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The Surge of Cryptocurrency in the Asia Pacific Economic Countries

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Abstract - Crypto currencies are computerized web based traded coupons. They are part of a block-chain technology system, which has procured admiration globally. It utilizes cryptographic scrips and sophisticated marks to assess exchanges. It preserves a strategic detachment from dual outlay of the analogous coins. This notion gave the world an intuition of operations without the intervention of a regulatory body, thus bringing down the transaction cost to its minimum. There is a dare need to better understand and utilize crypto currencies to its fullest potential. The prime purpose of this paper is to explore the financial and non-financial factors that corollaries the prices of these digital currencies in the Asia Pacific Economic Countries (APEC). This paper has explored the crypto currency attractive efficacy and the macroeconomic viability with its price. The significant relationship between the various components have disclosed the prominence of the cryptocurrency in the economic growth of the countries. The study is of significant help in identifying the components that can help in stabilizing the extreme volatility associated with cryptocurrencies. This paper is of prime importance for the legislators in identifying the law-giving areas, for the improved secured future economy.

Keywords: Cryptocurrency, Financial Technology, Macroeconomic Indicators, & Attractiveness

I. Introduction to Crypto Ecosystem

In 2008 Satoshi Nakomoto gave the idea of an entirely new entity, digital currencies (A peer to peer electronic cash system. Cryptocurrencies are computerized tokens that can be traded web based instruments, utilizing cryptographic hashing and advanced marks. It is used to check exchanges and preserve a strategic distance from twofold spending of the same type of coin. This notion bestowed the world an insight into the other forms of exchange medium. It can maneuver without the intervention of a third party or a regulatory body, thus bringing the transaction cost to its minimum. Cryptocurrencies are part of a financial technology (Fin-Tech) system which has gained global acceptance. Cryptocurrencies are considerably vogue now-a-days. Investors around the globe are exceptionally fascinated by this new financial ecosystem. Initially, the Bitcoin was in circulation, but by now, different other types of digital currencies are present on different coin exchanges. These digital securities have become part of the investment world, same as the stocks and bonds. It is thus the need of the day, to better understand this new phenomenon and fully utilize its usage. This study will help emphasis at various factors affecting the prices of these digital currencies. It will also help in identifying the components which leads to extreme volatility in the market. This volatility acts as a barrier to make cryptocurrencies globally conventional (Pavel and Miroslav, 2016). The other significance associated with this paper is in understanding the components that leads to financial viability of cryptocurrencies in the developing economies of APEC (Asian Pacific Economic Corporation) countries.

1.1.Characteristics of Cryptocurrency

A cryptographic money is a computerized or virtual cash that utilize cryptography for security. A cryptographic money is genuine to fake due to this security highlights. A characterizing highlight of a digital currency and its presumability leads to its most charming appeal of being natural nature. Its non-issuance by a focal expert, render it hypothetically resistant to government impedance or control. It is planned preliminary, from the earliest stage, to exploit the web and its operations. Cryptographic money exchanges are checked by the client's PCs, signed into the cash's system, rather than depending on customary money related organizations that confirm and assure your exchanges. Since the cash is secured and encoded, it winds up difficult to expand the cash supply over a predefined algorithmic rate. One cryptographic money enters the general population vocabulary as the go-to computerized resource i.e. Bitcoin. Its frequently is viewed as father of digital forms of money and various other cryptographic forms of money are alluded as altcoins. Since 2009, the fund world has been viewing the crackerjack ascent of Bitcoin with a mix of interest

