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BITCOIN IN LIGHT OF THE AUSTRIAN THEORY OF MONEY

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ABSTRACT

The rise of Bitcoin and similar digital payment systems presents significant challenges to the traditional fiat money system, igniting renewed discourse on the fundamental nature of money. Austrian economists devote considerable attention to the analysis and understanding of cryptocurrencies. This interest stems from three pivotal elements of Austrian monetary theory: Carl Menger's theory of the origin of money, Ludwig von Mises' theory of the value of money, and Friedrich August von Hayek's concept of competitive currencies. This paper explores Bitcoin through the perspective of Austrian monetary theory. In particular, the article analyses key questions, such as whether Bitcoin's emergence aligns with the evolutionary origins of money and its relationship to Mises' regression theorem; it explores Bitcoin's role in the broader context of Hayek's currency competition.

Key words: Money; Bitcoin; value of money; regression theorem;

JEL – codes : B11, B53 ; E40 ; O33

INTRODUCTION

The world economy in the twenty-first century has shown a new round of searching by economic agents for ways to improve the institution of money. The emergence of new means of payment such as Bitcoin, and then its analogues, question the current fiat money system. There are also attempts to implement official digital currencies such as Central Bank Digital Currency (CBDC).

The representatives of the Austrian school of economics pay particular attention to the understanding of the essence of cryptocurrencies. The reasons for such interest lie in the existence of three specific elements of the theory of money in the Austrian tradition: the theory of the origin of money by Carl Menger, the theory of the value of money by Ludwig von Mises, the concept of competitive currencies of Friedrich August von Hayek. There are many important theoretical questions related to the emergence of cryptocurrencies. We will focus specifically on the most common cryptocurrency, Bitcoin, and attempt to answer the following questions:

-Is the emergence of Bitcoin consistent with the evolutionary theory of the emergence of money?

- Is Bitcoin a good? What are the determinants of its value, and does it have intrinsic value?

- Is Bitcoin money?

- Does the emergence of Bitcoin as a medium of exchange contradict Mises' regression theorem?

- Can the proliferation of cryptocurrencies be interpreted as a competition between currencies?

All these questions will be covered in our article. The first cryptocurrency, Bitcoin, will be the main subject. The article is structured as follows: the first part outlines the principles of Bitcoin's functioning and analyzes its correspondence with Menger's evolutionary theory of the origins of money; the second part compares Bitcoin's performance of money functions in comparison to fiat money; in the third part the possibility to apply Mises' regression theorem to Bitcoin and the analyses of Bitcoin in light of Hayek's approach to currency competition are discussed.

1. THE EVOLUTION OF THE MONETARY SYSTEM AND BITCOIN

Throughout its history the institution of money has not been a static phenomenon. Money emerged, like other spontaneous orders, to reduce the fundamental uncertainty of exchange. It has constantly evolved, adapting to the changing demands of economic agents. The evolution of forms and types of money took place under the influence of financial and organizational innovations, as well as technology development and state intervention.

The selection of goods for the role of money is the result of billions of human actions. Each action improves the condition of an individual, but is not intended to "invent" money or even to select any commodities for the role of money. In the process of evolution, precious metals such as gold and silver, being the most marketable commodities, were selected for the role of money.

Originally, the monetary system was completely decentralized: the holding of a sum of money justified that its owner had previously created a certain good, which received public recognition through its purchase by other persons (we leave aside the non-legal violent-coercive variants of wealth acquisition). The presence of economic interest to obtain the most appropriate payment instrument and the inconvenience of paying with ingots led to the appearance of coins.

The monopolization of coinage by governments and the establishment of legal tender, with all the negative factors associated with the possibility to manipulate the quality of the coin, contributed to the unification of the monetary system between different regions, and thereby conditions for the development of trade were improved.

The choice of one currency via legal tender helps to reduce transaction costs but creates

the possibility of abuse in relation to the quality of the coinage. In his analysis Hülsmann demonstrates that the introduction of legal tender and coinage monopoly could lead to a decrease in the diversity of coins available on the market and lead to the alteration and debasement of the money (Hülsmann, 2008). Moreover, it may spur fractional reserve banking (Hülsmann, 2014).

In addition to the problem of the quality of the money issued by the state, legal tender has a negative influence on money as an institution. The state propagates among the public a dangerous illusion about the essence of money: a coin, which is a certified unit of weight, could be represented as a kind of conventional sign (Menger, 1871). The function of legal tender is emphasized by the state, while distorting the understanding of the essence of money.

