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THE IMPACT OF CRYPTOCURRENCIES ON THE FINANCIAL STABILITY

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Abstract

In this research paper the aim is to learn the nature of newest digital money called cryptocurrencies and their impact to financial system. Thesis consists of two part: First chapter of paper presents all the theoretical knowledge about cryptocurrencies and the technology named Blockchain. Here Bitcoin is the most focused point because of the popularity and ownership the greatest market capitalization. At the initial part, IT side of the peer-to-peer technology is clarified in a simple form also. Last chapter is counted as a core part thanks to being more practicable. Here the effect of cryptocurrencies and traditional monetary is described in a comparison form. The reason for comparison is to examine the best side of them for financial stability. Any new thing appeared in finance, definitely it is needed to analyze if this will work for or against the government interests. Second section also contains this issue. At the last, author has given a conclusion according to all work and has offered suggestions using perspectives of cryptocurrencies and blockchain in Azerbaijan case.

Contents

Introduction

Cryptocurrencies are secured with cryptography to hamper cyberattacks. However, there was observed some theft cases, generally, this system is considered safer rather than traditional electronic scheme. Virtual money called cryptocurrencies offer people decentralized system where there is not any intermediary – government, banks or financial instruments to control their money. Technology that cryptocurrencies rely on is named blockchain and all transactions are executed there with peer-to-peer background. Digital money is hold in the wallet in blockchain with two key public and private key. With public key everyone on the network can see the amount of your money in wallet and which transactions you have done. Private key just owns you and let you access to your wallet. To use cryptocurrencies just needed thing is network connection. If digital money spreads to large scale, there will not need to exchange cryptocurrencies to fiat money and all over the world people will trade with just currency.

There is no doubt that Bitcoin is the most discussible topic in daily news. Most large corporations have already practiced to trade with Bitcoin, governments think the ways to legitimate cryptocurrencies through regulations, banks tend to use blockchain technology to get efficiency in their works. All these practices show us that digital money and peer-to-peer technology will cause considerable changes in the financial system. The mystery here is that if these changes will be positively or negatively. One of the beneficiary point is the possibility of quick payments in seconds rather than days in traditional banking system which is the most valuable thing in modern times for businesses. To take out banks through utilizing cryptocurrencies, individuals likewise remove heavy levies imposed on themselves. To trade with virtual money miners who execute transactions require from peers just a modest sum expenses as they are incentivized by getting Bitcoin. Most appeal side is the secrecy that everybody can track every exchange on the system yet they really don't know who are the dealers. These feature can also serve for the plausibility for illicit exchanges. Another great side is additionally solidness against cyberattacks

which is secured by cryptography program. Not accepted widely because of the uncertain future of cryptocurrencies, volatile prices, lack of knowledge, difficult IT system and others are the dark sides of virtual money.

Now the most crucial point is to break down which side: great or awful will be substantial. Uncertainty and being new makes it harder to come conclusion. This just can be hypothesis through tracking current financial and economic condition. With this meanwhile it can be possible to clarify the future.

1. THEORETICAL BACKGROUND AND GENERAL CHARACTERISTICS OF CRYPTOCURRENCIES

1.1 The essence and the history of the cryptocurrency

The digital money called cryptocurrency is secured by cryptography. Unlike the fiat money, cryptocurrency is decentralized which means any government controls it. This type of electronic currency completely based on network. Instead of government agencies, central banks nodes – users of network decide all the currency issue such as exchange value, emission, transactions issues etc. Eliminating of third part in transactions is the most impressive property of the cryptocurrency. Here two party already need not any middleman to transact each other. There are several thoughts around this theme. Some of the people sure that Bitcoin will be currency of the future while others think that Bitcoin is not currency but investing asset or speculation instrument. It is also sound that Bitcoin has not future and it will disappear soon.

Cryptocurrencies appeared in 2008 by Satoshi Nakomoto who publish white paper through metzdowd.com which is called ``Bitcoin: Peer-to-Peer Electronic Cash System``. First type of cryptocurrency named Bitcoin is also most used all around world. It is unknown who founder of the Bitcoin is. He, she or group of people use pseudonym called Satoshi Nakomoto. Paper which is the foundation of Bitcoin is written in high academic language and carries technical aspects in itself. It is possible that new burst of innovation occurred during financial crisis is not coincidence. Obviously, 2008 was the most difficult year almost for each country. Bear Stearns etc. To be in short, banks gave people`s deposits as risky credits and invest them in bad projects. Fear of going to bankruptcy of such big banks makes government bailing out those banks. It is clear that government donations came from people`s paid taxes. After that government printed money in big amount to cover expenses and increasing money amount in people`s hand. So, this step brought out economy in deep recession ever. That crisis was resulted in bankruptcy of the biggest

banks as Goldman Sachs, Lehman Brothers, Bear Stearns etc. On the another side, both banks and government lost trust on themselves. People do not want anymore any regulative hand on their money. It is believed that Bitcoin is established to answer all these issues like trust, uncertainity or high volatility of the US Dollar. For eliminating dependency of the financial system from government, politicial or economicial issues Bitcoin was seemed best way.

BLOCKCHAIN and Bitcoin

Blockchain is the base technology that cryptocurrencies are used. It consists of the chain of blocks and its technics is given in 1991 but it became popular after the paper of Satoshi Nakomoto on Bitcoin. There are a few principles behind using Bitcoin. One of them is open and distributed ledger. **Open ledger** means everybody on network can see all transactions and the amount of money in your wallet. **Distributed ledger** means this centralized ledger are distributed among peers and all users get same copy of the ledgers.

Here users run their own issues instead of banks or government. In detail, if you want send $100 to your friend you should announce this to all network nodes. Some of the users called ``**Miners**`` who have enough CPU power – special kind of computers that are so expensive and claims an lot of electric energy rather than others notice this transaction and begin to `work`. Working include to valid transaction that if you have $100 - it is easy because of open ledger and everybody can see how much money you have. Secondly, miners have to solve complex problem – hash problem to execute transaction. It is like a competition among miners and the winner get reward – Bitcoin. And the establishment of Bitcoin is called **`mining`**. Generally, if you announce to transact $100, your claim fall down into transaction pool as an unvalidated one and miners take this transaction randomly to solve and to make this validated. Here we came conclusion that you have to wait until miner notice and take your claim.

After the validation process miner announce this to the all network peers to verify this block and they come to consensus if it is validated or not. After then new block is

added to blockchain. For taking part of all users any tampering issue is nearly impossible. It also should be noted that one transaction can`t be solved again by others after it is done.

HASH and Proof-of-work

Hashes are used in mining process. It is mathematical issue and enough complex to handle and it is getting to be more difficult to solve each time passed. Hash function takes each transaction to produce fixed output. It is smaller than original input and it is impossible to derive original form of input. It ensures blockchain security. Any minor change in hash function cause completely change in input. Miners must find concrete hash target according to input and must try many combinations maybe even trillion times. The fast miner who solve the problem wins and get reward.

Output must begin with several such as 30 or 40 or more (not exact figure). 41 zero claims double calculation than 40 zero. Number of calculation may be more than trillion times. That`s why it is needed enormous amount electric energy and CPU power.

Following illustration shows the working principle of hashgraph which is used by miners to confirm transactions and get Bitcoin. They take a few transactions to solve and should to solve mathematical problem. They try several attempts until to find right one which consists of several zeros at the beginning. Time to solve the problem changes according to the CPU power. In bitcoin blockchain used hash is named SHA256. Hash function works on the same principle with the vending machine which gives chocolate or juice after accepting paper money or coin. Hash function takes the info, process on it and gives the outcome.

Picture 1

Attempt1 EBC4C57D8A84B342A74931A592374CF2

Attempt2 BC566NAHQ82329D9JJ2N AA234N3O2A2

Attempt3 547BSSD8S24429CNRQA347S324JAH14N

…..

0000000000000002A74931A592374CF2

0000000000000000D9JJ2N AA234N3O2A

0000000000000000RQA347S324JAH14N

…

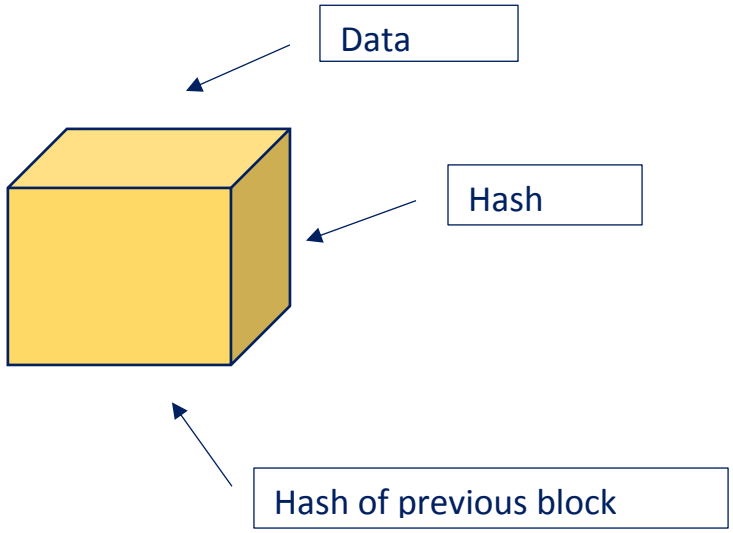
Source: Own investigation

Another presented illustration is the form of block as a part of chain. Each confirmed transaction by miner is includes the blocks with immutable terms. Transaction orders are fell down the mem pool where miners take them from there to execute. Expanding measure of exchanges cause the ascending in the quantity of blocks. Toward the end of April in 2018 number of daily transactions are 195k and blocks are 128[1].