and doubt. Attributes of Bitcoin brand it in a general sense not quite the same as a fiat money, which is indorsed confidently and credited administratively by a country's national bank. Elsewise, the estimation of a Bitcoin is entirely subject to the financial specialists' payment at a specific point in time. It employs disseminated block-chain organize, exchanges data, where all individuals are equivalent and no focal server is there to instructs everyone. (Nakamoto.2009) This decentralization is kept up on Satoshi Nakamoto (2008) thought of joining "verification of work" (Vow) with other cryptographic procedures. Consequently, Vow preserves the guard instruments for crypto currencies against hacking. Not with-standing, Pow (proof of work) mineworkers put into cutting edge PC machines that all day, every day works (devouring vitality) with the objective of approving exchanges (comprehending hashes) and making new squares. When it finds "delightful" it pronounces that the square is settled and each digger gets compensate (bitcoins) corresponding to their work spent on tackling the hash. Consequently, digital currency mining under Pow convention is duteous, costly, and sporadically rewarding. On the other hand, numerous altcoins began to utilize "confirmation of-stake" (CoS) convention which is more financially savvy (less expensive) and eco-accommodating (greener) contrasting with Pow that requires a heaps of
PC vitality utilization to tackle numerical algorithmic hashes. If there should arise an incidence of CoS, miners don't need costly PC machines, the maker of another square is picked deterministically, conditional upon its riches, additionally categorized as stake.
The digital currency platform has grasped an exceptional level of attentiveness from financial specialists in 2016. Bitcoin, the world's biggest advanced cash, has risen in excess of 1,500 percent since the beginning of 2017. The market is fundamentally more intricate than the general population dictionary may recommend. Keeping in mind that there have been a lot of studies looking at the eventual fate of Bitcoin and its instability (Polasik et al. 2015; Letra, 2016; Bouoiyour and Selmi, 2016; Katsiampa, 2017; Chiu and Koeppl, 2017; Chu et al. 2017), there have been not many that investigate the more extensive digital money market and its advancing.

1.2. Crypto Currencies Industry Sectors

The crypto ecosystem is based on the following four pillars mentioned by Dr. Garrick Hileman and Michel Rauchs, 2017. In other words, there are four sectors in which virtual currencies operate.

1.2.1. Crypto Exchanges

Coin indices or exchanges, assume a fundamental part in the digital money economy by offering a commercial center for exchanging, liquidity, and value revelation. The first use case of cryptocurrency were exchanges and the highest number of employees work in this sector of the crypto industry. Crypto Exchanges give administrations to purchase and offer cryptographic forms of money, advanced resources for national monetary forms and other digital forms of money. These are digital currency exchange or coin exchanges. Those enables clients to trade i.e. purchase or offer, digital currencies for different types of cash or resources, as other mediums (Hileman & Rauchs, 2017).

1.2.2. Wallets

Cryptographic money wallet is a protected computerized wallet used to store, send, and get advanced cash like Bitcoin. Most coins have an official wallet or a couple of authoritatively prescribed outsider wallets. Keeping in mind the end goal to utilize any digital currency, one could utilize a cryptographic money wallet. Cryptographic money itself isn't really "put away" in it. Rather, a private key (secure computerized code known just to you and your wallet) is put away that shows responsibility for open key (an open advanced code associated with a specific measure of money). So your wallet stores your private and open keys, enables you to send and get coins, and furthermore goes about as an individual record of exchanges. (Hileman & Rauchs, 2017).

1.2.3. Transactions in crypto market.

All digital currency frameworks have a coordinated payment system to process exchanges, designated in the local token. The guarantee of these frameworks is that clients can freely execute on these systems. (Hileman & Rauchs, 2017). Organization`s payment for the most part go about as passages between clients of blockchain exchange frameworks and the extensive economy, crossing over national monetary standards and digital forms of money. To summarize, this sector includes all transactions being done in crypto coins. Markets will list the trade rates for every digital currency they augment. These trade rates will fluctuate from market to showcase as they mirror the rates utilized in the exchanges led through a specific market.

1.2.4. Cryptocurrency Mining and the Block Chain

Block Chain technology is the foundation of nearly all cryptocurrencies. A block-chain is a digitized, decentralized, open record of all cryptographic money exchanges. It is a technical process which involves

finding the right codes to locate valid transactions of cryptocurrencies and adding them as a block to the previously existing blocks, hence forming a chain of all proceedings. This aids to maintain the record of all the transactions completed in cryptocurrencies without the presence of any regulating body. Moreover, the record's legitimacy can't be distorted. Its validity can be checked by the whole network utilizing the block-chain rather than a solitary unified specialist. Anybody with access to the web and appropriate equipment can take an interest in mining. The miners are then rewarded for their contribution. The mining part has created in a short time allotment from a side intrigue development performed on personal computer into a specialist and capital-genuine industry with its own specific regard chain. (Hileman & Rauchs, 2017).

