

AN INVESTIGATION ON THE CRYPTO CURRENCIES AND ITS FUTURE

Selim ŞANLISOY

Dokuz Eylul University, Faculty of Economics and Administrative Sciences

<https://orcid.org/0000-0002-0629-0905>

selim.sanlisoy@deu.edu.tr

Tuğberk ÇİLOĞLU

İzmir Katip Celebi University, Faculty of Economics and Administrative Sciences

<https://orcid.org/0000-0002-7387-3692>

tugberk.ciloglu@ikc.edu.tr

ABSTRACT

Crypto Currencies (CC) have recently become one of the most debated topics in the public opinion. One of the most fundamental reasons for this is that the fluctuations in transaction volumes and prices of CCs that emerged in 2009 have increased visibly in recent years. CCs have many direct and indirect effects on the global monetary system and the world economy. At this point, as well as the factors that lead to the emergence of CCs, the change and transformation process that CCs create in the world economy is also very important. One of the factors that will determine the degree of future expansion of CCs will be the functions of money. The degree of which CCs can fulfill the functions of the classical currencies will have a direct impact on the process of CC dissemination. CCs cannot fulfill the appraisal function at this time. The most basic reason for this is the excessive fluctuations in prices of CCs. This volatility prevents economic units from valuing any goods and services using CC and leads to preclude the spread of CCs. However, since this fluctuation will persist over time, CCs will begin to fulfill the function of appraisal and the spread will accelerate. The power of governments to direct economic and monetary policy will change and transform with the spread of CCs. The effect of this change and the extent to which the states will allow this change remain unclear. Besides, how CCs will affect the global reserve money system is also very important. It remains unclear whether the CCs will be used as reserve currency in the future and how the major central banks will react to it. CCs are also closely related to the seigniorage income. As the CCs become widespread, the seigniorage income which the major central banks obtained from the banknotes will also be jeopardized. The question of how states and central banks will react to this should also be discussed. Measures that are taken against crypto-currencies by the central banks, whose

seigniorage incomes decrease, will be determinant of the global reserve money system. The purpose of this study is to foresee the future of the global reserve money system with the emergence of CCs and how the seigniorage incomes of central banks will be affected from this process.

Key Words: *Crypto Currency, Global Financial System, Monetary Policy,*
JEL Classification: E42, E51, E58

INTRODUCTION

Crypto currencies have been one of the most debated issues both in the economy and the public in recent years. Even though the crypto currencies that emerged in 2009 have a recent history, they have begun to draw attention rapidly with their increasing transaction volume and usage areas. Crypto currencies, which are not managed from a single center and can be produced with specific mathematical solutions, are completely differentiated from today's classic money supply methods. This situation brings with it important problems related to the externality of money supply. In addition, the effectiveness of monetary policies which are implemented by central banks may also be jeopardized with the widespread use of crypto currencies. Besides, the issue of how the national and global monetary authorities will react to the presence of future crypto currencies maintains its importance. On the other hand, crypto currencies have various effects on the world economy. These effects can be listed as commercial, financial, economic and political, and tax effects. For this purpose, the historical process revealing crypto currencies was analyzed in the first part of the study. While in the second part of the study, the interaction between crypto currencies and the functions of money were analyzed. The possible regulatory policies also were analyzed in this part. The reactions of central banks and states against to the existence of crypto currencies and the effects of crypto currencies on the world economy were analyzed in the third part of the study.

1. HISTORICAL BACKGROUND OF THE CRYPTO CURRENCIES

While analyzing the historical background of crypto currencies, we have to analyze the development process of classical currencies as well. Coins have dominated for a long time in the history of the world, and paper money gradually has begun to gain importance from the 17th century onwards. The banking system has developed in this process as well. The central banking system was established in parallel with the development of the banking system in this period. The main reason for this is the willingness of the states for controlling the paper money which has increasingly taken part at the center of the economic system.

Along the period, the indexing of the paper money to the gold which is found in the reserves of the central banks continued until the First World War. But after the war, the gold standard was abandoned by many countries. Paper money has become deposit money along with the development of banking system in particular and disengaged from its representative status. The US dollar was indexed to gold in 1944 together with the Bretton Woods system and the currencies of the participating countries were indexed to the US dollar. Thus the US dollar became the global reserve money. The indexing of the US dollar to the gold ended together with quitting of this system by the US in 1971. Hence, the golden money system came to an end.

As a result of technological progress and increasing global trade, the digitalization process of money has also begun. This process started with the development of EFT (Electronic Fund Transfer) system in USA. The use of ATM machines and credit cards followed to this. Money transfer has increasingly become digital, especially with the effect of the advancement in internet technology after 2000. As a result of these, the transition to crypto currencies started (Dilek, 2018: 9).

It can be said that the 2008 Crisis had an impact on the process of transition to crypto currencies. Having confidence in central banks and financial institutions has declined considerably together with the 2008 Crisis. The distrust against to the US dollar and Euro which are the global reserve currencies has also begun. Along with the experiencing of global crisis, the crypto currency Bitcoin was firstly mentioned in the article "Bitcoin: A Peer-to-Peer Electronic Cash System" written by Satoshi Nakamoto.

