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Bitcoin and other virtual currencies

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Thesis title

Bitcoin and other virtual currencies

Objectives of thesis

The purpose of this thesis is to examine what are virtual currencies, to assess the current international situation and compare how many people use electronic currency and which one, is most popular and safe? The goal is also to assess the solutions to the preservation of funds in electronic currency in a secure form . Try to make predictions for the future process of growth or decline in the popularity of e-currency, and conduct a survey of how many people nowadays use e-currency in everyday life and which one?

Methodology

Theoreticl part will be focused on basic knowledge about e-currencies, how they work. Review of the history appearance of cryptocurrency, what important components affect to the prices and demand, find out when the first cryptocurrencies appeared and how e-currencies could interest many people.

In practical part, let's consider the trend of growth of new currencies, such as Bitcoin.Will be analyzed the charts with the rise in Bitcoin prices over the past 5 years. In the thesis was made an attempt to predict the further development of the situation in the cryptocurrency market through a survey of users in the social network. Mathematical and statistical analyses will also be carried out to identify the percentage of protection of the most famous electronic currencies. Big role in the modern world are playing other virtual currencies, which are regularly used by every third person. For example, Qiwi, Yandex Money and WebMoney. Why is it convenient to use these Internet services? What are the pluses and minuses. What are the main criterias for choosing a specific service? Consider different life examples, talk about the needs of age groups and on the basis of this will be concluded about the interest in a particular type of Internet service.

The proposed extent of the thesis

40 pages

Keywords

Bitcoin, money , bank, virtual currency ,business , fees , math, price ,stock, wallet, transaction.

Recommended information sources

Bitcoin and Other Virtual Currencies for the 21st Century. By J. Anthony Malone ISBN 13978-1499324617

Digital Virtual Currency and Bitcoins: The Dark Webs Financial Market – Exchange & Secrets 2013. Richard Amores, Pierluigi Paganini. ISBN 1481905953

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Virtual Currency and the Bitcoin Revolution: Perspectives and Considerations from Congressional Hearings. Valerie Duskin 2014. ISBN 1631172808

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Declaration

I declare that I have worked on my bachelor thesis titled "Bitcoin and other virtual currencies" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15.03.2018 _____

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I would lid to thank Ing. Petr Procházka for this support and advice during my work on this thesis.

Bitcoin a jiné elektronické měny

Souhrn

V abstrakty dáme posudek virtuální měny, kde jsou uloženy, jak jsou bezpečné a jak můžem použit? Zvážit virtuální měny, které jsou populární v dnešní době. Budeme hodnotit a porovnávat tyto elektronické měn, vybrat si ten nejlepší. Také porovnat, jak populární jsou v dnešní době a jaký je poplatek na jejich předávání do jiných zemí

Vzhledem ke skutečnosti, na základě matematických principů, virtuální měny, zejména Bitcoin , jsou přitahuje zvýšený zájem, k dispozici jsou 2 společné body pohledu:1) virtuální měna je považována za odrazový můstek pro budoucí rozvoj platebních systémů; a 2) virtuální měny v rukou zločinci osob podílejících se na financování terorismu a jiné protiprávní prvky se snaží obejít tresty se stal nový masivní zásob, pro pohyb a uchování devizových takovým způsobem, že jsou mimo dosah vymáhání práva a další příslušné orgány. Zvážit nejslavnější elektronických měn a udělat analýzu, pro něž jsou k dispozici?

Klíčová slova: Bitcoin, peníze , banky, virtuální měny ,podnikání , poplatky , matematika, cena ,skladem, peněženku, transakce.

Bitcoin and other virtual currencies

Summary

In the thesis will be described the virtual currencies, where they are stored, how to safe them and why they are needed? Consider the virtual currencies that are popular nowadays. Will be evaluated and compare these electronic currencies, choose the best one. Also compare how popular they are nowadays and what is the fee on their transfers to other countries

Due to the fact based on mathematical principles, virtual currency, particularly Bitcoin , are attracting increased interest, there is 2 common points of view:1) virtual currency is considered a springboard for the future development of payment systems; and 2) virtual currencies in the hands of cybercriminals persons involved in the financing of terrorism and other illegal elements trying to circumvent punishments become a new massive inventory for the movement and preservation of foreign exchange in such a way that they are beyond the reach of law enforcement and other competent authorities. Consider the most famous electronic currencies and do an analysis for whom they are provided?

Keywords: Bitcoin, money , bank, virtual currency ,business , fees , math, price ,stock, wallet, transaction

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1 Introduction

When exactly electronic money arose - it is unclear. Probably went unnoticed, as it were by itself. Elementary with time, we increasingly began to receive salaries and pay for services without leaving home. For the share of time and nerve savings, the importance of virtual money can be compared with a gadget like a mobile phone.

