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# Does the Velocity of Bitcoins Effect the Price Level of Bitcoin?

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## 1. Introduction

Bitcoin is a decentralized, peer-to-peer virtual currency that was created by an entity named Satoshi Nakamoto; it is unknown whether this is an individual or a group of people. Bitcoin is decentralized in its nature because it is not supported or controlled by any central monetary authority. Think about sovereign currencies today and how most nations' economies have a central bank controlling the money supply, among other things. This is nonexistent in Bitcoin's economy because the software responsible for establishing the rules essentially, is designed so that the Bitcoin users are the ones in control. And no one single user has any power over another because of the open-source software meaning the users build it, and the peer-to-peer activity in the Bitcoin network. The supply of Bitcoins is controlled in the following sequence of events: firstly, miners expend their computing power to verify Bitcoin transactions through a series of complex, cryptographic, proof-of-work puzzles, secondly, the miner(s) that successfully verify the next "block" of transactions before anyone else and the network of miners approves of their work, are rewarded 25 Bitcoins for their efforts, and thirdly, these 25 Bitcoins are the newly "printed" Bitcoins that now enter the Bitcoin economy. This entire sequence of mining and creation takes place approximately every 10 minutes, and the Bitcoin software adjusts the mining difficulty accordingly to maintain this "timed-release" of Bitcoins, so to speak, i.e. there is a mining difficulty metric that increases how hard it is for miners to verify transactions so the entire supply of Bitcoins is not mined until the year 2140, a grand total of 21 Million Bitcoins.

The popular virtual currency Bitcoin has gained substantial recognition over the past few years due to its controversial nature, and the amount of attention and money the Bitcoin economy has attracted. Bitcoin entered into the public's sight because its value was fluctuating dramatically. As a result a few

early adopters realized they became millionaires overnight, making it a good story for not only the media but for this revolutionizing idea of digital currencies. Questions were being asked, but there were no answers that addressed them. In April 2013 Bitcoin closed at its highest price to date at $143.91, but then dropped in the following months, only to later spike to $979.45 on November 25, 2013. This perplexed people of all professions including government officials, business leaders, and Bitcoin enthusiasts alike.

One major question these groups were asking themselves was, "How viable is this virtual currency Bitcoin?" In terms of defining itself as a currency, it was fulfilling the duty of acting as a superior medium of exchange for transactions of goods and services, but of course people had to be willing to accept Bitcoin in exchange for goods. The other two features, store of value and unit of account, were clearly not being met by Bitcoin, evident through its volatility and uncertainty. But it is possible that Bitcoin cannot function as a viable currency at all, and instead it is seen being used as a financial instrument for investing and speculation purposes. Bitcoin also has an established entrepreneurial community that is creating start-up companies to address many of the needs Bitcoin users have, and consequently this is causing a lot of investment into the Bitcoin economy. The goal of my paper is to start attacking this question of identity for Bitcoin through an econometric model with the price of Bitcoin as the dependent variable, and measuring the velocity of Bitcoin through the Bitcoin days destroyed metric, which is the hypothesis independent variable. The results will not explicitly state whether Bitcoin works as a currency, financial instrument, or commodity, however they give insight into which identity the users of Bitcoin want Bitcoin to function as.

**2. Literature Review**

There is a variety of literature available on Bitcoin, however there are few econometric studies done with Bitcoin to date, in fact only one that I found. Many of the professional papers I read were studies in understanding questions like what Bitcoin exactly is, what sort of potential does it have in the global economic environment, what sort of implications it has on the financial industry, and what are the driving forces behind the creation of Bitcoin. Since there are no existing papers out there at the moment

that develop a model such as the one in my paper, all of these sources act as a strong foundation for where my paper gets its motivation.

In Yermack (2013) the main goal is to outline and explain the three characteristics of what makes a currency viable and how Bitcoin is not sufficient as a currency. For a currency to be deemed as such, it must satisfy three qualities: to function as a medium of exchange, a store of value, and a unit of account. Bitcoin clearly works as a medium of exchange, as new businesses are accepting Bitcoin as a form of payment for goods and services every day. However, Bitcoin fails to meet the latter two, argues Yermack. Bitcoin is not a good store of value because of its extreme volatility, and the large amount of risk it imposes on its users who hold the currency. Yermack also measures correlations of Bitcoin against foreign currencies like the Yen, British Pound, Swiss Fanc, and the Euro, as well as London's price of gold and finds that there is some between other currencies but Bitcoin exhibits virtually zero correlation with any of these, further solidifying his point that Bitcoin cannot function as a viable currency.