1.3 Types of Crypto Currencies (CC)

1.3.1.Bitcoin

Bitcoin is the most popular type of cryptocurrency that has touched its peak profits over the last few years. It is the first application of the block-chain technology. (Hileman and Rauchs, 2017). Bitcoin, the world's most established cryptographic money, has been expanding in fame. It has the same essential structure as it did when made in 2008, yet recurrent evidences of the mutable global market have spawned interest for cryptographic forms of money more prominent since its inception. (Peter D Vries, 2016). With no third party involved, crypto users can exchange value. The principle objective of cash administration is to boost the capital development by applying an ideal use factor without danger of destroy. The invention of bitcoin Kelly's idea of wealth management becomes inevitable and reachable. (Kelly, 2014). Among the variables which may have added to bitcoin price ascent, were the European sovereign-obligation emergency, especially in the 2012– 2013 i.e. Cypriot monetary emergency. It enhanced the money's legitimate standing and rising media and internet interest. Until 2013, all market with bitcoins were in United States dollars. As the market valuation of the aggregate load of bitcoins moved toward US$1 billion during 2013-2015, a few analysts called bitcoin, a bubble.

1.3.2.Ethereum

Bitcoin's fame and open-source arrange has prompted numerous comparative participants into the market. The general cryptographic money showcase has had additionally a comparable ordeal, with the option of new coins and formation of whole exchanging system. This led to the formulation of a new coin i.e., Etherium. It uses the same block-chain technology as Bitcoin but with a slight disparity. Ethereum's block-chain enables pieces to be mined amazingly rapidly with a square time of 14 seconds, contrasted with Bitcoin's piece time of 10 minutes, which guarantees more prominent value-based speed. (Ghosh, Haiders and Kim, 2016). Ethereum is one of the most up to date advancements to join this development. While bitcoin expects to upset PayPal and web based managing an account. Ethereum has the objective of utilizing a block-chain to replace web outsiders — those that store information, exchange home loans and monitor complex money related instruments. Ethereum gives a decentralized turing-finish virtual machine, the Ethereum Virtual Machine (EVM), can execute contents, utilizing a universal system of open hubs. "Gas", an interior exchange estimating instrument, is utilized to alleviate spam and allot assets on the network. The estimation of the Ethereum cash developed more than 13,000 percent in 2017. (Vitalik Buterin,2013)

1.3.3.Litecoin

Litecoin is a distributed or peer to peer internet money that empowers moment, close to zero cost installments to anybody on the planet. Litecoin is an open source, worldwide installment organize that is completely decentralized with no focal experts. Arithmetic locks the system and empowers people to control their own particular funds. Litecoin embraces speedier exchange assertion time and improved stockpiling proficiency than the main math-based cash. With generous industry provision, exchange volume and liquidity, Litecoin is a demonstrated medium of trade essential to Bitcoin. Litecoin network offers faster transaction confirmation. This coin also uses block chain technology in which encrypted algorithms are calculated to identify a valid transaction and then a chain of blocks are being made. Litecoin is available on almost all exchanges available. There are a lot of traders using them. (Wang and Vergne, 2017).

1.3.4.Ripple(XRP)

Ripple is created in 2004 by Ryan Fugger, a web engineer in Vancouver, British Columbia. It was intended for enterprise use, to dispose of bitcoin's dependence on concentrated trades. Swell interfaces banks, installment suppliers, computerized resource trades and corporates by means of Ripple Net to give one frictionless experience to send cash all in Utilizing XRP. Banks can source liquidity on request continuously without having pre-subsidize accounts. Installment providers utilize XRP to grow venture into new markets It bring down remote trade costs and give quicker installment settlement. XRP also uses same blockchain technology. (Armknecht, Karame, Youssef and zenner, 2015).

1.4. Crypto Currencies (CC) Versus Standard Currency

The three main functions of the money are medium of exchange, unit of account and store of value. In order to investigate whether CC can replicate standard currency, there is a need to look at its characteristics. According to Folkinshteyn et al. (2015) Bitcoin, the most popular kind of CC can act as a perfect medium of exchange owing to its low transaction cost and rapid transaction time. Since CC is virtual with no physical existence, it does not require production cost like the standard fiat currency. (EPRS, 2014, EBA, 2014).The other plus points in favor of it are the privacy and anonymity, infinite divisibility and no pressure of inflation.

There are also some characteristics that go against its usage as a medium of exchange, are summarized here. Moore, Christine and Plassaras, (2013) believed that security is a main threat to use CC as medium of exchange as there is no oversight institution in control. Furthermore, cyberattacks cannot be ignored because of its obscurity. Velde, (2013) suggests that CCs need proper expertise and technical equipment to be adopted, hence adding the cost. Whereas, the standard currency can operate without such an adoption cost. Finally, Yermack, (2014) contradicts the idea of virtual currency system as this virtual system is not easily understood and globally accepted. The most important of all is its extreme price volatility which impedes its use as a conventional currency.