However, it so happened that every development brings to our lives not only pluses, but also minuses. And virtual payments did not become an exception - as soon as a new economic sphere arose, it was studied by numerous scammers. There are other difficulties, except dangerous criminals — people themselves often make mistakes in the application of virtual means of payment. As a result, some citizens refer to virtual finance with disdain or with caution. In addition, many do not understand what cyber-money is supposed to be in legal terms and how the internal mechanisms of electronic settlements operate.

In essence - probably quite similar to the usual traveler's check, only you sign it with ink and with the password and electronic code. What is good about this approach? Cyber-money is allowed to be transferred from anywhere and anywhere - there would be internet! In addition, a large part of the money transactions are allowed to create without contacting the bank. There is only software that monitors the correctness of the transaction. This device allows you to pay for a purchase in a few seconds, while using a bank account to conduct a transaction would take at least 2-3 hours. Another advantage of this system is contained in anonymity. Kidnap electronic means is unrealistic, including if the attacker knows the number of a web wallet. While knowledge of credit card details theoretically allows you to withdraw a large amount from your account. Thus, paying for any services or purchases with the help of a credit or debit card, a person goes to the established risk - if this data on the card gets to an unreliable person, then there is a chance to lose a specific amount. Electronic means are allowed in the absence of fear of paying from any semi-basement firm-one-day, without the risk of losing the balance of the Internet wallet.

2 Objectives and Methodology

2.1 Objectives

The purpose of this thesis is to examine what are virtual currencies, to assess the current international situation and compare how many people use electronic currency and which one, is most popular and safe? The goal is also to assess the solutions to the preservation of funds in electronic currency in a secure form . Try to make predictions for the future process of growth or decline in the popularity of e-currency, and conduct a survey of how many people nowadays use e-currency in everyday life and which one?

2.2 Methodology

Theoreticl part will be focused on basic knowledge about e-currencies, how they work. Review of the history appearance of cryptocurrency, what important components affect to the prices and demand, find out when the first cryptocurrencies appeared and how e-currencies could interest many people.

In practical part, let's consider the trend of growth of new currencies, such as Bitcoin.Will be analyzed the charts with the rise in Bitcoin prices over the past 5 years. In the thesis was made an attempt to predict the further development of the situation in the cryptocurrency market through a survey of users in the social network. Mathematical and statistical analyses will also be carried out to identify the percentage of protection of the most famous electronic currencies. Big role in the modern world are playing other virtual currencies, which are regularly used by every third person. For example, Qiwi, Yandex Money and WebMoney. Why is it convenient to use these Internet services? What are the pluses and minuses. What are the main criterias for choosing a specific service? Consider different life examples, talk about the needs of age groups and on the basis of this will be concluded about the interest in a particular type of Internet service.

3 Literature Review

3.1 Electronic money

Electronic money is a tool that is used to pay for products and services on the Internet, and it has the same value as real money. Traditionally, people face them only when they are going to pay or make money online. Since these funds are used specifically to pay for labor. For example, some people want to make translations from the English language via the Internet. First need to find an Internet site where it is possible accept applications, and start working. Suppose someone made an application and get credited with some amount. Here in order to get it ‘‘on hand", you must have your own electronic account. The next step to quote it on the website, and paid to this account. Later they are allowed to spend on the Internet or to get cash. Is it possible to manage without them?

Often people use the Internet very actively, but they do not have an electronic account. And it is customary, as at the moment almost all products and services can be paid with a card. Probably even easier than starting some kind of wallets and understand them. However, if you intend on the Internet to earn or order services from other people, then e-currency is the first thing you need to meet. As probably the most simple, fast and safe calculation method [1]

