

Bitcoin – A Brief Analysis of the Advantages and Disadvantages

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Abstract: *Along the history, people organised in communities needed payment means in order to exchange goods or deliver services. From beads and feathers to metal and paper money they have always improved the way transactions were made. The invention of the Internet opened new doors in the field of payments, through the quick access to information and the emergence of significant international online communities. The members of these communities became aware of the importance of decentralising the way they acquire goods or services, thus eliminating the middlemen. Cryptocurrencies represent the response of these communities to the old centralised means of payment, controlled by the bankers, politicians and interest groups. Our paper aims to analyse the cryptocurrency phenomenon revealing some of its advantages and disadvantages, to increase the awareness on the topic. We based our research on the existing literature, the relevant international databases, the official positions of the financial and regulatory institutions on the analysed matter.*

Key-Words: *Bitcoin, Nakamoto, cryptocurrency, altcoins, blockchain, ethereum, security.*

JEL Classification: *G, G1, G23*

1. Introduction

The first attempts to use cryptography to build digital currencies date back in the late 1980s. The Internet was the environment that facilitated the creation of significant online communities of people driven by common interests that needed a safe payment system for their online transactions. To this end, Wei Dai (1998) proposed for the first time a cryptocurrency under the name of B-money. Wei Dai based his initiative on the fact that in a community the members exchange ideas and even goods and services. An efficient cooperation among them requires a medium of exchange (money) and a way to enforce contracts. To address these issues Wei Dai considered two protocols. One of them was similar to the Bitcoin protocol, based on an undetectable network of individuals identified by a digital pseudonym.

In 2008, Satoshi Nakamoto was claiming there was a need for a purely peer-to-peer version of electronic cash that would bypass the financial institutions. He mentioned the financial institutions as third parties in commercial transactions were necessary due to the trust issues between buyers and sellers and the cost of this "trust" was high because they were not irreversible and involved mediation costs that made the services even more expensive. Nakamoto proposed an electronic payment system based on cryptographic proof (blockchain) instead of trust (Nakamoto, 2008). Just one year later, the Bitcoin network became functional, now is the most traded cryptocurrency in the world (Table 1).

The primary driver for the emergence of cryptocurrencies according to Vigna and Casey (2016) is the current bias towards decentralised models "that bypass middlemen gatekeepers". People embrace these models realising the possibility to avoid intermediaries when searching for goods or services. On the other hand, young people see Bitcoin as a means to invest or save money. For them, it makes more sense to acquire these new currencies than to invest in gold, or bonds or any other liquid assets.

Golumbia (2016) shares a similar opinion, predicting though that even the middlemen banks, will end up adopting the Blockchain technology to reduce their costs. Already a consortium of large European banks employed IBM to create a new trade finance platform based on Blockchain technology. Visa started the first pilot phase of its blockchain platform for business-to-business payment services that will also eliminate the go-between banks and cut the costs of transactions.

Today, hundreds of virtual currencies are widely clones of the famous Bitcoin, differing by issuance scheme, block time or supply. They are all known under the name of altcoins.

According to Hileman and Rauch (2017) from the Cambridge Centre for Alternative Finance, in 2016 there were around 10 million people around the world that owned Bitcoin. The report also reveals there is a growing number of merchants worldwide that accept virtual money as a means of payment. Still, people do not use cryptocurrencies for their daily purchases due to the price volatility and the fact that the economy is not yet cryptocurrency-based.

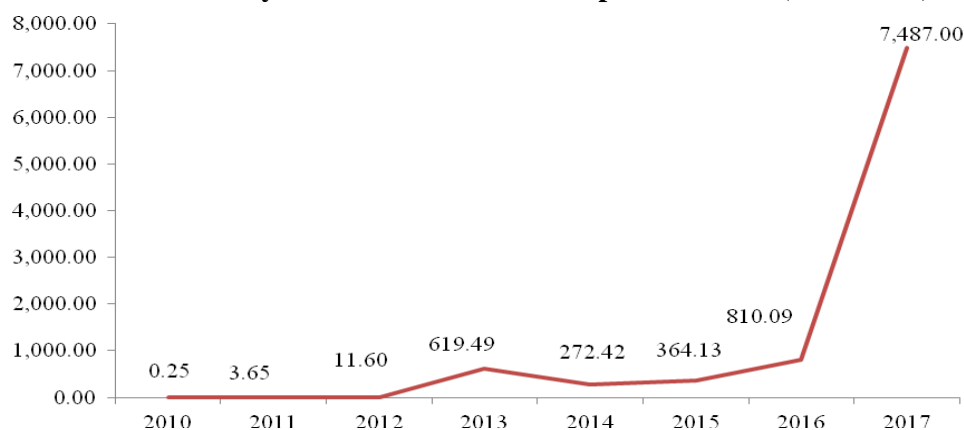
Table 1. Cryptocurrencies Market Capitalizations on the 16th of November 2017

