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Cryptocurrencies – a return to money being a commodity?

At first, the term “cryptocurrencies” arouses a certain distrust in us, reinforced by their young age and the mathematics and computer science behind them, often incomprehensible to the layman. Meanwhile, from the point of view of statistical analyses, more and more seems to suggest that the cryptocurrency market is becoming mature and can be an alternative to investments in other financial markets.

Statistical analyses conducted by researchers from the Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN) in Cracow clearly suggest that the global market created by several dozen of the most important cryptocurrencies is maturing before our eyes. It is interesting to note that the cryptocurrencies which comprise this market are more and more often treated by interested parties in a manner that refers to the original function of money as a universal commodity of measurable value, which can be exchanged by anyone with anyone, at any time.

The first cryptocurrency, bitcoin (BTC), appeared in 2008 as a virtually worthless means of payment. Suffice it to say that as recently as mid-2010, 5,000 bitcoin could buy at most a pizza. Today, one bitcoin is worth around 36 thousand dollars, the capitalisation of all bitcoins is approaching one trillion dollars, and daily trading on various exchanges reaches several billion dollars. Moreover, bitcoin is no longer alone. Once a monopoly, now still a leader, it currently makes up only 40% of the market. Its main rival is ethereum (ETH) with a share of 20%. In total, there are now over 7,000 cryptocurrencies, with the top 20 accounting for around 90% of the capitalization of the entire market. Most of the transactions in the market thus created take place without the intermediation of traditional currencies.

“Thanks to cryptocurrencies, for the first time in history we have the possibility of a full, quantitative analysis of the dynamics of the financial market from its inception to virtually full maturity,” says Prof. Stanislaw Drozd (IFJ PAN, Cracow University of Technology), one of authors of the analytical paper published in *Entropy*.

The Cracow-based researchers posed the question of potential correlations between different cryptocurrencies: if the returns of one change, how do the others behave? Will rises in the observed cryptocurrency be accompanied by rises in the others? Or will there be falls? Or will there be no interdependence at all?

“The quantitative characterisations we have performed prove that the various cryptocurrencies no longer function independently. They not only ‘see’ each other, but also interact with each other. Their market today is becoming more and more correlated,” reports Dr. Jaroslaw Kwapien (IFJ PAN), co-author of the article.

The observed effect resembles the behavior of stock prices, which are strongly correlated with each other on the global stock exchanges, and results equally from the psychology of investors and various types of algorithms used for trading. An interesting fact is that the increased correlation between cryptocurrencies coincides with the early stages of the pandemic, which may be related to the greater nervousness among investors at that time.

Since cryptocurrencies turned out to be highly correlated with each other, it was natural to ask whether the market thus formed as a whole showed any correlation with other well-known global financial markets, such as the US stock market or oil markets.

“During the period we analysed, covering 2020 and 2021, the cryptocurrency market showed the strongest correlation against the main US stock index Standard and Poor's 500 (S&P500). Synchronisation can also be seen with markets for other commodities such as oil, copper and gold. This is a very interesting result as there were no such correlations before the pandemic and the cryptocurrency market was generally considered as separated from traditional financial markets,” says Dr. Marcin Watorek (Cracow University of Technology), co-author of the publication.

Among the analysed correlations, the correlation of bitcoin to the yen attracted attention. It was very clear but negative: rises in one currency were accompanied by falls in the other, and *vice versa*. However, this phenomenon is a simple consequence of the well-known fact of the negative correlation of the Japanese currency to the oil market.

The work of the Cracow physicists shows that the cryptocurrency market is becoming similar not to the currency market, but to the commodity market. This process is in line with the original idea behind the introduction of bitcoin as money with measurable value, under the control of all players in the market and resistant to manipulation by central banks. However, at the current stage of market development, the assessment of the observed trend should be approached with great caution.

Cryptocurrencies, including bitcoin, are today subject to violent speculation that undermines confidence in their stability and makes them hard to use for valuation of various goods. Consequently, they are still different from, for example, gold or silver, which are the basis for the valuation of goods and are therefore not a speculative instrument. *“However, we should remember that nowadays there are strong changes in the prices of precious metals, and yet they are perceived as relatively safe instruments. So there is a chance that the opinion about some cryptocurrencies will also change someday”*, notes Dr. Kwapien.

Bitcoin and other cryptocurrencies are increasingly seriously beginning to be seen as fulfilling their original intention of protecting fiat currencies from loss of value during a period of increasing monetary base by central banks.

“In recent years, the cryptocurrency market has grown and matured to such an extent that it can be treated as a potential investment alternative to other financial markets. However, this market still has to deal with many obstacles to be considered as a potential alternative to the international Forex currency market,” concludes Prof. Drozd.

The Henryk Niewodniczański Institute of Nuclear Physics (IFJ PAN) is currently one of the largest research institutes of the Polish Academy of Sciences. A wide range of research carried out at IFJ PAN covers basic and applied studies, from particle physics and astrophysics, through hadron physics, high-, medium-, and low-energy nuclear physics, condensed matter physics (including materials engineering), to various applications of nuclear physics in interdisciplinary research, covering medical physics, dosimetry, radiation and environmental biology, environmental protection, and other related disciplines. The average yearly publication output of IFJ PAN includes over 600 scientific papers in high-impact international journals. Each year the Institute hosts about 20 international and national scientific conferences. One of the most important facilities of the Institute is the Cyclotron Centre Bronowice (CCB), which is an infrastructure unique in Central Europe, serving as a clinical and research centre in the field of medical and nuclear physics. In addition, IFJ PAN runs four accredited research and measurement laboratories. IFJ PAN is a member of the Marian Smoluchowski Kraków Research Consortium: “Matter-Energy-Future”, which in the years 2012-2017 enjoyed the status of the Leading National Research Centre (KNOW) in physics. In 2017, the European Commission granted the Institute the HR Excellence in Research award. The Institute holds A+ Category (the highest scientific category in Poland) in the field of sciences and engineering.

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SCIENTIFIC PUBLICATIONS:

“Cryptocurrency Market Consolidation in 2020–2021”

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LINKS:

<http://www.ifj.edu.pl/>

The website of the Institute of Nuclear Physics, Polish Academy of Sciences.

<http://press.ifj.edu.pl/>

Press releases of the Institute of Nuclear Physics, Polish Academy of Sciences.

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The cryptocurrency market is starting to consolidate and is becoming more and more like a commodity market, according to research by the Institute of Nuclear Physics of the Polish Academy of Sciences in Cracow. (Source: IFJ PAN)