

CRYPTOCURRENCY MARKET OF BITCOIN AND PAYMENT ACCEPTABILITY IN E-COMMERCE

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Abstract

The purpose of this article is to present the cryptocurrency market from the perspective of its acceptability as a means of payment in e-commerce. It should be emphasized here that considered in this perspective are only legally operating economic entities that accept payments in, among others, bitcoins for their activities. It should be emphasized that a positive attitude to this form of settlements automatically increases confidence in cryptocurrencies, as well as greater recognition of them, which at the same time conditions their further development. It is not without significance that the largest number of companies carrying out such settlements in the US is dictated by the fact that it is the most advanced market in this respect, the so-called high-tech trade turnover in e-commerce. In the case of Europe, the best developed economies like Germany or Great Britain lead the way. It is worth emphasizing that not so long ago, i.e. before COVID-19, payments in cryptocurrencies were not significant in countries such as Middle East or Asia. It resulted from unfavourable legal regulations in the countries of the region, such as China. However, the pandemic and the ubiquitous form of contactless payment, the purpose of which is to minimize contact for the benefit and protection of health, has caused the world of virtual finance, including cryptocurrencies, to have more and more supporters, for example because of the aforementioned minimal or even zero money-money contact. This is especially new in the case of cryptocurrencies, as the very idea of their formation and the circulation mechanism break the assumptions of traditionally adopted paradigms in economic sciences, where the Central Bank is the issuer of money and money operates in centralized circulation, which in the case of cryptocurrencies is not completely reflected. It should be emphasized, however, that in today's dynamically and unpredictably changing times, the search for new payment solutions or capital investment opportunities, which are provided by cryptocurrencies, arouses more interest.

Keywords: cryptocurrencies, e-commerce, payment, bitcoin, companies, finance-technology

1. INTRODUCTION

Monetary policy is the fiscal policy, the main macroeconomic pillar of the state. It is intended to affect interest rates, exchange rates and their relationship to the real economy [M. Burda]. The following monetary policy instruments are distinguished, i.e. open market operations, determining the required reserve rate, determining the rediscount rate, refinancing operations. This policy is a policy on the relationship between the money demand and the money supply. A unique story about the interest rate that affects the rate of money, which in turn affects the processes of inflation, employment, cost of credit for investors, etc. The government may affect monetary software indirectly, e.g. through budget deficit, the size of the complaint debt or the size of fiscal redistribution.

Therefore, the scientific study of monetary analysis from the perspective of cryptocurrencies should use the initial operational criteria of monetary policy, i.e. caring for the value of the national value, and therefore the right amount of money for the market, so that the economy can develop without any obstacles and prices are stable. It should be added that this is the initial assumption of the monetary policy of the state, which in the process of developing online money in this area of financing technology changes [J.Gali].

The quest for an independent digital currency began in 1992 when T. May, a retired Intel physicist, invited a group of friends to his home outside Santa Cruz, California to talk about privacy and the nascent Internet. In the previous decade, cryptographic tools such as public key encryption have proven useful for controlling who can access digital messages. Fearing a sudden shift in power and information

control, governments around the world have started to threaten to restrict access to such cryptographic protocols.

So it can be said that: just as printing technology has changed and diminished the power of medieval guilds and the structures of social power, the same cryptological methods will fundamentally change the nature of corporations and government interference in economic transactions.

In the same period, N. Szabo was one of the first to envision a new digital currency from scratch. While many believe his program, which he has called "bit gold", is the precursor to Bitcoin, privacy was not the most important thing in his design. The main goal was to turn zero into something people value: "I started to think about the analogy between hard-to-solve problems and the difficulty of mining gold," he said. If a puzzle took time and energy to solve, it could be considered to have value, reasoned N. Szabo. This solution can be given to someone as a digital coin [N.Szabo].

In N. Szabo's bitco-gold scheme, a shareholder would dedicate a computer to solving cryptographic equations assigned by the system. "Anything that works well as a proof of work function, creating a specific binary string so that it can be proved that generating this string is computationally expensive, will work" - said Szabo. In the golden web, the solved equations will be sent to the community, and if accepted, the work will be assigned to the person who did it. Each solution will become part of the next challenge, creating a growing chain of new real estate. This aspect of the system provided a clever way for the network to verify and stamp new coins because if most parties did not agree to the new solutions, they could not start the next equation [C. Walsh].