The emergence of money substitutes in the form of private banknotes exchanged for coins at the first demand of depositors, had a dual effect. It gave elasticity to the money supply and to some extent contributed to the stability of the value of the monetary unit: banks expanded the volume of lending during the boom of economic activity, and during the decline reduced it, thus leveling inflationary and deflationary trends. Such a task could only be accomplished when the reserve ratio on money substitutes was relatively high i.e., when the issue of banknotes and deposits was relatively small compared to precious metal reserves. As soon as the link with the gold reserve was abandoned, the unrestrained bank emission caused prices to rise. The described credit money came in the form of banknotes, bills or other securities, as well as in the form of records of bank accounts, i.e. deposits. Technological progress in the twentieth century, in particular computerization, led to the transformation of accounts and corresponding records into electronic ones, to the use of payment cards. Money increasingly lost its material basis. Private banknotes were replaced by government banknotes, which gained a monopoly on the existence of centralized monetary systems. Finally, technological innovation has led to the emergence of digital currencies in centralized (such as WebMoney) and decentralized (such as Bitcoin) networks.

The first observation concerns the status of cryptocurrencies, like Bitcoin, the best-known and the most common cryptocurrency (50% of Cryptocurrency Market Capitalization, September, 2024), based on four key elements: 1) peer-to peer network; 2) asymmetric cryptography; 3) distributed ledger technology (blockchain); 4) mining based on proof of work.

In various studies, the definition of its role in the economy ranges from money ("Bitcoin is the digital equivalent of gold") to a money laundering tool. Bitcoin, as determined by its creator, is "an electronic coin as a chain of digital signatures. Each owner transfers the coin to the next by digitally signing a hash of the previous transaction and the public key of the next

owner and adding these to the end of the coin. A payee can verify the signatures to verify the chain of ownership" (S. Nakamoto, 2008).

The Bitcoin emission algorithm is as follows. The total supply of Bitcoins to be issued is set at 21 million coins. The first 50 coins became the property of the author for creating the first block of transactions, then the emission took place as a reward for "mining". Transactions create a new block in the blockchain. The first miner who solves the equation receives a reward consisting of a certain number of coins. Every four years the amount of reward decreases twice - from 50 coins in 2009-2012 to 1 "satoshi" (10^{-8} Bitcoin) by 2140, when the emission will be finished. However, today the volume of issues has already exceeded 19,74 million Bitcoins, i.e. more than 94% of the maximum amount (September, 2024).

Anonymity, transparency, absence of centralized control, the security system, high speed of payments, especially international ones, and absence of difference between cash and non-cash sums determine the advantages of the described system and create a high stable demand to join Bitcoin network (Sinel'nykova-Muryleva, 2019). Bitctoin was followed by a great number of various cryptocurrencies. Their number exceeded 20 thousand. The cryptocurrency market capitalization is close to $2.10 trillion (September, 2024, 29d).

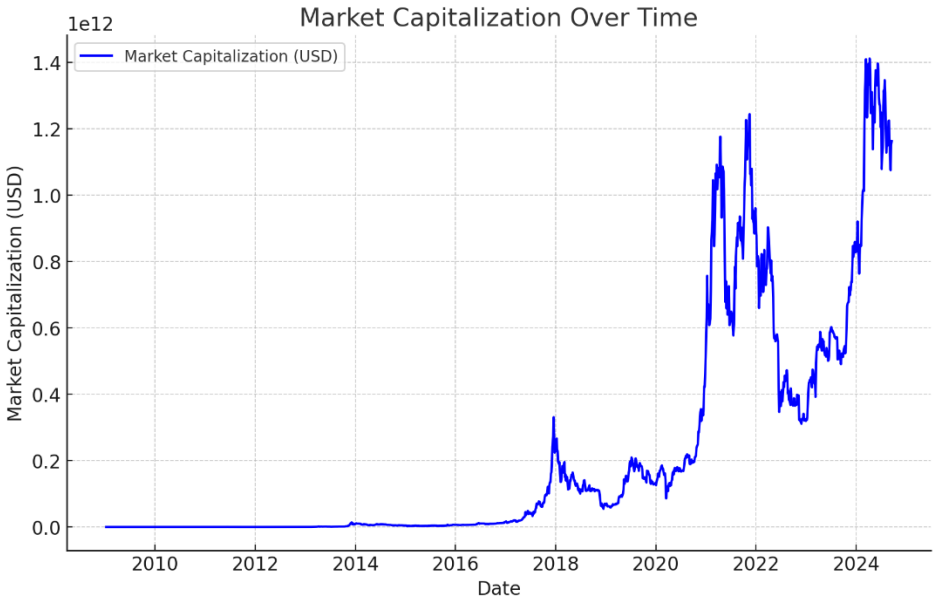

FIGURE 1. BITCOIN MARKET CAPITALIZATION [1]