[1] Bitcoin.com

Picture 2

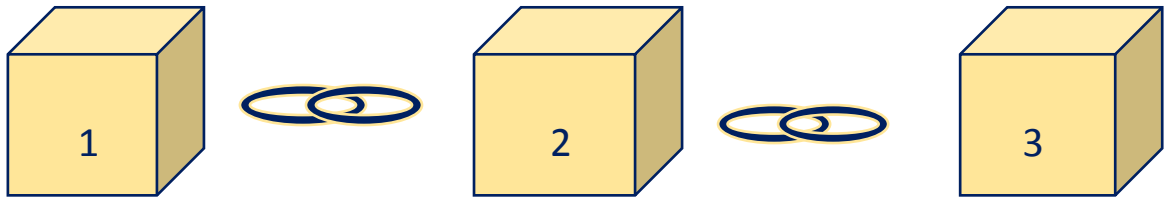
Each block consists of as follows:



Source: Own investigation

Here the data includes details of transaction such as sender receiver and amount of coins. Hash of each block is unique. It identifies the block and its content. If you try to change the hash you will change the block completely. Hash of previous block is used for security issue and this technique is the base stuff for blockchain – it creates chain of blocks as presented below:

Picture 3



Hash: 1Z8F	Hash: 6BQ1	Hash: 3H4Q
Previous hash:0000	Previous hash: 1Z8F	Previous hash: 6BQ1

Created by author

Picture 3 describes the order of the chain of blocks. As seen each block holds new hash and the previous block`s hash. System like this obstacle the hacker attacks and provide the security of the system. Attempt to change one block there must be changed millions of previous ones that is nearly impossible.

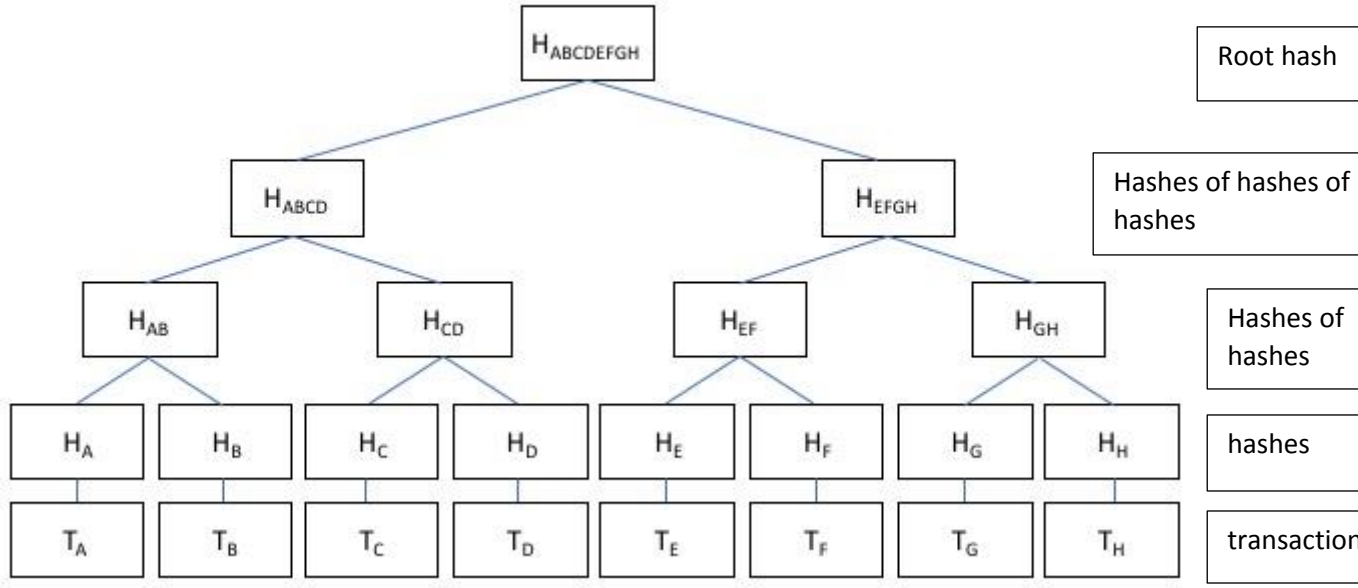
It is so easy to generate hashes, but proof-of-work side makes it more difficult to add block to blockchain network. It is seen that each block depends on each-other and one changing in one block will cause changing all blocks and it is nearly impossible to change millions block. It is required 10 minutes to add block, number of zeros which hash starts with and surely CPU power makes it harder `work`.

MERKLE TREES

Merkle trees are kind of technique used in blockchain for data integrity. It is known that all transaction history is recorded on the chain of blocks. All these have size and amount of size are growing over time. Merkle trees are necessary to facilitate to keep transactions. It is done through combining old blocks in one header block.

For the 30th April in 2018 the size of blocks in blockchain equals 797.9 KiB (797.9 * 1024 bytes) which this figure was 1.9 KiB in 2011[2]. So, increasing number of transactions raises number of blocks likewise size of blocks. This attempt prevents the confusion and minimalizes the size of block in blockchain and makes efficient condition for computer RAM.

[2] Bitcoin.com



Source: https://www.investopedia.com/terms/m/merkle-tree.asp

Here main idea is that it is kept current block and header block which consists of full transaction history. It is calculated that because of generation of block in each 10 minutes equal to 4,2mb per year and it is not big amount for current computers` RAM capacity. Despite this, with merkle trees is paid attention to this content. Head block named $H_{ABCDEFGH}$ consists of more than 500 transactions.

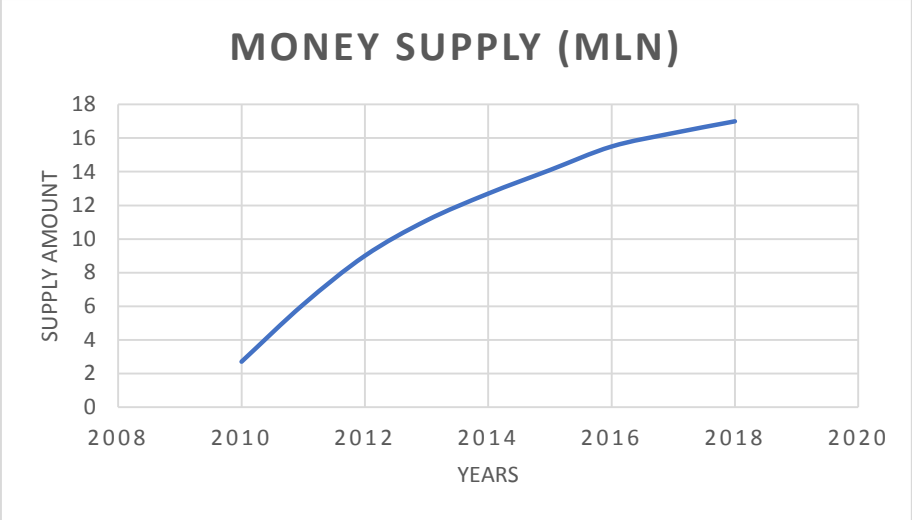
So it is already known how difficult is the IT side of cryptocurrency technology. It also noticed the first cryptocurrency created by Satoshi Nakomoto. Thanks to difficulty level of digital money it stays mysterious for most people. This enough complicated study will be continued by the investigation of several kinds of cryptocurrencies and the history of their price fluctation.

Development tendency of Bitcoin

It is clear that the price of cryptocurrency depends on demand and supply as other currencies and since 2008 high demand by investors, businesses and individuals raised significantly the value and market capitalization of Bitcoin. This expansion

arised the question among economists if it will be durable. Following graphs show the development tendencies of Bitcoin.