Chowdhury and Mendelson (2013), cover a wide range of Bitcoin topics from the currency's origins, incentives to use Bitcoin, obstacles users face, and its potential impact on the financial and monetary policy systems. Due to Bitcoin's decentralization and pseudo-anonymity, there is currently no regulation in regards to banking laws, specifically anti-money laundering, which are non-existent in the Bitcoin protocol. The decentralized characteristic of Bitcoin is contrary to the modern monetary policy and financial system that national economies as well as the global economy adhere to. Despite its unique qualities and development Chowdhury and Mendelson conclude that the Bitcoin economy should be analyzed in order to understand the workings of the economy. They also state that there must be regulations administered, not necessarily governmental, but financially at least in order to establish some credibility and standardization for Bitcoin users.

Plassaras (2013) explains how Bitcoin works and focuses more on how the current Bitcoin protocol presents a potential threat to the global economy because the IMF cannot influence Bitcoin directly. He discusses several things about the way Bitcoin works and how they are obtained, which

coincide with the r my paper. After describing characteristics of Bitcoin, for example how to obtain them and how mining works, both which represent supply and demand factors in terms of the Bitcoin economy, he goes on to explain how the nature of Bitcoin is out of the International Monetary Fund's control, and how this could pose a threat to foreign currencies being under attack and consequently affecting the future global economic stability. In closing, he notes two ways the IMF can attempt to regulate Bitcoin: indirectly through member nations buying Bitcoin and paying part of its membership with Bitcoin, or directly by allowing Bitcoin to have a quasi-membership that would provide a legitimacy for Bitcoin and allow the IMF to accumulate Bitcoins to prevent a currency attack.

Kroll, Davey, and Felten (2013) researched and modeled the process of Bitcoin mining. One of the major characteristics of the Bitcoin protocol is the way Bitcoins are created through the mining process. Participants gather resources, use them to solve cryptographic puzzles, and the end result is a reward in the form of newly created Bitcoins. As more participants enter the game, as the authors have described it, it becomes increasingly difficult to mine additional Bitcoins, likewise it becomes less and less profitable for miners to offer their resources. The implications of mining along with Bitcoin's fixed supply give rise to the notion that the Bitcoin community will have to make important decisions in the future, whether it be adjusting the rules that miners adhere to, increasing the supply of Bitcoin, or taxing transactions, and these decisions will come from some type of governance structure that will induce political debate within the Bitcoin community.

My paper uses these studies as a foundation of knowledge on the topic of Bitcoin and expands upon them by developing one of the early econometric models using the price of Bitcoin as the dependent variable. There were no previous econometric studies that lay the groundwork for my paper, but rather these literature all served the purpose of providing me with enough knowledge on Bitcoin and the world around it, that I was able to create a model based the velocity of Bitcoins, among other independent variables that effect someone's demand for Bitcoin.

**3. Hypothesis and Model**

**Commented [MJD1]:** A description of your hypothesis and of the model in which it is embedded. Your descriptions should include a priori justifications for both your hypothesis and model. These help to persuade readers that the study is well thought out and therefore worth reading about. As noted above, be sure your justifications are based on economic reasoning and theory. More details concerning hypothesis formulation and model building will be presented in class.

The section should conclude with a mathematical statement of your model in its econometric form:

The hypothesis of my paper is the following: Does the velocity of Bitcoin have an effect on the price level of Bitcoin? My use of the notion of velocity derives from the Quantity Theory of Money where the velocity of money is assumed to be constant, however in the case of the Bitcoin economy, the velocity of money is measured by the amount of Bitcoins spent in each transaction. Bitcoin days destroyed will be explained in subsequent paragraphs, but in short it gives a larger measure to the Bitcoins that have not been spent in a while. Since the velocity of Bitcoin is now measurable, this gives clear insight into the demand people have to participate in Bitcoin transactions. Since Bitcoin days destroyed cannot control for the entire demand in Bitcoin's economy it is necessary to incorporate other relevant independent variables.

The model is broken down into one revolved around measuring the demand for Bitcoin (other than the constantly exogenous supply variable) and seeing how it effects the price of Bitcoin. In the following section I will explain in detail the independent variables that are going to control for the demand of Bitcoin. These factors incorporated into my model are the following: Bitcoin days destroyed, price of gold, US inflation rate, Google trends metric, and the number of transactions, as well as the quantity of Bitcoin in circulation that represents the supply of Bitcoins.