The evolutionary theory of the origin of money was formulated by Carl Menger (1871, 1883, 1892, 1909), developed by L. Mises (1912, 1949). Menger affirms that the emergence of money is an evolutionary process, spontaneous in character, and conditioned by the

[1] https://www.blockchain.com/

economic interest of agents, which appears without convention or legislative constraint (Menger, 2007 [1871], p. 261-262). Money arose from the intentions and interests of economic agents, from their actions in finding an instrument to achieve their ends in the shortest time possible (in this case: the rapid acquisition of goods to satisfy human needs). The theory of the origin of money is consistent with the theory of human action and the general theory of goods. The final purpose of all economic activity is to satisfy human needs. Both production and exchange operations, which can satisfy human needs only indirectly, are undertaken in the pursuit of this final objective. In Menger's conception, only an economic good can be selected for the role of money.

To analyze the subject of this article we will focus on the following aspects of the theory. First of all, the origin of money was the result of the process of selection of goods for the role of medium of exchange between different economic goods. This indicates that these commodities had the ability to meet some human needs before they started being used as a medium of exchange.

It is important to note that, the process of selection was spontaneous, based not on human design, but on human action, determined by the subjective interests of economic agents, with no social contract or any legislative recognition required: "The origin of the money (as distinct from a coin, which is only one variety of money) is, as we have seen, entirely natural and thus displays legislative influence only in the rarest instances. Money is not an invention of the state. It is not the product of a legislative act. Even the sanction of political authority is not necessary for its existence" (Menger 2007 [1871], p. 261-262). Such institutions Menger called organic[2].

Another substantial point is that the process of selection was competitive with the freedom of economic agents to choose goods with the greatest marketability (goods that are sold and bought the easiest). Furthermore, the process of selection was evolutionary and progressive and it depended on habits and imitations. Not all individuals understand immediately the benefits of owning a commodity that is more exchangeable than other commodities. As people realize that there is an advantage in using one specific commodity to reduce the cost of exchange, indirect exchange develops and promotes this commodity to the rank of a universal medium of exchange.

It should be emphasized, that the spontaneity of the process means not only the absence of an initial design for the institution of money, an "ultimate goal" in the Aristotelian sense, but

[2] "Social phenomena come about as the unintended result of individual human efforts (pursuing individual interests) without a common will directed toward their establishment". (Menger, 1985 [1883], p. 133)

also the uncertainty of the result to which the development will eventually lead ("ends-independent" in the sense of a multiplicity of possible end states) (Horwitz, 2015).

The Bitcoin payment system cannot be considered an organic institution, it is a product of human invention, but the presence of such an element within the evolution of the monetary system is in line with the idea of the uncertainty of its final state. Bitcoin was designed to perform a role of digital cash, and in this sense, it does not fit the description of evolutionary theory either. Finally, there is no gold or any other commodity or collateral behind Bitcoin; it is a digital currency. At the same time, some similarities allow us to compare Bitcoin's status with gold in light of the evolutionary theory. First of all, there is the absence of any role of the state in its origin. Secondly, the limited supply of Bitcoins and the direct cost of its production (mining) is distinct from fiat currencies. Similar to gold, the production cost of Bitcoin is currently increasing over time, as its consensus algorithm requires miners to consume massive amounts of electricity. Third, as in the case of gold, Bitcoin's value depends neither on the trust in its emitter, nor on the emitter's financial health.

The evolutionary theory of money explains the emergence of money as an institution, and the choice of a certain commodity for the role of universal medium of exchange. Bitcoin is compatible with this theory because it can be considered as a new candidate for the role of money. Thus, various aspects of the emergence of Bitcoin can be described in terms of the evolutionary approach.

