlation test and the Spearman correlation test. The four Pearson assumptions namely, linearity, minimal outliers, normality and homoscedasticity are evaluated to assess the adequacy of the coefficients, as well as the two Spearman assumptions, namely ordinally or continuously scaled and monotonic relationship between the dependent variable and each independent variable [16],[17].

Further to the correlation analysis, a multiple linear regression model is generated to assess the significance of each of the independent variables, namely the security protocol surrounding Bitcoin, the volatility of the Bitcoin, the deflationary aspect of Bitcoin and the regulations surrounding Bitcoin on future of Bitcoin. The regression model aims at determining whether at least one of the regressors has a significant impact on the dependent variable. The linear regression model in this study is given as:

$$FUT = \beta_0 + \beta_1 SEC + \beta_2 VOL + \beta_3 DEF + \beta_4 REG + \varepsilon \quad (1)$$

From the regression equation, $FUT$ is the future of Bitcoin, $SEC$ is the Bitcoin security protocol, $VOL$ is the volatility of Bitcoin, $DEF$ is the deflationary aspect of Bitcoin, $REG$ is the regulations surrounding Bitcoin, and $\varepsilon$ is the error term of the regression model. For the linear regression model, the Ordinary Least Square (OLS) method is used to estimate the parameters of the regressors in the fitted model by minimising the distance between the estimated linear regression model and the actual data case [18]. Through the Ordinary Least Square technique, the Stepwise method is used to generate only the significant independent variable in the linear regression model and excludes the insignificant regressors. The Stepwise method has an important advantage compared to the Enter method, given that it mitigates the occurrence of strong multicollinearity in the model which can considerably affect the coefficients of the regressors. The four linear regression assumptions based on the linear model generated through the Stepwise method; linearity, normality of error terms, homoscedasticity of error



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terms and minimal multicollinearity are tested to justify the consistency of the linear model.

## IV. FINDINGS & DISCUSSSIONS

The evaluation of the research objectives and research discussions are based on the findings obtained from two sample groups namely Bitcoin Public and Bitcoin Experts. Eminent research findings explain that the two sample groups have delivered distinct and radical observations and findings. When assessing the demographic profiles of the two sample groups, the Bitcoin Public sample is observed to comprise of a younger group of individuals with an adequate level of study and study background equally relevant and irrelevant to the Bitcoin topic. On the opposite, the Bitcoin Experts sample is explained to include a more mature group of respondents which high educational achievements and well-knowledge on the Bitcoin concept given that the fields of study are mostly relevant to the Bitcoin subject. The evaluation of the frequency analysis of the five variables explains that the Bitcoin Public sample most displays neutral views on most of the statement provided while the Bitcoin Experts sample expresses more concerns on the present flaws surrounding Bitcoin in terms of its security protocol, its volatility, its deflationary aspect and its unstandardized regulations, by most participants agreeing with the statements provided for the four independent variables. Moreover, the Bitcoin Experts sample shows uncertainty in the future adoption of Bitcoin, given that most of the respondents disagreed to the six statements provided. This eminent finding enlightens on the overall risk behaviour for each sample group. The Bitcoin Experts are observed to be well-aware of the present weaknesses of Bitcoin and are sceptical of the future adoption of the cryptocurrency. On the other hand, Bitcoin users and enthusiasts are found to either be indifferent or unaware of the current inefficiencies surrounding Bitcoin and yet mostly neutral of the future adoption of Bitcoin. An inference of the frequency analysis for the Bitcoin Public sample can signify the presence of present and potential speculators within the sample group, who may be unconcerned of the future of Bitcoin given that they may only be willing to generate abnormal returns from Bitcoin investments. Further to the frequency analysis, the reliability test is assessed for the overall sample data and each study variable for both sample groups. The overall reliability explains that Cronbach's Alpha statistics, valued at 0.893 for the Bitcoin Public sample and 0.717 for the Bitcoin Experts sample, lies between the accepted range of 0.70 and 0.95 and, thus clarifies that the 23 items embodying the dependent and independent variables are consistent. It can hence be understood that the overall data for the Bitcoin Public sample and the Bitcoin Experts sample are both significantly reliable.

The assessment of the correlation between the future of Bitcoin and the each of the four independent variable highlights that both Bitcoin Public and Bitcoin Experts samples cannot be explained through the Pearson correlation analysis, given that most if not all the Pearson assumptions have been violated for the two sample groups.