In the relevant article, Bitcoin, the first crypto currency, is defined as an electronic payment system based on the encryption and in which the two sides are directly associated to each other. This study, describing Bitcoin, criticizes the intermediary services provided by banks, and emphasizes that there is no need for banks to realize the trade by considering the rising trend of electronic commerce. At the same time, a new insight about how the trust problem can be solved through technology after the global crisis, is tried to be given in the article. In this context, the trust which is the most important feature of the crypto currencies and which based on computer algorithms and mathematical rules reveals instead of the trust against authorities which have the power to issue money.

Blockchain technology, which appeared with Bitcoin in 2009, is seen as an important revolution. Blockchain is a constantly growing distributed database where records are linked to each other by cryptographic elements. The popularity of Blockchain technology has significantly increased with Bitcoin. Bitcoin, whose

value has increased rapidly in terms of both trading volume and market value since its emergence, has become phenomenon in recent years. Bitcoin is generally described as a digital value that is derived from the idea of a utopian crypto anarchist community and that is independent from states and has decentralized and encrypted network. The biggest feature that makes Bitcoin different is that it changes hands directly between the buyer and seller without need for an authority in the digital field.

It is seen as a transfer and investment tool since the digital transaction costs defined as crypto currency unit are very low and the transactions can be realized very quickly. The reason of be in need of this type of digital / virtual coins is having desire of people for being more free and for transferring their money in a cheap, comfortable and safe way. Another important factor is that they seek to compensate their lack of confidence against the banking sector with virtual currencies (Dilek, 2018: 13).

The information about major crypto currencies is given in following table.

Table 1: Most Powerful Crypto Currencies (2018)

Crypto Currencies	Symbols	Total Market Value (USD)	Current Value (USD)	Average Trading Volume (Daily, USD)	Percentage in Crypto Currencies
Bitcoin	BTC	133925007	7947.6	11792800	35.36
Ethereum	ETH	78235387	802.71	5315660	20.66
Ripple	XRP	30129548	0.772	1907880	7.96
Bitcoin Cash	BCH	16426880	968.91	596955	4.34
Cardano	ADA	9780183	0.377	1246710	2.58
Litecoin	LTC	8166372	148.19	922754	2.16
Neo	NEO	7401810	113.87	724572	1.95
Stellar	XLM	6884729	0.373	418426	1.82
Eos	EOS	5515333	8.44	1184200	1.46
Nem	XEM	5400338	0.60	74682	1.43

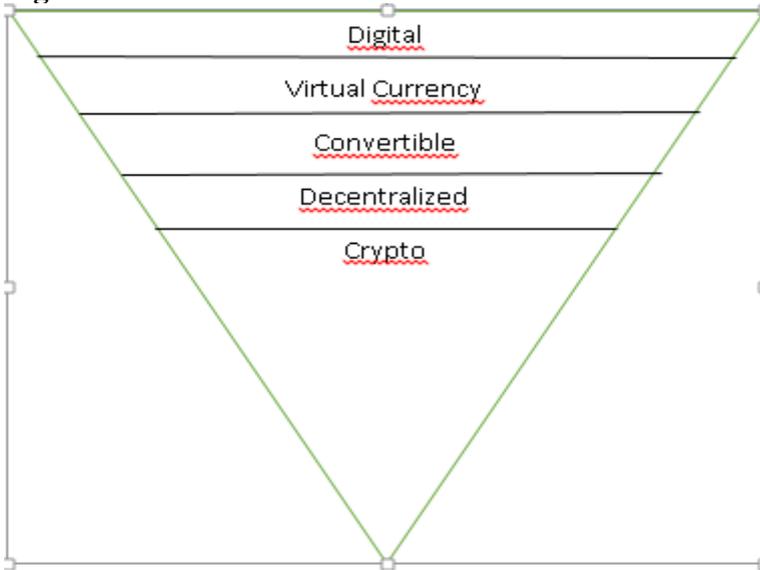
Source: Dilek 2018: 13

At this point, we can classify crypto currencies.

There can be a matter of many different classifications related to crypto currencies. The classification issued by the International Monetary Fund (IMF) in 2016 is as follows. According to the classification herein, the assets that represent a digital value are named the digital currency. E-currency and Paypal are given as examples which are not defined as credit money in terms of digital currency units.

Those which are not defined as credit money are named Virtual Currency (VC). There are varieties of VCs that can be converted according to their link with external world and that cannot be converted like online game money. The convertible currencies are divided into two as centralized and decentralized. Decentralized ones which use cipher science as a validation system are named crypto currencies (Üzer, 2017: 15, 16). The classification is as follows:

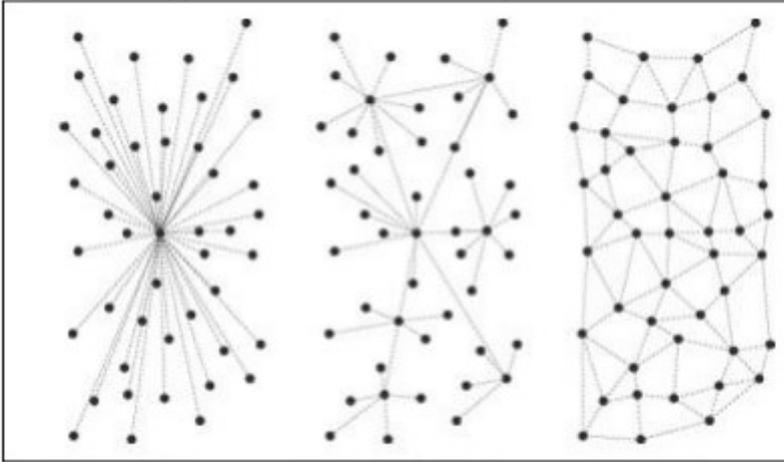
Figure 1: Classification



Source: Üzer 2017, 16

As shown in the figure below, the present VCs are in different forms from the centralized ones to the completely decentralized ones.

Figure 2: Crypto Currencies According to Centers



Source: Üzer 2017: 17.

Third one is the figure which is most similar to the shape of today's crypto money structure.. Decentralized VCs constitute a large part of the ecosystem. Therefore, it is inevitable that such VCs are classified among themselves. The three basic and technical aspects which play role in classifying decentralized VCs in their own are as follows (ECB, 2015):

- Approval mechanism: The first examples of decentralized VCs such as Bitcoin, Litecoin and Dogecoin have adopted the proof-of-work system. The proof-of-work is a series of data that is both time consuming and costly to produce but easy to be verified by other participants of the system. As the proof-of-work process involves approval of transactions by reaching an algorithmic solution through random trials, this process causes both too much error and high energy expenditure. As an alternative to this, Peercoin developed the method of proof of ownership. 7 In this system, the approval of the transactions takes place according to the share of the user in the system.

- Algorithm: Algorithm is the set of rules that determine mathematical processes such as calculating the speed at which data outputs are generated, and the way in which new currencies are exported. There are basically two algorithms. The SHA-2568 algorithm is used in VCs such as Bitcoin, Peercoin, Namecoin and Mastercoin. In words of one syllable, special equipment is required to realize the mining activities that can be called as VC production, and users should be competent in mining. Litecoin, Dogecoin and Auroracoin use the Scrypt algorithm, which can be defined as the extension of SHA-256, but require more

physical memory. Script allows users doing mining to realize activities with average computers.

- Supply: The supply of the currency is constant in many VC samples such as Bitcoin, Litecoin, Namecoin. For example, currently around 16 million Bitcoin is in circulation (Chart 1.1). According to the Bitcoin protocol, the final total will be 21 million and it is expected to be reached to this number in 2040. There is no supply limitation in some VC samples. For example, Peercoin supply is designed to provide 1% annual inflation and have unlimited supply. (Üzer, 2017: 19).

2. THE FUTURE OF CRYPTO CURRENCIES

The digital values that allow cryptographic / ciphered safe transaction and additional virtual money supply is called crypto currency. Crypto currencies are in decentralized type unlike centralized electronic money and banking systems. Control of this decentralized structure is performed by the Block-Chain transaction databases. Crypto currencies are alternative currencies, they are digital and they are also virtual money (Çarkacıoğlu, 2016: 8). Frequently, digital and virtual money are mixed with Bitcoin and its derivatives. Digital and virtual currencies other than Bitcoin and its derivatives are not the currency by themselves. They are based on the national currency of the country that they represent and can be regulated and controlled by the central authorities of that country. Bitcoin is a spontaneous currency and cannot be regulated and controlled by any central authority (Rotman, 2014: 1-2).

There are two important dimensions in discussing the future of crypto currencies, which are the main purpose of the study. The first is whether the crypto currency will fulfill the functions of money and the second is the attitude of the central banks against the crypto currency in terms of the effectiveness of the monetary policies. Therefore, these issues are discussed in this part of the study.

2.1 CRYPTO CURRENCIES AND FUNCTIONS OF MONEY

In order that any asset is considered as "money", it must be able to perform some functions. The first of these functions is that it has to be a unit of account or a common value tool. All economic activities are carried out on a common norm. This norm is money or rather unit of currency. That the money is a good norm of value depends on remaining its value as stable as possible. Otherwise, it shakes confidence in money by affecting the general value norm of money negatively. And over time, money becomes not to perform this function.

The value of crypto currencies occurs at the point where demand and supply are balanced, as in all other goods, products and money. Bitcoin's value is associated with its geographic suitability, prevalence, acceptability, investor's confidence, its ability to be the instrument of payment in real life and the current sensitivity of the market (McDonnell, 2015).

The weakness of the legal infrastructure of the crypto currency, the excessive fluctuations in its value, the value of losses or gains being experienced due to speculative attacks, seem to be a problem. The main point which is sought by economic units in the money that is used as payment instrument and unit of account is stability. Therefore, crypto currencies have difficulty today at the point of demand in terms of users. However, as Bitcoin users increase and Bitcoin use prevails, the price volatility is expected to decline. The investors who think that Bitcoin's price is cheaper can plan to buy it, and keep it for long-term, and sell when it reaches to the target price.