2. BITCOIN AS A GOOD AND THE FUNCTION OF MONEY

To answer the question of whether Bitcoin is money, it is necessary to analyze how fully it performs the functions of money. Bitcoin can be used for transactions, selling/buying goods and services; therefore, it can fulfill the role of medium of exchange that represents a key function of money. Menger considers it in this way: "…in a word, in trade markets certain wares emerge from the sphere of all the others and become means of barter, "money" in the broadest sense of the word" (1985 [1883], p.152). Meanwhile, money is a common, generally accepted, universal medium of exchange. Bitcoin is far from such status, it serves a negligible volume of transactions in the economy. Less than ten percent of Bitcoin transactions are made to buy goods and services, and all other transactions are to buy currencies (29e).

The duality of the economic nature of cryptocurrencies is emphasized by The Committee on Payments and Market Infrastructures of the Bank for International Settlements, which refers cryptocurrencies to a group of electronic "money", which is a system of monetary settlements using electronic computer technology, for which it is typical to have some

properties of money in addition to the properties of goods or an investment asset (Sinel'nykova-Muryleva, 2019). The International Monetary Fund does not consider cryptocurrencies to be money, but rather a high-risk investment asset.

We will first answer the question of whether Bitcoin is a good through the prism of the general theory of goods. An object acquires the character of a good under four conditions: 1) the presence of a human need; 2) the presence of a causal link from the object to the satisfaction of this need; 3) human knowledge of this causal link; 4) the possibility of using the object to satisfy the need (Menger, 2007 [1871]).

The need for a means of payment with a stable value, unaffected by government monetary policies and ensuring rapidity and transparency of transactions, caused the permanent emergence of various kinds of private money covering local communities (Genkin, 2002). Bitcoin was created as digital cash, and the need for a secure means of payment is arguably satisfied by it, meeting the second to fourth conditions. The volatility of Bitcoin's price is determined by the limited supply and unstable demand for Bitcoin as a digital investment asset from users who do not see it as a means of exchange and do not use it for that purpose. We can state, Bitcoin is a good and, like any good, has a source of value in its utility and rarity. Bitcoin's rarity is due to the maximum stock inherent in the issuance algorithm, and its usefulness relies on its role as a means of payment/ investment asset etc. There are two important uses of Bitcoin: 1) Bitcoin as a payment infrastructure: an infrastructure composed of an open-source software protocol and a distributed ledger with unmatched technical robustness, enabling the transfer of funds/values (as used by the startup Strike for fund transfers); 2) Timestamping and data authenticity verification: Bitcoin technology allows for timestamping digital documents and verifying their authenticity.

The following properties are required to perform the function of a medium of exchange. The first property is the recognition by economic agents of it as a payment instrument and the convenience of its use. The Bitcoin payment system was first used in a narrow environment of IT-specialists, and later spread to a wider audience. Payments with Bitcoin are robust and fast. With the development of the Lightning Network the transaction fee is low and is independent of distance and state borders. The Lightning Network allows for Bitcoin transactions to be conducted off the blockchain (off-chain). After an initial escrow of funds on the blockchain (on-chain), only the balance of the aggregated transactions is occasionally recorded on the blockchain. This network functions like an accumulation of clearing houses, aggregating different positions of buying and selling bitcoins (de Mombynes, 2020).

The second property is its relative rarity and inelastic supply. Bitcoin's initial code for limited issuance ensures rarity. Therefore, Bitcoin, like gold money, if it were adopted as money would result in deflationary growth (an increase in the production of goods and services accompanied by price decreases).

Furthermore, certain technical properties are required, such as durability, a high degree of security, divisibility, and compactness. Bitcoin meets all technical requirements. The minimum unit - satoshi - corresponds to 10^{-8} Bitcoin, which allows even small transactions to be serviced. The disadvantage is the necessity to have special equipment and software, but the same disadvantages are inherent to modern electronic money, settlements which are performed through cards or electronic devices (computer, phone).