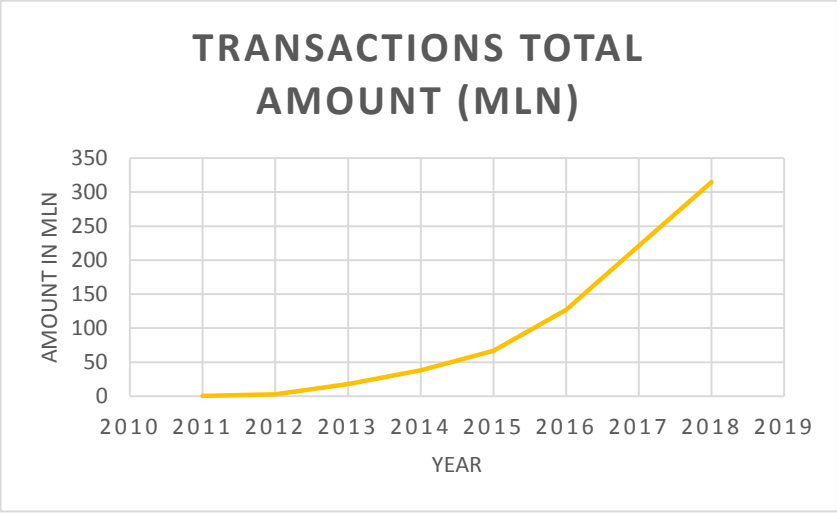
Chart 1



Source: https://charts.bitcoin.com/chart/money-supply

Chart described above shows the amount of BTC over the years. Continously rising trend proves the demand surplus (dates are belongs to early May 2018).

Chart 2



Source: https://charts.bitcoin.com/chart/total-transactions

Chart number 2 presents the total number of transactions in mln over the 8 years. This incredible growth also is the result of high demand by inviduals and businesses. All these cause price rise which will be described next paragraph.

1.2. Kinds of the cryptocurrencies and tracking the changes of price

There are 1601 kinds of cryptocurrencies in 01.05.2018[3]. In general, generating cryptocurrency is an easy process for network user. But creating demand to that coin is a bit challenge side. Because for rising its price there should be demand. There should be something attractive stuff that people buy that coin. It means, price of a coin depends on its utility as a medium of exchange. Example, if Starbucks creates a Starcoin and claims that after then customers must buy coffee with that coin, value of the coin will rise extremely. Here we can see that there must be big support behind the coin for its high value.

Table outlined below is adjusted for the date beginning of April in 2018. Overall cryptocurrency market capitalization is $409 893 497 485 and Bitcoin is the dominate among cryptocurrencies with 37,1%[4]. Bitcoin is on the top with its price and market capitalization. Just for limited supply requirement is lower than others and this feature makes it more valuable. Other cryptocurrencies are called altcoin except Bitcoin. Second one is Ether which price and level of capitalization is also enough high is traded on its blockchain called Ethereum Blockchain. The foundation of Ether is put by the software engineer Vitalik Butern in 2013. Thus, following table can help financial specialists and dealers to track the value changes with a specific end goal to come last choice in their work.

[3] Coinmarket.com
[4] Coinmarket.com

Table 1

#	Names	Market capitalization	Price	Circulating Supply
1	*Bitcoin*	$151 905 146 728	$8 999,53	17 009 237 BTC
2	*Ether*	$64 413 385 590	$649,57	99 163 261 ETH
3	*Ripple*	$32 208 517 501	$0,822775	39 146 203 398 XRP
4	*Bitcoin Cash*	$22 126 217 676	$1 293,65	17 103 788 BCH
5	*EOS*	$14 316 675 256	$17,28	828 674 349 EOS
6	*Cardano*	$8 888 785 009	$0,342838	25 927 070 538 ADA
7	*Litecoin*	$8 143 634 027	$144,56	56 334 313 LTC
8	*Dash*	$3 756 087 987	$467,14	8 040 620 Dash
9	*NEO*	$5 201 183 000	$80,02	65 000 000 NEO
10	*Monero*	$3 718 426 266	$232,60	15 986 743 XMR
11	*Ethereum Classic*	$2 124 455 240	$20,94	101 473 841 ETC
12	*Bitcoin Gold*	$1 181 159 189	$69,57	16 976 874 BTG

Source: https://coinmarketcap.com/

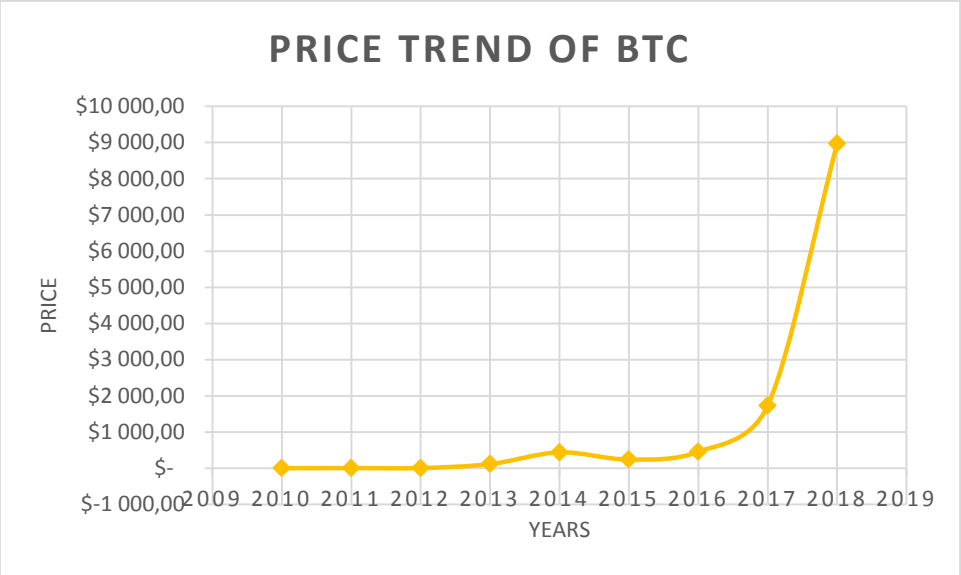
So we saw that how big figures play in cryptocurrency system. The reason of high level of prices and capitalization is just big incentive and interest to new money. Nowadays each person who seeks more gain address the cryptocurrency.

Bitcoin (BTC)

Now the most valued cryptocurrency is Bitcoin in cryptocurrency market. Its value is $8920,23 in 01.05.2018. BTC holds 37% of cryptocurrency market. BTC price will be around $50.000 and $60.000[5]. In 2008 when first cryptocurrency – Bitcoin is generated its value was just $0,01. Over the years its value on average was as follows:

[5] Longforecast.com

Chart 3

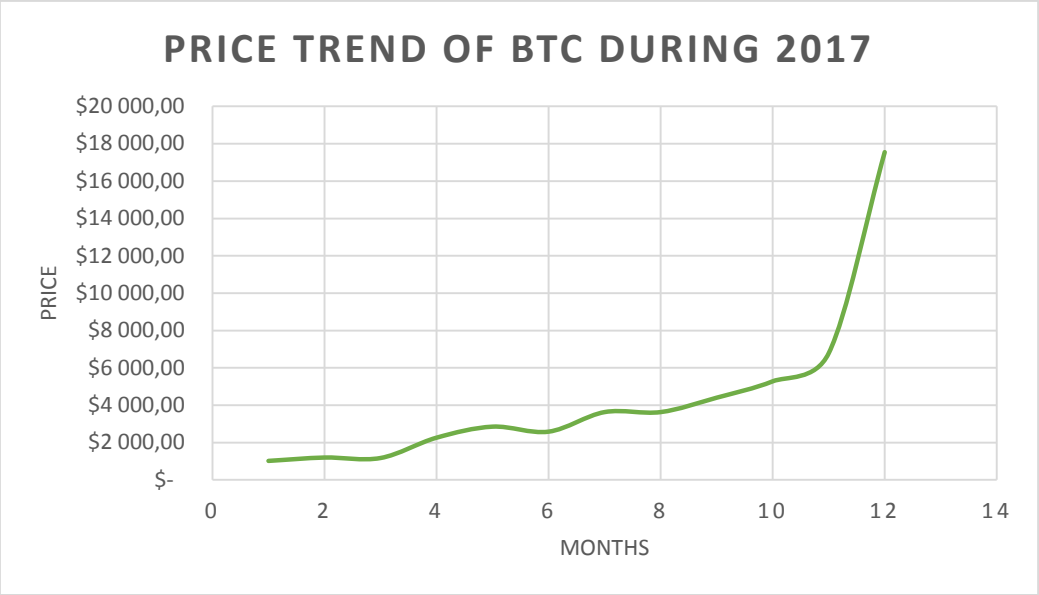


Source: https://www.coindesk.com/price/

Here we can observe that BTC has how drastic change over the 8 years. These are general prices properly each year`s April month. During one year – specially in 2017 had been considerable changes also.