Since the Spearman assumptions have been fully satisfied for all the variables for both sample groups, the outputs from the Spearman correlation analysis are used to interpret the strength in association between the dependent variable and the four independent variables for both Bitcoin Public and Bitcoin Experts sample. Table I displays a summary of the coefficients for the Spearman correlation analysis for both sample groups. The low and near-zero correlation coefficients for the Bitcoin Public sample may be due to a diverse set of opinions from the respondents. The correlation coefficients are found to have considerably improved for the Bitcoin Experts sample, but the belief of the respondents is seen to oppose that of the Bitcoin Public sample. For the Bitcoin Public sample, it can be interpreted that as the inefficiencies of Bitcoin in terms of its security protocol, volatility, deflationary behaviour and regulations, increases, the future adoption of Bitcoin



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increases, and vice versa. On the other hand, the negative moderate and significant correlation coefficients for the Bitcoin Experts sample implies that as the present flaws surrounding Bitcoin increase, the future adoption of Bitcoin decreases, and vice versa. It can thus be interpreted that the Bitcoin Public sample and Bitcoin Experts sample share opposite opinions in terms of the relationships between the future of Bitcoin and the independent variables.

TABLE I:

Summary of Spearman Correlation Analysis

| | **Bitcoin Public** | | **Bitcoin Experts** | |
|---|---|---|---|---|
| | *Coefficient* | *p-value* | *Coefficient* | *p-value* |
| **SEC** | 0.058 | 0.259 | - 0.416* | 0.000 |
| **VOL** | 0.107* | 0.037 | - 0.394* | 0.000 |
| **DEF** | 0.195* | 0.000 | - 0.430* | 0.000 |
| **REG** | 0.071 | 0.169 | - 0.413* | 0.000 |

Dependent Variable: Future of Bitcoin

*. Significant at the five percent two-tailed probability level

The Spearman correlation analysis however does not imply a cause-effect relationship between the future of Bitcoin and each of the four independent variables. The multiple linear regression analysis helps in a between understanding of the causal implication of the independent variables on the future adoption of Bitcoin. Table II provides a summary of the outputs for the regression analysis. The first assessment to verify the adequacy of the linear regression model is through the R-square value. Most of the past studies relevant to financial publications clarify an acceptable R-square value of at least 0.20 [19]- [21]. For the Bitcoin Public sample, the R-square is valued at 0.070, explaining that only 7.0 percent of the variation in the future adoption of Bitcoin can be explained by the deflationary aspect of Bitcoin, while the remaining 93.0 percent is unjustifiable through the linear model and may be explained by external factors. The low R-square value of 0.070 for the linear model explains that the linear model for the Bitcoin Public sample may be unreliable. On the opposite, the R-square value for the linear model of the Bitcoin Experts sample is equivalent to 0.379, inferring that 37.9 percent of the change in the perception of the future of Bitcoin can be explained by the Bitcoin security protocol and the deflationary aspect of Bitcoin, while the remaining 62.1 percent of the variation remains unjustified by the linear model and may be explained by external factors. Given the acceptable R-square value of at least 0.20 by previous studies, the R-square value of 0.379 implies that the linear regression model for the Bitcoin Experts sample is well-consistent. The R-square value is observed to have significantly improved from 0.070 for the Bitcoin Public sample to a more adequate value of 0.379 for the Bitcoin Experts sample.

When assessing the significance of the parameter estimates for four regressors through the linear regression approach, only the deflationary aspect of Bitcoin is observed to have a positive significant impact on the future adoption of Bitcoin for the Bitcoin Public sample, while the Bitcoin security protocol and the deflationary aspect of Bitcoin are found to negatively and significantly affect the future adoption of Bitcoin for the Bitcoin Experts sample. The opposite sign of the significant regressor(s) for the two sample groups has an important implication on the belief of the respondents. The positive impact of the present deflationary aspect of Bitcoin on its future adoption explains that the respondents from the Bitcoin Public pool may be unconcerned of the limited supply of Bitcoin and are optimistic regarding the future adoption of Bitcoin. On the other hand, the respondents from the Bitcoin Experts sample may be explained to be more aware of the present flaws surrounding Bitcoin, more importantly, the Bitcoin security protocol and the deflationary aspect of Bitcoin inferring that the Bitcoin Experts are sceptical towards the adoption of Bitcoin in the next five years.