Rank	Name	Market cap (\$)	Price (\$)	Circulation supply	Volume (24h) (\$)	% change in 7 days
1	Bitcoin	124,915,866,558.00	7,487.76	16,682,675.00	4,157,970,000.00	3.78%
2	Ethereum	31,718,817,624.00	331.23	95,761,281.00	696,121,000.00	3.42%
3	Bitcoin Cash	18,052,542,573.00	1,074.23	16,805,100.00	1,963,800,000.00	70.87%
4	Ripple	8,238,610,568.00	0.21	38,622,892,459.00	122,815,000.00	-2.36%
5	Litecoin	3,428,420,697.00	63.67	53,850,357.00	169,528,000.00	0.86%
6	Dash	3,236,113,295.00	420.72	7,691,919.00	94,258,500.00	28.64%
7	IOTA	2,243,039,245.00	0.81	2,779,530,283.00	105,177,000.00	43.35%
8	Monero	1,904,116,137.00	123.97	15,359,615.00	64,204,600.00	6.90%
9	NEO	1,892,371,000.00	29.11	65,000,000.00	40,880,000.00	-9.74%

Source: Coinmarketcap.com, 2017

Currently, there are 1,281 traded altcoins at a market capitalization of \$ \$216,996,366,219. Bitcoin has a share of 58 %. The table 1 reveals that the value of Bitcoin transactions exceeded \$4.1 billion daily, followed by Ethereum (\$0.7 billion daily) and Bitcoin Cash (\$1.9 billion daily). At the time of the analysis, AlphaCoin registered the highest price increase in the past seven days (2,137.46%) while ZCash Gold recorded the lowest drop (-59,11%).

Figure 1. Average USD market price across significant Bitcoin exchanges (USD) at the end of the year and the latest market price for 2017 (16.11.2017)



Source: <https://blockchain.info/charts/market-price>

Figure 1 reveals a considerable volatility of Bitcoin over an eight years span, but the return proved to be significant for the investors in the long run. In comparison to the end of the last year, on the 16th of November 2017, Bitcoin increased by 823%.

This trend is emphasised by Osterrieder et al. (2017) who proved that the annualised volatility of Bitcoin and other cryptocurrencies is substantially more significant than any of the standard financial asset, such as currencies, equities or commodities, with annual fluctuations reaching levels beyond 100%. According to their calculations, one can expect a loss of more than 10% once every 20 days. Still, in their opinion, the investment in Bitcoin is safer, in general, compared with other altcoins.

At the beginning of the year, Bovaird (2017) inquired some experts for their prognosis of bitcoin's price movements in the year ahead. The most optimistic forecasted that the price of Bitcoin would reach between \$2000 and \$3000 by the end of the year, while the pessimist one predicted a year-end price of \$1400. The reality proved them wrong, the current price of Bitcoin exceeded \$7000.

