CRYPTO-NOMICS: AN ECONOMIC EVALUATION OF BITCOIN

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INTRODUCTION

In the year 2008, a computer programmer or a clique of programmers under the name Santoshi Nakamoto invented a platform that facilitates digital transfers of representations of value (Santoshi Nakamoto, 2009). This system was called Bitcoin and it was the first ever cryptocurrency. A cryptocurrency is digital money in an electronic payment system in which payments are validated by a decentralized network of system users and cryptographic protocols instead of a centralized intermediary (such as a bank).

Cryptocurrency's acceptance is increasing day by day and there is hardly anyone who has not heard of it these days. People are so intrigued and fascinated by the charisma of cryptocurrency that they are going crazy for it. Day on day, cryptocurrency is attracting new investors from around the world. The only hindrance is in the fact that there is the lack of clear understanding of the complexities of the blockchain and crypto market and how these currencies interact with physical commodities in real time. It creates a little bit of confusionin some minds. Research is crafted in such a way that cryptoeconomics not only clears doubtsbut also gives an improved understanding of concepts. With the rapid digitalization of the globe and rapid changes in the technology, Moore's Law is predicted to dash to the groundby 2020. Everything is becoming progressively more digital. Efforts are being made to make this digitalization more secure and swift.

The cryptocurrency has seen a shocking trend from a mere value of $0 in 2011 to a value of $19,479 in 2023 providing a CAGR of roughly 169.8% on its investment. But besides the technical definition a lot of people are still perplexed as to what it means when I invest in cryptocurrency and how the value addition process goes on.

After the popularity and the rise of its worth in a very few years, it is inevitable to study the Crypto economics. Everyone seems to be hungry for block chain knowledge. It is rightly said that blockchain has revolutionized the era of technology. Cryptocurrencies, other than cryptocurrency, have seen this popularity which is worth an appraisal as well. So the question arises what is the economics behind cryptocurrency? How do some people make profits while some make losses?

Medium of Exchange

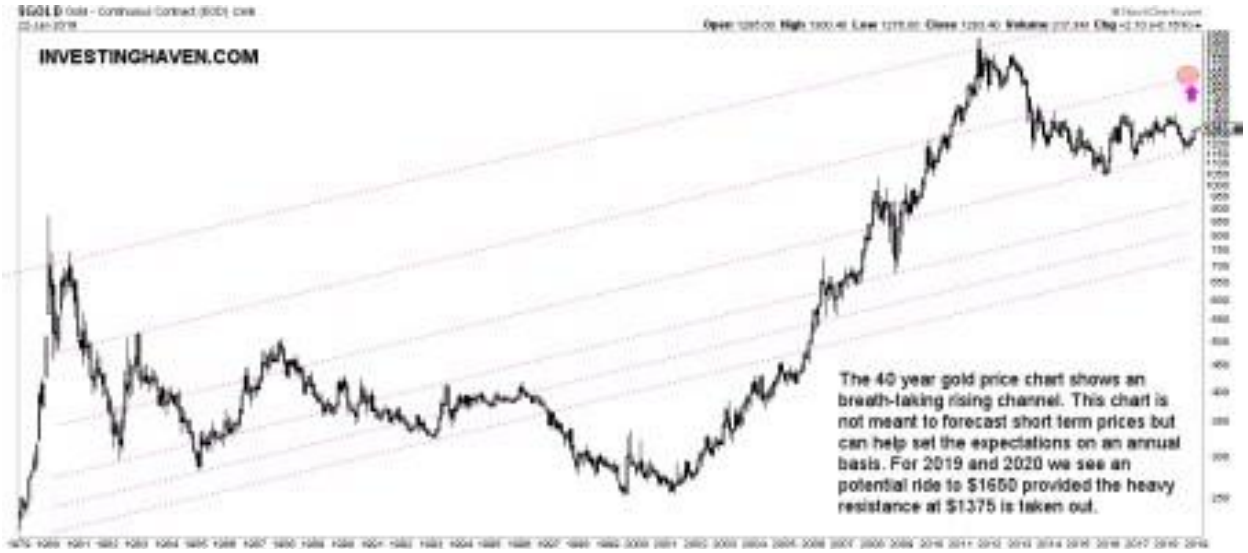
The use of cryptocurrency has expanded over the years. On 15th November, 2012, WordPress began accepting bitcoins for website upgrades. In December 2014, Microsoft began accepting bitcoin payments games and videos on X Box game consoles, apps, Microsoft softwares and other services. El Salvador on 7th September 2021 adopted Bitcoin as legal tender. Specifically mentioned in the Indian circuit, in 2014 itself, a pizza shop called Kolonial in Mumbai became the first restaurant to accept Bitcoin for food. India has the highest number of cryptocurrency holders in the world at 10.07 crore, according to broker discovery and comparison platform Broker Chooser. With 2.74 crore crypto-owners US came at the second position followed by Russia (1.74 crore) and Nigeria (1.30 crore) (News 18, 2021). Bitcoin prevents currency censorship by the virtue of its decentralization and blockchain protection technology has found its market in almost all the countries of the world, however consumption based on bitcoin is found more in the politically unstable regimes and therefore we can conclude the fact that the acceptance of bitcoin as a currency still seems a far cry.