Computerized cash manages clients finishes its insignificance by saying that each time you swipe your credit or platinum card; your own data is affixed. Organizations, banks and governments can utilize this information to track your exercises. Cryptographic money exchanges replicates the same. Consistent access to customary records can be embellished or solidified. However, advanced cash exists outside the directions and laws that enable this to occur, its extremely uncommon to be not able access your coins. This security likewise diminishes the odds of fraud. Conventional banks charge expenses to process exchanges. With advanced money being traded over the web, there are generally no exchange expenses and access is for everybody. There are around 2.2 billion individuals with access to the internet or cell phones who don't approach a customary trade. For these individuals, the digital money is great. Bitcoin, Ethereum, and Blockchain have moved toward becoming piece of the innovation publicity cycle in 2017. Bitcoin keeps on setting untouched highs for quite a while, while Ethereum guarantees to utilize Blockchain to disturb every monetary instrument and business forms. The digitalization of cash through cryptographic forms of money embolden another universe of ephemeral modest exchanges between people and machines.

II. METHODOLOGY:

2.1. Problem Statement

The main problem associated with the digital currencies is their immense fickleness. The elements that determine their prices are still ambiguous. Although this problem is not only associated with crypto prices in US Dollars, Yen and British Pounds but also with other currencies. This study will examine the effect of relevant factors on crypto prices in the country. Crypto currencies have been widely and exceptionally used by other developing and developed economies. In the twilight, significant saving money foundations and innovation organizations, for example, Intel, Barclays and Walmart have put their cash into the guarantee of cryptographic forms of money like Bitcoin and Ethereum. This has prompted nations with incapacitating monetary standards to embrace computerized money to replace devalued customary notes. A portion of these early adopter nations incorporate Brazil, Colombia, Turkey and Venezuela. Wealthy nations are likewise investigating digital money as lawful delicate. Governments of different countries are putting efforts in bringing together the resources, to look for a set of crypto system operation regulations and illegal usage.

2.2. Research Objectives

This study aims to highlight the following research objectives:

1. To identify the factors that affects the immense fickleness of the prices of different virtual currencies.
2. To explore the efficacy of attractiveness on virtual currency in place of standard currency or an alternative to payments.
3. To investigate the effect of macroeconomic developments on crypto currencies.

2.3. Significance of the study

Financial crisis of 2008, political manipulation and continuous devaluation of standard money prompted nations to switch to a digital financial system which can operate without the involvement of a regulating

body. This study will smooth the way for law makers to realize the importance of the globally emerging phenomenon of crypto currencies. This will help the policy makers to regulate and conduct laws accordingly. The prosperity of a country is the ultimate goal of the state, and it resides in the financial growth of its economy. Analysis of the causal effect between the macro financial developments of a country and virtual currencies will help determine the significance of this new digital form of money on a country's economic growth. The study is unique in capturing this effect by the incorporation of the quantity theory of money in its model.

The immense price flicks of crypto currencies act like a speculative investment. Investors can benefit from this research in deciding which crypto coin is the best for them to plough money into.

The research is unique as it is one of the stepping stone for future researches in this area.

III. THEORETICAL FRAMEWORK

Henry Thorton in 1802 surmised that more money supply in an economy leads to an increased inflation. This occurrence is known as the Quantity Theory of Money (QTM). It states that the total amount of money in circulation or the total money supply in an economy is directly proportional to the general price level of goods and services. When money supply increases the general price level also increases to compensate for a decrease in marginal value for money. Hence giving rise to inflation. QTM can be expressed as in an equation form which is as follows