Table 2. World's Top 10 Bitcoin-friendly/ unfriendly countries

Rank	Friendly countries	Official position	Unfriendly states	Reasons
1	Estonia	Estonia does not regulate the use of cryptocurrencies. The government is considering to use the blockchain technology for healthcare, banking services and other suitable public areas.	Nigeria	As of January 2017, Nigeria banned all transaction in bitcoin and other virtual currencies.
2	The United States	According to the U.S. Treasury, bitcoin is a convertible decentralised virtual currency (Forexsq, 2017).	Bolivia	According to the Central Bank, it is illegal to use any currency that was not issued, controlled and regulated by a country or any authorised entity (Yahoo News, 2014).
3	Denmark	Danish Central Bank declared that Bitcoin is not a currency, stating that it will not regulate its use in the country. Danish Financial Supervisory Authority suggests that Bitcoin is an electronic service and the earnings from its use would, therefore, be taxable. Denmark aims to digitalise its currency 100%.	China	Bitcoin is not allowed in the banking system. The citizens are permitted to mine and do transactions in cryptocurrencies (Forexsq, 2017). China is planning to create and use its cryptocurrency, as per the announcement from January 2017 by the officials of the People's Republic of China. The analysts from Bitcoinbans consider that all other cryptocurrencies will be banned when the Chinese cryptocurrency will be released (Bitcoinbans, 2017).
4	Sweden	The Swedish Financial Supervisory Authority (Finansinspektionen) declared Bitcoin and other cryptocurrencies as a means of payment. (Wikipedia, 2017).	Ecuador	Ecuador banned altcoins in 2014. The government declared an intent to issue a state-backed cryptocurrency.
5	South Korea	For the time being, Korea does not have regulations on cryptocurrencies (Wikipedia, 2017), though some analysts from the Bank of Korea suggested in 2013, that Bitcoin should be subject to regulations in the future (Library of Congress, 2014).	Iceland	The local currency cannot leave the country. As a consequence, buying Bitcoin may breach this rule (Cryptocoins News, 2015).
6	The Netherlands	The state does not regulate the use of cryptocurrencies, but the technology behind it (Blockchain) is under assessment and if proved proper to be implemented in the local banking to cut costs (Scott, 2016).	India	Banks do not service Bitcoin businesses.

Rank	Friendly countries	Official position	Unfriendly states	Reasons
7	Finland	Bitcoin is a financial service, VAT free (Scott, 2016).	The Russian Federation	The ruble is the exclusive means of payment in the Russian Federation. Central Bank considers transactions in Bitcoin as "dubious activities" connected to organised crime (money laundering, terrorism financing) It recommends that Russian citizens and companies should not transact cryptocurrencies (Library of Congress, 2014). In 2015, the government proposed steep fines on the use or creation of digital currencies. Still, the Russian government is reportedly looking to recognise Bitcoin as a kind of financial instrument in 2018.
8	Canada	Virtual currencies, including Bitcoin, are treated as "money service businesses" (Scott, 2016).	Thailand	Bitcoin is illegal as from the 29 th of July 2013 (Smart, 2015). It is forbidden to buy, sell or use Bitcoins to purchase goods or services inside or outside the country (Bitcoin bans, 2017).
9	UK	Bitcoin is currently unregulated and treated as foreign currency (private money). The Bank of England is analysing the possibility to implement Bitcoin technologies to improve its monetary system.	Vietnam	Vietnam banned the bitcoin in February 2014. The Central Bank considers bitcoin transactions highly anonymous. "Bitcoin can become a tool for crimes like money laundering, drug trafficking, tax evasion, illegal payment" (Smart, 2015).
10	Australia	Australian citizens are allowed to use Bitcoin freely as any other currency (Scott, 2016)	Colombia	Bitcoin is illegal in Colombia as of the end of 2016.

Author`s compilation of existing literature.

In table 2 we centralised some approaches of the countries towards the altcoins. On the one hand, some of the developed countries try to become pioneers in promoting the Blockchain technologies and their advantages to modernise the financial system and not only. On the other hand, there are countries reluctant to implement this new technology or even allow their citizens or companies to use it as a means of payment. An important aspect, worth being emphasised is that some countries consider implementing their cryptocurrencies for various reasons, the control being one that comes to mind. So, our analysis already identified two groups of countries, one of the countries favourable to altcoins and one of the nations against cryptocurrencies.

2. Advantages

2.1. Personal data protection.

In this regard, according to Franco (2014), there is a low risk for the Bitcoin users in case of a retailer or a partner in a transaction is subject to a cyber attack and loses traditional financial or personal data of the customers or its own. Bitcoin users are at risk only if the hackers get access to their private keys.

The average cost of a data breach reached \$4 million in 2016. That year, the US and Germany registered the highest average cost per capita \$221 and \$213 respectively. The costs are different from one industry to another. The average global cost of a lost or stolen record was \$158. Healthcare and education organisations recorded higher costs (\$355 and \$246). At the other end of the ranking, transportation (\$129), research (\$112) and public sector (\$80) had the lowest average costs for a lost or stolen record. In most cases, data breaches were caused by hackers and insiders. Malicious or criminal attacks caused 48% of all violations, and the average cost per record to resolve such an attack was \$170 (Ponemon Institute, 2016).

In 2007, Wonga, a short-term loan company, has suffered a significant data breach. Private information of around 245,000 customers could have been compromised, including bank account numbers, full names, email addresses, home addresses, phone numbers, and the last four digits of debit card numbers” (Dunn, 2017).