Another key characteristic is the relative stability of its value. Fiat money is characterized by depreciation, which can cause the loss of its function as a store of value or a measure of value. Bitcoin is characterized by large volatility of its value (Figure 1) which undermines the possibility of it playing the role of medium of exchange for the time being. "Commodities whose prices are not well known or subject to considerable fluctuations also do not pass easily from hand to hand" (Menger, 2007 [1871], p.255). It is difficult to implement a transaction with a medium of exchange which constantly changing price, therefore it is extremely difficult to plan future sales /purchases. As well, the volatility of the Bitcoin price does not contribute to the quality of its function as a measure of value. The fixing of transactions in Bitcoin, which is very volatile in price, does not help its participants to reduce the uncertainty in the economy. However, financial analysts have noticed a decrease in Bitcoin's volatility over the last 10 years despite some price booms. Based on the current trend, they predict that its volatility will decrease further over time, or at least continue to lessen the fluctuations in its price (Kaiko-research).

The further important trait is low transaction cost, which, in the case of Bitcoin, is achieved through the implementation of the Lightning Network. Money arose from the intentions and interests of economic agents, from their actions in finding an instrument to achieve their ends in the shortest time possible (in this case: the rapid acquisition of goods to satisfy human needs). The Bitcoin network can process no more than seven transactions per second. The average time for a transaction to be confirmed with Bitcoin is 10 minutes, although it can take from a few seconds to a few hours (this point concerns only on-chain transactions). When the Bitcoin network is overloaded, transaction times can increase significantly. This limitation in Bitcoin's transaction processing capacity represents a serious constraint for its use as a medium of exchange. This problem was resolved with the appearance of the Lightning

Network in 2018, which allows transactions to be completed offchain in a short time and at low costs (2020, Y. de Mombynes).

The debate over whether Bitcoin has intrinsic value is a controversial issue concerning its ability to fulfill the role of money. Some authors consider the presence of the costs of Bitcoin creation to be a factor allowing for intrinsic value, and the presence of consensus among users to be a measure of value (Andryushin, 2020). Others, on the contrary, believe that Bitcoin has no basis and its true value is zero (Kiselev, 2018).

In Austrian tradition, value is not an intrinsic property of an object, it is the judgment of economic agents about the value of a given good, and it has a different value in the eyes of different people. We will discuss not the intrinsic value of Bitcoin, but the presence/absence of its value other than monetary use. Should money have an independent value or can it be a kind of "certificate" for the purchase of goods? For Menger, the medium of exchange should have a value from non-monetary uses, at least at the initial stages. The lack of such value in fiat money can easily be explained by the attachment of its rate to gold and silver and the process of substitution, which took centuries, and today the value of fiat money is the value derived from the performance of the function of the medium of exchange.

The production costs of money are irrelevant. Fiat money is valuable not because it requires some amount of paper, ink, printing and human energy. Its value is not based on the existence of costs, but the utility of money as a means of exchange. Bitcoin mining, like many other industries, requires energy. Bitcoin's closest and most referenced real-world analogue is gold: Bitcoin requires 99.71 TWh per year and Gold needs 131TWh per year (see The Cambridge Bitcoin Electricity Consumption Index, c).

Finally, money serves as a measure of value, its value itself can only be measured through the number of goods that can be purchased with a unit of money. When we ask today how much Bitcoin costs, everyone will answer with its price in U.S. dollars or Euros or another fiat currency. Bitcoin itself is not a measure of value today.

The higher price volatility in combination with uncertainty about future value do not allow Bitcoin to fully perform the function of storing value, although the limited and transparent issuance algorithm gives it credibility.

It is important to note that Bitcoin volatility is the result of fluctuations in speculative demand combined with its limited supply. Additionally, there is a risk that future technological advances could lead to the devaluation of Bitcoin due to the emergence of more attractive, robust, and efficient digital alternatives in the long term.

