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VOLATILITY OF CRYPTO-CURRENCIES: A COMPARATIVE STUDY OF SELECT CRYPTO-CURRENCIES

D. Rajagopal
Assistant Professor (PT), Department of Commerce
University College for Women, Osmania University
Koti, Hyderabad, Telangana State, India

Abstract

A cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange that uses cryptography to secure its transactions, to control the creation of additional units, and to verify the transfer of assets. With the ever-increasing use of virtual currency and its volatility, cryptocurrencies are being adopted across world for various transactions- legal as well as illegal. The returns earned from crypto currency investments in recent times were huge but there has always been a question on their existence and credibility. A cryptocurrency is a digital or virtual currency that uses cryptography for security. Despite recent issues in crypto currencies, Bitcoin's success and its growing visibility since its launch has resulted in a number of companies unveiling alternative cryptocurrencies The study tries to compare five crypto currencies - Bitcoin, Ethereum, Tether, USD Coin, Binance (BNB) with respect to their volatility and stability in recent times and also tries to understand their trends in recent times.

Key words: Crypto–currency, Bitcoin, Ethereum, Tether, USD Coin, Binance, Volatility.

Introduction

A cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange that uses cryptography to secure its transactions, to control the creation of additional units, and to verify the transfer of assets. A cryptocurrency is difficult to counterfeit because of this security feature. A defining feature of a cryptocurrency, and arguably its most endearing allure, is its organic nature; it is not issued by any central authority, rendering it theoretically immune to government interference or manipulation. Cryptocurrencies are a type of digital currencies, alternative currencies and virtual currencies. Cryptocurrencies use decentralized control as opposed to centralized electronic money and central banking systems. The decentralized control of each cryptocurrency works through a blockchain, which is a public transaction database, functioning as a distributed ledger. The anonymous nature of cryptocurrency transactions makes them well-suited for a host of nefarious activities, such as money laundering and tax evasion.

The first crypto currency to capture the public imagination was Bitcoin, which was launched in 2009 by an individual or group known under the pseudonym Satoshi Nakamoto. As of September 2015, there were over 14.6 million bitcoins in circulation with a total market value of $3.4 billion. Bitcoin's success has spawned a number of competing cryptocurrencies, such as Litecoin, Namecoin and PPCoin.

Types of top 5 Crypto-Currencies

Bitcoin

Bitcoin is a cryptocurrency and worldwide payment system. It is the first decentralized digital currency, as the system works without a central bank or single administrator. The network is peer-to-peer and transactions take place between users directly, without an intermediary. These transactions are verified by network nodes through the use of cryptography and recorded in a public distributed ledger called a blockchain. Bitcoin was invented by an unknown person or group of people under the name Satoshi Nakamoto and released as open-source software in 2009. Bitcoins are created as a reward for a process known as mining. They can be exchanged for other currencies, products, and services. In 2012 and 2016, Bitcoin underwent "halving," where the yearly bitcoin inflation was algorithmically reduced by 50 percent. This is part of bitcoin's deflationary monetary policy. In these two years, the bitcoin price increased significantly the year leading up to the halving. Research produced by the University of Cambridge estimates that in 2017, there were 2.9 to 5.8 million unique users using a cryptocurrency wallet, most of them using bitcoin.

Ethereum

Ethereum is open access to digital money and data-friendly services for everyone – no matter your background or location. It's a community-built technology behind the cryptocurrency ether (ETH) and thousands of applications you can use today. Etherem is a decentralized, open-source block chain with smart contract functionality. Ether (ETH or Ξ) is the native crytocurrency of the platform. Among cryptocurrencies, Ether is second only to Bitcoin in market capitalization.

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Ethereum is also termed as Ether as this cryptocurrency is generated on Ethereum platform. It is public platform with open source, block chain-based computing. It has a smart scripting facility. It works on the modified version of Nakamoto's cryptocurrency with transaction-based payment system. Ethereum was first introduced in 2013 by Vitalik Buterin, who was a computer programmer and researcher in cryptocurrency. Software Development related to Ethereum was funded by an online crowdsale between July and August 2014 and developing a system that went live on 30 July 2015. It initially had 11.9 million coins "premined" for the crowdsale. This circulation was almost 13% of the total circulating currency. The price of the Ethereum currency grew over 13,000% from 2014 to 2017.