When trying to construct a transaction with a digital coin, the problem of "double spending" arises. After the data is created, restoring it is a simple matter of copying and pasting. Most e-cash scenarios solve this problem by dropping some control to a central authority that keeps track of each account balance.

Bit gold proved that it was possible to decentrally transform solutions into difficult calculations for ownership. But property is not cash and the proposal leaves many problems unresolved. After b-money and bit gold did not get broad support, the scene e-money ceased to be a topic of interest.

Due to the programmer under the pseudonym Satoshi Nakamoto, in 2008 he presented in his work "Bitcoin: A Peer-toPeer Electronic Cash System" the idea of the functioning of an electronic payment system eliminating the need for intermediaries to guarantee the correctness and security of financial transactions; January 2009, i.e. with the launch of the bitcoin system. Bitcoin can be understood in both narrow and broad terms. Bitcoin in a narrow sense refers to a unit which is a cryptocurrency, while in broad terms, bitcoin refers to a system that allows the execution of payments with the use of cryptocurrency units, which includes an innovative IT system and entities involved in it. The appearance of the bitcoin cryptocurrency should be included in the more and more accepted form of intangible money payments observed in the world. The functioning of the bitcoin system can be treated as a consequence of the so-called networking of society and economic transactions. In the literature on the subject, there is also the view that the creation of bitcoin could be an expression of disapproval of the way financial institutions function. The creators of the bitcoin system assumed the possibility of making direct and anonymous transactions in e-commerce. The advantages of the bitcoin system are especially seen in the case of the so-called micropayments. In the case of micropayments, it should be understood that in the traditional system, the costs of this type of payments are relatively high due to the necessity of the so-called a third trusted party as well as the possibility of withdrawing an already completed payment. The several years of functioning of the Bitcoin system have proved that the existence of a relatively effective and efficient payment system is real, largely independent of traditional financial institutions. It also indicated that the original assumption of Bitcoin's payment application was not only to focus on users and media. Cryptocurrency quotes indicate the use of Bitcoin, e.g. for investment purposes. Thus, the main players in the Bitcoin system are cryptocurrency users and bitcoin acceptors. In the first years of this innovation, their number grew dynamically, contributing to the increase in the usefulness of the Bitcoin system and the possibility of its economic application. The other participants of the system are cryptocurrency trading platforms and entities supporting the execution of bitcoin transactions, such as payment integrators. Worldwide, the number of Bitcoin users is estimated at several

hundred thousand to several million people. The Polish Bitcoin market, with the number of participants estimated at several thousand, has a significant position in Europe.

2. MATERIALS AND METHODS

2.1. Materials

This study uses materials from both English and Polish publications. The choice of such popular science publications in these languages is due to the fact that it is in the area of these countries, i.e. highly developed countries, that the issue of bitcoin and cryptocurrencies is more and more often discussed. In the case of compact materials, articles and publications from universities that deal with the broadly understood issues of cryptocurrencies in the perspective of their impact on the traditional financial market. It should be emphasized that the phenomenon of cryptocurrencies is perceived as an element of breaking in a number of the adopted paradigm in which the mechanisms of the currency functioning are conditioned by the issuance and centralized control in the Central Bank of a given country. Cryptocurrencies are created and function in the area of a decentralized mechanism, which means that they are not controlled by one main apparatus in the area of the financial system or the monetary state. Therefore, following the widely accepted and widely recognized standards and principles of the functioning of financial markets in the sciences of finance and economics, this study must not forget about the reference of cryptocurrencies to the area of traditionally adopted fiat finance. It should be emphasized that the Covid-19 pandemic has led to a situation in which the world of virtual finance, previously reluctantly accepted by the governments of several countries in the world, is now becoming, among others, due to contactless payments, thus minimizing the risk of contracting coronavirus, an increasingly important element of the financial market. Therefore, the presentation of the cryptocurrency phenomenon, among others Bitcoin, but also others such as Ethereum or Litecoin, which, like traditional currencies, the Dollar, Euro or Yen, compete with each other. They are becoming not only an acceptable form of payment in e-commerce in the coronavirus pandemic, but some argue that in the future it is one of the most popular and at the same time safe.

2.2. Methods

This article will use the analytical and descriptive method and a comparative analysis. First, the general characteristics of entities accepting bitcoin payments will be presented. This means determining the location of the seat of the business. Presenting and analysing this element at the beginning will show that the Bitcoin acceptance market in e-commerce has been functioning so far in highly developed countries. It seems that in the descriptive analysis the country representing this form of payment is the United States, which may result from the fact that it has one of the largest in terms of the value of the turnover of the most technologically advanced e-commerce markets [F.Richter], in which there are many market niches for innovative solutions.

