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Recognition of Cryptocurrencies Based on Empirical Tests

Rozpoznawalność kryptowalut w świetle badań empirycznych

Introduction

The issue of cryptocurrencies is becoming an increasingly important one in the world of high finance, in particular since December 2017 when bitcoin broke the so-called "glass ceiling", reaching a value of 20 thousand per unit. Due to this – not the first but the most spectacular stock exchange peak – the words "bitcoin" or "cryptocurrency" are among the most commonly used phrases [*Polska – raport specjalny…*, 2018, p. 2].

The evermore heated debate of both advocates and opponents, presenting their numerous arguments, gave rise to this paper, whose aim is to compare the recognition of international currencies to that of digital financial currencies operating globally. The paper also presents the author's findings on the level of cryptocurrencies recognition among the general public, as well as the opinions of survey respondents.

The study begins with an introduction to the concept of cryptocurrency, followed by the main assumptions of bitcoin, with a special focus on its dominance among

cryptocurrencies, after which the application of blockchain technology is outlined. The paper ends with the presentation of the author's results and suggestions for the directions of further research.

1. Cryptocurrency

The issue of cryptocurrency is receiving increasing interest among both its proponents and opponents. This is a result of the fact that cryptocurrency challenges the *status quo* in the monetary payment systems controlled by states and banks. These changes, however, are difficult for them to accept.

An analogy might be made here to the situation in 2014, when UBER, applying a new technology and absolutely novel approach, began their operations in the Polish market and offered car services. Initially, this new market player caused protests, but the new technologies were then implemented in car services.

Similarly, Satoshi Nakamoto may be credited for paving the way for changes; he created virtual money (and designed bitcoin). He wrote the whole manifesto *Bitcoin – A Peer-to-Peer Electronic Cash System* [Homa, 2015, p. 171] where the greater part of terms are defined centrally (among others: decreasing circulation of coin supply by 2033 [BLOCKCHAIN.INFO]), and, contrary to international currencies, these terms are not to be subject to any changes.

A cryptocurrency is a conventional cryptographic unit that stores information on the user's holding that functions in the digital accounting system and complies only with the rules of free trade. According to the words of Nakamoto, "in 20 years either the volume of transactions in bitcoin will be very high or it won't be used in transactions at all" [Kopańko, Kozłowski, 2015, p. 7].

Cryptocurrencies owe their power to technology, especially to the solution referred to as blockchain that allows cryptocurrencies to be independent of the external environment that is unfavourable for them (such as, among others, organizations, states, and groups of interests that are afraid of the entry of a new independent solution onto the financial market). Blockchain is a decentralized data base encrypted by means of cryptographic algorithms (elliptical curves) which makes use of the architecture peer-to-peer (P2P) to make transactions by users.

Bitcoin has two very important distinguishing features. One is rare occurrence – characteristic of rare metals such as gold or silver. The other is a centrally established limit of bitcoins possible for mining at the level of 20 999 999.97690000 BTC. In addition, cryptocurrencies, similarly to international currencies, may be viewed as fiat money[1].

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[1]   According to the National Bank of Poland, an international currency is money functioning internationally both in the official and private spheres [*Funkcje pieniądza międzynarodowego…*, 2011].

Table 1. Cryptocurrency market capitalization over years (in billion USD, June 2018)

	2009	2013	2014	2015	2016	2017	2018*
With bitcoin	0	1	8	4	12	105	265
Without bitcoin	0	0.1	0.7	0.5	1.7	8	145

* as of 1 April
Source: https://coinmarketcap.com/charts/ [access: 16.04.2018].

The increasing popularity of cryptocurrencies is confirmed by the growth of the global market capitalization. The inflow of funds is presented in Table 1. It is worth noting that bitcoin is 1.8 times more dominant than the rest of cryptocurrencies.

The growth in the popularity of cryptocurrencies may be observed in the US, Japan, Korea or Great Britain. In research carried out in the US (a sample of 2,001 Americans), as many as 1 out of 12 (7.95%) declared their possession of a certain amount of cryptocurrencies, and 5.15% admitted holding bitcoin (further in the rating is Ethereum at a 1.8% level). Compared to the entire population, this amounts to more than 2 million Americans [*Ankieta Findera: Co…*, 2018]. Another country where this market is developing is Japan where – according to the Financial Services Agency report – as many as 3.5 million inhabitants actually take part in the cryptocurrency trade [*3,5 miliona Japończyków…*, 2018]. Equally enthusiastic about cryptocurrency are as many as 40% of Koreans, while their actual holding is declared by 5.2% of all they surveyed [*40% młodych Koreańczyków…*, 2018].