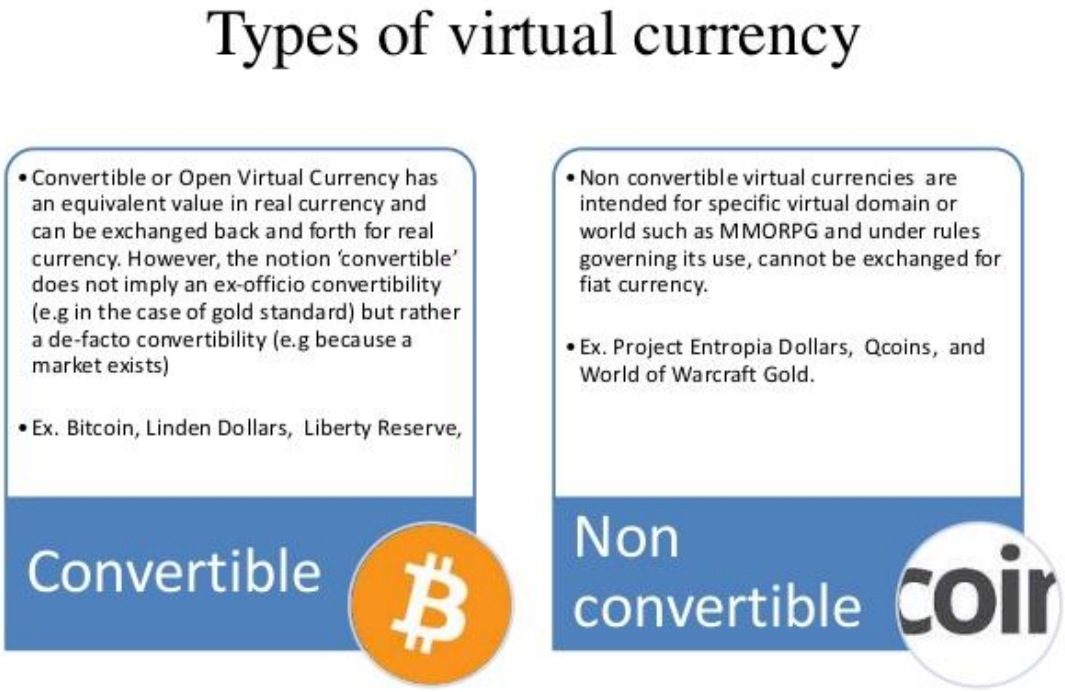
3.2 Virtual currency

Virtual currency is a means of expressing prices, which are allowed to trade in numerical form and which operates as (1) a means of exchange; (2) the estimated currency unit; (3) the means of storing the price, but does not own the status of a legal tender (that is, it is not considered to be an officially valid and legal means of payment when settling with creditors) in any jurisdiction. Virtual currency is not issued and is not provided by any jurisdiction and performs the above functions only under an agreement within the virtual currency users' society. The virtual currency differs from the fiat currency (also called ‘‘real currency", ‘‘real money" or ‘‘state currency"), which is a coin and paper money of the country that is considered to be its legal means of payment, are used and widely used and perceived as a means of exchange in the issuing country. Virtual currency is still different from electronic means, which are considered a digital means of expressing a fiat currency and are used for electronic transfer of value (expressed) in a denominated currency.

Electronic means presuppose a device for the digital transfer of a fiat currency; they are used for electronic currency transfer, they have the status of legal tender. The digital currency has the ability to act as a means of digital expression or virtual currency (non-currency currency), or electronic means (fiat currency), and is therefore often used as a synonym for ‘‘virtual currency". [2]

3.2.1 Convertible and non-convertible virtual currency

Figure 1. Types of virtual currency.



Source: slideshare.net

Centralized and decentralized It is proposed to divide the virtual currency into 2 main types: convertible and non-convertible virtual currency . Although the text of the definition "non-convertible" or "closed", and "convertible" and "open" are used as synonyms, it should highlight that the reference to "hard currency" in no way implies its official convertibility, but only shows on its practical convertibility (for example, the

presence of the relevant market). Thus, the virtual currency is "convertible" only until the time, as long as some private participants propose to her deal, and the others take them, as her "convertibility" in no way are guaranteed by law. [3]

Convertible (or open) virtual currency owns an equivalent value in real currency and has the ability to exchange to real currency and back. Examples of convertible virtual currency are considered to be: Bitcoin, E-Gold ; Liberty Reserve ; Second Life Linden Dollars and WebMoney .

Non-convertible (or closed) virtual currency is specialized for use in certain areas or virtual worlds such as massively multiplayer online role-playing game or the store Amazon.com and that under the rules governing its use, has the ability to be exchanged for Fiat currency. Samples of non-convertible virtual currency are considered: Project Entropia Dollars ; Q Coins ; and World of Warcraft Gold . In this case, we must note that even if, under the terms established by the administrator, non-convertible currency has the opportunity to formally be used only in a virtual world and is considered to be nonconvertible, you may experience an informal dark market where there is a chance to exchange "non-convertible" virtual currency for Fiat currency or another virtual currency. Traditionally, the administrator uses sanctions (including termination of the player account and/or forfeiture of remaining virtual currency) to those who are trying to create or use a dark market, in violation of the set rules of use of currency. The formation of stable dark market of a certain "non-convertible" virtual currency has the ability in practice to lead to the conversion of such currency into a convertible virtual currency. In this relationship hell "inconvertibility" need not be considered immutable and permanent. [4]

3.2.2 Analysis of virtual currencies

All non-convertible virtual currency are considered to be centralized: according to the definition they are issued by the Central administrator, which establishes the rules that limit convertibility. In contrast to non-convertible virtual currency, convertible virtual currencies are divided into 2 sub-types: centralized and decentralized. In systems of centralized virtual currencies have a single administrator, i.e. the person (a third party) that controls the system. Admin issues the currency, sets the rules for its use, maintains a Central registry of payments and has the right to exclude currency from circulation. The

exchange rate for a convertible virtual currency can be either floating-i.e. determined by market supply and demand for the virtual currency, or fixed, i.e. bound by the admin to the value in Fiat currency or in the rest of the values used in the "real world", such as gold or the currency basket. Currently, the bulk of payment transactions in virtual currency are used specifically centralized virtual currency. Examples of such currencies are: E-Gold ; Liberty Reserve dollars/euros ; Second Life Linden Dollars ; PerfectMoney ; WM units and World of Warcraft Gold . Decentralized virtual currency (called cryptocurrency) are considered to be distributed, based on mathematical principles of peer-to-peer virtual currencies with open source, which there is no Central admin and there is no centralized control or supervision. Examples are: Bitcoin ; LiteCoin ; and Ripple . [5]