Then the descriptive analysis and comparative analysis will concern the economic nature of acceptors of bitcoin payments. Then, the use of bitcoin in the strict sense in e-commerce will be presented, at the end, a descriptive analysis that determines the factors conditioning the implementation of the payment function by the cryptocurrency, which is Bitcoin. Such application of the aforementioned methods should clearly present the way cryptocurrencies function in e-commerce, which are increasingly being chosen by potential clients in a pandemic.

Entities accepting bitcoin payments

Before presenting the way of functioning and payments in the electronic trade of Bitcoin is presented, it is worth presenting once again the way of functioning in this virtual currency in the perspective of treating it as a means of payment. The best way to understand Bitcoin is to think of it as a digital book. Imagine a group of people at a table where everyone has real-time access to the same financial ledger on the laptops in front of them. The account book records: how many Bitcoins each person at the table has at a given moment, the balance of each account is necessarily public information, and if one person wants to transfer funds to the person sitting in front of him, he must announce this transaction to everyone present at the table. The whole group then appends the transactions to the general ledger which

all have to reconcile. In such a system money never has to exist in physical form and it cannot be spent twice. Basically, this is how Bitcoin works except that participants are dispersed in the global peer-to-peer network and all transactions take place between addresses on the network and not people. The ownership of the address is verified using public key cryptography without revealing who owns the system. This mechanism is used to replace traditional banking and transactions are made publicly but it is difficult to connect them with human identity. Maintaining dissociation requires vigilance on the part of the Bitcoin user and careful decision making as to which external applications in the exchange method are in use.

Before the issue of payments in e-commerce Bitcoin is discussed, let's look at this cryptocurrency in general from the point of view of its features.

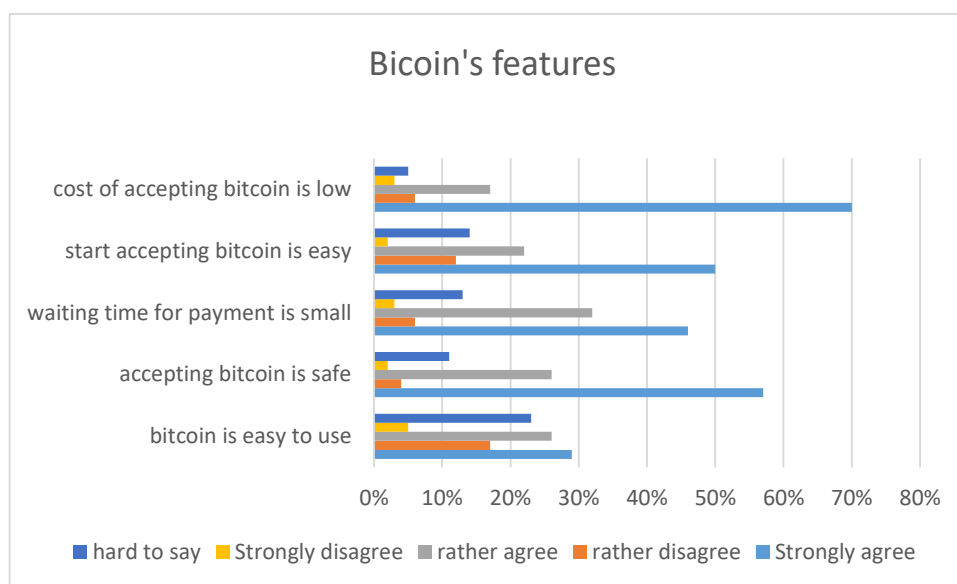


Fig. 1. Bitcoin's features

Source: A.I. Piotrowska, Bitcoin, płatnicze i inwestycyjne zastosowanie kryptowaluty, CeDeWu, Warsaw 2018, Poland

Based on the above list of bitcoin's features, it can be said that it is generally positively received by its users. The biggest advantage of bitcoin is the low cost of service and, interestingly, the security of bitcoin acceptance. It should be said that in the case of running a business, an important element is also the speed of the funds' impact on the seller's market, which has a significant impact on the decision regarding the acceptance of a given payment. Therefore, Bitcoin is more and more often chosen as a payment method also due to the short waiting time for payment. However, it should be noted that, based on the presented list, the greatest problem of the financial market among everyday users is still the ease of its use due to the fact that it is a new element of the financial market. This means that, despite everything, it is such a new phenomenon that it is not perceived as an easy element of financial trading on the market, which means that payments in this cryptocurrency require further refinement and familiarization with it by users.