2.2. Lower transaction fees

Bitcoin’s transaction fees are lower than credit cards’. Hayes (2016) shows that transacting \$100 of value with a credit card would cost \$3.37. A bitcoin transaction of similar value would cost at most around \$0.61 - making credit cards a little more than 5.5 times more costly for that operation. In this regard, Vigna and Casey (2016) consider that governments might be interested in supporting the adoption of cryptocurrencies to reduce procurement costs or bring greater transparency to governance. We already mentioned that some countries (Denmark, China, United Kingdom, Estonia) consider implementing Blockchain technology to better their banking systems and administration.

The business that accepts payments in bitcoins saves on credit card fees. These fees can range up to 5%, for each approved payment. The cost of transactions in Bitcoins is lower, reflecting the amount of data sent (Blystone, 2015).

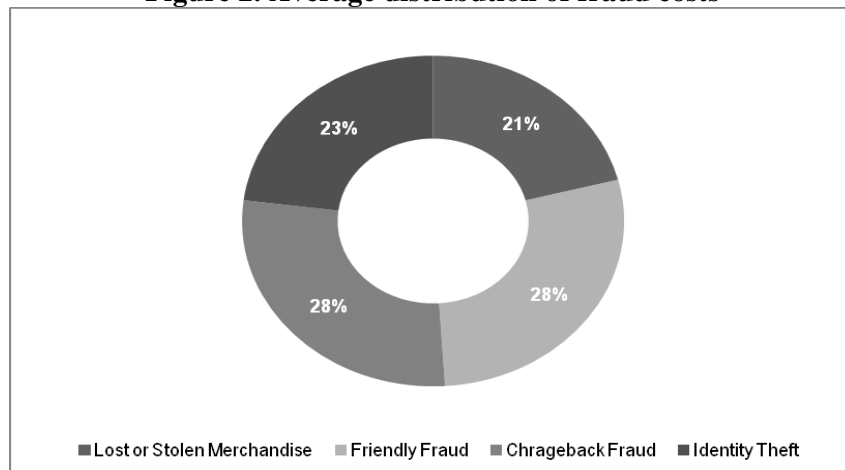
The Bitcoin transaction fee critics argue that the cost of transactions in bitcoins would be higher if they include theft protection and compliance/regulatory costs (Franco, 2014).

2.3. The speed of the transfer protects the merchants from chargeback fraud¹.

A Bitcoin payment is confirmed in 10 to maximum 30 minutes, while a bank might need several days to settle (Seaman, 2014). In this case, the merchants have time to check the transaction before they deliver the goods or services. Another advantage is the fact that altcoin transactions are irreversible unless the seller agrees to that with the customers, as a consequence, the risk of charge-back fraud is negligible.

The Lexis Nexis True Cost of Fraud Report 2016, reveals that in 2016 every dollar of fraud cost the merchants 2.40 dollars as compared 2.23 dollars in 2015, according to the Fraud Multiplier tool. The volume of successful fraudulent transactions rose to 206 in 2015, from 156 in the previous year. The ratio of fraud in the revenues of merchants increased to 1.47 percent from 1.32 percent (LexisNexis, 2016).