The means cryptocurrency is based on mathematical principles decentralized currency, which is protected with support for cryptographic methods, i.e. uses cryptography to create a distributed, decentralized and secure information economy. The cryptocurrency used public and private keys to transfer currency from one (physical or legal) person to another, and to transfer cryptocurrency any time need a cryptographic signature. The safety, the unity and actuality of the registers of cryptocurrency transactions is guaranteed by a network of unrelated persons (in the case of Bitcoin called "miners" (miners)), which protect the network in exchange for the likelihood of randomly distributed charges. (In the case of Bitcoin – some of new bitcoins are made, called "compensation block" (block reward), and some options are even used for transactions paid by users as a financial incentive to "miners" to connect their operations in the next block).[6]

Were identified hundreds of variants of cryptocurrencies, most of which are connected to Bitcoin, which used the principle of "proof-of-work" ("confirmation of the execution of works" – a system based on the fact that every operation requires a specific amount of calculations) to verify and prove the correctness of the operations and maintenance of chain blocks.

Although Bitcoin is considered the main working cryptographic Protocol for cryptocurrency, there is a growing interest in the study of other, most effective methods of validation and proof of the correctness of operations, such as "proof-of-stake" ("confirmation of ownership" – a system in which the latest coins are generated not through the use of computing resources, but due to the length of preserving the old coins."[7]

Bitcoin (Bitcoin) was launched in 2009 and became the first of the decentralized convertible currency and is the first cryptocurrency. Assume that a bitcoin unit of account in the form of a unique chain of digital and alphabetical characters composing save copy currency and have value only because users are willing to pay for them. Bitcoin trading is performed by the user in numerical form with the highest degree of anonymity, and bitcoins have a chance to share (bought or sold) for USD, Euro and other Fiat or virtual currency. Anyone has the ability to download free open source software application from the website to send, receive and save bitcoins, and another to control operations in the system of Bitcoin. Users still have chances to get a Bitcoin address, working as accounts on websites of service providers for the exchange of bitcoins or on the web-sites services of online wallets. Information about transactions (monetary flows) is considered available and is in a single register operations, where the operations themselves identifitseerida at a Bitcoin address that represents a chain of alphanumeric characters without systematic reference to the physiological person. [8]

Table 1. The Bitcoin amount

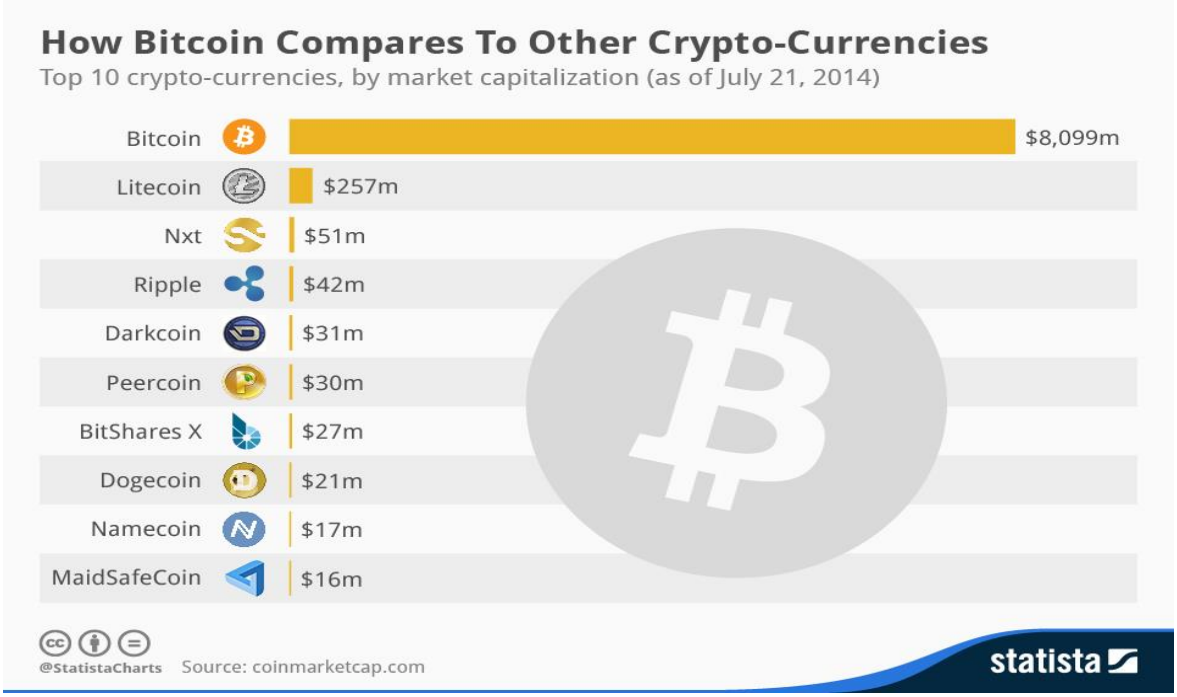
Name	Abbreviation	Amount
Bitcoin	BTC	1
MiliBitcoin	mBTC	0.001
MicroBitcoin	uBTC	0.000001
Satoshi		0.000000001