An important observation is made from the Bitcoin Publicsample. From Table II, considerably high p-values are observed for the parameter estimates of the three insignificant regressors, namely Bitcoin



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security protocol, Bitcoin volatility and Bitcoin regulations, reported as 0.717, 0.619 and 0.879 respectively. Reference [22] highlights that large p-values may result from several factors, including randomness in the data set, incorrect statistical analysis, irrelevant study design, and small sample size. The high p-value reported for these parameter estimates reveals flaws in the Bitcoin Public sample. An overview of the raw data explains the variation of opinions when the respondents filled in the questionnaire. The frequency analysis for the five variables for the Bitcoin Public sample, explains the domination of the respondents' neutrality on most of the statements provided. Moreover, it may be assumed that the Bitcoin Public sample comprises of respondents who are almost equally sceptical or optimistic on the future of Bitcoin based on the present inefficiencies surrounding the virtual currency. Thus, the opposite sets of opinion may have cancelled out each other, leading to low correlation coefficients, low R-square value for the linear model, and extremely high p-values.

TABLE II:
Summary of Linear Regression Analysis

| | **Bitcoin Public** | | **Bitcoin Experts** | |
|---|---|---|---|---|
| | *Coefficient* | *p-value* | *Coefficient* | *p-value* |
| **Constant** | 2.513 | 0.000 | 4.785 | 0.000 |
| **SEC** | 0.021 | 0.717 | - 0.428* | 0.000 |
| **VOL** | 0.031 | 0.619 | - 0.094 | 0.316 |
| **DEF** | 0.252* | 0.000 | - 0.229* | 0.014 |
| **REG** | - 0.010 | 0.879 | - 0.155 | 0.119 |
| **F – test** | 28.666* | 0.000 | 36.547* | 0.000 |
| **$R^2$** | 0.070 | - | 0.379 | - |

Dependent Variable: Future of Bitcoin
*. Significant at the five percent level

When linking the research findings for the Bitcoin Public and Bitcoin Experts sample groups to the theoretical framework and adapted to this research study an important disparity is noted between the two sample groups. For the Bitcoin Public sample, the positive insignificant impact of Bitcoin security protocol and volatility of Bitcoin, as well as the positive significant influence of the deflationary aspect of Bitcoin on the future adoption of the cryptocurrency portrays the belief of Bitcoin participants and enthusiasts on the promising future of Bitcoin although the present inefficiencies in these three variables. However, the negative insignificant effect of the present Bitcoin regulations on the future adoption of Bitcoin explains the scepticism of the Bitcoin participants and enthusiasts on the unstandardized regulations surrounding Bitcoin which is believed to hinder the adoption of Bitcoin in the future.

When adapting Bitcoin to the medium of exchange function of money, the positive influence of the present inefficiencies of Bitcoin in terms of its security protocol, its volatility and its deflationary attribution on the future adoption of Bitcoin demonstrates the promising future of Bitcoin irrespective of these flaws. As such, it can be inferred that Bitcoin can thrive as a medium of exchange in the next five years. However, the negative impact of the present unstandardized regulations surrounding Bitcoin on the future adoption of the cryptocurrency reports uncertainty in Bitcoin to fulfil the medium of exchange function of money.

By relating the unit of account function of money to the research findings, the positive impact of Bitcoin's volatility and its deflationary attribute may not directly infer that Bitcoin fulfils this second function of money. On the contrary, based on the important clarification of the speculative behaviour of the respondents from the Bitcoin Public sample, it is understood that the Bitcoin participants and enthusiasts praises the fluctuations in the Bitcoin price, which explains that Bitcoin may not exert the unit of account money function as no potential stability in the Bitcoin price is ascertained. Similarly, based on this research finding, the store of value function of money is explained to not be fulfilled



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given the speculative and risk-taking behaviour instilled within the Bitcoin Public sample. The ambiguity in the risk behaviour of the Bitcoin Public sample delivers several confusions on whether the cryptocurrency can fulfil the three functions of money. TheBitcoin Experts sample, on the other hand, has reported a categorical explanation on the current state of Bitcoin regarding the three functions of money. The negative impact of the present inefficiencies of Bitcoin relevant to its security protocol, its volatility, its deflationary behaviour and its unstandardized regulations, on the future adoption of the cryptocurrency defies the attribution of Bitcoin as a currency. As a medium of exchange, the relevant flaws surrounding Bitcoin regarding the four independent variables are described to trigger a reduction in the future adoption of Bitcoin. Thus, the deterioration of Bitcoin's future adoption explains that the cryptocurrency does not fulfil the medium of exchange money function, as uncertainty is mentioned to reign within the Bitcoin market.