It has already been said the Bitcoin acceptance market in e-commerce has been functioning so far, i.e. before Covid-19, mainly in highly developed countries, therefore the most numerous users in the field of e-commerce. Former clients from the United States, which, as it was said earlier, results from the fact that they have one of the largest in terms of value of turnover one of the most technologically advanced e-commerce market. In the case of European countries, the greatest number of users can also be found in the highly developed countries of the old continent, i.e. in Germany or the United Kingdom. One may be tempted to say that this proves the openness of operation in these countries of economic entities

willing to operate in the area of new technologies. Nor should it be surprising that the least potential customers accepting this form of payment can be found in Africa and the Middle and Far East. One may be tempted to say that this situation results from the lack of announcements on the acceptance of cryptocurrency payments on international websites due to three main reasons: the local nature of the activities of entities in this area, unfavourable legal regulations in a given country, one example of which may be the problems of Chinese companies receiving virtual currencies [P.Chu] as a form of payment and the fact that some entities hide their activities with the use of Bitcoin, another limitation in these countries may be the lack of infrastructure. This means that in these countries a large proportion of people do not have their company's registered office formally registered.

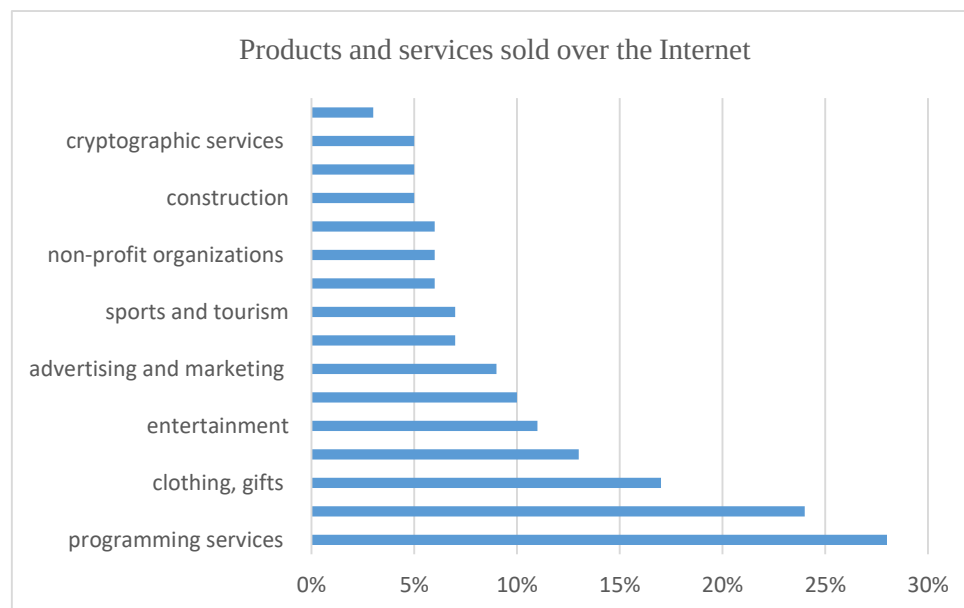


Fig. 2. Products and services sold over the Internet

Source: A.I. Piotrowska, Bitcoin, płatnicze i inwestycyjne zastosowanie kryptowaluty, CeDeWu, Warsaw 2018, Poland

Based on the above chart, it can be said that the acceptance of bitcoin as a currency used in online trading is widespread in many industries, but the dominant role is played by services that can be provided remotely, such as programming and hosting, but also design or financial. Providing services remotely in the era of the Covid-19 pandemic is another element showing how the world of flat finance is forced to enter the area of virtual finance. It should be emphasized that although the chart presents what happened on the Polish market in the area of e-commerce in 2018, at present the percentage share of other services or goods paid in e-commerce would be much higher. An example may be the participation of entities offering clothing and services as well as electronic equipment in which you can pay with bitcoins. It is worth noting that the presence of bitcoin among entities related to broadly understood entertainment is also interesting, i.e. the purchase of tickets to the theatre, cinema or amusement parks. This is dictated by, for example, faster purchase of a ticket without having to queue to buy it, which in the era of Covid-19 is associated with contact with too many people, which can be dangerous to your health. It is also worth emphasizing that Covid-19 has currently had a large impact on the offers in the area of health, beauty and education. The overwhelming majority of these services have entered the virtual world. The area of health and beauty in the virtual world includes classes in fitness schools and yoga schools carried out through videoconferencing platforms. Both early childhood education and higher education have also entered the virtual world. It is also worth emphasizing that non-profit organizations are starting to use Bitcoin in the fundraising process.