Figure 2. Average distribution of fraud costs



Source: Chargeback.com

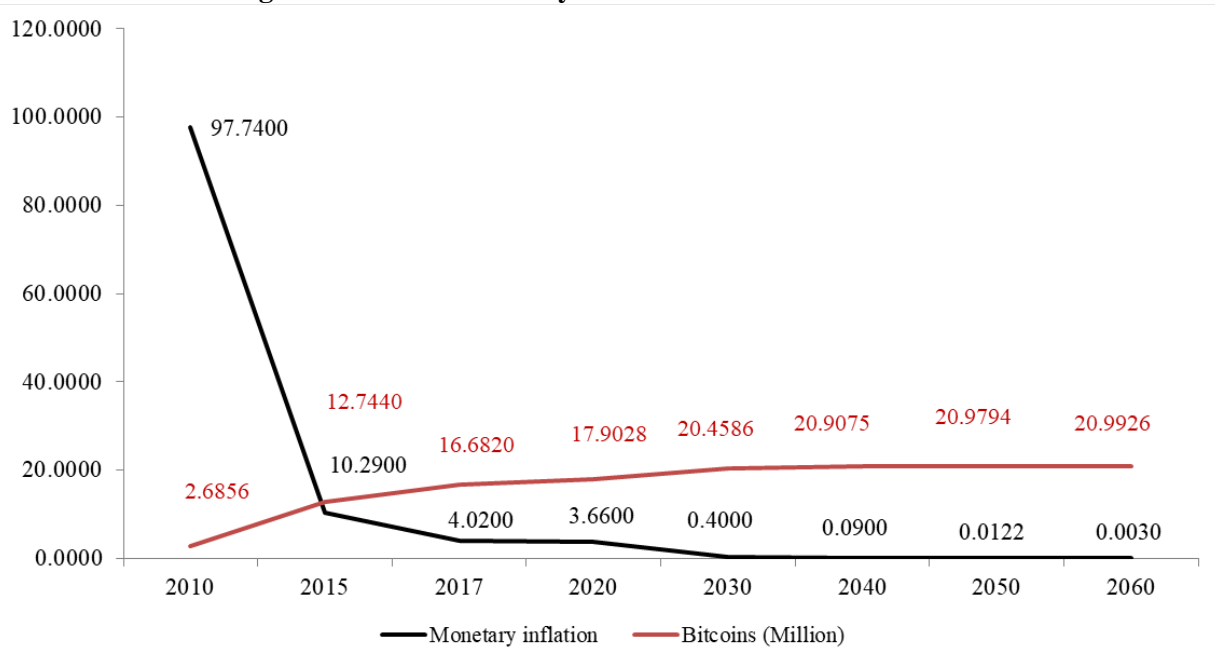
¹ Chargeback fraud, also known as friendly fraud, occurs when a consumer makes an online shopping purchase with their own credit card, and then requests a chargeback from the issuing bank after receiving the purchased goods or services. Once approved, the chargeback cancels the financial transaction, and the consumer receives a refund of the money they spent. When a chargeback occurs, the merchant is accountable, regardless of whatever measures they took to verify the transaction (https://en.wikipedia.org/wiki/Chargeback_fraud#cite_ref-mt_1-0)

In 2016, e-commerce industry suffered an estimated revenue loss of \$6.7 billion due to chargebacks, out of which 71%, \$4.8 billion respectively was due to friendly/chargeback fraud (Shukairy, 2016).

2.4. Bitcoin is immune to inflation

Young (2016) argues that the monetary inflation rate of Bitcoin would decrease at a fixed rate over the time as the number of Bitcoins in circulation continues to rise at a fixed rate until it reaches its maximum limit of 21 million Bitcoins. According to Figure 3, its monetary inflation rate decreased from around 90% and 2,916 million BTC in 2010 to 4.02% in 2017. By 2062, when it is supposed to reach the limit of 21 million BTC, the monetary inflation is expected to reach 0.0015%.

Figure 3. Bitcoin Monetary Inflation between 2010 and 2060



Source: <https://plot.ly/~BashCo/5.embed>

3. Disadvantages

3.1. Lack of solid anonymity

Reid and Harrigan (2013) argue that Bitcoin transactions, including cryptocurrency's centralised services such as exchanges and wallet services, are not entirely anonymous. The same opinion share Fanti and Viswanath (2017) who argue that current flooding protocols used in the Bitcoin network do not sufficiently protect user anonymity. Since there is no information about the user in the public key of the cryptocurrency, Bitcoin enjoy a better degree of privacy than in other traditional digital transfer services. Still, staying completely anonymous it is challenging if one takes into consideration the statistical techniques and pattern analysis that can profile and reveal up to 60% of the Bitcoin users (Tsukerman, 2015).

A survey performed by Fabian et al. (2016) revealed that seven out of ten people consider that Bitcoin has a reasonable level of anonymity (medium to high), while the associated risks are medium or low. However, almost every 5th user has already considered abandoning Bitcoin due to anonymity concerns.

3.2. Like other currencies, Bitcoin could be prone to scams

The private key gives the owner access to the bitcoin wallet. If that key is lost or stolen, the owner cannot access the money anymore. To steal the key, a perpetrator needs direct access to the folder that contains it.

A study conducted at the Southern Methodist University from Dallas (SMU, 2015) shows that fraudulent schemes have scammed over 10 million dollars in Bitcoin deposits from unsuspecting cyber customers between 2011 and 2014.