A Store of Value in the Future

Major supporters of cryptocurrencies back its value as a store of value, just like precious metals which have been conclusive proofs of store of over a time period of about 2,000 years. Some major characteristics shared by cryptocurrencies and bitcoins involve limited supply with the former being restricted to 21 million coins and latter at 53,000 tonnes.

As of January 2022, there are approximately 18.9 million bitcoins issued and about 2.1 million bitcoins are yet to be released.

Each is a safe way of storing money out of traditional banking systems and models, they both have purely speculative investments, although some experts may argue the utility of gold in traditional industries such as jewelry, but both of them derive their value out from economic reasons of store of value and a future expectation of price rise. Empirically, we observe that both have a long term increase in price, however gold is a relatively safer investment since it has proved itself over the span of more than 70 years. The prices of gold have been increasing in the long run from $422 in April, 2015 to $1974.90 in April, 2022, proving it a store of value in the global economy.



A similar trend can be seen in the price of bitcoin which has increased from $5 in January 2012 to $46,154 in April 2022. Therefore, bitcoin has to prove itself further in order to establish itself as a store of value in the future as strongly as gold and thus it remains to be observed over the years.

Cryptocurrency: A Zero Sum Game

Many economists hold a different opinion of bitcoin as a currency. Šurda (2014) has an opinion that with a proper blockchain network and with the development of trust between economic participants, bitcoin has safely ensured smooth and efficient running of the system although it itself doesn't have an intrinsic value.

Yermack (2013) has a similar opinion about cryptocurrency arguing that it is identified as a commodity and has a speculative investment opportunity.

In our research, we identify that cryptocurrency is based on the concept of zero sum game or a negative sum game. A zero sum game is defined as a game where the sum of net gains and losses is 0. Therefore, if two people invest in cryptocurrency, a new investor must be added.

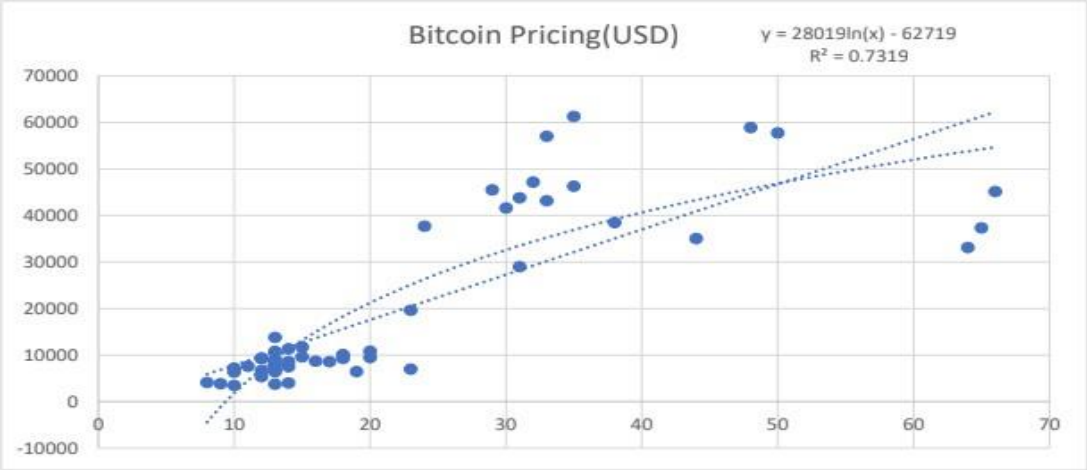
Crypto currency has no intrinsic value and is not supported by countries as legal tender (except in El Salvador). The gains from cryptocurrency for one person correspond to losses for other market participants. With increasing transaction costs on various cryptocurrency trading platforms and other expenses associated with its purchase, it makes it a negative sum game.