In addition to elements such as specifying the categories of products and services sold over the Internet as part of online bitcoin payments, it is also worth considering what is the average value of one order or transaction. This is because payments in bitcoin carry out mainly low-value transactions. A number of studies conducted in this area have shown that most of these are operations below \$ 50 or in the range from \$ 50 to \$ 249, however, it should be emphasized that the low values of individual transactions should be associated with the type of assortment offered in which the dominant service, as shown in the chart above web hosting apparel and gifts. In addition, it is worth emphasizing that a number of studies conducted by American researchers, i.e. in the country where internet transactions are most popular, have shown that the average number of transactions carried out in a period of one month is at the level of 250, so this proves the small scale of operations of entities accepting the payment in bitcoins, which is characteristic of micro and small enterprises dominating in this area.

In the case of cryptocurrency payments in e-commerce, it is also worth considering which payment methods accepted by participants are most often chosen in the case of Bitcoin cryptocurrency.

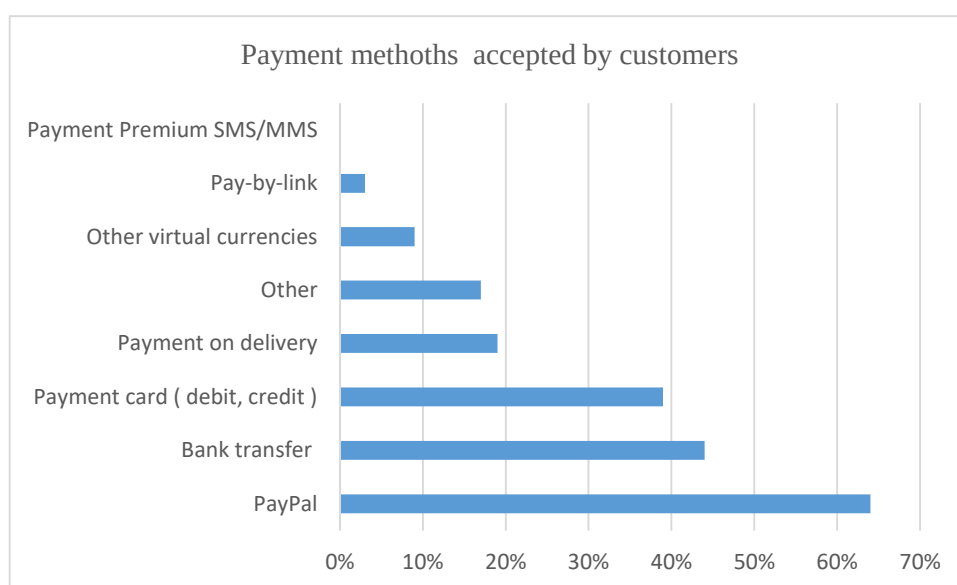


Fig. 3. Payment methods accepted by customers

Source: A.I. Piotrowska, Bitcoin, płatnicze i inwestycyjne zastosowanie kryptowaluty, CeDeWu, Warsaw 2018, Poland

Based on the above statement, it can be concluded that 64% of customers in the e-commerce payment system use PayPal services. This may mean that it is one of the most popular payers in international trade, the scope of which also includes payments in the Bitcoin cryptocurrency. This is also due to the fact that representatives of the companies in the United States on a large scale use just PayPal. It should be said that in the United States, PayPal is the most popular payment method in online stores. Moreover, it should be emphasized that PayPal is characterized by wide openness when it comes to online customers who want to make mobile payments. In addition, it is worth emphasizing that the Board of Governors of the US Federal Reserve System in 15% carried out mobile payments in this country, which were financed with funds accumulated on the PayPal account. Moreover, it is worth emphasizing that the main recipients in electronic payments, including Bitcoin payments, are young people who in the United States are eager to use PayPal because it is the age group between 25 and 35 years old. It is also interesting that cashless payments are also a popular method of payment, which at the moment in the Covid-19 pandemic is encouraged by a number of countries. However, it should be emphasized here that non-cash methods are in countries where Bitcoin is also accepted. These are the aforementioned United States, but also Great Britain and Australia and Canada belonging to the British Commonwealth Community. Moreover, these countries are defined by the World Bank as a group of four countries with

the highest number of cashless transactions per capita and they are in the group of countries with the highest total number of transactions. It is also interesting that in this leave it was shown that 9% of customers use cryptocurrency payments other than Bitcoin, so it may also be a proof of customer openness to new technologies.