The hypothesis independent variable in the model is Bitcoin Days Destroyed (BDD) because it encompasses the velocity of Bitcoins and consequently it gives insight into speculative behavior with Bitcoins, the two most important factors in my model. Bitcoin Days Destroyed is a metric that takes the number of Bitcoins per transaction and multiplies it by the number of days it has been held at one address. For example, if someone bought 100 Bitcoins 7 days ago, and spent all 7 today, those Bitcoins represent 700 BDD (100 Bitcoin*7 days = 700 BDD). In a slightly different approach, however yielding the same final result, suppose that 700 Bitcoins were bought and spent today, they represent 700 BDD as well.

The idea of the BDD metric is to apply more weight to the Bitcoins that are not being used. Instead of using them, people may be interested in participating in speculative activity or using Bitcoin as an investment vehicle, which is a common activity in the Bitcoin economy. If there is a relatively large

number of BDD in a single transaction, it is evident that the owner of those Bitcoins involved has been holding their Bitcoins for a substantial amount of time. During that period where Bitcoins were not spent the Bitcoin economy has experienced a lack of economic activity, possibly from expected drops in price levels, a slowdown in economic growth, or speculative actions from participants who are looking to sell their Bitcoins when the price is high enough. As the reader will see in the forthcoming results, the level of speculative activity, or general lack of economic activity has a significant impact on the price level.

Gold has always been a valued commodity in the eyes of humanity for its scarcity, efficient characteristics as a metal, and input in luxurious items, making it a safe place to diversify one's wealth, especially in times of financial crises when currency values may drop. Tracking the price of gold over one year will control for the people's confidence in the economy, e.g. if the economy worsens, people may be inclined to purchase gold because of its intrinsic value. If the demand for gold rises, i.e. people are willing to pay more, the price rises. When thinking about Bitcoin, if people are looking to diversify wealth or speculate on commodities, and gold is priced to high, they may turn to speculate in Bitcoin. Controlling for the price of gold will not tell us that people are buying more Bitcoins but it is an indicator of economic confidence.

The Inflation rate of the US dollar follows similar rationale using the price of gold as a control variable. Inflation rates are not a measure of economic confidence but inflation, particularly larger values, will affect the people's confidence in the US currency. For instance, with an increase in inflation rates people see these effects directly through their purchasing power. Higher rates mean people's dollars are worth less, which may incentivize people to look for alternative ways to spend, invest, and store their US dollars, maybe even by purchasing gold and exchanging local currency for Bitcoins. This is not the immediate alternative for citizens in the US, however for illustration purposes only, Argentine people have adopted Bitcoin as a major currency there because the value of the peso has inflated to be almost worthless.

It is important to control for people's economic confidence in this model, but the popularity of Bitcoin is also a relevant factor to consider when measuring the demand for Bitcoin. The popularity is even more so important because as business journals and newspapers from around the world fill their pages with Bitcoin articles, the public's view of the virtual currency can be influenced. Google has a feature called Google trends that tracks the number of searches made for a term relative to total Google searches. This independent variable represents the ratio of "Bitcoin" Google searches relative to the total number of searches on Google. Google is the largest search engine on the Internet and is frequently a place where people go to have any question answered, which is how "googling" became a verb in the 21st century.

The last variable that will represent users' demand for Bitcoin in the model is the number of Bitcoin transactions. If there is transaction demand for Bitcoin than it is evident that there is demand for using Bitcoins. This variable is different from Bitcoin Days Destroyed in that it solely measures for the quantity of transactions over a period of time, it does not measure transaction volume, which is what BDD does. By looking at the number of transactions I can assess people's preferences for using Bitcoin as a medium of exchange for goods and services as opposed to another form of currency. Since Bitcoin operates in a free market, where buyers and sellers come together to exchange currency for goods and services, the number of transactions illustrates how much of a demand there is for that currency; when there is little demand for Bitcoin, there will be a relatively small number of transactions and thus price levels will decline since people are not demanding Bitcoins, and the opposite is true for a higher amount of transactions.

As all of these variables are controlling for the demand, there is only one variable necessary to represent the supply of Bitcoin. The number of Bitcoins in the economy is strictly limited, controlled, and calculated, where 25 new Bitcoins are created approximately every 10 minutes, i.e. when a new block of transactions is verified by miners, these miners are awarded 25 Bitcoins for their effort, and thus new Bitcoins enter the market.