Bitcoin is a means of payment that exists only in its virtual form and is stored in the individual wallets of users. An example of a wallet may be found at: 1PmzAik-sLzgcJjPAVqftBRPqjS7uuBVWKL. By means of NiceHash application, bitcoins are mined onto a wallet (by means of NiceHash application) and transferred (at a value of 0.00984255 BTC), which may be verified at https://blockchain.info/.

2. Research findings analysis

2.1. Research methodology

The research on the recognition of cryptocurrency comprised university students, and the characteristics of the research sample are presented in Table 2. The survey was anonymous and to run it, the CAWI (Computer-Assisted Web Interview) technique was applied. An electronic version of the questionnaire was posted on the website (http://ankiety.ekonomia.umcs.lublin.pl). The survey was carried out between February and April 2018 and involved 742 respondents.

First, 67 records (9.0% of the total) were removed while processing the data. The main reasons for the removal of part of the recordings were, among others, empty records, incompletely filled-in questionnaires, and questionnaires with a total time for completion below 80 seconds. A final sample size was 675 respondents (91% of the total).

Table 2. Characteristics of the sample of the research into cryptocurrency recognition

		Responses (%)
Gender	Male (average age 20.07)	35.4
	Female (average age 20.06)	64.6
Declared place of residence	Country	35.7
	City with 200,000–499,999 inhabitants	26.7
	City with less than 50,000 inhabitants	21.5
	City with 50,000–199,999 inhabitants	10.5
	City with more than 500,000 inhabitants	5.6
Education	Secondary	85.5
	Undergraduate	6.2
	Post-secondary	4.6
	Vocational	2.8
	Others	0.9

Source: Author's own study based on the survey.

The size of population according to the Statistical Office in Lublin (and considering the processed studies) was 73.7 thousand. The confidence level was 95%, and the sampling fraction was at the level of 0.5. The maximum error was at the level of 4% [*Kalkulator doboru próby*, 2018].

The data collected were analysed and elaborated on, and the achieved results are presented in the next part of the article.

2.2. Recognition of international currencies

The respondents were asked to give spontaneously the names of five international currencies[2]. After providing the answers, the respondents turned to another questionnaire page where they could choose currencies they were familiar with.
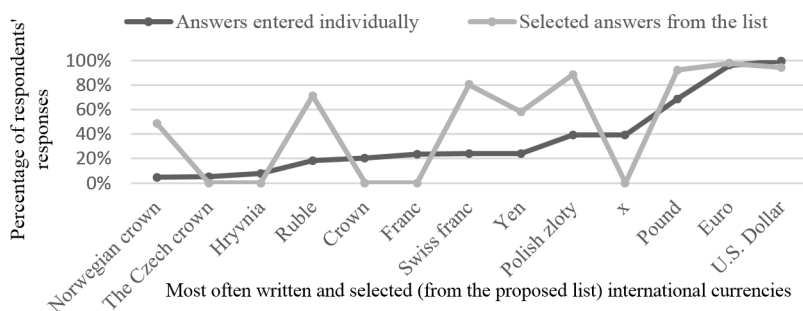

Figure 1. Summary of most often given and selected international currencies (from the suggested list) among the respondents

Source: Author's own study based on the research.

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2 In the 1970s, following the agreements at Bretton Woods, there was a departure from coating coins with bullion.

As Figure 1 shows, approximately 90% of persons know cryptocurrencies such as the euro, US dollar or pound (the respondents probably meant pound sterling) very well. More differences between the given and selected answers occurred in the case of such currencies as Polish zloty, yen (probably Japanese yen), Swiss franc, Russian ruble or the Norwegian krone, where the discrepancy is at the level of more than 30%. Additionally, in a number of cases, the respondents made spelling mistakes in the names (e.g. "hryvnia", "ruble"), factual mistakes (e.g. Swiss pound or British dollar), or gave incomplete names of currencies (e.g. "korna" or "frant"), which made it impossible to group a given response. The respondent also had the option to write "x", which means that he/she was not able to mention a higher number of international currencies in at least one field.

