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Cryptocurrencies in the Light of Money Definitions

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***Abstract*:**

Purpose: *The aim of the article is to attempt to assess the phenomenon of digital currencies through the prism of existing money definitions as well as to determine to what extent the existing definitions of money are able to answer the question whether private decentralized digital currencies are money in the traditional sense or are they a completely new phenomenon that cannot be put in the framework of previous definitions of money.*
Design/methodology/approach: *This study provides a critical literature review of the cryptocurrency's definitions in comparison to traditional money definition. The literature review was intended to determine whether bitcoin could be treated as money.*
Findings: *The findings indicate that all the cryptocurrency definitions quoted in this study demonstrate that bitcoin together with other cryptocurrencies have ceased to be a niche phenomenon as at the time of the definitions being published and that in no way can the novel trend already marked across the world be ignored by pretending it simply does not exist.*
Originality/value: *This article intends to cover the gap observable in the current scientific discourse in the relations between the notions of classic money and digital currencies.*

Keywords: *Cryptocurrency, money definitions, bitcoin.*

JEL Codes: *E51, E58.*

Paper type*: Research article.*

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1. Introduction

The phenomenon of cryptocurrencies cropped up only recently in the universe of contemporary finance. The origination of this prodigy in 2009 was an outcome of a crisis that had broken out on the world's financial markets. In order to save the world's financial system, unprecedented and yet resolute actions had to be taken. These were authored and performed at the same time by the world's leading central bank, the American Federal Reserve Bank (FED). The actions required the usage of non-standard (at that time) monetary policy tools, altogether termed quantitative easing (QE). Putting it plainly, they comprised in printing and introducing to the world's monetary system tremendous amounts of new money (at a rate of several dozen billion USD per month). The quantitative easing policy was later on continued by other central banks being of importance for the system - the Bank of Japan (BOJ) and the European Central Bank (ECB). The policy intensified the growing inflation concerns across the world's economy and in many countries drained some investors' confidence in banks, market regulators, and in the entire global financial system. That was an initiator of unparalleled bottom-up activities that led to freeing (or privatizing) the issue of money. As a result, a first world's private cryptocurrency was created, known as bitcoin (BTC)[2]. From its very origination and during its development, an increasingly intriguing question was arising whether bitcoin could be treated as money.

The purpose of this article are attempts to assess the phenomenon of digital currencies from the perspective of the existing definitions of money, and to answer the question whether private decentralized digital currencies are money within its traditional meaning or whether they constitute a brand new invention that cannot be framed within the to-date definitions of money. This article also intends to cover the gap observable in the current scientific discourse in the relations between the notions of classic money and digital currencies.

The article structure is as follows. First of all, reasons for the occurrence of the entirely new phenomenon of cryptocurrencies are described. Then, focus is given to money definitions used in commonly known literature, subsequent to which considerations cover definitions of digital currencies and bitcoin itself, and finally similarities and differences are discussed in the theoretical coverage of bitcoin vis-à-vis classic money. A summary and conclusions wind up the study.

2. Origin of Cryptocurrencies

The origins of bitcoin date back to the publication on 1 November 2008 by an anonymous creator (or a group of creators) hiding under the pseudonym Satoshi

[2] *The name bitcoin refers both to the digital currency (cryptocurrency) unit, and also to the IT system by way of which transfers are made in this currency - having its name capitalized as Bitcoin.*

Nakamoto of the white paper being a manifesto explaining the mechanism of the functioning of the cryptocurrency itself and of the entire system, the blockchain, underlying the cryptocurrency architecture (Nakamoto 2008). In relation to the classic money system architecture, it has a number of advantages, the main of which seems to be its decentralization preventing any "manual" manipulations inside the blockchain environment. Another advantage is the inability to carry out an unrestricted printing of empty money, which instrument has been used on a mass scale in a coordinated manner by central banks of the world's leading economies (ECB, BOJ, FED) since as early as 2008.

It was those factors that initiated changes on financial markets. A brand new, and yet unknown in the history of humans, market came into being - that of a new class of digital assets, cryptocurrencies. It is characterized by a number of features, the first and foremost being, simultaneously, the above-average volatility and a very dynamic growth. Proof of that is the continuously growing number of cryptocurrencies (over 5,600 in mid-June 2020) coupled with the ever-changing volume of their capitalization reaching approx. USD 268 billion (CoinMarketCap 2020). This demonstrates the deep interest in the new class of assets, displayed not only by private users but also by institutions.