The main scams were:

- a) High-yield investment programs (online Ponzi schemes that promise high-interest rates on deposits);

- b) Mining investment scams (taking orders and money from customers but never delivering any mining equipment);
- c) Victims were convinced to make Bitcoin deposits into “scam wallets” that offer greater transaction anonymity(if the deposit rises above a threshold, scammers move the money into their wallet);
- d) Exchange scams (offering better exchange rate than competitors, but customers never get Bitcoin or cash after making payment).

3.3 A new, better cryptocurrency

As we have shown in table 1, on the 16th of November 2017, there were 1,281 traded altcoins at a market capitalisation of \$ \$216,996,366,219. Just a few months back (end of April 2007), there were 816 traded cryptocurrencies, totalling a market capitalisation of \$35,740,655,054. Out of the total market capitalisation of the Cryptocurrencies, Bitcoin has a share of 60.36 percent at the end of April and 58% in mid-November 2017. That points out that the share of bitcoin is decreasing. Moreover, this is only due to new altcoins that entered the market. If big players like Visa, Mastercard, and significant banks join in, the picture could look different. Vigna and Casey (2016) share this belief that a well-renowned company might implement a better payment system benefiting from a wide range of clients established distribution networks and better mobile technology. Still, Hayes (2017) considers that in 2017, the focus on Bitcoin as the dominant digital currency will increase despite the competition, and its technological improvements since its next competitors have a way lower market capitalisation (Table 1).

3.4. Trust

Adopting altcoins and trusting them with one savings or earnings could be a difficult choice for people, especially the older generations which are accustomed to classic money (coins, notes, cards).

Since the cryptocurrency phenomenon is relatively new, one can understand the reluctance of people or businesses to jump into the unknown. For the general public, the complicated algorithms and the idea of a virtual wallet might be frightening.

A survey conducted by Harris Interactive in the US in 2014 found that 48% of American adults are aware of Bitcoin, but only 13% would choose it as an investment over gold (WebWire.com, 2017).

Table 3. Support for Bitcoin increases with Income and Education, Declines with Age, Men slightly More Supportive

	Allowed (%)	Not Allowed (%)	Don` t know (%)
All	38	47	14
Male	43	46	10
Female	34	47	17
High School	31	50	17
Some College	40	47	11
College+	47	41	11
<\$75,000	36	49	14
\$75,000-\$110,000	41	37	17
\$110,000+	55	39	5
18-34	56	37	7
35-54	39	47	13
55+	25	54	19

Source: Ekins, 2014

Table 3 shows that the most significant support for Bitcoin (56%) comes from the Americans aged 18-34, followed by the Americans with yearly incomes over \$110,000 and at least college educated ones (47%). As a conclusion, the more highly educated, young and wealthy, the more open to experimenting disruptive technologies, benefitting from the window of opportunity.

6. Conclusions

As we emphasised, the phenomenon of cryptocurrencies is developing at a high rate. Bitcoin is for the time being the king of virtual money regarding market capitalisation, and daily transactions.

The developed countries are more open to adopting cryptocurrencies than developing countries. In such developed countries Bitcoin is regarded as private money, money service businesses, financial service, means of payment, electronic service, decentralised virtual currency and so on. Some developing countries consider bitcoin, and other cryptocurrencies illegal because they are not issued and controlled by a government and can be involved in “dubious activities” such as money laundering, terrorism financing, human and drug trafficking, tax evasion, illegal payments. There are several countries (Ecuador, China), that consider implementing their cryptocurrencies.

Bitcoin has several advantages that can help its development in the following years. Personal data protection of the users is better ensured. In case a retailer is compromised by a security breach, customers` data are still safe. The transaction costs are over five times lower than the ones made by credit card.

On the merchants` side, it offers more protection in case of charge-back fraud, the transactions being confirmed in 10 to 30 min, giving the seller time to receive the money before delivering the ordered goods. The monetary inflation of Bitcoin will decrease in time until it reaches the limit of 21 million mined bitcoins.

On the downside, we identified that the anonymity of the transactions in bitcoins could not be 100% ensured. Keeping safe the private key to the wallet might also prove to be a problem in the case of computers connected to the Internet, or if an attacker has physical access to one`s storage device. As we showed, some scams are being operated by criminals against bitcoin owners (Ponzi schemes, mining devices never delivered, buffer wallets and exchange scams).

No system is perfect, but the dynamic of the cryptocurrencies phenomenon, the intentions of some developed states and large private companies to adopt blockchain to improve the financial and administration systems indicate that there are other opportunities to be explored in the future.

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