2.3. Recognition of cryptocurrencies

The respondents were also obliged – similarly, as in the case of international currencies – to write down (and in the next page to select) currencies familiar to them, which are presented in Figure 2.

While writing down currencies familiar to them, the respondents were able to indicate on average only two names of cryptocurrencies, filling in other fields with the mark "x" (average 3.23). This proves a significant lack of knowledge of other cryptocurrencies. In the next question, where the respondents were asked to choose the cryptocurrencies they know well in the proposed list, only 11.4% of them admitted that they do not know any cryptocurrency. Figure 2 also shows that bitcoin dominance is unquestionable, as it fluctuates between 75.6% and 86.7%. Similar research was carried out by the portal Ceneo.pl, according to which 84% of Poles know what bitcoins are [*Jak dobrze Polacy…*, 2018].
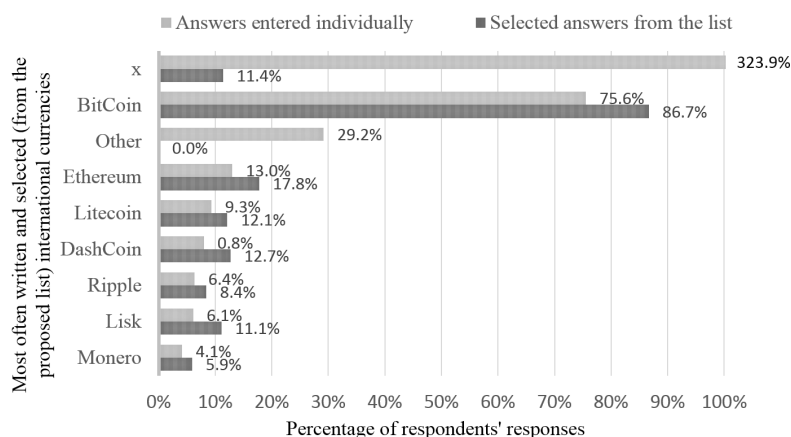

Figure 2. Summary of the most frequently indicated and selected cryptocurrencies (from the suggested list)

Source: Author's own study based on the research.

Another category ("others"), got as much as 29.2%, and this category was created because among the answers provided by the respondents, there were single names of cryptocurrencies or elements of a similar nature. The second cryptocurrency recognized globally achieved 13%–17.8%.

Despite the significant recognition of bitcoin among the respondents, only 17.8% declared their contact with cryptocurrencies, and 82.2% declared no such a contact at all, which might have an effect on the perception of cryptocurrencies as a hazardous financial tool. This situation is illustrated by Figure 3. According to the research, 35.2% of the surveyed expressed some moderate concerns about cryptocurrency security, 20% believe cryptocurrencies to be secure, and nearly a half (49.8%) view this security as very low.
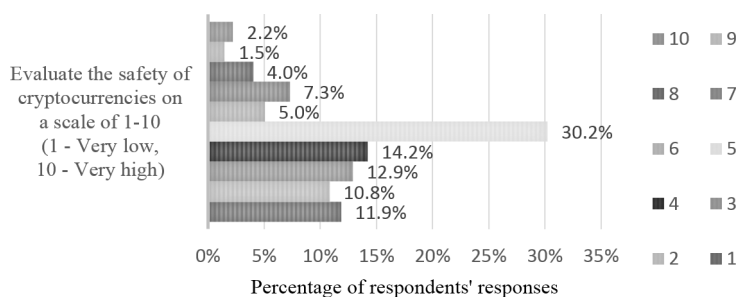

Figure 3. Assessment of cryptocurrency security according to the respondents

Source: Author's own study based on the research.

The respondents who declared the contact with cryptocurrency provided answers to additional questions. In this extra part, the answers given by 120 research participants admitting their contact with cryptocurrencies were analysed.

The first of these questions (in the case where the contact with cryptocurrencies was declared) was related to cryptocurrency theft. 97.5% (117 persons) of the respondents did not encounter cryptocurrency theft, but, unfortunately, 2.5% of the respondents (3 persons) confirmed they had encountered this phenomenon.