The econometric form of the model is below:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu$ where,

$X_1$ = BDD = Bitcoin days destroyed

$X_2$ = PG = Price of gold

$X_3$ = IR = U.S. inflation rate

$X_4$ = GT = Google trends metric

$X_5$ = T = Number of transactions

$X_6$ = Q = Quantity of Bitcoins in circulation

$\mu$ = error term

**4. Data**

The model in this paper is a 52-week time series model, where each observation equals one week, it was too high-frequency to have each observation be one day, and the sample size would have only came out to be under two months of time observed. Most of the data I gathered for my explanatory variables was daily, therefore averages were taken over seven-day periods to agree with the weekly average price of Bitcoin (the dependent variable). The data to test my hypothesis was drawn from varying sources. Coindesk (2014) and Quandl (2014) were the two most used sites in my data collection in regards to specific Bitcoin-related variables. The price of Bitcoin and number of transactions were gathered from Coindesk (2014) in daily numbers, and then averaged over a seven-day period for each observation. The same average rule was applied to all of the following data: the Bitcoin days destroyed obtained from Quandl (2014), the Google trends metric taken from Google trends' website (2014), the price of gold, and US inflation rates found on The World Bank Group (2014). The descriptive statistics for the entire database can be found in Table 1.

The analysis of the descriptive statistics table is critical when interpreting the results from the multiple regression analysis. The dependent variable, the price of Bitcoin, has a minimum of $13.41 and a maximum of $979.45, and Bitcoin has been generally increasing from beginning to end of the 52-week

model I present. Bitcoin days destroyed are in millions of BDD, ranging from close to 2 million, to less than 26.5 million. The price of gold and the US inflation rate have stayed relatively close to their respective averages of $1350.17 and 1.5. The Google trends metric is an index that ranges from 1-100, 1 being the lowest ratio of Bitcoin/Total Google searches, and 100 being the largest. In the attached database, the reader can observe that the largest Google trends value of 100 matches the highest price of Bitcoin in the 52 weeks of the model. The number of transactions variable is measured in thousands of transactions to read the tables more easily. The range of average weekly transactions ranged from 35,800 to 83,900, and similar to the case of the Google trend index, the largest value of transactions, 83,900 matches up with the same week the Bitcoin price was the highest.

**Table 1: Descriptive Statistics**

| | **ID** | **Description of variable** | **Mean** | **Median** | **Min** | **Max** |
|---|---|---|---|---|---|---|
| **Y** | **P** | Bitcoin price | 185.46 | 114.17 | 13.41 | 979.45 |
| **$X_1$** | **BDD (in millions)** | Bitcoin days destroyed | 7.979 | 6.039 | 1.9709 | 26.377 |
| **$X_2$** | **PG** | Price of gold | 1414.53 | 1350.17 | 1224.45 | 1671.85 |
| **$X_3$** | **IR** | U.S. inflation rate | 1.48 | 1.5 | 1 | 2 |
| **$X_4$** | **GT** | Google trends metric | 23.25 | 13 | 3 | 100 |
| **$X_5$** | **T (in thousands)** | Number of Bitcoin transactions | 53.8 | 53.7 | 35.8 | 83.9 |
| **$X_6$** | **Q (in millions)** | Quantity of Bitcoins in circulation | 11.374 | 11.3553 | 10.625 | 12.165 |

**5. Empirical Results and Discussion**

The results of my multiple regression analysis can be found in Table 2 (page 10?). The variables and their respective results that are important for discussion are the following: Bitcoin days destroyed (BDD), Google trends metric (GT), and Bitcoin transactions (T). We can see from the p-values in Table 2 that these three independent variables are statistically significant; BDD is significant at the 1% level, GT and T are significant at the 5% level. Statistical significance is essential in determining what variables we are able to reject the null hypothesis for, i.e. that a particular independent variable has an effect on the dependent variable, but upon further analysis of the coefficients, one can see how substantial each independent variable's effect happens to be on the dependent variable, holding all other independent variables constant.

The hypothesis independent variable of my model is Bitcoin days destroyed. Recall the model hypothesis: "Does the Velocity of Bitcoins affect the Value of Bitcoin?" I am able to reject the null hypothesis, that BDD do not affect the value of Bitcoin, at the 1% level of significance. Bitcoin days destroyed do indeed have an effect on the value of Bitcoin. The level of impact that BDD has on the value of Bitcoin is determined by the coefficient, which equals -4.64. This says that an increase of 1,000,000 BDD (BDD measured in millions) will cause the value of Bitcoin to decrease by $4.64 holding all other independent variables constant.