Factors that determine the price of Cryptocurrency

Modern day crypto currencies are subject to a lot of volatility based on numerous factors involved. With a brief literature review from several categories we can divide these factors into 3 data categories, namely macro-economic and financial indicators, attractiveness and demand and supply.

Attractiveness drivers

Bitcoin emerged as a popular currency in the modern day with the era of internet, social media and network engines. Since bitcoin has a complex structure, there is a difficulty in understanding the working of bitcoin. Naturally a lot of search engines and the peculiar aspect works upon the relationship between number of searches and the demand of these coins (Polanski, 2015) has strongly argued that popularity is a very strong factor that indicates the Bitcoin price returns. The authors further stated that a 1% increase in the number of articles mentioning the term bitcoin generated an approximate return of 31 to 36 basis points on its price. For the analysis, we assume that bitcoin pricing is in USD as the dependent variable and Google trends (i.e., a database capturing how frequently a given search term is entered into Google's search engine relative to the site's total search volume over a given period of time) as the independent variable.



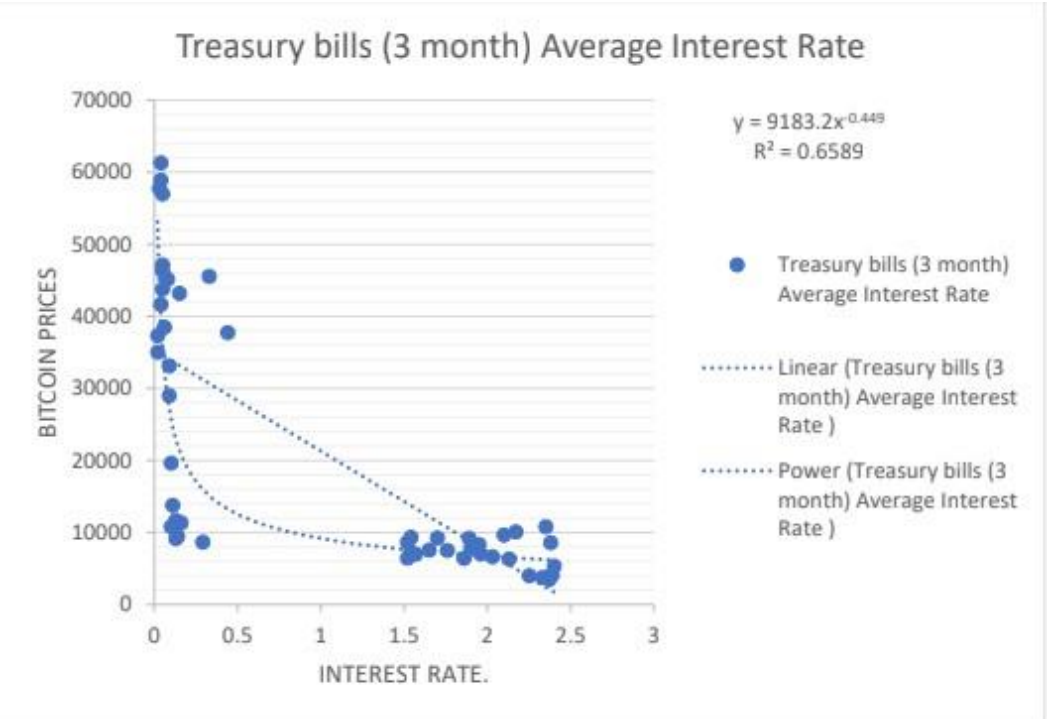
Regression Statistics	
Multiple R	0.85553
R Square	0.731931
Adjusted R Square	0.726346
Standard Error	9627.179
Observations	50

The above graph establishes a linear-log relationship between Google trends data and bitcoin prices over the 48 months between March 2018 and 2022. The R-square value comes out to be 73% which simply means that 73% of variation in Bitcoin pricing is explained by the log of google trends. This can be translated (since Google trends measures in index from 1 to 100) an increase of 1 point in log of Google trends index will increase the price of bitcoin by $28,019. In simple words, the popularity of bitcoin measured in the amount of Google searches, tweets and its popularity plays a major role in determining its price.

Macroeconomics Indicators

a) A negative relationship with interest rates on the treasury bills.