$$\mathbf{MV=PT}$$

Where,

M = Amount of money

V = Velocity of its circulation

P = Price level

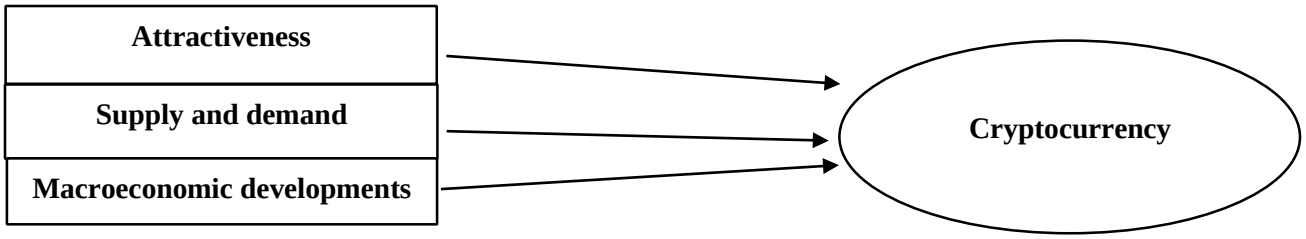
T = Volume of transactions

Wesley C. Mitchell clarifies that money supply alone doesn't decide the measure of expansion and prosperity in the economy. At the point when joined with its velocity, a relationship can be resolved. The money supply and velocity being comparable to the price level and volume of its transactions, decides the model relationship. This model assumes that the velocity and volume remain constant. Omer Farooq, Qazi Hassan and Muhammad Shahid (2015) concluded that there is a direct relationship between both sides of this equation in the long run.

There is a strong ongoing debate on whether cryptocurrencies can replicate standard currencies. Virtual monetary forms are proliferating across the globe. In a few sections of the world they are an indication of disagreement against financial arrangement and expert. Somewhere else, they are simply fascinating better approaches for payment, speculation and mix of genuine methods virtual life into real living (Beate Sauer, 2016). All this happened in objection to financial crisis in 2008, fall back of the corrupt political systems and intervention of strict regulatory authorities into the money market. Cryptocurrency fulfills these needs by not driven by any standard third party laws and legislations and far away from the reach of monetary crisis. But the question arises as if virtual currencies perform the same functions as standard money does i.e. medium of exchange, unit of account and store of value (Pavel & Miroslav, 2016). Pavel and Miroslav also suggested that the extreme price volatility of bitcoin acts as a hindrance to perform the above stated functions of money. These extreme variations in prices is due to the global hype created by investors and subsequently exaggerating the demand and supply function of it.

Cryptocurrencies can substitute standard forms of money if they follow their exact path and behave in the same fashion. For digital forms of money to replicate standard currency they should also follow the Quantity theory of money. This implies that increasing the circulating supply of crypto coins, causes a flick in its value. Other factors that affect the crypto prices are supply function, attractiveness and global macroeconomic and financial developments. (Pavel & Miroslav, 2016). In light of the above stated relationship the study has made a theoretical framework between crypto prices and the factors that affect them. The three determinants of Crypto currency price as mentioned in above diagram are suggested by previous studies which are (Buchholz et al. 2012, Kristoufek, 2013, Van Wijk, 2013, Bouoiyour & Selmi, 2015). It can be well understood by the Figure 1 below.

Figure. 1. Theoretical Framework of Crypto currency



IV. RESEARCH METHODOLOGY

This is a causal research study; mostly quantitative analysis of secondary data is done. Daily crypto price data from the year 2015 to 2018 has been taken from (coingecko, 2018), (btcpk, 2018), (coinmarket, 2018). This study has analyzed the method of regression analysis. There are over 600 crypto currencies available in the market today. However, the selection of crypto currencies is done on the bases of data availability. i.e. Etherium. The study has evaluated the effect of price of crypto currencies with respect to crypto supply and demand, attractiveness and macroeconomic indicators. Supply and demand are gauged by market capitalization and trading volume respectively, Attractiveness is measured through percentage change in value respectively. Macro variable included in this study is Exchange rate.

4.1 Econometric Model

On the basis of QTM and determinants of crypto price we make our model as follows

$$P_t=\beta_0+\beta_1 Qd_t+\beta_2 Qs_t+\beta_3 A_t+\beta_4 EXe_t+\varepsilon_t$$

Pc_t = Price of crypto currency
Qd_t = Crypto demand
Qs_t = Crypto supply
A_t = Attractiveness
EX_t = Country exchange rate (USD)
ε_t = error term t = time subscript

The prices of crypto currencies are denominated in the APEC market. The study will be studying the effect of different economic factors on their prices in the APEC economies. Price data of crypto currencies, market capitalization which is, Ethereum, has been taken from (coingecko, 2018). Demand for crypto coins will be gauged through market capitalization data following (Pavel Ciaian, 2016). The data has also been taken from (coingecko, 2018) and (coinmarket, 2018). According to the quantity theory of money, money supply is positively related with price, the value of crypto coins should also increase with the increasing market cap of the relative coin market. We are using size of the crypto economy as a measure to gauge the demand variable. This infers that the coefficient of supply, that is β_2 should have a positive sign with it, thus showing its direct relationship. In other words, when trading volume of the virtual coins' increases, their prices should diminish. Attractiveness is measured through the percentage change in crypto value.