Figure 4 presents the respondents' contact with cryptocurrencies (multiple choice questions were asked). More than a half (55.8%) declared their interest in the cryptocurrency market, while one in four declared mining cryptocurrency as a hobby, every fifth respondent selected cryptocurrency as an investment for the future or a donation they received, 10.8% declared cryptocurrencies to be a short-term investment of a more speculative nature, only 4.2% chose to make transactions, and 10% chose the option "others", for which they wrote "university", "talks with friends", and "websites".
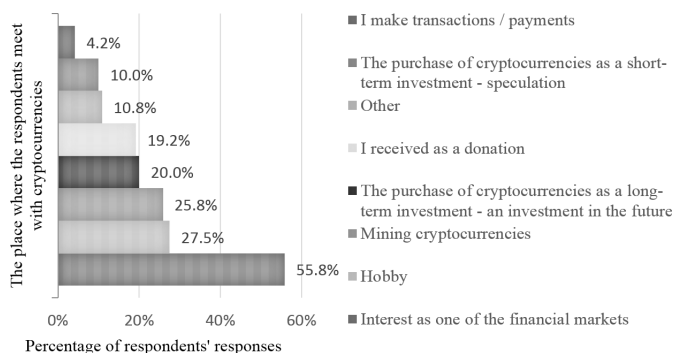
Figure 4. The place of contact of the respondents with cryptocurrencies

Source: Author's own study based on the research.

To compare, as many as 87% of the respondents taking part in the Korean Central Bank are holding cryptocurrencies, mostly for investment purposes [*40% młodych Koreańczyków…*, 2018].
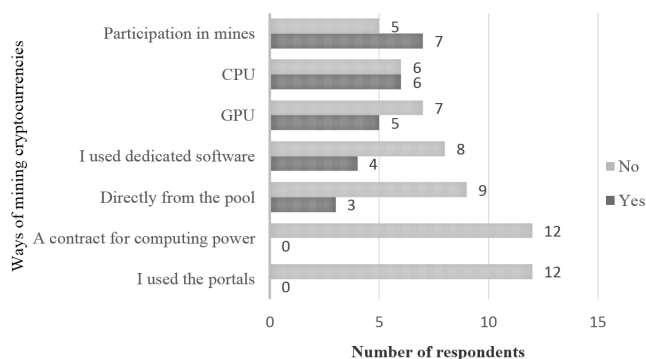

Figure 5. Summary of the ways used to mine cryptocurrencies by the research respondents

Source: Author's own study based on the research.

Persons who declared mining cryptocurrencies provided answers to an additional question related to mining cryptocurrency. Figure 5 confirms that 7 respondents declared their participation in cryptocurrency mines, 6 of them mined using a CPU (central processing unit), 5 respondents used their own GPU (graphics processing unit), 4 respondents declared their use of dedicated software, and 3 persons were mining directly from the pool. Two users gave also their approximate power of mining, which is 25 MH/s and 5.5 GH/s, respectively.

According to the research by Ceneo.pl, 31% of Polish respondents were able to indicate a specific place where cryptocurrencies were accepted [*Jak dobrze Polacy…*, 2018]. In the survey conducted by the author, the respondents were asked

if they knew websites where payments may be realized with cryptocurrency. In the research sample, 11.7% of the respondents declared the knowledge of portals that accept cryptocurrency, which is more than two times less than in the research run by Ceneo.pl [*Jak dobrze Polacy…*, 2018].

In the research conducted by Paymentsense (January 2018) in the UK, as many as 35% of 504 small British companies expect that within two years, cryptocurrency transactions will become commonplace, while 21% believe cryptocurrency payments will be widely available as early as in 2018 [*Research: Will Cryptocurrency…*, 2018].
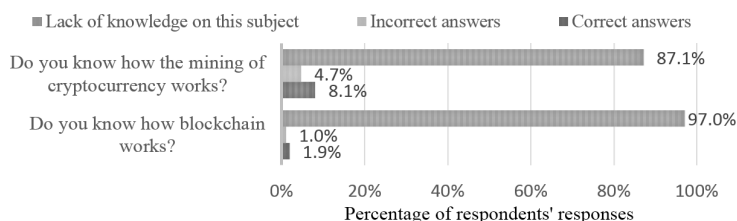

Figure 6. The respondents' knowledge of rules of mining cryptocurrencies and block-chain functioning

Source: Author's own study based on research.