As a unit of account, based on the research findings, the significant fluctuations in the Bitcoin price as well as the high chance of the occurrence of a severe Bitcoin deflationary spiral explains the instability of the Bitcoin price. It can be inferred that the difficulty in using Bitcoin to set the prices of Bitcoin or assess the price of an item denominated in Bitcoins, given its prevailing price fluctuations, explicates that Bitcoin is unfit to deliver the "unit of account" function of money. Similarly, the store of value function of money is explained to not be fulfilled by Bitcoin given the instability in the Bitcoin price, relevant to its severe fluctuations.

In the light of the above discussion, it can be concluded that the Austrian monetary theory may not be adapted to the concept of Bitcoin in this research work for the Bitcoin Public sample and the Bitcoin Experts sample mainly due to the irrefutable inefficiencies surrounding Bitcoin. Reference [23] supports that Bitcoin lacks these three crucial money functions which are the pillars of monetary regimes to fulfil and control the stability of fiat currencies. The concluding note explicates Bitcoin as a crypto asset rather than a cryptocurrency.

## V. CONCLUSION

An overall conclusion of the study regarding the two sample groups enlightens on the opposite risk behaviour of the Bitcoin Public sample and the Bitcoin Experts sample. The Bitcoin Public sample explains a more optimistic view on the future adoption of Bitcoin while tending to be mostly neutral of the present inefficiencies of Bitcoin. This infers that this sample group is comprised of respondents who are either unaware or unconcerned of the limitations surrounding Bitcoin. An important inference also delivered from the research findings explains that the respondents from the Bitcoin Public sample tend to be risk-takers and are likely to utilise Bitcoin as a speculative investment. On the other hand, the Bitcoin Experts sample reports a more sceptical opinion on the future of Bitcoin, while strongly acknowledging the present inefficiencies surrounding Bitcoin.

The concluding remark on the theoretical framework highlights on the non-accomplishment of the Austrian Monetary theory to explicate the concept of Bitcoin, based on the three functions of money, namely as a medium of exchange, as a unit of account and as a store of value. The inability of support the Bitcoin model with the Austrian Monetary theory concludes on the viability of Bitcoin as a currency. The ongoing speculative activities reigning in the Bitcoin economy proves that Bitcoin should not be referred to as a currency, but rather as an underlying asset.

Several implications have been drawn based on the findings delivered in this research study. The firm acknowledgement of the present flaws surrounding Bitcoin and their detrimental impact on the future of Bitcoin, as per the findings from the Bitcoin Experts sample, has deliberately given ground to regulatory authorities, financial institutions and Bitcoin entities



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to impose reforms in the aims of alleviating the inefficiencies of Bitcoin, hence contributing to the potential incline in the future adoption of Bitcoin. Due to the inclining uncertainty surrounding the built-in privacy protocol in the Bitcoin network further to the increasing threats of theft by third party intruders, Bitcoin mixing services should be regarded as an eminent tool in tightening the privacy and anonymity measures, alleviating the occurrence of Bitcoin theft.

### **A.** *Limitations and Recommendations for Further Studies*

The main limitation observed in this research work is the discrepancies of the Bitcoin Public sample. The data analysis performed on the Bitcoin Public sample is explained to be inconsistent given the weak and near-zero relationships between the dependent variable and the independent variables from the Spearman correlation analysis. Most importantly, a relatively small R-square value of 0.070. The inconsistency of the Bitcoin Public sample is most likely to be caused by the randomness in the opinion of the respondents. As such, the low R-square value accounted explains that more profound investigations are required to evaluate the different risk behaviour of the Bitcoin participants and enthusiasts. Thus, an important recommendation for future studies, built on this research work, emphasises on evaluating the risk profile of the Bitcoin participants and enthusiasts to have a clearer understanding on how the present inefficiencies of Bitcoin affect its future adoption based on the risk behaviour of the individuals.

Moreover, a key limitation is observed through the theoretical framework which is adapted to the Bitcoin concept. In this research study, the findings explain that Bitcoin does not fulfil the three functions of money. The lack of a robust theoretical framework to represent the Bitcoin concept thus limits research studies to fully understand the Bitcoin economy. Thus, an expansion of this research work may focus on the design of an adequate Bitcoin theory by analysing the research variables through a qualitative research study. By assembling the opinions and beliefs of Bitcoin Experts as well as Bitcoin participants, an adequate Bitcoin model can be generated backed up with a robust theory of the economy of Bitcoin.

## REFERENCES

[1] Mirzayi, S. and Mehrzad, M. (2017) Bitcoin, An SWOT Analysis. 7th International Conference on Computer and Knowledge Engineering. 26th and 27th October [Online]. Available: https://ieeexplore.ieee.org/document/8167876.