Tether

Tether (often called by its symbol USDT) is a stablecoin cryptocurrency that is hosted on the Ethereum and Bitcoin blockchains, among others. Its tokens are issued by the Hong Kong Company Tether Limited, which in turn is controlled by the owners of Bitfinex. Tether is called a stablecoin because it was originally designed to always be worth US$1.00, maintaining $1.00 in reserves for each tether issued.

While, according to its 2021 settlement with the New York Attorney General Letitia James, "Tether represents to users that any holder of tethers can redeem them from Tether the company at the rate of one tether for one U.S. dollar", Tether Limited as of 2017 stated that owners of tethers have no contractual right, other legal claims, or guarantee that tethers will or can be redeemed or exchanged for dollars. On 30 April 2019, Tether Limited's lawyer claimed that each tether was backed by $0.74 in cash and cash equivalents. In May 2021, Tether published a report showing that only 2.9% of Tether was backed by cash, with over 49.6% backed by commercial papers.

USD Coin (USDC)

An open source, smart contract-based stablecoin. A mode of value exchange that is price stable is necessary for true financial interoperability. Stability in crypto is provided through Centre's technology for fiat-backed stablecoins. The first implementation is called USD Coin (USDC), which can be used with Ethereum ERC-20, Algorand ASA, Avalanche ERC-20, Flow FT, Hedera SDK, Solana SPL, Stellar asset, and TRON TRC-20. It opens up possibilities for payments, lending, investing, trading, and trade finance, and the ecosystem will expand as more fiat currency tokens are added.

A digital stablecoin linked to the US dollar is called USD Coin (USDC). A group called Centre, which was established by Circle and consists of representatives from the cryptocurrency exchange Coinbase and the Bitcoin mining business Bitmain, an investment in Circle, manages USD Coin.

USDC is issued by a private entity and should not be confused with a central bank digital currency (CBDC). Circle claims that each USDC is backed by a dollar held in reserve, or by other "approved investments", though these are not detailed. The wording on the Circle website changed from the previous "backed by US dollars" to "backed by fully reserved assets" by June 2021. The tokenization of the US Dollar into USD Coin happens in a three-step process: A user sends US dollars to the coin issuer's bank account. The issuer uses a USD Coin smart contract to create the equivalent amount of USD Coin. The newly minted USD Coins are sent to the user and the substituted US dollars are held in a reserve. The redemption of USD Coins for US Dollars follows the process listed above but in reverse.

Binance BNB

In terms of daily trading volume of cryptocurrencies, Binance is the largest cryptocurrency exchange in the world. It was established in 2017 and has Cayman Islands registration. Changpeng Zhao, a developer who had previously produced high frequency trading software, launched Binance. Initially established in China, Binance later relocated its headquarters there as a result of the country's escalating regulation of cryptocurrencies.

The United States Department of Justice and Internal Revenue Service both opened investigations into Binance in 2021 over claims that it had engaged in money laundering and tax evasion. In June 2021, Binance must cease all regulated operations in the UK, according to a directive from the Financial Conduct Authority of the UK. In 2021, Binance shared client data, including names and addresses, with the Russian government.

BNB is the cryptocurrency coin that powers the BNB Chain ecosystem. As one of the world's most popular utility tokens, not only can you trade BNB like any other cryptocurrency, you can also use BNB in a wide range of applications and use cases. Use BNB to pay for goods and services, settle transaction fees on Binance Smart Chain, and participate in exclusive token sales and more.

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Table No 1: Crypto-Currencies according to Market Capitalization.