Contrary to classic fiat currencies that prevail on markets in unrestricted amounts, the total (final) supply of bitcoin is predefined by an algorithm and will never exceed 21 million pieces, which is calculated to occur in approx. the year 2140 (Kosior 2020). At present, i.e. as of June 2020, the number of bitcoins in circulation is 18.9 million (CoinMarketCap 2020). Thus, the supply of bitcoin has been on the rise, although at a decelerating rate due to the increasing difficulty of "mining" BTC, i.e. of carrying out cryptographic calculations that must be made in order to obtain new currency units. In this respect, BTC imitates physical gold, the supply of which is also relatively constant and has been growing slowly and steadily as its new deposits are being mined. It would seem this is not enough, however one bitcoin is divisible down to the eight-decimal place, i.e. it divides into as many as 100 million parts referred to as satoshi (corresponding to the British penny and the American cent). Thus, there is no fear that a shortage of an appropriate volume of the currency may arise in the future to prevent the coverage of all the transactions settled with it. By comparison, traditional currencies are quoted to four decimal places and physical cash - to two. The limited and predefined maximum supply of bitcoin is the main factor causing it to be treated as a digital asset that may in certain circumstances retain its buying power for a long time.

Another significant bitcoin feature differentiating it from the traditional money is that the market of the former, unlike traditional markets, is decentralized and deprived of geographical or time limits, while functioning 24/7. All those features cause that during the era of quantitative easement and the widespread additional printing of

money, bitcoin and other cryptocurrencies may become in the future an alternative to classic fiat currencies.

3. Definitions of Classic Money

By way of an introduction, it would be worth considering what in essence is money and what is its nature shaped over the ages. Money was since the dawn of time and still is an inherent part of both historical and contemporary civilizations. Without it, our civilization could not correctly function and satisfy the needs of participants in the complex processes of exchanging goods and services, as well as the needs of man taking centre stage, together with his necessities, aspirations, and dreams.

The present deliberations of the scientific world about money focus not so much on searching for the most accurate definition of the money substance, constituting otherwise a fundamental economic category, but rather proceed towards a more practical and so to say utilitarian direction, pointing to the identification of the shapes it can take and the functions it fulfils or should fulfil. Specialist literature recognizes a number of definitions of such a common phenomenon as money is. Intrinsically, their nature is rather more general than specific, which may be due to the very nature of money, given the fact that the essence of its phenomenon is less its form but first of all the function it serves.

This recognition may be confirmed by the definition contained in a publication in the field of macroeconomics, which also deals with the realm of money, in which J. Jagas and H. Pałaszewski specify money to be: "a general and common equivalent of exchange durably expressing the value of goods" (Jagas, Pałaszewski 1997). Goodhart (1977) defines money as "aset of liquid financial assets which has both a close correlation with the development of the economy, and which is potentially subject to the control of the authorities". It is similarly captured in another publication from within this discipline, authored by E. Skawińska, K.G. Sobiech-Grabka, K.A. Nawrot, where it is defined as: "any type of assets commonly accepted as a means of payment" (Skawińska, Sobiech-Grabka, and Nawrot 2010). In this definition, the authors stress the need of having common acceptance based on which (any?) type of assets may function in social awareness as a form of money. This view is confirmed in turn by another definition contained in a well-known book Economics by Samuelson and Nordhaus, according to which: "money is the medium of exchange" (Samuelson and Nordhaus 1995; Friedman and Jacobson Schwartz 1970). A similar argumentation is used by other financiers. To this effect, the well-known Professor of finance, F.S. Mishkin (Mishkin and Serletis 2011) defines money as follows: "money is anything that is generally accepted in payment for goods or services or in the repayment of debts". This view is in the scientific world frequently thought to be tantamount to (or mistaken for) money supply. A conclusion may be drawn that also in the case of money, similarly as with other matters, it is not the form that gives a meaning to a given phenomenon, but first of all its content. It seems that the definition proposed by

E. James (1958) follows this way of thinking, according to which money is any good that has instant purchasing power and the force of a means of payment. This stance on the phenomenon under investigation is confirmed by the formulation presented by J.K. Galbraith, (2017) following which: money is what is usually given or taken while buying or selling goods, services, or anything else. This spirit seems also to underlie the definition given by the best-known representative of the Chicago school of monetarism, M. Friedman (1968) who defines money as: receivables or units of goods, which are generally acceptable as a medium for settling liabilities at a predetermined nominal value. This approach somewhat broadens the concept of money by scrip (deposit) money, i.e. money that originates outside the central bank of the given country (central bank of the uniform currency area, e.g. the Eurozone) owing to the creation of a new money resource by a system of commercial banks.

Based on the above considerations of the definitions of money and its nature, a rather simple conclusion can be reached that money, irrespective of its form, is usually defined from the perspective of the functions it performs in the market exchange process. The most general and common understanding of money is that it is any type of assets commonly accepted as a means of payment (Pigou 1917; Keynes 1930; Goodhart 1977).