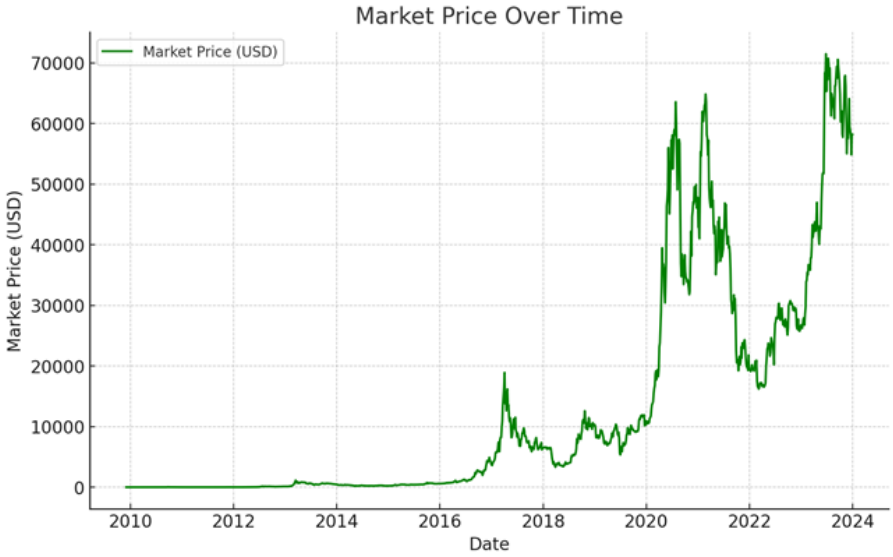

FIGURE 2. BITCOIN MARKET PRICE[3]

Term deposits, buying investment assets with money, etc., are not savings in money, even though the value of those assets is expressed in monetary units. The only case in which money generates income, is when commodity prices go down, when those who have been keeping money in their hands can buy more goods. In that sense, Bitcoin is not different from gold in periods of deflation.

As for its function as a means of payment, it requires the conclusion of a transaction with a deferred payment term, the certainty of a future flow of payments in Bitcoins and its existence, and the ability to predict the future value of the currency or to hedge the risk of value change, with hedging instruments already developed and in use. Loans in Bitcoins and other cryptocurrencies are common, with low interest rates and short terms, also due to volatility. (Andryushin, 2020).

The analysis of Bitcoin's performance of money functions does not allow us to conclude that the first of the cryptocurrencies has reached the status of a universal means of exchange. Qualitative performance of the function of means of circulation is limited to a negligibly small area of action. The functions of a means of savings and a means of payment are severely limited by the volatility of Bitcoin prices. Finally, Bitcoin's function as a measure of value is not fulfilled due to the weak spread of Bitcoin, and it is most convenient to measure the value of goods in a universal medium of exchange; the value of Bitcoin itself is usually expressed in fiat currencies.

[3] https://www.blockchain.com/

3. BITCOIN THROUGH THE PRISM OF MISES' REGRESSION THEOREM

The emergence of Bitcoin provoked a debate between representatives of the Austrian school of economics about its correspondence to Mises' regression theorem. The theorem was originally applied by Mises to solve the logical problem of explaining the exchange value of money by marginal utility, which, in turn, depends on the exchange value of money (Mises, 1981 [1912]).

In his analysis Mises includes a historical component - and explains the present exchange value (purchasing power) of money through its valuation by economic agents based on yesterday's exchange value. Regressing the emergence of money to a commodity and the appearance of corresponding additional demand for this commodity to fulfill the monetary function, Mises shows that at this point the value of future money is based only on its non-monetary utility. This approach is in line with Menger's theory of the origin of money, which claims that a commodity without "non-monetary" value could not be promoted for the role of money.

> As soon as one commodity or a number of commodities have become generally used media of exchange for a people, there arises in every individual economic unit that participates in the division of labour, in addition to the demand that may have existed previously for these commodities for purposes of consumption and technical production, a further and different demand for medium of exchange purposes... at first it probably is not separated from the stock intended, for example, for consumption purposes, but subsequently it becomes a separate stock, especially if the part of the commodity that has become money acquires a special form in trade or a special name and even a different look. (Menger, 2002 [1909]. P. 107).

In *Human Action*, Mises extends the requirement of the theorem not only to money, but to any asset that, over time, may become a new medium of exchange: "The regression theorem establishes the fact that no good can be employed for the function of a medium of exchange which at the very beginning of its use for this purpose did not have exchange value on account of other employments" (Mises, 1998 [1949], p. 500).

This is why the following arguments do not seem correct. The first one asserts that we should not analyze Bitcoin in light of the regression theorem at all, since it is not money. Murphy (2013) accurately observes that the process of promotion to the role of universal medium of exchange is long and we cannot determine the exact moment when a commodity from non-money turns into money.

The second argument states that Bitcoin should not be analyzed in connection with the regression theorem, as it only deals with the initial promotion of money *de novo* from the state of barter and the relative prices formation. It does not apply to the problem of the emergence of new means of payment as long as economic calculations are settled in the current money. "The

theory therefore is not an explanation for the origin of all money or all media of exchange" (Davidson, 2015, p. 318). However, Mises points out that "It merely explains how a new kind of media of exchange can come into use and remain in use" (1998 [1949], p.500). New kind does not equal to *de novo*.