S.No	Crypto - Currencies	Market Cap
1	Bitcoin	$410,080,498,500
2	Ethereum	$151,910,579,513
3	Tether	$67,102,703,432
4	USD Coin	$56,041,604,016
5	BNB	$39,267,649,613

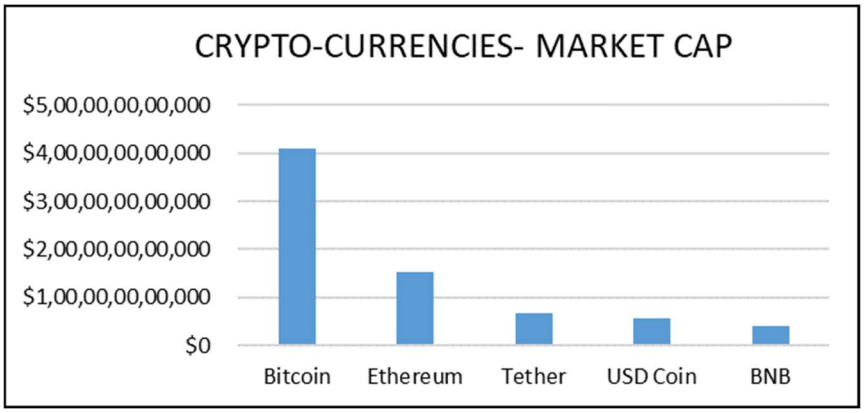

Fig 1: Cryptocurrency market capitalizations as of 26 June 2022, in billions of US dollars.

Literature Review

- (Nakamoto) in his paper describes a bitcoin to be introduced as a peer to peer electronic cash system. It allows electronic cash to be sent to other party without using any financial intermediatery.
- (Raymaekers, 2014) in his research article states Bitcoin to be a cryptocurrency which was introduced in 2009 to be first decentralized digital currency. Bitcoin allows online payments to be made by sending money via banks, buying goods and services online to be done from one party to the other without going through a financial institution (Raymaekers, 2014). There are many advantages of using bitcoin currency such as the speed of transaction, security of transaction, cost and convenience (Raymaekers, 2014). The technology that supports bitcoin is blockchain technology. Over US$1.2 billion has already been invested in blockchain start-ups (Shin, 2016). Blockchain technology increases the efficiency and transparency of governance, financial and security settlements, and financial clearing processes. Hence, blockchain is of great interest to businesses legitimately involved in the bitcoin eco space (Robb, 2017).
- With its origins in distributed databases, the blockchain's data is partitioned into blocks, continuously adding new sequential blocks of data (Swan, 2015). The blocks are linked together using cryptographic signatures which results in transactions being time-stamped, and tamper-proof. A recent study estimates that within five years blockchain could allow for $16bn of cost savings by simplifying accounting and audit processes.
- Bitcoin only very recently became a subject of research in economics. The topic has been of interest for longer in computer science. A small number of theoretical papers written by computer scientists addresses incentives.
- (Eyal, 2013) show that mining is not incentive-compatible and that the so-called "selfish mining" can lead to higher revenue for miners who collude against others. The threshold for selfish mining to be profitable is lower than for double-spending attacks.
- (Babaioff, 2012) argue that the current Bitcoin protocols do not provide an incentive for nodes to broadcast transactions. This is problematic, since the system is based on the assumption that there is such an incentive. Additional work in the computer science field includes (Christin, 2013), who examines the anonymous online marketplace in cryptocurrencies. Some work on Bitcoin has been reported in legal journals as well, but there is very little in the economics literature. One of the few exceptions is the European Central Bank's (2012) report on virtual currencies. Using two examples, Bitcoin and Linden dollars, the report focuses on the impact of digital currencies on the use of fiat money.
- (Gans, 2013) analyze the economics of private digital currencies, but they explicitly focus on currencies issued by platforms such as Facebook or Amazon (that retain full control), and not decentralized currencies such as Bitcoin. (Dwyer) provides institutional details about digital currency developments.

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- (Moore, 2013) empirically examine Bitcoin's exchange risk. Using Bitcoin traffic at Wikipedia, (Glaser) examine whether user interest in cryptocurrencies is due to interest in a new investment asset or in the currencies themselves. Their results suggest that most of the interest is due to the asset aspect.

Objectives

1. To study the overall performance of Top 5 crypto-currencies.
2. To analyze the volatility of different crypto currencies for future investments.