Source: zarabotokbusiness.blogspot.cz

In this relationship the Bitcoin referred to as "pseudonymous". The greatest number of bitcoins that will be generated is 21 million (but any unit can be divided into the smallest shares), and this degree will be reached in 2140. As at 2 April 2014, it was issued more than 12 and a half million bitcoins, the total price which slightly exceeded 5.5 billion USD based on average exchange rate at this date. Althin (Altcoin) means mathematically based decentralised convertible virtual currencies other than bitcoin, which is the first currency of such family. Currently, examples of altcoins are: Ripple , PeerCoin , Lite-coin , zerocoin , anoncoin and dogecoin. According to reports, Cryptsy, one of the most popular

exchange services, carries out exchange operations with more than 100 different virtual currencies the Anonymizer (Anonymiser) means tools and services, such as the "black network" (darknets) and "mixers" (mixers), intended to hide the source of bitcoin transactions, and facilitate the provisioning of anonymity. [9]

Figure 2. How Bitcoin compares to other crypto-currencies



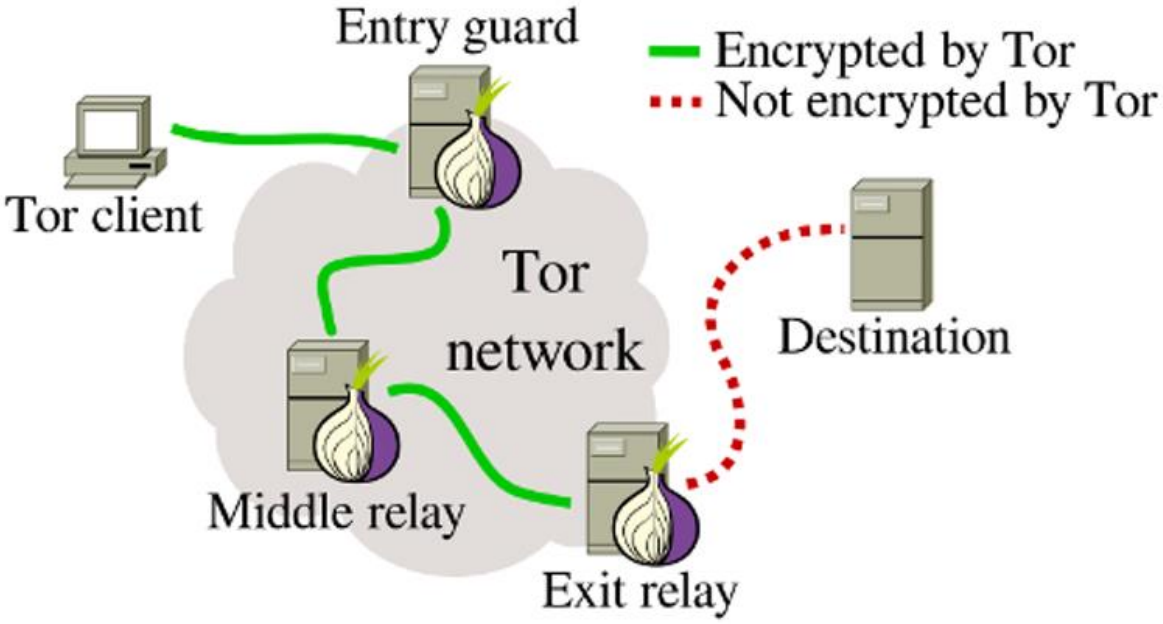
Source: coinmarket.com

Examples are: Tor (anonymous network), Dark Wallet (tools anonymous network), Bitcoin Laundry ("mixer"). "Mixer" (Mixer) (service on laundering, "mixer") is considered one of the anonymizer, which guarantees the concealment of a chain of transactions in the block chain by relating all transactions to the same bitcoin address, and sending them all together so that there is a sense that they are directed to different addresses. "Mixer" or "mixer" sends transactions through a complex series of quasi-random dummy operations, which is very difficult to reference specific virtual resources (addresses) for specific operation. Services "mixers" are receiving orders from the user to send foreign currency funds at a particular bitcoin address. After this "mixer" "mixes" this operation with the operations of other users in such a way that it is unclear who the user is going to send foreign currency funds. Examples of the "mixers" are: Bitmixer.io; SharedCoin; Blockchain.info Bitcoin Laundery; Bitlaunder; Easycoin. The Tor network (was originally

called "The Onion Router") is an anonymous distributed network of computers on the Internet that hides the real IP addresses (addresses of network protocols) and, consequently, the identity of the users of the network by routing communications/transactions through a huge number of computers located around the world, and repeatedly coding them. [10]

The Tor network makes very difficult the task of establishing the physical location of the computers which are located or through which marks the access to the websites in the network. This task can be further complicated through the use of additional "mixer" or proxy in the Tor network.