Let me remind the reader of what Bitcoin days destroyed are measuring. Bitcoin days destroyed measure the velocity of Bitcoins in the network; the volume of Bitcoins in each transaction. If the average number of BDD is relatively high for that week, then Bitcoin users are not spending or transacting with the Bitcoins that they own. The higher the value of BDD, the longer the Bitcoins are sitting in an individual's wallet and not contributing to activity in the Bitcoin economy. As a result, and supported from BDD's estimated coefficient, other things equal, the very Bitcoins being held, possibly for speculative reasons, are the reason behind Bitcoin losing its value.

The Google trends metric (GT) is controlling for the popularity of Bitcoin through comparatively measuring the frequency of Google searches done for the term “Bitcoin” in relation to total Google searches. The p-value for GT is 0.0168, which means the null hypothesis, that GT does not have an effect on the value of Bitcoin, can be rejected at the 5% level of significance. The estimated coefficient for GT is 2.148. This is interpreted in the following way: a change in one unit in the GT variable, i.e. a 1% increase in the ratio of Bitcoin searches to total Google searches, causes the value of Bitcoin to increase by $2.148, holding all other independent variables constant. This illustrates that if the general popularity of Bitcoin rises, determined by the Google trends metric, then Bitcoin’s value will increase. In a given week where the term “Bitcoin” is googled relatively more than other weeks, the average price of Bitcoin this particular week will be higher.

The last independent variable that has shown significant results my regression analysis is T, the number of Bitcoin transactions. The p-value for T is 0.0191. This means the null hypothesis, that the number of Bitcoin transactions does not affect the value of Bitcoin, can be rejected at the 5% level of significance. Since the number of Bitcoin transactions has an effect on the value of Bitcoin, examining the estimated coefficient will explain how much of an impact this variable is causing. The coefficient for T is 4.791, which says: when the number of Bitcoin transactions increases by 1000, since transactions are measure in thousands of transactions, the value of Bitcoin will increase by $4.791, holding all other independent variables constant. This result shows that as people increasingly spend and transact with their Bitcoins, the value of Bitcoin increases, thereby making the Bitcoin economy more predictable and healthier; if people continue to transact with their Bitcoins the price level will rise. It follows to say that people’s demand to spend Bitcoins, measured by the number of transactions, has an increasing effect on the price of Bitcoin. Recall the BDD result that says in general, as people hold more Bitcoins and do not spend them, price goes down, contrary to the T result that illustrates, when people spend Bitcoins the price actually rises.

It is a common problem in many time series models for an autocorrelation issue to arise, and it did so in this model. In order to correct for this, it was necessary add an autoregressive term (AR) of the first order in the model, as the reader can see in the attached Eviews output file. The purpose of this is to control for the error terms that are lagged with time up to one period prior. The way to determine to what order the autoregressive term must be considered is through a Durbin-Watson test. If the test statistic calculated by Eviews is outside the range of 1.9-2.2, then an autoregressor term of order one is to be added to the equation. If by adding this term, the Durbin-Watson statistic falls within the range, then no autocorrelation exists, but if the number lies outside the range the autoregressor term is taken to the second order, and so on until it lies within the interval.

**Table 2: Regression Results**

| **Variable** | **Coefficient** | **P-value** |
|---|---|---|
| Bitcoin days destroyed (BDD)<br>*In millions* | - 4.640 | 0.0100* |
| Price of gold (PG)<br>*In thousands* | - 9.664 | 0.980 |
| Google trends metric (GT) | 2.148 | 0.0168** |
| US inflation rates | - 6.825 | 0.913 |
| Bitcoin transaction<br>*In thousands* | 4.791 | 0.0191** |
| Supply of Bitcoins<br>*In millions* | 544 | 0.1013 |
| $\underline{R^2} = 0.94$ | $\underline{DW} = 2.11$ | |

* = statistically significant at the 1% level
** = statistically significant at the 5% level

**6. Conclusions**

In the six independent variables that were incorporated into the model in determining whether the velocity of Bitcoins has an effect on the value of Bitcoin, Bitcoin days destroyed, number of transactions, and the Google trends metric proved to yield statistically and substantively significant results. Bitcoin

days destroyed was the most statistically (at the 1% level) and substantively significant with a p-value of 0.0100 and a coefficient of -4.640. In general this says, as people refrain from spending Bitcoins, the value of Bitcoin actually drops. More specifically it drops by a value of $4.64 when the number of Bitcoin days destroyed (measured in millions) increases by 1,000,000, one unit.