Being a tool of change and payment is another function of money. When economic units purchase any goods or services, they pay money to the seller in exchange for the goods or services, and the transfer of money to the seller in exchange for the goods bought points out function of money as medium of exchange. International trade, financial movements and technological developments have also brought some innovations for providing that money can fulfill this function. Together with the establishment of the EFT system in US as the first time in the world and the transfer of money in the electronic environment, the digitalization process of the money has started. The bank card or credit card applications following the EFT transactions also changed the people's money usage habits and the use of electronic money gradually gained momentum. Together with the widespread use of electronic money, the problem of information security, the increased costs of transfers and the increasing profit ambition of financial institutions, especially banks, caused the realizing of the money transfers at high costs. This situation has increased the need for safe and fast money transfers with low costs and crypto currencies were emerged. Satoshi Nakamoto who sees the gap and the need in the system, introduced a payment system based on bitcoin in his article "Bitcoin: A Peer-to-Peer Electronic Cash System" in which he criticizes the high cost of money transfer transactions offered by banks and reveals that there is no in need for banks. From this point of view, it can be stated that the need for payment function of money is the factor in the emergence of crypto currency.

The most important feature that makes money valuable is the confidence of people in money. One of the important elements behind this confidence is the state authority behind it. The states have established trust by means of regulations in the financial field together with the transition to the electronic money. Blockchain technology in crypto currency is the element that provides trust in this money phenomenon where there is no state authority. It is continuously stated that the blockchain technology, which forms the infrastructure of crypto currencies, has high security. On the other hand, the stock market and account books serving to crypto currencies are one of the important aspects of the security problem. In addition, since crypto currencies are not managed by any head office or institution, when there is a loss of the account password or when crypto currency is mistakenly transfer into someone's account there is no return of these transactions and there is no institution to apply legally. Additionally, since it is not regulated and audited by any authority, for instance, when an account in the Bitcoin stock exchange is stolen, the issue of what are the legal obligations of the stock exchange is still one of the controversial issues, and any legal legislation has not been developed.

The fact that the withdrawal and transfer transactions are carried out independently of the country's financial system increases the demand for crypto currencies. Particularly, it is preferred in transferring money abroad in the case of leaving a country for reasons such as a war or financial crisis.

In order that money can perform this function properly, its amount must be sufficient to make the exchange of goods and services in the economy without interruption. We can say that there will be some disruptions in performing this function due to the amount of bitcoin to be produced is limited. However, considering the increases in the amount and diversity of crypto currency, it can be stated that such a problem will not occur.

Speed is increasingly gaining importance in the information economy and it is becoming one of the most important areas of competition. Big fish can no longer swallow small fish; instead, fast fish can swallow slow fish (Jennings and Haughton, 2001: 22). One of the most important issues in money transfer is speed. Transfer of international funds by traditional methods takes 3-4 days. The speed is very high in crypto currencies and the speed difference between different crypto currencies is one of the main components of the competition. The Central Bank of Saudi Arabia has agreed with Ripple to make payments faster and safer. While Ripple states that it can done cross-border money transfer in 4 seconds, this transaction time for Ethereum is over 2 minutes. Another important difference of

Ripple is the presence of a head office and therefore presence of an addressee. This example also gives a clue as to the future of crypto currencies. That Ripple is more preferable in time due to this feature perhaps will pull other crypto currencies in this environment.

One of the most important criticism, related to the payment or transfer function of crypto currencies is about their use in illegal activities (World Bank, 2016: 98). Since the crypto currencies are open to money laundering, the restrictions in their use imposed by the states or the being asked that the accounts are named with real identities may decrease the demand for these currencies and reduce their values significantly. Many states and G20 have explanations on this issue.

When the status of the crypto currencies as a payment instrument is evaluated related to the function of money, at least, it can be stated that it cannot fulfill this function sufficiently for it has not been stabilized yet. In addition, the policies which are implemented by states as a strategy against money laundering and the use of illegal activities will reduce the demand for these currencies.

Another function of money is the saving. Undoubtedly, there are many assets outside the money that have the feature of saving, but the money has an important feature: The likelihood of losing value is close to zero. In fact, a security or real estate can also be used as a savings tool, but they may experience serious depreciation if they need to be quickly turned into cash. In other words, their liquidity degrees are low. As to money, as it is already cash it can be turned into cash without scarcely losing in its value. This feature makes money the most basic and important saving tool. That the money is able to be a good saving tool depends on its ability to maintain its value. The money whose value often changes and especially which lose its purchasing power begins to lose function as a good saving tool. Therefore, it is possible to state that crypto currencies may have difficulty in fulfilling this function due to fluctuations in the present value. The fluctuation experienced in the crypto currencies can be seen in figure 3.

Figure 3: Fluctuations of Bitcoin

Published on Investing.com, 1/Apr/2019 - 7:37:25 GMT, Powered by TradingView.