There are some ways that affect the price of Bitcoin. Firstly, as mentioned value of the cryptocurrency depends on the willingness of the people to use that digital money. It doesn`t matter if Bitcoin is used as a speculative asset or currency, demand always raises the price. Supply of Bitcoin has also a big affection on the price. Limit to the supply of Bitcoin is 21 million and now there are more than 16 million Bitcoin in circulating. It is predicted that there will be nearly 19 million in 2022. So, according to the paper of Bitcoin by Satoshi Nakomoto mining challenge increases over time (every 4 years by half). The aim is to stabilize the supply and keep the balance on value. Because, increasing the supply without any demand there will cause supply excess and the price will fall. Here we can came conclusion that the value depends on demand-supply as other currencies or speculative assets.

Chart 4



Source: https://www.coindesk.com/price/

Some economists believe that Bitcoin is the biggest bubble ever. Their thought came true after December of 2017 as the price of Bitcoin became $20.000. If we consider today`s price – $8999, mentioned thought may be proved. Increasing of approximately $10.000 in 17 days and again falling same amount in 30 days cause doubts among people if Bitcoin will not be exists in financial area in future. Price changing in big amounts exhibits that Bitcoin is used as a speculative asset rather than a currency and speculative interests as changing in expectations cause the price volatility.

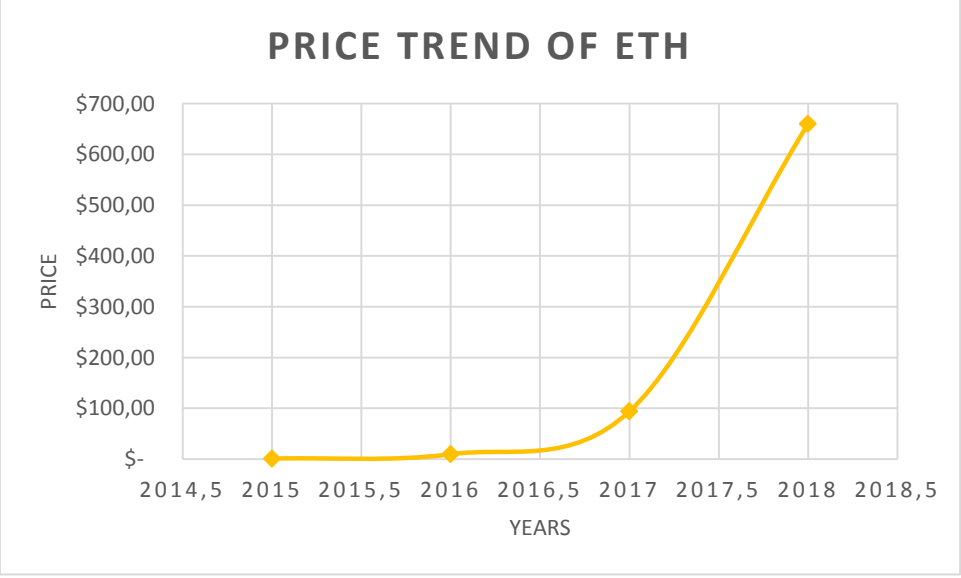
Ether (ETH)

Ether (sometimes called Ethereum) is the kind of cryptocurrency which is used as a payment means, reward for miners, can be bought or sold against other fiat money. Ether is used in Ethereum Blockchain which is a decentralized platform runs smart contracts on traditional blockchain (smart contract are absolutely same as known contracts, but in digital form. It means, terms on contract are adjusted and

executed automatically when both parts meet these terms). It carries nearly same functions with Bitcoin blockchain. But it is considered that Ethereum blockchain is more secured and it stores more data rather than Bitcoin blockchain.

As mentioned there are 1601 kinds of cryptocurrencies and most popular and valuable ones are Bitcoin, Ether, Ripple, Litecoin etc. Except Bitcoin, other cryptocurrencies are called altcoin. Ether is the second largest used crypto coin after Bitcoin.13% of digital money market belongs to ETH. It was generated in 2015 which price was just $2,83. Comparison to bitcoin as is geneareted in 10 minutes, it is genereated every 15 seconds. It means supply of Ether is in big amount (now more than 98 million) and it makes Ether less valuable than Bitcoin (supply law: more supply less value). During 2016 its value was varying between $10-$13 while in 2017 these figures were $10-$886. The peak was in early 2018 – more than $1.000. The price of Ether is $659[6]. Chart described below shows the price changes of ETH between 2013 and 2018.

Chart 5



Source: https://coinmarketcap.com/currencies/ethereum/

[6] Coinmarket.com

As seen another sharp growth in prices has been in ETH. Although its history is newer that BTC, ETH can be strong competent to BTC. This competition proves itself in the close balances in market capitalization.

Ripple (XRP)

Ripple is in third place in market capitalization after Bitcoin and ETH with $32 billion although its current price far less than BTC and ETH - $0,832. Here we can come conclusion that XRP is used more in transaction rather than speculative asset. It is generated in 2013 and varied between $0,005-$2 all times. Ripple plays a bridge role among both digital and fiat currencies. It is converted any currency easily and very fast. Required transaction time is only 4 seconds while it takes minutes with BTC and ETH. Using XRP helps banks to increase liquidity in an easiest way and allows users to lower foreign exchange cost and to make payments faster. It also claims far less transaction fee in comparison other crypto currencies.

XRP is run through Ripple technology built on advanced blockchain. It is created by Ripple company in 2012. Ripple Protocol is the money transferring system which enables providers transferring any fiat and digital currencies (not only XRP) very fast, easy and almost costless. Ripple transferring system does not compete against bank but works with them. It is mostly used as interbank payment technology and seems that takes the place of SWIFT. Ripple technology allows banks instant settlements and low operational costs. Accross 27 countries, more than 100 banks are in partnership with Ripple as Akbank, American Express, UniCredit Group, Royal Bank of Canada, Bank of America Merill Lynch, Axis Bank etc. It also provides its partner bank with anti-money laundering, decreases counterparty risk and secures people`s deposits. It makes financial system be more sustainable.

Bitcoin Cash (BCH)

Bitcoin Cash was released in 2017 as an answer to block size problem of Bitcoin. The limit of the blocks in Bitcoin blockchain became problem recently as transactions were increasing steadily and speed of confirming transactions was beginning to slow as miners could not take more transactions to execute. So developers began to research to solve this problem. New separate blockchain ledgers are generated which size was eight Megabyte. In this blockchain used cryptocurrency is Bitcoin Cash. Larger blocks mean more confirmed transactions. Possibility of taking more transactions by miners would cause mining more Bitcoin Cashes and more supply would decrease its value. To balance this issue difficulty level is increased to mine BCH. Now the price of BCH is $1291,69 and its market capitalization is more than $22 billion with fourth place in cryptocurrencies.

As founded in July 2017 its price was $555,89. Over time its value increased significantly, specially, in December 2017 price was more than $2.000, even $3.000. At this time mempool (when you want to transact something your claim fall to mempool and then miners take your transaction randomly to execute) of Bitcoin raised significantly, because miners were interested in to mine BCH because of expectation of rising in prices of BCH in future. But then falling down in prices make miners come back to BTC.

Generally, something gets value because of its usability and scarce. BCH is useful because of speed of transactions and also is limited in amount as BTC. That`s why it got enough value in market.

Litecoin (LTC)

LTC is the most resembled cryptocurrency to BTC. Most differentiated thing are their prices and time for block generated as it takes 2,5 minutes in LTC while this figure is 10 minutes in BTC. These means transaction confirmation speed is more than BTC.

Litecoin is in the fifth place according to its market capitalization (more than $6 billion) after BCH. It was included the market with the price $4,30 and till April 2017 price ranges between $1-$5. After then variation increased and reached from $50 to $300. As for all other cryptographic currencies, LTC price also reached its peak in December 2017 - $300. Today (beginning of May 2018) its value is $145,42.

Chart 6

Source: https://coinmarketcap.com/currencies/litecoin/

This general trends also shows continous rise over years. But it is fact that there have been high fluctuations during years. Except 2017, in 2013 prices fluctuated between $0 and $41.

Cryptocurrency Exchanges

Exchanges have crucial role in finance system. Investors carry out speculative operations for gaining a margin for a short time or invest stocks in long term. Recently with the appearing of cryptocurrencies, cryptocurrency exchanges are released. Main cryptocurrency is Bitcoin almost for all exchanges and they are busy

with buying, selling or investing Bitcoin. Bitcoin acts both as a currency for speculative operations and asset for investing. You can change your Bitcoin against any altcoins or fiat money maybe for get reward from rate differences or buy Bitcoin from sellers to hold and wait excellent time to sell or to use in transaction.