4. Definitions of Bitcoin and Cryptocurrencies

Bitcoin as the first and most recognizable virtual money was referred to by its creator Satoshi Nakamoto as: "[A] purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution."(Nakamoto, 2008). In other words, the Bitcoin network functions without any intermediaries or the need of participation by a trusted third party, which to-date were banks with their complex transaction systems. As the market of cryptocurrencies became to develop, bitcoin started to be noticed also by large financial institutions.

The first official and also significant from the systemic point of view financial institution that ventured to define virtual money (cryptocurrency) was the European Central Bank (2012). In the report Virtual Currency Schemes published as late as in October 2012, a virtual currency was defined as: "a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community". By its nature, such money does not have a physical representation in the form of e.g. coins or banknotes, as it functions only in the Internet's digital universe.

Another institution, the European Banking Authority (EBA), presented its own and a little different definition of digital currencies. Following this definition, a virtual currency is: "a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established

currency and does not possess a legal status of currency or money, but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically" (National Bank of Poland 2017). This definition shows emphasis placed on currency decentralization, the simultaneous functioning of national currencies controlled by central banks, and on the phenomenon of certain measurable value being attached to it, which can be used at one's discretion depending on the underlying motive of the entity reporting demand for the given currency.

However, a remarkably interesting approach to defining the essence of virtual currencies (cryptocurrencies) could be observed in Poland. The legislator (the Polish Diet) presented its own definition in the Act under the telltale name of the Act on Counteracting Money Laundering and Terrorist Financing of 1 March 2018. Under the Act, (2018) a virtual currency is deemed to be "digital representation of a value that is not:

a) a legal tender issued by National Bank of Poland, foreign central banks or other public administration authorities,
b) an international settlement unit established by an international organization and accepted by particular countries belonging to or cooperating with such organization,
c) electronic money within the meaning of the Act on Payment Services of 19 August 2011,
d) a financial instrument within the meaning of the Act on Trading in Financial Instruments of 29 July 2005,
e) a bill of exchange, promissory note, or cheque– as well as is convertible in business dealings into legal tenders, is accepted as a medium of exchange, and may be electronically stored or transmitted or may be the subject of electronic trading".

Extreme caution looms out of this definition, displayed by the central authority making the generally applicable national law vis-à-vis cryptocurrencies which may be breaking the state's existing monopoly on issuing currency. An indelible impression arises that the legislator presents - to put it mildly - a rather unfavourable attitude towards a decentralized system that cannot be manually controlled but is based on a blockchain technology enabling "digital representation of a value" (*The Polish Act on Counteracting Money Laundering and Financing Terrorism of 1 March 2018* 2018). The Act title suggests the Polish government's express disapproval of the new revolutionary technology which embodies an irreversible trend in the world finance and which may soon become the competition for and a serious threat to not only central banks, by also the world's entire banking system.

5. Classic Money vs. Cryptocurrency - Similarities and Differences

The initial considerations above may give rise to a conclusion that the most popular and also general definition of money, represented broadly in the specialist literature,

is based on equating money with a general and common equivalent of exchange that durably expresses the value of assets. This is possible only once three elementary economic functions of money are fulfilled simultaneously, being: a medium of exchange (enabling transactions to be performed in business dealings), a measure of value (enabling comparisons to be made between one type of goods and others), a medium used for accumulation of wealth (as it can be used in the future to purchase goods and it will still represent its original purchasing power) (Poskart, 2015).

For the time being, none of the cryptocurrencies fulfils jointly all the functions of money continuously and uninterruptedly and to the full satisfaction of its user. Assuming the perspective of the aforesaid basic definition of money referring to it as "…a general and common equivalent of exchange…" (Jagas and Pałaszewski, 1997) then in the case of cryptocurrencies it is difficult to view them as common. Today, we do not find ourselves in the situation of them being commonly accepted, which is also of key importance for their being a matchmaker – an equivalent - in the process of common exchange of goods and services, which is an inherent feature of contemporary market economy. Yet another basic and inseparable feature of money covered by the aforesaid definition is its ability to durably express the value of goods, i.e. to perform the function of a measure of value for one type of goods in relation to others.