3. RESULTS

The article analysed the cryptocurrency market and presented its reflection in the area of flat finance, i.e. in the area of payments in the electronic market. It should be emphasized that Bitcoin but also other cryptocurrencies such as Ethterum and Litcoin should be properly defined. This also includes their value and, in the perspective of Covid-19, what is their future and whether they can become the main currency in the future. It should also be considered whether they can affect the monetary policy of countries for example, you can say what it was said at the beginning that Bitcoin is a fully decentralized currency but it has value because its supply is limited and there is a demand for low transaction costs, while its anonymity, investment opportunities and, unfortunately, the possibility of using it in illegal activities due to the lack of control over him. Therefore, its future is questionable as cryptocurrencies have several serious drawbacks such as high price volatility, vulnerability to breakage, the already mentioned lack of Central Bank protection and lack of consumer protection. You may be tempted to say that the two strong cryptocurrencies Bitcoin and Ethereum are characterized by high anonymity and the mentioned low transaction costs, which are not necessarily what the average consumer requires. However, cryptocurrency technology and Bitcoin can also be used for other currencies, especially in the era of the coronavirus pandemic in which cash turnover is minimized and system payments are traded that can have a permanent impact on how people will spend money in the future. It should be emphasized, however, that transaction costs are not necessarily what the average consumer requires.

4. CONCLUSIONS

Summarizing, it can be said that money is one of the most valuable and sought after commodities in the world, affecting people in almost every aspect of their lives. One of the most controversial innovations in this field is cryptocurrency. It is a currency that is not protected by government regulation or law, making it immune to government interference. Currency is fully decentralized and unlike fiat money the government cannot influence its value. The first cryptocurrency created, and the most widely used, is the aforementioned Bitcoin. A book called the blockchain publicly records all Bitcoin maintenance transactions and users are completely anonymous. The supply of Bitcoin comes from "mining", i.e. a process that involves computing a complex algorithm with increased difficulty over time, making it more costly and resource intensive and therefore less profitable over time. The demand for Bitcoin is mainly due to its decentralization and anonymity, transaction costs, use for illegal transactions, and as a financial instrument to profit from its price, volatility or portfolio diversification. Other possible uses for Bitcoin include measures to avoid currency controls or other sources of government interference and tax evasion.

However, cryptocurrencies also have disadvantages. As the currency is decentralized, there is very little consumer protection, stolen Bitcoins are lost forever, and Bitcoins are very vulnerable to code-based attacks. The price is very high, volatile and therefore it is very risky to hold many Bitcoins as well as lack of liquidity. This currency is also taxed in many countries, such as the USA, Japan, Finland and Germany. Countries with strict capital controls such as China and Iceland also have recognized currency and they forbade transactions, eliminating the possibility of bypassing restrictions on capital controls.

In its current version, Bitcoin is unlikely to become the official currency for the general public as it has too many flaws and too many risks, while its strengths are not necessarily something the general public wants in a fixed currency. In order to be called an innovative currency and to be successful, it needs to improve what a debit card and credit card have to offer. So cryptocurrencies need to be more convenient, safer and accepted by sellers around the world.

In the case of Poland, where cryptocurrencies are prohibited and not recognized as a safe source of financing, a number of benefits can also be seen. In addition to a significant increase in tax revenues - especially in the event of the introduction of appropriate regulations stimulating market development - we can expect other, less measurable benefits, including:

- Increased interest in the aspect of "mining" cryptocurrencies, which currently generate tens of millions of dollars in daily income worldwide. This will translate into the demand for electricity, and thus - for hard coal to power the power plant
- Increased interest in blockchain technology and its application. This means that the country's cyber security will increase, transaction costs in the economy will decrease, the costs of functioning of the financial system will decrease, the country's innovativeness will increase and its competitive position in the world will improve
- Increase in the level of education of blockchain specialists - the vast majority of them come from the cryptocurrency sector in the world (with few exceptions, it is difficult to develop blockchain applications without first developing cryptocurrencies)
- There will be an inflow of foreign portfolio investments (subject to appropriate regulations) on the scale of up to several hundred million dollars annually. It is possible that companies with high market value will emerge (over a dozen blockchain projects around the world are valued above \$ 1 billion).

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