Figure 3. The Tor network „The onion router“.



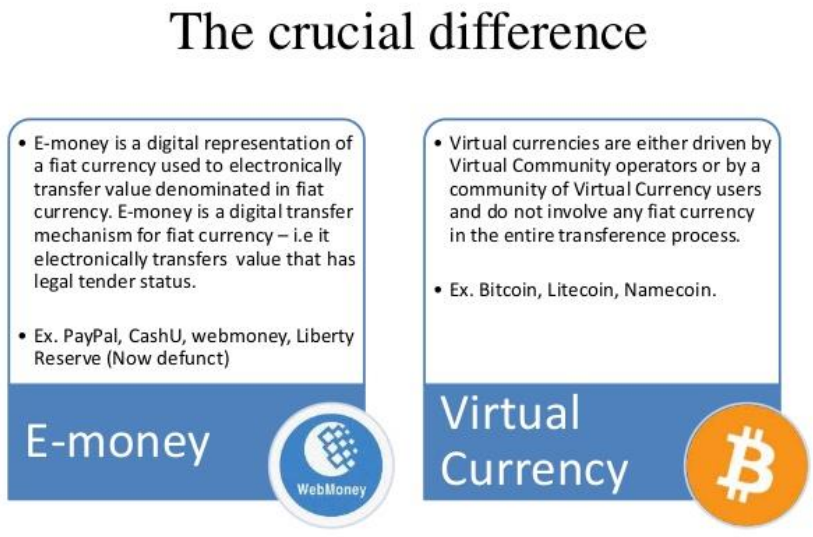
Source: cs.kau.se

The Tor network is one of several underground distributed computer networks, often referred to as "dark networks," cyberspace, "the deep web" (Deep web) or unknown networks that use physiological entity to obtain access to content in such a way as to disguise their own personality and corresponding activity on the Internet. "Black purse" (Dark Wallet) so the purse is a component of the browser Chrome (and maybe Firefox) that is designed to supply the anonymity of bitcoin transactions through the use of the subsequent functions: automatic anonymizer ("mixer"), decentralized trade, uncontrolled

platform to raise money, dark markets, stock markets and information, and decentralized markets like "silk road" (Silk Road). "Cool saving" (Cold Storage) so the Bitcoin wallet operating in offline mode, i.e. The bitcoin wallet that does not own an Internet connection. "Cool saving" podsoblyaet to defend the stored virtual currency against hacking (hacking) and theft. "Hot conservation" (Hot Storage) so a Bitcoin wallet that operates on the Internet. As in this case, the wallet is connected to the Internet, the "hot save" the most vulnerable to hacking (hacking attacks) in/ theft, if the "cool saving". Trading system local exchange (Local Exchange Trading System) means a local Finance company (society) which allows its members to share among themselves the products and offers. In the trading system of the local exchange used personal the price created for the expression cost units that have all the chances to be used as payment or to exchange for products or services. Theoretically, bitcoins have all the chances to be accepted as a local currency used in the trading system of the local exchange. (Samples: Ithica Dollars and Mazacoin).[11]