BTC/USD, Bitfinex:BTC/USD, M



Source: <https://tr.investing.com/charts/cryptocurrency-charts>

Another point to be considered at this point is whether crypto currencies will be classified as a currency unit or as an investment tool such as asset or commodity. Considering its first emergence, bitcoin can be expressed as a means of payment. In fact, the Nakamoto does not mention anywhere in his article that bitcoin is an investment tool. He only mentions that it is a means of payment facilitating payment transactions at very low costs, and he explains its technological infrastructure (Erdoğan, 2017). In spite of these explanations, it is seen that a value of crypto currency has been created in the market, even though an international consensus has not yet been achieved and legal regulations have not been sufficiently realized. In the current status, some countries regard crypto currency as goods legally and others regard as financial asset (Dilek, 2018: 28). Moreover, in some studies in which bitcoin is seen as a speculative investment tool or a

means of exchange or a wealth accumulation tool by some individuals who do not know anything about its function, it is concluded that bitcoin is seen as investment tool (Glaservd. 2014; Kristoufek, 2015; Back and Elbeck, 2015; Baur et al., 2017; Dorfman, 2017). Crypto currencies in the crypto money market unless identification problems and uncertainty are eliminated will continue to be dependent on the speculative movements, and it will be discussed in terms of clarity and security and in terms of financial stability continuity (Ceylan et al. 2018: 273).

In case crypto currencies are considered as an investment tool, it will be appropriate to identify the factors affecting their demand. The two main factors affecting the demand of an investment instrument are risk and return. Investors decide to invest by considering these two variables. Crypto currencies do not yield returns when considered in this respect. Bitcoin owners have control of all their wealth. Their wealth is not entrusted to any bank or financial system. Those who wish to earn interest yield from Bitcoin can transfer their Bitcoins to another Bitcoin address and may earn interest yield. However, this is a highly risky situation, and the sent Bitcoins are unlikely to be taken back except voluntary basis. For example; <https://www.bsave.io/> yields an annual interest of 2.51% for Bitcoin. Bsave is operated by Coinbase, one of the world's largest and trusted Bitcoin exchange and account operators. The purpose of interest yield is to provide its own liquidity. Similarly, companies such as Bter, HaoBTC, BitBays, Bitcoincryptobank also provides different interest rates and investment options (Dean, 2015). However, if we pay attention the risk is very high in this area and it is not rational to carry out such an operation in order to yield interest income.

In this case it is possible to say that the purchase of crypto currencies for investment purposes can be preferred to provide capital return with a speculative purpose. Hence, there will be a return based on price increases. This makes crypto currencies, especially bitcoin, be speculative and unstable. On the other hand, another challenge for person who invest in crypto currency will be the determining the exit price for the investment. In case of investing in a country's financial instruments as traditional investment instruments, the economic and political risk of the country in question affects the value of the financial instruments and a price expectation is created with respect to this risk environment. That the crypto currencies are not associated with any central authority or intermediary institution eliminates this risk. However, that it is not dependent on any central authority can make it dependent on all countries where transaction volumes are high? Because the arrangements that different countries will make related to crypto currencies at different times will have important

effects on their values. One of the important issues discussed will be on the taxation of their returns if they are accepted as a goods or financial instrument. The differences that will arise between the implementations of countries regarding the taxation of the earnings depending on the both price change of the crypto currencies, and regarding earnings depending on mining will cause the activities related to this field to be different between countries. For example, the National Tax Administration of Japan imposes a tax rate of 15% to 55% on earnings in the crypto currency.

Another example related to differences in implementations of countries regarding crypto currencies is perspectives of Muslim societies or states on such a financial instrument. Although Saudi Arabia made an agreement with Ripple, the agreement is related to the payment system. Considering as an investment instrument, it is observed that fatwa institutions in Turkey, Egypt and Palestine do not accept crypto currency impermissible (Kaya, 2018: 15-17). On the other hand, Turkey Ministry of Religious Affairs, by pointing that money either should be valued by state authority or should have inherent value such as gold, made a statement that crypto currencies could not be considered as a currency.

The use of Bitcoin as currency, money transfer tool and digital payment system is defined as Bitcoin 1.0. The creation of all financial and economic applications technology such as bonds, bills or loans in the near future by using the Block-Chain is defined as Bitcoin 2.0 (Swan, 2014). For now, Bitcoin only can be bought, expended and saved in Bitcoin system. However, in Bitcoin 2.0, loans will be able to be borrowed, interest will be able to be yielded or a variety of rights will be able to be purchased in financial products. Companies can theoretically issue their shares directly through the blockchain by using the features of Bitcoin 2.0. These shares can then be purchased and sold in a secondary market located above the block chain (Hayes, Date not specified, a and b). Both banks and other financial institutions, which foresee these changes that are expected to be experienced in the future, have not excluded themselves from this technology; and they are increasingly investing in this area by showing their interest in these areas (Adkins, Date Not Specified).