There are several Bitcoin exchanges. Most popular ones are Bitstamp, Coinsetter, BTC-e, Coindesk, CEX.IO, Coinbase.com, Kraken, Coin.mx. They differ from each other with services provided, reputation, liquidity, safety fees for transactions etc. Exchanges mostly belong to country where is founded and more attractive for that country`s investors. Customer satisfaction is very important for their reputation. That`s why DCEs (digital currency exchanges) mostly offer customers with easy access to operations through provide mobile apps, websites etc. Number of offering cryptocurrencies to change may be vary according to DEC. It can be 100 or maybe thousands. According to their rate best exchanges are as follows:

Binance Exchange

Binance Exchange launched in 2017 and it originally belongs to British Virgin Islands, Tokyo and Hong Kong. Although it is quite new in market it has already has over ten million users and on the top of the world exchanges due to its rank. Binance is crypto-to-crypto exchange, so it does not offer exchange or trading on fiat money. It allows users to trade very range of cryptocurrencies even some of them are not in other exchanges. It seems positive side but not offering fiat money can be leading a bit disappointment in future. However, security is not proven yet. Because it is new in market and it is important to predict what will be.

It is clear that Binance is used mostly for its low fee rates (0.1% for every trade). It suggests even less transaction fee if traders use its own tokens – BNC (Binance). Also traders can trade each other from every point in the world – there is no any restriction to enter exchange and no any limit to trade amount. Good side is also that they provide customers with mobile apps from which they can track market

condition or doing operations. As addition, there is no any restriction to trade amount. You just should verify your account to increase trade limit.

According to these facts we can compare other exchanges:

Table 2

Exhanges	**Service offered**	**Payment methods**	**Transaction fees**	**Trade limits**	**Countries supported**	**Safety**	**Number of users**	**Legal compliance**	**Mobile apps**
CEX.io (2013)	Buy, sell BTC or ETH	VISA, Master Card	75% of purchase (high)	$300-500	Not all (99%), London founded	PCI SSC (Payment card industry Security Counsil), not detected any crucial complaint	>700 K?	MSB status (Money Services Businesses) in FinCEN	+
Coinbase (2012)	Buy,sell,tradee with BTC,ETH,LTC	VISA, Bank transfers	2-4%	To increasing limit you should verify your account with additional data	32 countries, US founded	PCI SSC (Payment card industry Security Counsil),CB Payments Ltd and Coinbase UK Ltd adjust the privacy of customers	>10M	KYC (Know Your Cusyomer), AML (Anti-Money Laundering),	+
BitStamp (2011)	Trade with BTC,XRP,LTC,ETH,BCH	Credit cards, bank transfers	0,25%	Minimum trade $5	Available for all countries, UK founded	Funds stored offline and has yearly audited by Big Four, hacked in 2015	N/A	KYC, AML, 2FA (two factor authentiaction – it means site requires	+

								more data from user rather than name and password)	
Kraken (2011)	EUR,USD,JPY,CAD and 15 kinds of digital money	Bank transfers	0,16-0,25%	Minimum limit according to digital money kinds	Europe,Canada,Japan,US,UK	PGP (Pretty Good Privacy-cryptographic privacy),audited every year	N/A	2FA	-

Source: Own investigation

Table 2 is described through data collected by each Bitcoin exchange to compare them easily. This table allows person come into decision which exchange offer better service or safer.

1.3. Countries and companies against or for the using of cryptocurrencies

Cryptocurrencies became a nightmare of most governments however some of them are not against using digital money. Mostly developing countries fear the presence of cryptocurrencies. Because, already the low power of governments on financial system will decrease more after the new innovative money. Still, some developed countries supports using of Bitcoin, although they also worried about security issues as Bitcoin can be used in drug and terrorism transactions easily. These type of countries just try adjust illegal operations through this system. However, each government wants to hold all power in their hand in anyway. But it is nearly

impossible to seize or to stop using cryptocurrencies, as is impossible to prevent using internet. Just way could be juridical stuff as arrest or money penalty. It is known that Russia and China have started a war against Bitcoin, but European countries and US are not so agressive yet.

Russia

Russia has agressive opinions against cryptocurrencies. Here using cryptocurrencies as a payment or trade with them is prohibited. Virtual currency is accepted as a ``foreign currency`` and is allowed to trade with it outside the Russia by Russians. Although fearful approach to cryptocurrency, blockachain technology is seem as a ``saviour`` of the financial system.

In 2017 CryptoRuble released by Vladimir Putin. It was owned and issued by government as Ruble. Its value also same with Ruble. The purpose for establishing this currency is to prevent terrorism, money laundering through other decentralised cryptocurrencies, protect users from financial risks, use blockchain technology effectively and impose tax to revenue with cryptocurrencies easily. The future of the CryptoRuble is unclear because, the aim of digital money is being decentralized and anonymous. Cryptocurrency issued by government agency may not be demanded by people.

At first, Russia is in the strict position against Bitcoin, then began to be soften. It can be noticed that Russia saw the big opportunities to mine Bitcoin as it has own electricity. Specially, Siberia district is the ideal place for miners.

US

US government also worries about digital money risks – terrorism, pornography, drug trade, money laundering etc. Undoubtedly, these are realized with dollar too. But through Bitcoin this is much more easy and free of fear of seizing. Even there was official internet site for drug trade with Bitcoin called Silkway which was shut down by Federal Bureau of Investigation (FBI) in 2013. In the same year

Financial Crimes Enforcement Network (FinCEN) subjected virtual currencies to Bank Secrecy Act (BSA- legislation that requires banks and other financial institutions to report transactions in high amount or suspicious conditions, in our case exchangers) to prevent mentioned risks. Yet US Treasury Department declared that virtual currencies are not subject to any jurisdiction.

According to Internal Revenue Service virtual currencies are properties and they should be imposed to taxes. As taxpayers should report their gain or loss on Bitcoin trade to taxation agency. They also should notice that authority when gets income in Bitcoin or mining Bitcoin for income taxes. Cryptocurrencies also can be used as a payment means such as currency. In this situation digital money must be exchanged to fiat money. Just problem is that taxpayers may hide their gain or income and IRS now can`t track all transactions in blockchain as people may use anonymous accounts.

Federal Reserve is relatively optimistic for using Bitcoin. It does not believe that Bitcoin will cause danger for financial system while it makes sound macroeconomic policy and dollar will continue be the major currency in the world.

Other US government agency Security Exchanges Committee (SEC) governs stability, fairness in stock exchange market. Bitcoin is considered property – an investment tool, it is rare to use Bitcoin as currency. This authority oversees the risks of Bitcoin investments. But this is also limited as intercede of government agencies to decentralized system is not so easy.

China

China`s Central Bank has banned Bitcoin and other cryptocurrencies in its territory strictly. Here companies can`t trade with Bitcoin, Chinese citizens can`t hold cryptocurrencies legally. Despite the strict rules, this country is one of the top countries in Bitcoin mining due to the cheap energy resources. That`s why government is going to readjust electricity bills, taxes etc.

If it is needed to look through other countries example, in Iceland trade with Bitcoin in foreign exchange is banned or in Bangladesh payment in Bitcoin is severely restricted, even there is punishment to Bitcoin users till 12 years` prison. But in some countries there are supportive behaviors. In Finland, Belgium Bitcoin is exempt from taxes. In UK and Germany Bitcoin is under certain tax regulations. Overall, in any country cryptocurrencies are not counted the part of financial system in regulation as a currency. Most countries behave with them as commodity or property. It is clear that each country worries Bitcoin`s power and try to be aware all times.

Unlike countries, most companies are interested in Bitcoin. It may be forced by public that already millions of people are virtual currency users. It also good for their business management. Because accepting Bitcoin as a payment provides these companies with high speed, lower transaction fee than banks, financial instutions. It is also good for companies that they may avoid taxes (not all countries). Some cryptocurrency exchanges offer traders to exchange digital money to fiat money easily.

It is clear that value of any cryptocurrency depends on trust of public. This trust comes from big corporations which accept them. It means, how global corporations have affection on the future of Bitcoin and other altcoins.

Microsoft

Microsoft accepted Bitcoin as a payment method in game, movie, app, video purchasing in 2014. When the price of Bitcoin rised to $20.000 (in December 2017) and fell down in a few days to $14.000, Microsoft temporarily stopped Bitcoin acceptance due to high volality and risk. This decision was not so long and soon company confirmed that Bitcoin is a payment option again.

Apple

Apple has not accepted Bitcoin as a payment way directly. It means anyone can`t buy Apple products online with Bitcoin. Apple just let apps in IOS system to work with Bitcoin. There are certain apps that offer to send or receive Bitcoin and Apple just switched on green light to them.