In our studies, we have also observed that there exists an inverse relationship between bitcoin prices and the average interest rate of US treasury bills. The R-squared value indicates that approximately 66% of the variation in bitcoin prices is explained by the US treasury bill (3 month) interest rate. This is standardized with our theory that when relatively safer asset classes offer a higher return just as the US treasury bill, it naturally reduces the price of cryptocurrencies, thus making it a lucrative option for the investors. However it may be noted that the interest rate on treasury bills is not the sole reason for drifting of prices of bitcoin but one of the factors along with Government bonds and other financial instruments.

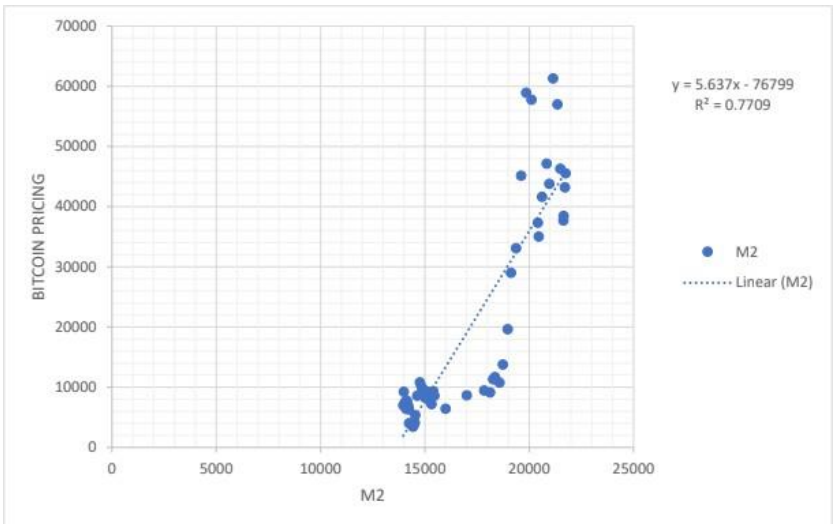


b) A positive relationship of bitcoin prices with the Money supply (M2):

A lot of economists argue that an increase in the price of cryptocurrency is relative to the increase in money supply by the central bank. When there is an increase in the money supply in the economy there is a reduction in the nominal interest rates which reduces yields from the securities and traditional investment options, therefore, people look for other lucrative opportunities to invest in, such as cryptocurrencies, NFTs, real estate, etc.

M2 consists of M1 plus (1) savings deposits (including money market deposit accounts); (2) small-denomination time deposits (time deposits in amounts of less than $100,000) less individual retirement account (IRA) and Keogh balances at depository institutions; and (3) balances in retail money market funds (MMFs) less IRA and Keogh balances at MMFs.

We take M2 as the independent variable and bitcoin prices (USD) as the dependent variable. The above graph establishes a linear relationship between money supply (M2) data and bitcoin prices over the 48 months from March 2018 to 2022. We estimate a linear regression with an R square value of roughly 77 % which indicates that roughly 77 % of the variation in Bitcoin prices is explained by the M2 component of the money supply in the US, proving our argument to be correct in this scenario.



Regression Statistics	
Multiple R	0.878008
R Square	0.770899
Adjusted R Square	0.766126
Standard Error	8899.981
Observations	50

Conclusion

In our observations, we continue to see bitcoin to be an emerging asset pertaining to its increased acceptance in the last decade and from its journey to a value of $0 since its launch to a price point of $16,529.40 USD to this day. Also from our observations we very positively saw that bitcoin can be treated as a store of value in the future similar to gold and other precious metals, however, bitcoin will have to prove itself in the coming 20 years to compete with gold which has a reputation and goodwill as a store of value 60 years after the war and has stayed strong despite having faced crises. However, we still have a skeptical view of cryptocurrencies being adopted as legal tender based on the fact that it has essentiallyno economic value and is a zero sum game ultimately running losses for a breadwinner and encouraging professional gambling.

However we have established some useful relationships, we observed there being a positive relationship between bitcoin pricing and Google trends, indicating a positive relationship between popularity and its increased price. Macroeconomic trends such as having a direct relationship with the money supply indicates decreasing interest rate making bitcoin investing a lucrative opportunity symbolizing the trust and reliability of bitcoin at the present juncture, also there exists an inverse relationship between bitcoin prices and the average interest rate of US treasury bills (3 month) indicating a reliable trust from the investors in the situation of a crisis in the traditional economy.

Therefore, we can safely conclude that although bitcoin may have a bright future based on the current base and market it has, it will need to find new and significant mediums of exchange in order to grow and flourish.

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