There is no contradiction either with Bitcoin's value from alternative uses, or with the explanation of its current exchange value.

The "non-monetary" value of Bitcoin could be based on people's desire to participate in testing a new network, engaging in a game, collecting, or simply helping to promote an idea (Graf, 2013). Other motivations might include using a blockchain-based payment system and, more importantly, transferring funds across borders without government control, among other reasons.

The motives for determining Bitcoin as a good are irrelevant to the problem (Surda, 2014). When the first exchange using Bitcoin was carried out, one of the counterparties to the transaction was its owner, and both counterparties of exchange evaluated it, so there is no contradiction with the regression theorem. Since Bitcoin was used before the exchange, it had utility for its owner, and the nature of this utility within the framework of methodological individualism is not under dispute.

The question, however, is what was the subject of the first Bitcoin transaction. K. Hansen (2019) shows that contrary to the popular perception that 2 pizzas were purchased for 10,000 Bitcoins on May 22, 2010, the pizza acted as a medium of exchange for the agent who wanted to purchase 10,000 Bitcoins and had the information about the person interested in buying the pizza for Bitcoins. He bought 2 pizzas for fiat money, and exchanged it for Bitcoins. This interpretation reveals a different picture. This transaction can be interpreted as well as a rejection of the use of fiat money. The purchase of Bitcoin could well be interpreted as the purchase of a financial asset in anticipation of a rise in its price.

Murphy (2014) argues, if someone decides first to give up some economic good in exchange for an asset, that has the potential to be an effective medium of exchange, it may contribute to the actual emergence of that medium of exchange. Murphy says that there is a *loophole* in Mises' argument in such a case. However, if we take into consideration that the commodity given by the participant of the first transaction was a fiat currency, it makes sense. The prohibition of gold money by governments and the unsatisfactory performance of monetary functions by fiat money prompted the first experimenters to try to replace it with Bitcoin. The process of the emergence of money is evolutionary, progressive and dependent on habits and imitations. Not all individuals understand immediately the benefits of owning a commodity that

is more exchangeable than other commodities. As people realize that there is an advantage to using one specific commodity to reduce the cost of exchange, indirect exchange develops and promotes this commodity to the rank of universal medium of exchange. The diffusion of knowledge leads to the formation of a social institution and this process takes a long time (C. Menger (2007), Festre (2012)).

4. BITCOIN THROUGH THE PRISM OF HAYEK'S CURRENCY COMPETITION

For many economists, Hayek's *Denationalisation of money* (1976) is a prediction of the new monetary phenomenon of cryptocurrencies. In his book the author proposes a way to obtain monetary stability through the private emission of money. The book was set during a period of high inflation, caused by expansionary monetary policy, as a response to the government's monopoly on the issue of money.

The theoretical idea is simple: money should be considered as an ordinary commercial commodity and therefore should be produced through market forces. In the same way that competition between ordinary goods improves its quality and removes low-quality products from the market, competition between private currencies allows the selection of high-quality ones which perform the role of money in the best way (for currency Hayek used the Latin term valutus, which means the object with a changing value).

The design of the monetary system proposed by Hayek can be characterized by the following features.

The first one is the government abolishes the legal tender, revokes its monopoly on issuing money and allows private money producers to issue currency under their own brand name. This system differs from free banking, where all money producers issue the same currency.

The second aspect is the quality of a currency depends on its quality as a medium of exchange. This requires relative stability of a currency's value over time.

The third point is that money issuers will take various measures to ensure the stability of the value of their currency. In the early stages, for example, they will guarantee the redemption of banknotes in existing national currencies at the exchange rate declared at the time of issue. At the same time, convertibility is not the key point of his idea: "Convertibility is a safeguard necessary to impose upon a monopolist, but unnecessary with competing suppliers who cannot maintain themselves in the business unless they provide money at least as advantageous to the user as anybody else." (Hayek 1976, p. 84)

Furthermore, as people become familiar with different types of money, they will form a demand for those that best fulfil the function of money. Hayek identifies several uses of money, complementing the medium of exchange function: creation of reserves for the future; fulfilment of contracts with delayed payments; a unit of account - and points out the reliable unit of account function as the primary factor that determines the demand for money. The quality of the last will be an important factor in the demand for currency (1976, p. 55-57).