It is also very important whether crypto currencies will be accepted as investment and debt instruments. In the context of this issue, it is also important to see whether countries will gain a profit if they create their own crypto currencies. A scenario analysis can be done via Turkey to clarify the issue at this point. For example, suppose that creation of crypto currency within the boundaries of the country is regulated by a legal arrangement and only Central Bank of Turkey

(TCMB) or another state authority supplies crypto-currency named Turkey-Coin. At this point, what may motivate foreign investors and global portfolio managers to buy the Turkey-Coin? At this point, interest income comes to the fore. There is no widespread interest pay in crypto currencies around the world. The main reason for this is that crypto currencies are not used as the borrowing and lending tools. Therefore, since it cannot be mentioned about interest income in the current situation, the only motivation of investors for buying Turkey-Coin is to benefit from difference between the purchase and sale price of crypto currency. At this point, the benefit of Turkey which supplies the Turkey-Coin is to prevent decrease in the seigniorage income of Central Bank stemming from crypto currencies that are not in control of the state. In case any crypto currency outside government control reduces the demand for TL and the seigniorage income of Central Bank, Turkey-Coin may be engaged. Government entity which supplies Turkey-Coin such as TCMB will also generate seigniorage income.

That the Turkey supplies its crypto currency will benefit in terms of the real investments and economic growth / development. For example, many investment projects that cannot be funded under normal conditions or can be funded at high cost can be funded by bonds / bills issued in Turkey-Coin denominated. For example, many Turkish companies seeking funding for project financing may be able to issue bonds / bills in domestic crypto currency in the bond market. It can be said that financing cost of borrowing in TL denominated will be lower than borrowing in foreign currency, in case of financing with Turkey-Coin. At this point, not only the companies but also the Undersecretariat of Treasury may issue in bills / bonds in Turkey-Coin denominated. This will give the Treasury a separate borrowing alternative and an opportunity to reduce borrowing costs. In addition, if the domestic crypto currency is used for borrowing purposes, the profit which is as far as interest rate of the crypto currency will also be yielded naturally. The providing of the Turkey-Coin interest return will also motivate many foreign investors to buy Turkey-Coin.

Crypto currencies have various effects on the world economy. These effects can be listed as commercial, economic, financial political and tax effects. We talked about commercial, financial, political and economic impacts. Crypto currencies can be used for tax evasion. Tax evasion occurs unless the gains from the trading of crypto currency are declared (Ağan ve Aydın, 2018: 6-10).

2.2 CRYPTO CURRENCIES AND CENTRAL BANKS-MONETARY POLICIES

The central bank generates a very important seigniorage income by banknotes that it issued and noted. If the crypto currencies quickly supersede the banknotes in economies, the seigniorage income of central banks will reduce. This will be on the strategy practiced by both central banks and countries against crypto currencies.

As crypto currencies become more widespread and increasingly began to use for transaction purposes, there will be serious falls in the seigniorage income of central banks. The widespread use of crypto currencies will seriously damage the reserve money status of the global major currencies. As a result of this, there will be a serious decline in the seigniorage income of the major central banks together with using crypto currencies as reserve money in international and national business transactions. The reaction of the central banks and states to these decreases will be the determinant of the global monetary system.

A part of the seigniorage income created by the central banks depending on the monetization will pass to the miners who produce crypto currency. Mining refers to economic units that verify and record transactions. Miners ensure the security of the blockchain system and the realization of crypto currency transfers. By the cost that they bear and the transaction power that they provide, they get the crypto currencies into circulation in exchange for the system verification and registration service and thus they gain profit (Dilek, 2018: 18). The income obtained in this way can be compared to seigniorage income. The most important cost that miners bear is the cost of electricity. Since the most important element of the system is security, the system consumes very high levels of electricity. Because the lack of a central authority in crypto currency transactions requires the system to protect itself against attack and corruption and this task is carried out by miners and thus electricity consumption increases. This brings about the shifting of mining activities and investments to countries such as China where electricity prices are low. The fact that the activities related to crypto currencies increase the electricity consumption reveals that there are also environmental and social costs. It is stated that the increasing electricity consumption associated with crypto currency activities may lose its attractiveness due to global warming and environmental problems and even the system may collapse (Citigroup, 2017). However, it can be said that the amount of energy required by the system may decrease due to the changes in the technological area and the problem will decrease in time.

As time progresses and the decisive power of crypto currencies on the economic system increases, states will want to have control over crypto currencies. In other words, after a while, the states will begin to issue their crypto currencies themselves and will not allow other private institutions / individuals to issue crypto currency. The trend is likely to be in this direction. This will most likely be through either central banks or "Central Electronic Money Banks" established by countries. For example, the British Royal Mint has released its gold-based crypto currency. Thus, gold-backed crypto currency was put onto the market and steps were taken to eliminate the criticism that they have no monetary equivalent.

At this point, we can say that states and central banks have two options as response. The first option is the prohibition of crypto currencies. We can consider this option as "first best" if the prohibition attempt is successful. Because, provided that the prohibition attempt is successful, the crypto currencies will be eliminated and danger regarding seigniorage income loss of central banks will end. However, it is controversial whether this prohibition attempt will be successful in today's information age. If the prohibition attempt is unsuccessful, crypto currency will continue to be used in the global system and as a result, the state's monetary policy effectiveness will reduce. In addition, if a country prohibits crypto currency, the capital will began to flow towards the countries that do not prohibit them and these countries will gain advantage.