The number of transactions and Google trends variables both showed statistical significance at the 5% level. The number of Bitcoin transactions was both statistically and substantively significant with a p-value of 0.0191 and coefficient of 4.791. This illustrates the opposite effect that BDD had on the value of Bitcoin. As the number of transactions (measured in thousands) increases by one unit, the Bitcoin's value increases by $4.79. The Google trends metric controls for the overall popularity of Bitcoin by measuring the total number of Bitcoin Google searches relative to total Google searches there are in a given week. The variable has a p-value of 0.0168 and coefficient of 2.148. This is the weakest in terms of effect size for these three independent variables, nonetheless it shows that as the ratio of Bitcoin to total Google searches increases by one percent, the value of Bitcoin increases by $2.15. If people are searching the Internet they are at the very least, interested in learning more about Bitcoin. One thing to consider about this Google trend metric is that people may be searching the Web for Bitcoin information and depending on what they find, may be convinced to act in one of three ways: to buy Bitcoin, to sell/trade their Bitcoin, or do nothing with their Bitcoin, which will in turn have an effect on the price of Bitcoin.

When considering future research with this model there a few things to do that would increase the robustness of the model: expand the sample size to include 104 weeks, or more, instead of 52 weeks, explore the Bitcoin popularity index in more depth, control for regulation and investment effects, and lastly pursue a higher level of econometric analysis for a time series model. Having a larger sample size will increase the accuracy of the test, especially in a high-frequency time series model where there is a lot of data changing from week to week. Obtaining a media mentions index would be my goal in further researching this topic. The Google trends metric does a good job to control for the popularity in terms of who searches the Web, but a media mentions index would control for those who do not search Google

and how widespread information on Bitcoin reaches. There may be a "regional interest" measurement as well to observe demand comparison across nations, and pinpoint more accurately demand comes from. Regulation and investment are all taking place as I am writing this paper so there were no direct variables that measured investments and regulation taking place in Bitcoin. Controlling for these two variables will have great implications on people's demand for Bitcoin; regulation may hinder some businesses from transacting with it, investment may be inducing more businesses to participate in the Bitcoin economy.

In terms of policy implications, this model and future ones alike, will be important in determining and deciphering an identity and hopefully a future role for Bitcoin. It may never fulfill the additional roles to be considered a currency, to act as a store of value or unit of account. In fact, my results combined with the nature of Bitcoin illustrate that Bitcoin will not be able to become a store of value in the near future because of its free market nature, and the way buyers and sellers actions directly affect the price of Bitcoin. One major regulation that happened on Bitcoin and, outside the timing of my model, was the IRS declaring Bitcoin to be taxed as property, not as currency. A capital gains tax is an appropriate regulation on Bitcoin if people are going to treat Bitcoin as an investment to buy, observe the price rise, and then sell. In order to stimulate Bitcoin spending and facilitate the flow of Bitcoins in the economy, which my results suggest for a healthy expansionary Bitcoin economy, then people need to be incentivized to transact with their Bitcoins, and not just hold them in their wallets to "collect dust". At the moment it seems like the free market of Bitcoin is doing a good job because after looking at the effects of two of the major coefficients, for BDD and for T, other things equal, they are close to balancing each other out. This suggests that holding Bitcoins and spending them are both beneficial for the Bitcoin economy, as the users of Bitcoin are in full control and decide when to spend and when to store.

The economy for Bitcoin is a free market because people can constantly be trading, buying and selling Bitcoins with other users at virtually no cost, no intermediaries, and minimal regulations. The no cost aspect is essential. Bitcoin has great potential to be a global medium of exchange, it is safe to transact with because of its cryptographic structure and it need not be attached to any specific nation. It instead

would act as the world currency, accessed by all through the Internet. To get to this level, Bitcoin will have to experience significant levels of regulation I feel, some of which Bitcoin users may be opposed to, and most of which I do not know the answer to. The Bitcoin economy is in its early stages of development and it is constantly adapting, through its users' actions, to the dynamics of the free market. In 2014, and the years to come, the success of Bitcoin will rely upon Bitcoin's trial and error process. There will be things that work, and things that do not work, and it will be essential to adapt quickly to the flaws in the system, which is a realistic expectation because of Bitcoin's decentralized nature and open-source software.

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