Amazon

Amazon is the largest online retailer all over the world. Its sales are more than 95 billion USD. Now all eyes on this platform if, it will receive Bitcoin in transactions. It would wrong if we say that if such big company doesn`t accept digital money, it will cause cutting down of Bitcoin. But it is clear that this may hit a heavy blow to cryptocurrencies. It is predicted that if it adopts virtual currencies, its price will rise approximately 20-30%. It seems that company has fears about tarnsaction speed (in Bitcoin it is 7 transactions per seconds, while this figure is 600 in this online platform), fees, high volatility of BTC. Company doesn`t give any official declare about new payment method yet.

In 2014 **Wikipedia** began to work with Coinbase Bitcoin exchange to accepting this digital currency. Exchange company offered it changing Bitcoin to USD immediately and provide company with unrisky condition. Other big global corporation **Starbucks** Chairman informed public that they wait to be sure Bitcoin`s future life. They do not believe that Bitcoin can be a currency and adopted by people so easily, but they also are not aggressive to such new payment method idea. **eBay** is also company that fears from cryptocurrencies and do not think to get Bitcoin in transactions. It also worries about customer dissatisfaction and volatility of price of electronic money.

2. CRYPTOCURRENCY AND STABILITY OF TODAY'S FINANCIAL SYSTEM – MAIN CHALLENGES

2.1. Analysis positive and negative impacts of cryptocurrency to the stability financial system

Financial stability

There are more and more different opinions in cryptocurrency area. One side thinks that it is ever great danger to financial system while others think that cryptocurrencies are big chance for future. It is widely spread idea that Bitcoin is just a big bubble or just a commodity but not currency. Likewise, some economists have come to decision that, in future digital money will be just currency in the world.

In general, financial stability contains financial risk management of investors, to prevent or smooth financial crisis, resource allocation (taxation), proper work of financial intermediaries – banks, hedge funds, exchanges etc., innovation (e-banking, blockchain), security on money transfer, stable regulatory base and so on. All these terms affect the financial system of the country. Main role belongs to banks that we try to identify if it is possible to run financial system without intermediaries through cryptocurrencies or these are just a big bubble?

Transactions

Traditional payment services positive and negative side

In modern time, all economic subjects in monetary market depend on banks. Banks adjust their money flows under regulation of governments. Liquidity, safety, speediness in monetary relations are vital for businesses. Most used system is Society for Worldwide Interbank Financial Telecommunication which provides financial information transmission about financial transactions between banks. It is regulated under global standards and appropriate governments. It means here all customer data is accumulated under one roof and this centralized system makes customers and

banks vulnerable to cyberattacks. Money transfer fees are also so high beginning $25 and changes according to amount you wish send. On the security side condition is not so dark, although there have been some threats in case. In 2016 SWIFT officially addressed its customers for complaints about cyberattacks that customers faced. Officials advised that customers should claim their banks to be more sensitive to such issues. Other big problem had been in 2017 that $81 million is theft from Bangladesh Central Bank through SWIFT account in New York Federal Reserve Bank. Focusing on timeline proceeding process takes approximately 5 business days which is so long.

It is known that banks use mentioned in international money transfers, businesses and individuals also use private money transfer companies such as Western Union, Золотая корона, World First, Currency Online, TransferWise etc. All these systems are centralized and are counted as third party between parties wish to transact each other. These companies differ from each other according to transfer fees ($0-50 or more), timeline (1-5days), minimum required amount for transaction etc.

All these money transfer services work with different currencies of hundreds countries. Main currency is USD in fees and each of them offers different exchange rates in foreign currency. It is doubtless that exchange rates always fluctuate.

It makes trust between customers that government stands at the back of their money. They have rights on legislation. Most noteworthy point is that bank is the backbone of the financial system. They can detect suspicious transactions that may rise black economy, make black list of unreliable persons to prevent waste of capital (persons who are not willing to pay credit interests). Monetary policy is founded on the banks that money supply depends on rates (with high rate people will be willing to save money and money supply will decrease and vice verca). Banks themselves can also invest in different sectors, it will cause economic growth in country.

Working with government backed currencies, real money that you can touch after transfer makes good sense.

Cryptocurrency trading system positive and negative

Cryptocurrencies are traded on the several blockchains. There are different types of blockchains which offer different cryptocurrencies. So, base technology in digital money trade are blockchains. It is counted safer and cheaper than traditional transaction systems. Best side is that third party is eliminated and is called peer-to-peer technology. Parties transact each other without confirming any bank or financial institution. Just miners should execute your transaction order in return very little amount fee. Example, if you want to send 0,23615221 BTC you should give on average 0,0001 BTC as fee. The incentive to confirm your transaction is also getting Bitcoin from mining process. It is clear that, as number of rewarding Bitcoin is decreasing, amount of fee will rise. Other good side is the impossibility of changing transaction data as they are chained each other with hashes. To change any data it is needed to change all before recorded transactions and it is impossible with present CPU powers. It is also considerable that, to attack to network relatively unrealizable. There should be 51% of users to wish attack and it equals millions of people.

Because of anonymity bad minded people can lead illegal transactions such as drug, terrorism, weapon, pornogrophy etc. Taking on average 10 minutes to each transaction may be a little bit annoying which is so long to wait. It means, if you want to send money to somebody you should wait 10 minutes that miner to confirm your transaction. It can be longer to wait miner choose your transaction from mempool.

Exchanges

Forex good and bad sides

Forex is the international currency market which enables users to buy, sell or change currencies. Businesses deal with border cross trade, use FX to change currencies. For speculative purposes, investors buy currencies with expectation of rise in value for sell then to gain on fluctuation of rate. Exchange rate of currencies depends on demand and supply of currencies in market, also central banks can adjust

through indirect ways such as increasing or decreasing money supply or currency intervention. External factors as the stability of financial system, political issues, economic power, wars etc. affect the value of currencies. So it is possible to come conclusion despite of high fluctation with the reason external factors it is nearly good approach to address currencies of governments with sound economic power to mitigate risk. Other good side is that Forex offers different operations – swap, futures, spot to eliminate losses on exchange rates. This exchange market is a decentralized and removes third party as users connect each other through network easily. It works 24 hours a day but just 5 days in a week that it may cause certain delays for businesses.

Cryptocurrency exchanges good and bad sides

There are several cryptocurrency exchanges that offer different exchange rates, fees, cryptocurrency and fiat money to exchange. These markets work 7/24 which is good opportunity for businesses. Rate of cryptocurrencies in market also depends on demand and supply which is affected by external factors in turn. Here any government can`t intervene to rates, just exchange company itself determines certain ceiling according to market. Cryptocurrency exchanges are not decentralized and owned by private companies. Bitcoin and other altcoins are used for speculative purposes rather than payment. So to gain profit it is needed to follow crypto market closely.

Stock market and cryptocurrency market (Investment)

Stock market is the ``place`` where companies offer their shares and bonds to raising fund in return interest to investors. Investors in turn, make a portfolio consisting shares in order to gain profit. Regulatory body is SEC (The securities and Exchanges Commission) which overseeing the whole stock market. Similarly, with cryptocurrencies, stocks are not in physical form and running throw network. Value of stocks depends on company`s financial condition, economic and political issues in country etc. as value of cryptocurrencies also depends on the same manners. But it is

different that own the share make investors feel in safe rather than owning Bitcoin. Because, you will research and try to address to companies with sound management, reputation or financial state. It makes investors feel in safe with their money. On the other hand, presence of certain regulatory body, regulation, certain requirements for listed companies and absence of big shock in market (except 2011 shock) makes stock market attractive. It is also notable that price of shares is not as volatile as Bitcoin. More fluctuation is recorded in cryptocurrency market rather than stock market.

Taxation on cryptocurrencies

Taxation is the crucial point for any government to carry out its functions properly. With the arising of Bitcoin, governments took alarm as the fear of increasing anonymous transactions, money laundering, profit gaining without tax imposing. So nearly all countries began to apply rough tax laws (in Italy there is zero tax on cryptocurrency trading, in China trading with Bitcoin is banned absolutely). Internal Revenue Service (IRS) in US counts Bitcoin as an asset rather than currency. Exchanging cryptocurrency to fiat money or other cryptocurrency, using as a payment method, gaining profit from holding cryptocurrency for a certain time – all of these are taxable event. Good side is that governments get additional budget funding through taxes. Imposing taxes also decreases the incentive to use cryptocurrency. Other side is that business are overload with massive account issues as they have to report all transactions on cryptocurrencies. Traders should report fair value of USD according to cryptocurrency amount which is difficult thanks to the volatility of the rates. According to statistics big part of crypto users avoid to report their profit and detecting this evasion nearly impossible because of the anonymous nature of blockchain and Bitcoin.