Monetary policy is the most commonly used instrument in economic policy (Doğan, 2005: 26). The effectiveness of monetary policy is very important for the stability of economies. The monetarists point out that money supply plays an important role in determining economic performance (Düzgün, 2010: 230). Maintaining price stability and financial stability are one of the most important goals of monetary policy. However, apart from the currencies that the central banks have officially released, the effectiveness of central banks on monetary policy will be largely lost if crypto currencies are widely used in the economy.

Since Bitcoin cannot expand the monetary base, there are also claims that this currency may cause serious deflation when used widely (McDonnell, 2015). However, this situation can be seen as a problem that can be overcome, or even is not expected to emerge due to the entry of new crypto currencies into the market.

The second option that can be applied by the state against crypto currencies is that the state supplies its own crypto currencies. In this case, even if there is a significant increase in the use of crypto currency, the state will be able to maintain its effectiveness on the monetary policy by taking it under its control.

When analyzing the future of the changes in the prices of crypto currencies, it would not be correct to disregard the policies of major central banks. Crypto currencies are competitors of classic banknotes. This means that the money supply decisions of major central banks will have a direct impact on the value of crypto currencies in the coming period. For example, there is a negative correlation between gold, silver and other precious commodities and US dollar. Besides, there is also causality between the dollar and the goods. The source of this correlation is the causality in question. Since the precious metals and other goods such as gold, silver are bought and sold with the US Dollar today, the price of these goods increases as the supply of the Dollar increases and its value decreases. When the supply of the dollar decreases and its value increases, prices of goods fall, except for the times when there is a risk of global war and conflict. While a similar causality and correlation may change over the long term, it will be valid at least for crypto currencies in short and medium term. That is, as the major central banks make monetary expansion and the supply of banknotes increases, the price of crypto currency will increase, because the crypto currencies are currently traded with these banknotes and as a more fundamental reason, they are rivals to these banknotes. While in times of monetary tightening, since the trust in the major banknote currencies will increase, the price of the crypto currencies will decrease.

CONCLUSION

Crypto currencies will be discussed in public and economic literature for a long time, because, it is an issue that will affect all the global monetary system due to its structure. Crypto currencies have various effects on the world economy. These effects can be listed as commercial, economic, financial political and tax effects. The existence of crypto currencies will have a significant impact on the global reserve money system as well as on the monetary policy effectiveness. In this case, the reaction of states to this process will be the determinant of global monetary system as analyzed in our study. Under the assumption that attempts to prohibit crypto currencies in today's technology age will most likely fail, there are high possibility to supply their own crypto currencies for states and central banks. Thus, states will be able to maintain their effectiveness on economy and monetary policy. It is difficult for Bitcoin and others, whose legal infrastructure is not yet established, to supersede the legally equivalent currencies in the short term. In the medium and long term, it seems that non-state actors who can shake up the monopoly power of central banks in monetization, will have the strategies to become partners of sovereignty of nation-states and then to implement their own

political forces. As a concluding remark, crypto currencies are seen as the future money.

REFERENCES

Adkins, Troy. (Tarih Belirtilmemiş) *Bitcoin Innovations And Obstacles*, <https://www.investopedia.com/articles/investing/020914/bitcoin-innovations-and-obstacles.asp>. [Accessed 29.03.2018].

Ağan, Büşra, Üzeyir Aydın. (2018) “Kripto Para Birimlerinin Küresel Etkileri: Asimetrik Nedensellik Analizi”, *Uluslararası Katılımlı 22. Finans Sempozyumu*, Mersin: Mersin Üniversitesi. pp. 797-816.

Aslan, M. Hanifi. (2009) *Para Teorisi ve Politikası*. Bursa: Alfa Aktüel.

Atik, Murat, Yaşar Köse, Bülent Yılmaz and Fatih Sağlam. (2015) “Kripto Para: Bitcoin ve Döviz Kurları Üzerine Etkileri”, *Bartın Üniversitesi İ.İ.B.F. Dergisi*, Vol. 6, No. 11, pp. 247-261.

Baek, C. and M. Elbeck (2015) “Bitcoins As an Investment or Speculative Vehicle? A First Look”, *Applied Economics Letters*, Vol. 22, No. 1, pp. 30-34.

Baur, D. Dirk, KiHoon Hong and Adrian D. Lee. (2016) “Bitcoin: Currency or Asset?”. *Financial Institutions, Regulation & Corporate Governance (FIRCG) Conference*. <https://mbs.edu/getattachment/fircg/FIRCG-2016/Papers/8-Adrian-2c-KiHoonBitcoin-Baur-et-al-2015-P.pdf>. [Accessed 21.03.2018].

Ceylan, Fatih, Ramazan Ekinci, Osman Tüzün, and Hakan Kahyaoğlu. (2018) “Determination Of Bubbles In Cryptocurrencies Market: Bitcoin And Ethereum”, *Business & Management Studies: An International Journal*, Vol. 6, No.3. pp. 263-274.

Citigroup. (2017) *Citigroup: by 2022 Bitcoin Mining Can Become Unprofitable*. <https://hype.codes/citigroup-2022-bitcoin-mining-can-become-unprofitable>. [Accessed 20.03.2018].