However, considerable fluctuations in the exchange rates of bitcoin and other cryptocurrencies prevent the said function from being fulfilled, making all cryptocurrencies in this very case entirely useless. The only function comprised in the definition of money, which they seem to fulfil is the wealth accumulation function, which is on the one hand due to the limited supply hard-wired into the algorithm of bitcoin (and of other cryptocurrencies), and on the other hand - the common and unrestricted additional printing of money on traditional markets by the central banks of most leading world's economies. Massive concerns about the consequences of those actions, which may with ease lead an outbreak of uncontrolled worldwide inflation, cause that investors start to perceive bitcoin and cryptocurrencies as a kind of digital "gold" that may fulfil the wealth accumulation function belonging so far with first of all and - so to speak - by definition to classic money. This in turn causes their holders to be inclined to store them for fear of uncertain future and for hope of their growing value expressed in classic currencies, not to spend them on ongoing transaction handling. That fact corresponds to the well-known Kopernik-Gresham's law, according to which "bad money drives out good money".

Having subjected digital currencies to an analysis, they may be found to be a type of money bearing many hallmarks characteristic of the good money. Nevertheless, such considerations should become a part of an independent study devoted solely to that aspect. Bearing in mind the argumentation given above, a conclusion could be reached that currently bitcoin and other cryptocurrencies do not completely fulfil all the defined functions of money, but only share some features. The future of the present

money is rather blurred, gloomy, and uncertain to a degree that it is highly likely that cryptocurrencies will play a significant role in the architecture of the future monetary system and will constitute its meaningful part. Accordingly, today they are not money within the classic understanding of this notion but may become its successor or component in the nearest future.

6. Summary and Conclusions

Bitcoin initiated the world's development of digital currencies, laying the groundwork for the establishment of an entirely private, independent of any central banks or governments (decentralized), uncontrollable, global value transfer (monetary) system. Bitcoin and other digital currencies have, thus, become the competition not only for all the fiat currencies, ubiquitous across the modern world's financial system, but also for the existing transaction systems (networks) comprised within the traditional banking system.

All the cryptocurrency definitions quoted in this study, especially those published by financial world institutions and by legislative authorities - being of so much importance from the perspective of the system operation - and giving details about what are and what are not digital (virtual) currencies, demonstrate that bitcoin together with other cryptocurrencies have ceased to be a niche phenomenon as at the time of the definitions being published and that in no way can the novel trend already marked across the world be ignored by pretending it simply does not exist. The entity that came into being as such should be systematized, made more specific, customized, and positioned both against the background of the definitions of money and of the contemporary understating of its phenomenon.

A number of central banks of the world's leading economies and international commercial banks alike, also including international corporations, have already started working on not only implementing their own applications of the blockchain technology but also on their own cryptocurrency – Central Bank Digital Currency (CDBC) or Libra – the Facebook currency. The names blockchain, bitcoin and other leading currencies like ethereum or ripple have started to appear in official documents published by the Bank for International Settlements (known to be the central bank of central banks) and of the International Monetary Fund or the World Bank (Rotman 2014) and describing the challenges to be faced in the future by the world's financial system.

Today bitcoin and other cryptocurrencies are functioning in the existing niche circulation which, although having a bright and promising future, continues to be laden with the element of considerable uncertainty as they do not fulfil most of the functions of money described in money definitions. Nevertheless, the dynamic development of the wonder of digital currencies, the future capacity of the associated market, and the very promising perspectives of their development, cannot have passed

unnoticed by investors, mainstream media, and chief stakeholders in the world of global finance. Market participants are aware of the capacity being offered by the revolution taking place "outside of their jurisdiction" and creating decentralized digital money, in particular its blockchain-based architecture. With the current state of technology, the blockchain cannot be disabled or broken (by hacking attacks), not to mention its threat to the functioning of the existing monetary system established during the Bretton Woods Conference in 1944.

The considerations hereof become a part of the existing modest, yet very necessary, trend intending to bridge a growing gap within the contemporary scientific discourse and within specialist literature being its outcome. Therefore, they should constitute input for further, more detailed investigations and analyses the purpose of which will be to answer the question what the money of the future will be like and to what extent (if any) its definition will change. Will (and to what extent) cryptocurrencies become an integral part of the new monetary system architecture? The usage of cryptocurrencies as official money would bring about a number of far-reaching consequences. First of all, control would be lost by central institutions over the monetary system, its manual control would become out of the question, and the entirety of interactions would be regulated by a completely independent mechanism.

This would entail a thorough reorientation of the present economic relationships and the complete marginalization of the role of the state and of other institutions on the financial markets (Franków, Kopyściański 2016). Significantly, it is difficult to predict in what direction the current - increasingly indebted and ineffective - financial system will evolve, and once and if it collapses what will arise out of its ashes, and what the future money will look like. The sure thing is that it will have to simultaneously fulfil, to the user's satisfaction, all the functions arising from the definitions of money. Otherwise, the system might collapse, bringing dealings back to the barter (goods for goods) exchange, undoing the development of money and market as a whole, and moving them back by millennia, to their most primitive form.

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