FED warning

The Fed vice-chairman of supervision – Randy Quarles, declared the position of Fed in front of cryptocurrencies. He spoke that increasing market capitalization of

cryptocurrencies will lead to financial instability. According to Fed, if turnover of the USD will not be in certain level, there will be liquidity issues in banks therefore decreasing potential in crediting. It is also possible that enhancing the Bitcoin using will cause decreasing the demand to USD, thus value of USD will lower. Fed also doubts about the durability of Bitcoin. Their state is that, cryptocurrencies are not backed by official agency and it makes crypto users vulnarable to risks.

In US example it is clear that increasing demand to Bitcoin would lower the price of USD and it would cause big danger for US financial system. As nearly all world countries take borrow from US, example, giving borrow with 5% interest rate and then get pays with more than 10% valueless USD will cause extremely loss (however this situation is appropriate if in the future Bitcoin will not need to exchange USD and be an independent currency).

Inflation

Certain level of inflation is counted desirable for economy as relatively high prices inspire producers to increase supply of goods and services in order to get more gain. Fed usually try to adjust inflation level around 2%. However, in developing countries these figures are in two or three-digits. This decreases purchasing power of money holding by citizens. This problem is completely removed by Bitcoin. Thanks to predetermined limited supply (21 million) makes Bitcoin carries deflationary feature.

Table 3

INFLATION	**Purchasing power**
1996 - $15	A full basket of food
2003 - $15	An half basket of food
2018 - $15	One or two kinds of food

DEFLATION (cryptocurrency)	**Purchasing power**
2012 – 1BTC	One or two kinds of food
2017 – 1BTC	Car and a full basket of food
2022 – 1BTC	A luxury car and house

Source: Own investigation

Table illustrated above shows how money`s value has been decreased over the years, in turn people`s purchasing power. But electronic money offers money with deflationary character that assures just rising trend in value.

Gold standard and cryptocurrencies

World currency system have passed several stages which every stage is related to economic and political condition. Firstly, Paris currency system (1867-1920) was contain in itself gold standard and fixed exchange rate. The presence of the gold standard prevented the inflation and adjusted the balance payments of countries. After 1922 with Genoa currency system English sterling and USD became the equivalent to gold. 1930-1933 Great Recession claimed new system and in 1944 in Bretton-Woods system only USD became equivalent to gold. After its collapsing in 1971 gold equivalency to currency is cancelled and float exchange rate regime is applied in Jamaica system. World monetary system felt severe inflation and recession (2008) after the removing of gold standard. Volatility of gold was relatively lower than USD or Euro. Now Bitcoin is called new ``Gold`` because of the big similarity –

scarcity. As fiat money printed in huge amount causes inflation, Bitcoin`s supply is limited and it carries deflationary character. In general, it is impossible to return gold standard thanks to scarce amount can`t substitute all money in circulation. But it is also arguable if Bitcoin be a world currency? Probably, not. Because, Bitcoin fluctuate in huge amounts as from $0,1 to $20,000 and people would not to consume with BTC to purchase a fridge. Because, they know that they may purchase two fridges tomorrow. That`s why Bitcoin and Gold are just the most preferable investment assets nowadays.

Is it possible to counterfeit BTC?

Double spending is the major problem in today`s banking system. Through electronic payments hackers could send $1 to separate people at the same time. Bitcoin is created to avoiding this problem. Because of the nature of blockchain all transactions are executed by miners and confirmed by everyone. So, everyone can see your transaction and amount of money in your wallet. Thanks to distributed ledger, people easily determine if you have money to send or not.

Removing exchange fees

Using cryptocurrency doesn`require to search exchanges and pay high fees to exchange national currency to foreign currency while travelling to foreign country. It also removes stealing or losing physical money.

2.2 How can be Bitcoin applied in Azerbaijan or is it should be?

Bitcoin is a quite new area in financial system in the world. Every new stuff appeared in financial system or economy should be analyzed on the behalf of the government rather than individuals. When first cryptocurrency came to the scene governments became to be worry its affection to financial stability. If Bitcoin is accepted as a currency by government then government budget income will fall under

the question. Because, people who pay taxes on the transactions, income etc. would easily hide from government because of the anonymous nature of blockchain. On the other hand, central banks would not print money, so government will can`t to continue to deal with its functions as transfer payments, wages, infrastructure investments and so on. If Bitcoin is accepted as a commodity, because of the price volatility investors` financial condition will be under the high risk. Accepting Bitcoin as a means of payment also carries risk that government is not backed that ``tool``, so businesses trading with it stay in a risky zone too.

The chairman of Azerbaijan`s Central Bank (CBA), Elman Rustamov recently informed that Azerbaijan government approach to cryptocurrency area in a conservative way. In Azerbaijan Manat is the only legal means of payment and currency and Bitcoin doesn`t get legal position yet. Nevertheless, number of people using Bitcoin as an investment asset is not low. Mr.Rustamov also stated that government has created a research team consist of financial analysts and IT specialist to analyze the cryptocurrency market, foreign countries` experiments, perspectives in Azerbaijan financial sector etc. The aim to found that team is the researching the possibility of new legislation called ``Regulating of cryptocurrency market in Azerbaijan``.

It is also notable that financial enthusiasts have started to pilot project called Azcoin. Unlikely other coins here the aim is to make Azcoin as a government backed – national cryptocurrency. That cryptocurrency doesn`t get legal tendency yet, however founders` have a big desire to create first government backed cryptocurrency in the world and make Azerbaijan advanced country in this sphere.

In practice, is seems challenging to enhance the using cryptocurrencies as a means of payment. Reason is that in Azerbaijan even non-cash payments are not desirable level yet. Here people mostly prefer paper money to handle and consume and it seems this situation will cause to delay cryptocurrency spreading in financial markets. Another obstruction is a technology side which is the foundation of

cryptocurrency is based on high innovative and expensive computer technology – blockchain. It also directly related to educational level of people both in financial and IT area which is not heartwarming. Trying to develop all mentioned negative sides may cause be in hope about future of cryptocurrencies in Azerbaijan.

Another question is that if it is needed another currency to compete with Manat? We mentioned that why governments do not want Bitcoin to enter their economic area. At present in this country financial and exchange markets are not competitive. So it is questionable if it is necessary to focus cryptocurrency developing rather than healing currenct financial system. Certainly, to keep pace with world financial tendency, adopting innovative phase of financial system is important. Nevertheless, it should to take account that it is impossible to step further stage before make the indestructible the previous one. So, before to admit cryptocurrencies into national market it would be better to fix current banking system.

Perspectives of cryptocurrencies in Azerbaijan could be shine in investment area because of the lack of stable investment commodities. In foreign countries stock market is highly developed thanks to shares, bonds of global multinational corporations with the millions dollar turnover. For the present, it seems that the only way to increase the Bitcoin using is the rising incentive to invest Bitcoin to gain additional profit by people.

2.3 Modern banking system and cryptocurrencies

How works today`s banking system?

We everyday face with the banks through indirect way – withdrawing wages from cards, paying electricity bills online, buying closes by Visa etc. All these operations are run by banks on the intermediary role. It implies, banks warning all transactions we carried out and they control our money. Principally, there are three

prime functions executed by banks – deposits, credits, intermediary role. All these functions formulate the base of money circulation in the economy. Firstly, people who have more money than need for consumption deposit banks to earn interest rate. This process carries vital significance as the money flows into economy. Second function is the loan that banks offer financial support to people in return interest rate. Banks also deal with investment issues with depositing money to gain additional profit which it causes the economic growth. Last function is the intermediary role, as mentioned, for any financial transaction it is needed to take permission of your bank.

Traditional banking system has positive and negative sides as affect the financial stability:

Benefits

- ✓ ***Existence for a long times makes banking system more trusted***

  Ancient history of banking comes from ancient Greece and Roman Empire (800 – 500 B.C.) and in medieval times it developed in Italy, Genoa and Venice. These times core functions were the primitive form of modern banks` functions and beginning from 17$^{th}$ century in England first bank system developed. Main process was the accepting peoples` gold to hold in return giving banknotes as today`s paper money. So the foundation of modern banking practice began from this time and flourished till this time.

- ✓ ***E-Payment system works successfully all around the world***

  As the result of advances of technology and internet-based banking, online payment system has enhanced increasingly. Through Visa, Master cards people conduct with online payments via internet or directly with POS Terminals in magazines. It is counted as the most efficient and convenient service ever banks have offered. ``one click`` payment system also prevent the tax evasion of businesses by transparency and lowers the level of Black Economy.

- ✓ ***Relies on legislation, insurance and reserve banking system in depositing process and ability to withdraw money anytime***

In Azerbaijan money and currency system, including banking system is regulated by Financial Markets Supervision Chamber and Central Bank. Banks are regulated under the ``The Law of the Republic of Azerbaijan on Banks`` which defines the legal framework for principles and rules of banks. Capital requirements, restrictions on bank operations, standards for relations with clients, audit, report standards and many others all for customer satisfaction and providing transparency in the financial system. Banks which are not follow these obligatory requirements are punished by law.