V. ANALYSIS AND CONCLUSION

The regression results of the Asia-Pacific Emerging Countries(APEC) is given in the following table.

Table 1. Regression Analysis

Variables	Coefficient of China	Coefficient of Maxico	Coefficient of Malaysia	Coefficient of Thailand	Coefficient of Phlipines	Coefficient of Russia	Coefficient of Indonesia
Quantity demand	1.03E-08***	1.03E-08***	1.03E-08***	1.03E-08***	1.03E-08***	1.02E-08***	1.03E-08***
Quantity supply	9.14E-12	2.60E-11	5.55E-12	3.49E-11**	3.43E-12	5.62E-12	4.09E-12
Attractiveness	14.36***	37.03***	8.63***	70.77***	102.4712***	132.3149***	27882.83***
Exchange rate	0.84***	0.097	4.46	1.03***	5.167685	-1.906717	7.099***
constant	-5.74***	-2.23	-0.11	-36.64***	-1.344267	-1.747182	-366.62***
R-squared	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adjusted rsquared	0.99	0.99	0.99	0.99	0.99	0.99	0.99
F-statistic	994152.6***	1090884***	1029009***	1036045***	1098774***	994615.8***	1098742***
Durbin-Watson Stats	1.97	1.98	1.94	1.96	1.95	1.98	1.94

Supply has a comparatively larger affect as compared to its demand. Moreover, the positive coefficient of the supply variable indicates the direct relationship of different countries' currencies with crypto price. This relationship holds true for the Quantity theory of money which depicts that, increasing supply will accelerate the prices. So our hypothesis is in line with QTM. Bitcoin prices are driven mainly by its circulating supply. According to the law of demand prices. Cryptocurrencies prices and volume are positively related to each other. As per QTM it is verified by the results of Thailand. Percentage change in value is a measure of attractiveness. Highly significant measure which means the prices of cryptocurrency are effected largely by the attractiveness associated with this new financial phenomenon. As proved by (Selmi, 2015) The exchange rate has an inverse relation with the price of cryptocurrency. Currency worth declines with an escalation in exchange rate and thus pushes the price of the cryptocurrency upwards. The Durbin Watson values at different regression results shows minimal autocorrelation. The coefficient of determination depicts the shows the optimal fit of the model.

In this analysis Money supply, Attractiveness and Exchange rate are significant to the great extent, thus once again affirming the Quantity theory of money.

VI. Conclusion and Future Recommendations

The APEC analysis depicted that Crypto coin's price movement is mainly and significantly driven by their circulating supply. Pavel Ciaian(2016) in his study proved that Bitcoin price is driven mainly by supply and

demand. This study affirms the previous study findings of Pavel (2016). Attractiveness has a also the largest effect on the prices of Cryptocurrency, as approved by (Pavel Ciaian, 2016). Some crypto coins' attributes give its inclination to be embraced at any rate in some portion of currency advertise if not in a more extensive setting. Specifically, crypto coins' may have a high advantage as for standard monetary standards in nations with developing economies, and may give an option in contrast to standard monetary standards in nations with poor and not generally accessible budgetary administrations, nonconvertible money, costly budgetary administrations and high managerial weight in opening an account.
Moreover, crypto coins may be declared to a practical settlement framework in developing economies, where customary exchanges are exceptionally costly and managing an account framework is immature and unbound. Given that crypto coin's exchanges can be finished with moderately insignificant expense and asset prerequisites and are autonomous of geological area or keeping money framework set up, they are in a perfect world situated to fill in as a proficient universal settlement system.

The Block Chain opens up a few different conceivable outcomes, mechanical advancements, including micropayments, crowdfunding, conveyed trades, brilliant property, property vault, ticketing and secure voting frameworks. For instance, Block Chain innovation could give an approach to track the history of individual gadgets. It is done by chronologically recording the traded information among it and different gadgets, web administrations, and human clients. Also, Block Chain could empower keen gadgets to wind up free specialists and self-governing bodies, directing an assortment of exchanges. Further, the problematic advancement of Crypto coins gives the possibility to give subjects coordinate command over their monetary exercises by evacuating exorbitant and cloud intermediation layers, encouraging budgetary incorporation.
This study tried to find the effect of cryptocurrency on the economic well-being of a country. More research is needed to inculcate its importance with the firm's profitability and cost-effectiveness. An in-depth sectoral analysis is required to expounded the potential of crypto coins.

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