The respondents were asked to explain what cryptocurrency mining is and the rules governing blockchain functioning. As Figure 6 shows, as many as 87.1% were not able to determine the rules of mining cryptocurrency, and 97.0% of the respondents do not know how blockchain functions.
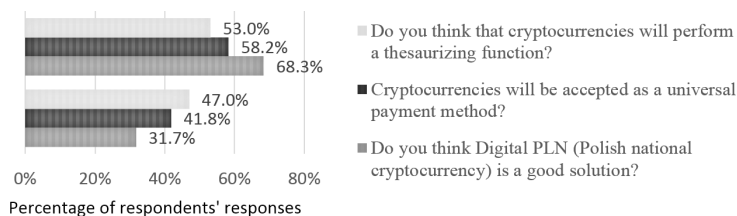

Figure 7. Summary of responses of those who support selected statements (%)

Source: Author's own study based on research.

In the sequence of questions, the respondents were asked to choose between the options "Yes" and "No" to show their attitude towards subsequent statements, the results of which are shown in Figure 7. Slightly more than half (53.0%) of the respondents think that cryptocurrencies will not play the hoarding function, and 41.8% believe that cryptocurrencies will be accepted as a widespread means of payment. Almost every third person (68.3%) does not support the idea of Digital PLN, which was also abandoned by the Polish government [Tomaszewski, 2018].

Conclusions

The recognition of cryptocurrency (both spontaneous and supported) is lower than the recognition of international currencies. The research findings reveal the significant dominance of bitcoin among functioning cryptocurrencies. The reason for the bigger recognition of bitcoin might also be a significant growth in its value, which on 17 December 2018 (at 13:19:14 UTC +1) achieved a value of USD /1 BTC20.089,00 (approx. PLN / 1 BTC 67.553) and at present (20 April 2018) the exchange rate is fluctuating around USD / 1 BTC 8.000 [CoinMarketCap].

As for the contact with cryptocurrency, only one person out of five (17.8%) declared any contact at all. Potential young users rate cryptocurrency security very low, which may instead indicate there is limited knowledge about blockchains as a very good cryptographic algorithm. Moreover, persons who declared any contact with cryptocurrency showed mainly a general interest in the subject of cryptocurrency rather than in mining or long-/short-term trading.

The research findings may suggest that the interest in cryptocurrency is not going to be so dynamic as was commonly assumed. This is proved by the fact that the knowledge of cryptocurrency among the younger generation is relatively low, as this is usually a group of advocates who often make use of various technological developments.

The author is aware of some constraints in inferring on the basis of the presented research; it was carried out on a local scale among academics. A full picture of cryptocurrency recognition requires running cross-cutting nationwide research. Furthermore, detailed research into related areas would also be justified, with the focus on:
- the level of knowledge of cryptocurrency in society;
- determinants of the weak recognition of cryptocurrency;
- a comparative analysis of the tax treatment of cryptocurrency in the area of the European Union.

Apart from the above-mentioned directions of future studies, it seems desirable to conduct research into the level of capacity of the society to use cryptocurrency.

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Rozpoznawalność kryptowalut w świetle badań empirycznych

Wzmożone zainteresowanie kryptowalutami stało się bodźcem do podjęcia dyskusji pomiędzy ich zwolennikami i oponentami. Celem artykułu było porównanie rozpoznawalności funkcjonujących na świecie walut międzynarodowych i cyfrowych kryptowalut oraz przedstawienie wyników badań własnych autora, dotyczących rozpoznawalności kryptowalut wśród respondentów. Opracowanie rozpoczęto od podkreślenia wiodącej roli bitcoina wśród obecnie wykorzystywanych kryptowalut, następnie przedstawiono miejsca styku respondentów oraz ich wiedzę na temat kryptowalut. Z wyników przeprowadzonych badań wynika, że rozpoznawalność kryptowalut (zarówno spontaniczna, jak i wspomagana) jest mniejsza niż rozpoznawalność walut międzynarodowych, a bitcoin jest najbardziej znaną kryptowalutą.

Recognition of Cryptocurrency Based on Empirical Tests

The growing interest in cryptocurrencies has become a springboard for debate between their proponents and opponents. The aim of this paper was to compare the recognition of international currencies to that of the digital cryptocurrencies in operation globally. It also presented the author's findings related to the recognition of cryptocurrencies among the respondents. The study begins by emphasising the leading role of bitcoin among the currently used cryptocurrencies, and then highlights the areas of contact of the respondents as well as their knowledge about cryptocurrencies. The results demonstrate that while the recognition of cryptocurrencies (both spontaneous and supported) is lower than the recognition of international currencies, bitcoin is the most recognized cryptocurrency.