3.2.3 The participants of virtual currency systems

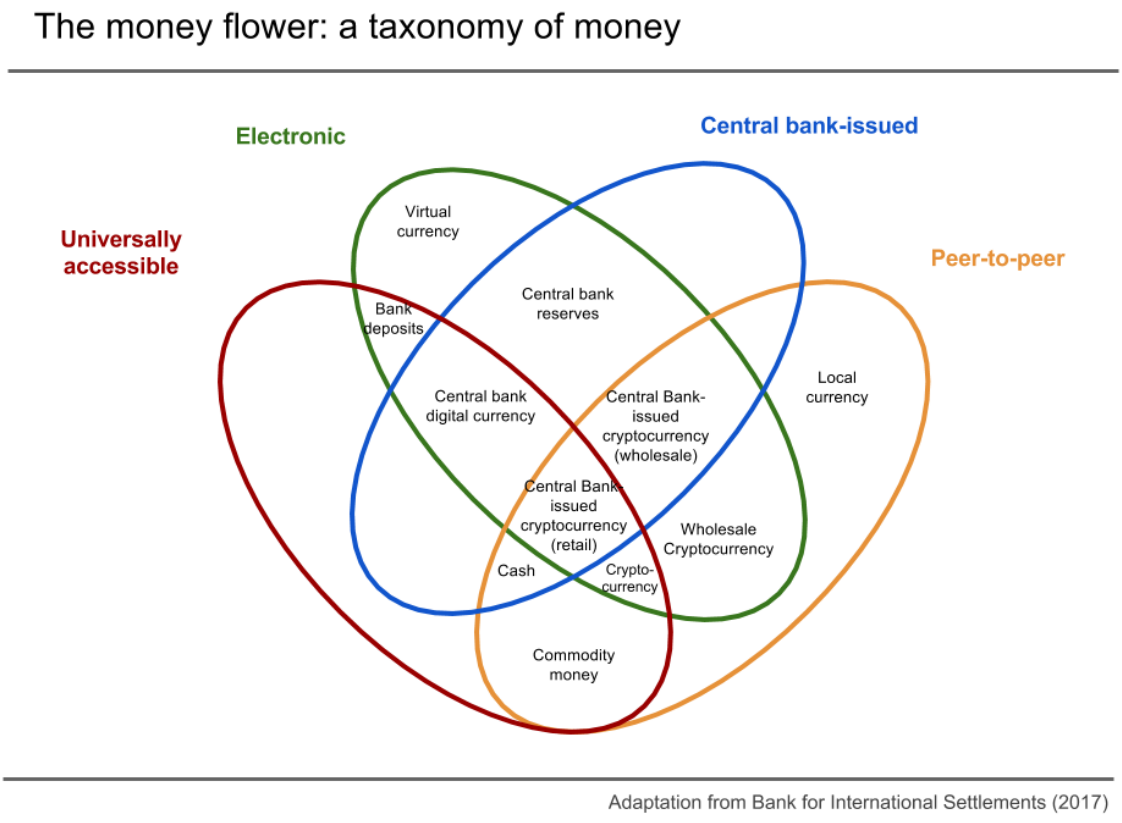
Figure 4.The crucial difference.



Source: slideshare.net

Provider exchange (Exchanger) (also sometimes referred to as an exchange virtual currency), a physical or legal person engaged in the Commission business of the exchange of virtual currency for real currency, non-cash monetary funds or other virtual currency, and precious metals, and Vice versa. In General, providers of exchange services accept different types of payments, including cash payments, electronic transfers, credit cards and other virtual currencies, and can be affiliated with the administrators not affiliated with the administrators, or be a third-party service providers. Providers of exchange services can act as an exchange or as an exchange item. Individuals usually use the services of providers for depositing and withdrawing money from accounts in virtual currency. [12]

Figure 5. The money flower:a taxonomy of money.



Source: bis.org

Administrator (Administrator) – a natural or legal person who carries on a business in issuing (putting into circulation) a centralized virtual currency, the definition and

introduction of the rules for its use, maintaining a Central register of payments and having the right to redeem (withdraw from circulation) the virtual currency.

User (User) – a natural or legal person who acquires virtual currency and uses it to purchase real or virtual goods/ services or send transfers in private to another person (for personal use) or that holds virtual currency as a (personal) investment. Users can obtain virtual currency in several ways. For example, they may (1) purchase virtual currency with real money (for the provider of exchange services, or in exchange for a specific centralized virtual currency directly from the administrator/ Issuer); (2) to participate in certain activities, payment for which is carried out in virtual currency (e.g., participating in promotions, surveys/ questionnaires, providing a real or virtual goods or services); (3) in the case of some decentralized virtual currencies (e.g., Bitcoin), self-generate units of the currency by "mining" (see the definition of "miner" below) and receive it as a gift, remuneration or in the framework of free distribution. [13]

"The miner" (Miner) – a natural or legal person involved in the operation of a network of decentralized virtual currency through the use of special software to solve complex algorithms in a distributed system "proof-of-work" ("evidence of completion") or other distributed proving system used to verify and validate transactions in the virtual currency. "Miners" can be the users if they self-generate convertible virtual currency for his own personal purposes, such as investments or for the payment of current obligations or for the acquisition of goods and services. Miners may also participate in the virtual currency systems as providers of exchange services by creating a virtual currency within the framework of commercial activities for the sale in exchange for Fiat currency or other virtual currency. Wallet virtual currency (Virtual currency wallet) is a means (software application or other mechanism/ medium) for Deposit, storage and transfer of bitcoins or other virtual currency. Provider wallet (Wallet provider) is an entity that provides a virtual currency wallet (i.e., a means (software application or other mechanism/ medium) for Deposit, storage and transfer of bitcoins or other virtual currency). The wallet contains a private (closed) key user, allowing him to spend virtual currency, is fixed at the address of the virtual currency in the block chain. Provider wallet facilitates the participation in the system of virtual currency, allowing users, providers, exchange and merchants are more simple and convenient way to conduct transactions with virtual currency. The provider of