Çarkacıoğlu, Abdurrahman. (2016) *Kripto-Para Bitcoin*, Yer Belirtilmemiş: SPK.

Dilek, Şerif (2018). *Blockchain Teknolojisi ve Bitcoin*. SETA. <https://setav.org/assets/uploads/2018/02/231.-Bitcoin.pdf>. [Accessed 20.03.2018].

Doğan, Çetin. (2005) “Para Politikasının Etkinliği: Türkiye Açısından Bir Değerlendirmesi”. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, Vol.10, No.1, pp. 25-42.

Dorfman, Jeffrey. (2017) “Bitcoin Is An Asset, Not A Currency”, *Forbes*, <https://www.forbes.com/sites/jeffreydorfman/2017/05/17/bitcoin-is-an-asset-not-a-currency/#4f5e41532e5b> [Accessed 20.03.2018].

Düzgün, Recep. (2010) “Türkiye Ekonomisi'nde Para ve Maliye Politikalarının Etkinliği”, *Journal of International Social Research* Vol. 3No. 11, pp. 230-237.

ECB. (2015) *Virtual Currency Schemes - A Further Analysis*. Frankfurt.

Erdinç, Yaşar. (2017) *Adım Adım Bitcoin!*, <https://www.bilgeyatirimci.com/2017/12/14/adim-adim-bitcoin/>. [Accessed 20.03.2018].

Glaser, Florain, Kai Zimmermann, Martin Haferkorn, Moritz Christian Weber and Michael Siering (2014). “Bitcoin -Asset or Currency? Revealing Users’ Hidden Intentions”. *Twenty Second European Conference on Information Systems*, <https://poseidon01.ssrn.com/delivery.php?ID=984094084082031119099005122123091068102080021061010049073012107118078005022116106098016059027059030017044100110117003094118018043027046041038064117097120125083088024095049046113096090071093029028096116026092073067002099097126006072091099101101083113007&EXT=pdf>. [Accessed 21.03.2018].

Hayes, Adam. (Tarih Belirtilmemiş, a) *Bitcoin 2.0 Applications (AMZN, EBAY)*, <https://www.investopedia.com/articles/investing/042015/bitcoin-20-applications.asp>. [Accessed 29.03.2018].

Hayes, Adam. (Tarih Belirtilmemiş, b) *How Will Bitcoin 2.0 Change The World? (MSFT, OSTK)*, <https://www.investopedia.com/articles/investing/041315/how-will-bitcoin-20-change-world.asp>. [Accessed 21.03.2018].

IMF. (2016) *Virtual Currencies and Beyond: Initial Considerations*. Washington DC.

Jennings, Jason and Laurence Haughton. (2001) *Büyük Balık Küçük Balığı Değil, Hızlı Balık Yavaş Balığı Yutar*, Çev. Şefika Kamceç, İstanbul: Koç Sistem Yayınları.

Kaya, Süleyman. (2018) *Kripto Paralar ve Fıkhi Açından Değerlendirilmesi*, Sakarya: İSEFAM Rapor.

Kristoufek, Ladislav. (2015) “What Are the Main Drivers of The Bitcoin Price? Evidence from Wavelet Coherence Analysis”, *Plos One*, Vol. 10, No. 4, pp. 1-15.

Mc Donnell, Patrick “PK”. (2015) *What Is The Difference Between Bitcoin, FOREX & Gold? ‘A Tripod Theory’ [Revised]*. <https://www.newsbtc.com/2015/09/09/what-is-the-difference-between-bitcoin-forex-gold-a-tripod-theory-revised/>. [Accessed 29.03.2018].

Nakamoto, Satoshi. (2008) *Bitcoin: A Peer-to-Peer Electronic Cash System*. <http://bitcoin.org/bitcoin.pdf>. [Accessed 21.03.2018].

Rotman, Sarah. (2014) *Bitcoin Versus Electronic Money* World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/18418/881640BRI0Box30WLEDGENOTES0Jan02014.pdf?sequence=1&isAllowed=y>. [Accessed 29.03.2018].

Swan, Melanie. (2014) *Bitcoin 1.0, 2.0, and 3.0: Currency, Contracts, and Applications, Beyond Financial Markets*. <https://ieet.org/index.php/IEET2/more/swan20141110>. [Accessed 29.03.2018].

Üzer, Betül. (2017) *Sanal Para Birimleri*, Ankara: Türkiye Cumhuriyet Merkez Bankası Ödeme Sistemleri Genel Müdürlüğü.

Walsh, Dean. (2015) *How to Earn Interest on Bitcoin 5 Different Ways*. <http://cryptorials.io/how-to-earn-interest-on-bitcoin-5-different-ways/>, <http://cryptorials.io/how-to-earn-interest-şon-Bitcoin-5-different-ways/>. [Accessed 29.03.2018].

World Bank. (2016) *Digital Dividends*. <http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf>. [Accessed 29.03.2018].

Investing, *Canlı Kripto Para Grafiği*, <https://tr.investing.com/charts/cryptocurrency-charts> [Accessed 01.04.2019].