[2] Douma, S. (2016) Bitcoin: The Pros and Cons of Regulation. Universiteit Leiden Review. 1 (2016), pp. 1-53.

[3] Vora, G. (2015) Cryptocurrencies: Are Disruptive Financial Innovations Here? Modern Economy. 6 (2015), pp. 816-832.

[4] Sharma, M. (2017) Cryptocurrencies and the Regulators Dilemma. Institute for Defence Studies & Analyses – Special Feature, pp. -20.

[5] Frunza, M. C. (2016) Cryptocurrencies: A New Monetary Vehicle. Solving Modern Crime in Financial Markets: Analytics and Case Studies.1 (2016), pp. 39-75.

[6] Fry, J. and Cheah, E. T. (2016) Negative bubbles and shocks in cryptocurrency markets. International Review of Financial Analysis. 47 (2016), pp. 343-352.

[7] Baur, D. G., Dimpfl, T. and Kuck, K. (2017) Bitcoin, Gold and the US Dollar – A replication and extension. Finance Research Letters. 1 (2017), pp. 1-8.

[8] Baraniuk, C. (2014) Building on Bitcoin and lingering concerns on the future of the digital currency. New Scientist. 8th February [Online]. Available: https://www.sciencedirect.com/science/article/pii/S02624079146402748

[9] Barber, S., Boyen, X., Shi, E. and Uzun, E. (2012) Bitter to Better — How to Make Bitcoin a Better Currency. Financial Cryptography and Data Security. Chapter 29, pp. 399-414.



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[10]Murphy, E. V., Murphy, M. M. and Seittzinger, M. V. (2015) Bitcoin: Questions, Answers, and Analysis of Legal Issues. Congressional Research Service Report. 7 (2015), pp. 1-32.

[11]Moore, T. and Christin, N. (2013) Beware the Middleman: Empirical analysis of Bitcoin-Exchange Risk [Online]. Available: https://fc13.ifca.ai/proc/1-2.pdf

[12]D'Alfonso, A., Langer, P. and Vandelis, A. (2016) The Future of Cryptocurrency: An Investor's Comparison of Bitcoin and Ethereum. The Economist. 1 (2016), pp. 1-24.

[13]Hays, D. (2015) Bitcoin and New Austrian Monetary Theory. University of Liechtenstein Review. 1 (2015), pp. 6-8.

[14]Gaikwad, R. and Singh, A. P. (2014) Bitcoin – Its Economic Impacts. Academia Publication [Online]. Available: https://www.academia.edu/8080162/BITCOIN_ITS_ECONOMIC_IMPACTS

[15]Cookson, R. (2017) Bitcoin analysis part 2: can it ever become a unit of account? Medium. 18th December [Online]. Available: https://medium.com/@robert.cookson/Bitcoin-analysis-part-2-can-it-ever-become-a-unit-of-account-a266ce6ed4f7

[16]Summoogum, J. P. and Chan Yin Fah, B. (2016) A comparative study analysing the demographic and economic factors affecting life expectancy among developed and developing countries in Asia. Asia Development Policy Review. 4 (4), pp. 100-110.

[17]McDonald, J. H. (2014) Handbook of Biological Statistics. 3rd edition. Maryland: Sparky House Publishing.

[18]Law, C. and Vahlqvist, M. (2018) Can Bitcoin be used as a hedge against the Swedish market? Stockholm University Review. 4 (2018), pp. 1-46.

[19]Beck, T., Demirguc-Kunt, A. and Levine, R. (2004) Finance, Inequality and Poverty: Cross-Country Evidence[Online]. Available: http://www.nber.org/papers/w10979 .

[20]Bonfiglioli, A., Rosario, C. and Gino, G.(2016). Trade, Finance and Endogenous Firm Heterogeneity.[Online]. Available: https://www.econstor.eu/handle/10419/130445.

[21]Ayadi, R., Arbak, E, Naceur, S. B. and De Groen, W. P. (2013) Financial Development, Bank Efficiency and Economic Growth across the Mediterranean. Mediterranean Prospects Report[Online]. Available: https://www.researchgate.net/publication/257141074_Financial_Development_Bank_Efficiency_and_Economic_Growth_across_the_Mediterranean [Accessed: 15 August 2018].

[22]Nahm, F. S. (2017) What the P values really tell us. The Korean Journal of Pain. 30 (4), pp. 241-242.

[23]He, D. (2018) Monetary Policy in the Digital Age. Finance & Development – A Quarterly Publication of the International Monetary Fund. 55 (2), pp. 13-16.

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