Another important feature is that, to test the stability of a currency's value, it is advisable for money issuers to link the currency to a particular set of goods that will help maintain its value (1976, p. 40), and to adjust this set over time according to the revealed preferences of the public.

Finally, once a stable demand for the currency has been established, the money producer can manage its value by regulating the money supply. In a competitive environment, Hayek argued, such a system would best ensure the credibility and stability of the currency.

The value of money, like that of any other commodity, is based on its utility and rarity, with its utility depending on how well it performs its primary function— as a medium of exchange. Therefore, money producers will compete to fulfill this function in the best possible way.

How can Hayek's ideas be applied to the cryptocurrency market? The answer to this question is obscured by the absence of a key condition for currency competition: the state has not relinquished its monopoly on money issuance, therefore cryptocurrencies, primarily, play the role of financial instruments. In fact, the share of transactions in which cryptocurrencies serve as a medium of exchange is negligible. The same conclusion is reached by the authors of the article (F. Mayer, P. Bofinger, 2020), who notice that competition between cryptocurrencies is not centered on their role as a means of payment, but rather on their role as speculative stores of value.

There are some implications of this position for cryptocurrencies. First consideration is that the stability of value, as an important demand factor for money, has not yet become a central issue for cryptocurrencies. In fact, their price volatility exceeds that of other financial instruments. Another point is the inability of any of them to serve as a unit of account. And it's not just because of the high volatility of the value of cryptocurrencies. It makes no sense to measure the value of commodities in terms of an asset as long as the asset itself is priced in traditional fiat US dollars or euros.

At the same time, we can observe in the functioning of cryptocurrencies the confirmation of the idea that trust in a currency is a fundamental factor of its demand. And

"pure trust" as one of the bases for the value of fiat money has been replaced by a more fundamental factor: cryptographic verification of transactions.

Notably, stablecoins, which are tied to the value of commodities or currency baskets, more closely resemble the private currencies described by Hayek. In this segment of the market, the most stable currencies have been selected, with one of them (Tether) dominating payments, in line with Hayek's reasoning.

Hayek's idea that different degrees of liquidity entail different degrees of "monetization" of a particular cryptocurrency is confirmed (Sans Bas,2020). Bitcoin has higher liquidity than other cryptocurrencies, as it was the first decentralized digital currency and its network is larger than others.

The development of the cryptocurrency market remarkably confirms Hayek's general theoretical framework of evolution. Competition has opened up unknown opportunities for market development due to the market process. Thus, special crypto-exchange markets and other virtual financial platforms were created, accepting different crypto-assets as instruments of payment – and segmentation of the cryptocurrency market appeared rapidly.

CONCLUSION

For any medium of exchange to be promoted as universal, i.e., money, it does not need to be recognized as legal tender by the State. What is important is the spreading of the habit of using this instrument of exchange under free competitive choice among economic agents in the same way that gold and silver were once chosen to play this role.

Contrary to gold and silver, which won the competition for the right to play the role of money from a multitude of alternative goods, Bitcoin has to compete with fiat money (among others), which is controlled by government monopoly.

Bitcoin was the first and continues to be the most prominent cryptocurrency due to its widespread usage. Its key strengths include decentralization, enhanced security, and incorruptible governance. Fiat money itself is money because its monopoly was imposed by governments through the legal ban on the use of gold money in transactions, first as an instrument of payment and then as a measure of value (the abolition of the "gold clause" in the era of F. Roosevelt's "New Deal").

Bitcoin does not fully perform the functions of money today, is not a universal means of exchange, and therefore is not money. At the same time, it either partially performs or is capable of performing all the basic functions of money, including, in the case of its use spreading widely, the function of a measure of value, i.e. it can potentially become money.

According to Menger's evolutionary theory, the selection of goods for the role of money is the result of countless human actions, each of which improves the condition of an individual, but none of which are intended to "invent" money or even to select any commodity for this role. Bitcoin, by its nature and the functions it performs, can be considered one of the candidates for the role of money. Nevertheless, the answer to the question of whether it will become money is outside the scope of theoretical economics: the process of selecting a good for the role of money is spontaneous in the free competition of all alternative instruments of exchange. However, hypothetical speculations about what economic agents would prefer - gold and silver coins, commercial banks' accounts with electronic cards, or a digital record in a distributed ledger - may be relevant and will therefore continue to excite the inquiring minds of those interested in monetary theory.

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