Research Methodology

The closing prices for Top 5 crypto-currencies were compared for April 2021 to March 2022 as this was the time when the volatility of crypto-currencies was very high. The secondary data collected from the Coindesk website for the analysis. It was seen from the chart that there is a highest volatility of Bitcoin and the prices for the Bitcoins show a declining trend but at the same time Ethereum comparatively showing increasing trend as they are newly introduced coins into the market.

Table No 2: Crypto –Currencies according to Price, Supply and Market Capitalization.

S.No	Crypto - Currencies	Price	Available Supply	Market Cap
1	Bitcoin	$21,495.44	19.1 Million / 21 Million	$410,080,498,500
2	Ethereum	$1,252.58	121 Million / ∞	$151,910,579,513
3	Tether	$1.00	66.9 Billion / 66.9 Billion	$67,102,703,432
4	USD Coin	$1.00	55.9 Billion / 55.9 Billion	$56,041,604,016
5	BNB	$240.51	163 Million / 163 Million	$39,267,649,613

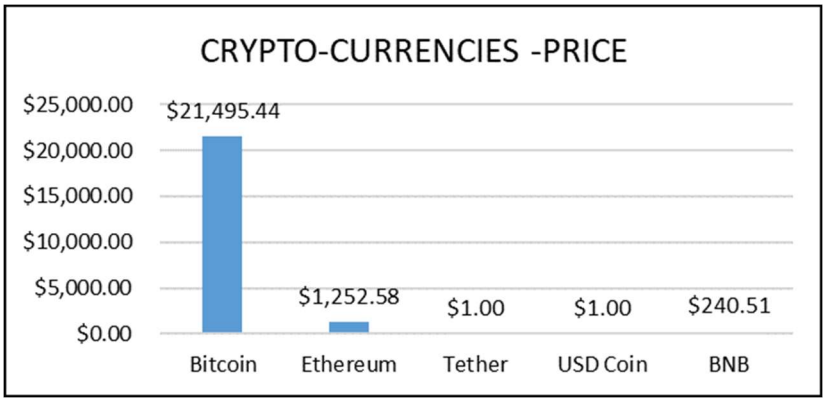

Fig 2: Crypto-currency prices as of 26 June 2022, in billions of US dollars.

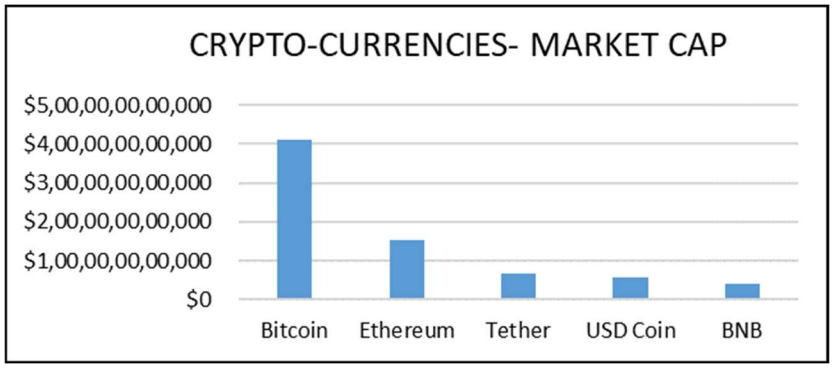

Fig 3: Crypto currency market capitalizations as of 26 June 2022, in billions of US dollars.

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Figure 4: Crypto – currency Price Comparison

Figure 5: Crypto – currency Market Capitalization Comparison

Conclusion

With the advent of block chain and crypto currencies being as new and revolutionary as it is, predicting the five-year projected value of Bit coin, Ethereum and Lite coin requires numerous factors to be considered. Through a combination of qualitative research conducted through interviews with industry professionals, linear regression, and a Monte Carlo analysis, it can be concluded that Bitcoin can leverage its existing user base and proven use case is likely to experience more growth in the five-year time horizon. Ethereum, while having a lower expected value has a much greater variance as a result of its strong correlation with speculation, news, and hype. Ethereum's wide range of outcomes, both positive and negative, indicates that it should be included in the investment portfolio to take advantage of this fact.

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