- ✓ ***Paper money doesn`t claim internet connection. This case mostly beneficial for older people***

Beside the good side of electronic payment systems, it also may harmful for some people who can`t reach internet connection or can`t use innovative technology. So banks also offer services directly by themselves to customers. Some people are willing to conduct with bank employee in order to lower wrong operation possibility.

Drawbacks

- ✓ ***Human fail through accounting system***

Employees in banks may intentionally to gain illegal profit or by accident may include wrong figures through accounting process. This will harm customer`s financial position and decrease reputation of bank. It is also possible to give risky credits by employees in order to get bonus which will even led bank bankruptcy.

- ✓ ***Wrong risk management (risky credits, investments) can result in bankruptcy***

In order to get better financial condition, banks always invest in with deposit funds. It is risky if investment project is not lucky bank will go liquidity scarcity and will fail to repay depositors` funds. This case had been

observed in 2008 which many risky mortgage loans will result in massive bank run in US and this negativity will spread to all world economy. It proves the power of banking system on financial system one more time.

- ✓ ***Dependency of deposit and credit level from interest rate and reserve ratio determined by Central bank***

  This dependency makes bank operations to be volatile. It means, if Fed increases the interest rate, people will be incentivized to deposit their money to get benefit from high interests. Likewise, investors, businesses will reject to take credits and this cause stagnation in bank system. Vice versa – decreasing interest rates will cause rising in the number of credit takers and shorten in number of depositors. In this case banks may face with liquidity problems.

- ✓ ***High bank fees***

  Bank fees are the major part of overall revenue of banks. It normally be around the 40% of total income of bank. Fees are usually charged on money transfers, ATM transactions, money orders etc. Example, ``Kapital Bank`` in Azerbaijan charge 0,2% on the card to card fund transfers or 1,5% charged on the withdrawing of funds from ATMs. These figures may seem little for huge amount money transactions. However, it is considerably high for trivial quantity of moneyş

<u>Can cryptocurrencies substitute the modern banks</u>

To compare today`s banking system with cryptocurrencies, we will reach contoversial approaches. To start from the beginning, substituting the deposting function through cryptocurrency blockchain may gives some advantages. It is fact that modern banking system ensures depositors with safety as they insure customers` accounts with FDIC (Federal Deposit Insurance Corporation). In US case, Fed is responsible to bail out banks in severe times. Yet there are certain problems – because of the detecting artifical using of funds by banks and do not afraid of risky investments, FDIC claims strict requirements. Under the other condition, in 2008

example, US government incurred high inflation after the bailingout (financial aim) banks. Banks collapsed and government to be forced to print more money to cover consumptions and it drove economy into inflation. So, holding money in blockchain, seemed more safe. You will gain from rate exchanges of cryptocurrencies during holding time rather than interest rates and it doesn`t need to worry about cyber attacks or fail of system. Bad side implies that losing private key of account will be result in loss of all money and any agency would not carry responsibility unlikely banking system.

Cryptocurrencies as an alternative way to loan processing is not as lucky as depositing. It is undeniable that businesses, indviduals run their work on credit. And the question is that if it is possible to funding people without financial institutions? Almost no. Crediting requires trust to each other, deal with risk managment to prevent any default and claims collateral to secure investment. All these processing is nearly impossible without third party. It could be done through Smart Contracts to determine mentioned agreements, but it doesn`t work yet.

The main purpose to creation of cryptocurrencies is to eliminate banks from the transaction process. Peer-to-peer technology doen`t require third party to confirm or let to execute the transaction. It also cuts bank fees which are incredibly high.

From table described below it can easily to differentiate modern banks and cryptocurrencies. Table illustrates the main characteristics of financial institutions and digital money.

Central Bank cryptocurrencies

Cryptocurrencies are not danger for Central Banks today. But if its market capitalization, also accepting level by business as a means of payment increases, it will affect Central Banks power to adjusting economy through monetary policy will substantially decrease. Circulation velocity and value of national currency will decrease. In this meanwhile, seeking a way to compete with cryptocurrencies,

governments let to public know that Central Banks are willing to create a coin. Federal Reserve wish to manage ``Fedcoin`` and Fed Blockchain backed by US government. Other countries including Greece (Eurocoin), Canada (CAD-coin), England also are interested in this idea. This step is the against the nature of cryptocurrency – decentralization and anonymity. People turned to Bitcoin with enthusiasm in order to get rid of their money from Central Banks and government. Positive approach could be that governments would easily track illegal financial activities. It is also notable that government will back that currency with certain legislation. This step would be end of the paper money and all beginning era of the new financial era – digital USD. If this effort is lucky, governments will remove carrying, emission, holding costs of paper money and whole system will adopt to high innovative technology.

Banks versus cryptocurrencies

It seems not possible that digital money deactivates banks in close future. They work together yet. Even certain businesses accept Bitcoin in trading, they exchange digital money to fiat money after then. In 1994, Bill Gates stated these words: ``Banking is necessary, banks are not``. He had seen the future of digital financial system and set this quote to take attention the significance of IT. In order to compete with new money, banks should increase customer satisfaction through lowering fees and creating more secure systems. Cryptocurrency itself may seem danger, but the future of blockchain technology looks shiny. Already some banks experimented operations on blockchain – Goldman Sachs, Bank of America Merrill Lynch, Royal Bank of Canada, HSBC etc.

Conclusion

World of finance is at the point where one step further is the wholly different. This new emerging industry could attract many IT programmers, finance specialists, economists, speculators, businesses. Enthusiasm by them made more request to cryptographic forms of money and the value rising in turn. Crypto money market now worth billions of USD, although it even doesn`t have physical possession like gold, silver or any other precious money. Non-existence of central issuing authority or regulatory body to tracking the transactions makes Bitcoin and other cryptocurrencies to depend on wholly newtork users. Due to the cryptographic system used hashes traditional financial system problems such as double spending, conterfeit money,cyberattacks are hampered through digital forms of money.

Despite of the being safer than tardiotional financial system, there are also hundreds of people who have lost BTCs worth to millions of USD. According to report by Ars Technica (source of tech news, scientific aprroachs), trading with this new digital money impose people under the big risk. That`s why for not to be electronic money victim it is necessary to measure risks, get knowledge about crypto money industry before entering this pool. The most shockable effect was in 2014 February to MtGox exchange which was leading the biggest crypto money exchange trade aproximately 70% of overall trade. There have been 850.000 BTCs are stolen that 1BTC was nearly $500-600. Not just MtGox but other exchanges also were incurred DDOS attacks and lost thousands of BTCs roughly each year.

In this research paper it is also mentioned double spending which is prevented by cryptocurrency system. As traditional accounting system works on the principle which payment is registered on the balancesheet and level of debt increases in the case even not money on account. But with cryptocurrencies it is possible to send only the amount of money that exists in person`s account.

It is also reminded the differences and relations between banks and new digital money system. While incentive of bankers is the gain from interest on credits and fees from operations, stimulus for miners is Bitcoin reward and fees in trivial amount. It is also considerable when risk is centralized in banking system, means all responsibility on financial operations belongs to bank itself, there is distributed risk among peers who trade with digital money. It leads possible losses just belongs to person itself nobody else.

As known, supply amount of Bitcoin is decreasing over time. It is not exception that limited supply will cause rise in value of virtual money. With this process miners` incentive to get Bitcoin will be substituted by high fees which will be paid by traders. Likewise growth figures of transaction will be resulted in delays in trade time. All these issues may be eventualized by diminishing of demand to Bitcoin.

Suggestions

Applying Blockchain technolgy must be definite step by big corporations, banks and governments. World countries should be kept pace with modern era technologies. With the applying this technology, governments may cross more efficient way in economic growth. Blockchain is not runned just for cryptocurrencies but also for electornic agrrements (smart contracts) which removes shortcomings and fails between parties, music, movie, game selling which prevent piracy – labor theft. To incetivized people to use blockchain singers, artists or companies can sell their product or services through peer-to-peer technology. Governments should invest in digital industry by budget allocation.

To block up Bitcoin is nearly impossible. Because, to prohibit cryptocurrency means just like to restrict internet using which even its imagination is ridiculous. So only thing governments can do – to prepare legal framework. Despite of existing several reports and guidances, also AML (Anti Money Laundering), KML (Know Your Customer) regulations on Bitcoin exchanges, there is not yet consistent law on

cryptocurrencies. To set up law is necessary to protect citizens from fraud, losess also to stabilize effects of cryptocurrencies on the financial system.

Because of the prevent losses and fails on cryptocurrency trading and lessen the vulnerability to risks, it is needed to inform people about this industry. Making teams and appropriate programs by governments or private companies for interested parties for education and advisory purposes is a step which must be paced.

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