the wallet maintains a balance of virtual currency client, and generally provides safekeeping of and transactions with the virtual currency. For example, in addition to providing bitcoin addresses, services purse can include coding, protection signed using multiple keys, backup/ cold storage, and "mixers". All bitcoin wallets can be linked. Wallets can be stored both online ("hot storage") and offline (cold storage). Examples: Coinbase, Multibit, Bitcoin Wallet. In addition, other entities may be participants in virtual currency systems and can join the providers of exchange services and/or administrators, or to be independent. This category refers to service providers on administration of networks (also called web administrators); third-party payment processors, which provide a receiving means of payment in retail outlets; software developers; and providers of software (some "other entities" listed in this paragraph may already be subject to one of the categories listed above). Development of applications and software can be carried out for legitimate purposes, for example, to facilitate acceptance of payment of funds and payments to clients or to respond to legitimate concerns regarding the protection of private data. At the same time, applications and software can also be developed for any illegal purposes, for example, a developer/operator "mixer" can work in the interest of illegal users who use products that are specifically designed to evade inspections regulatory and law enforcement authorities. It must be emphasized that given the list of participants is not exhaustive. Moreover, with the rapid development of virtual currency technology and business models, in such systems there may be additional participants from the potential risks in AML/CFT. The classification of virtual currencies Centralized Decentralized Convertible Administrator, providers of exchange services; the users; the register kept by the Issuer; the possibility of exchange for Fiat currency Example: WebMoney (WebMoney) service Providers exchange; users (no administrator); the repository is stored in a distributed manner; the ability to exchange for Fiat currency Example: (Bitcoin) Bitcoin is not Convertible Administrator, service providers exchange; the register kept by the Issuer; there is no possibility of exchange for Fiat currency Example: World of Warcraft Gold (gold in the game "World of Warcraft") [14]

3.3 Potential risks

Convertible virtual currency that can be exchanged for real money or other virtual currencies are potentially vulnerable with regard to their illegal use in money laundering and terrorist financing for many of the reasons stated in the Guide, NPA from 2013. First, they can provide a higher degree of anonymity compared with traditional ways of cashless payments. The system of virtual currency which can be traded via the Internet, in General, characterized by a lack of direct interaction with customers and can allow anonymous funding (funding in cash or third party financing through a virtual exchange offices, which do not identify adequately funding source). They can also provide the possibility of anonymous transfers, if the identity of the sender and the receiver is not properly installed.[16]

Decentralized systems are particularly vulnerable with respect to the risk of anonymity. For example, Bitcoin addresses, functioning as the accounts are not inherently contain names or other identifying information about customers, and the system has no Central server or service provider. The bitcoin Protocol does not require and does not provide for the establishment and verification of identities of parties or the formation and maintenance of operations data for the last period that is certainly linked to the identity of the participants in the real world. In addition, there is no Central controlling body, and currently there is no software for the purposes UNDER which it would be possible to trace and identify the schema of suspicious transactions. Law enforcement agencies unable to identify one Central location or entity (administrator) for investigative or arrest of assets (although the relevant authorities may identify individual providers of exchange services to obtain information from them about customers, which they can collect). Thus, this provides a potential level of anonymity that is impossible in the case of credit and debit cards or the older traditional on-line payment systems such as PayPal. The wide spread of virtual currency also increases potential risks in AML/CFT, which it represents. System of virtual currencies available across the Internet (including mobile phones) and can be used for making cross-border payments and remittances. In addition, virtual currencies typically operate through a complex infrastructure consisting of a number of individuals, often located in several countries, providing transfers and making payments. This segmentation of services means that may not be entirely clear who is specifically responsible for

ensuring compliance with AML/CFT requirements and the supervision/ implementation of enforcement actions. Furthermore, data and records on transactions and customers can be maintained and kept by different individuals, often from different jurisdictions, which further complicates their is compounded by the rapidly changing and developing nature of the technologies and business models of decentralized virtual currencies, including the changing number and types/ roles of participants providing services in the framework of the payment system using virtual currency. It is also important to consider the fact that the various elements of the system of virtual currency may be in jurisdictions where there are no proper control measures in AML/CFT. The participants of the system of centralized virtual currencies can be involved in money laundering and deliberately seek out jurisdictions with weak regime of AML/CFT. Decentralized convertible virtual currencies allowing anonymous transactions between individuals can exist in the digital space, which is completely unavailable to any individual state. [17]

3.4 The Bitcoin Exchange

There are four major exchanges that hold most of the market, and a bunch of smaller exchanges. Each exchange functions as simpl entering your money and buy bitcoins at the current price, and each buyer can try to trade, hoping to earn on the fluctuations of the rate. A large part of the exchanges require prior confirmation of identity for Fiat money, resulting in a long process of sending by email a scan of the passport and a two week wait.[18]

Bitstamp

The old stock exchange which works only with USD. Holds almost half of the market BTC/USD.

BTC-E

There used to be a Russian stock exchange. Just like the previous two, it has a third of the volume of trading in dollars, and also of those that were founded in 2011 after the first bubble. It holds approximately 40% of the entire bitcoin trading market. Adapted to work, has convenient inputs through mobile phones, but problems with the minimum amount of output. But does not require verification of your identity. Currency: USD/EUR/RUB.

By reason of the detention of Alexander Winnick and the seizure of servers (which were in the U.S.) has gone offline 25.07.2017. Rose 15.09.2017 under a new name WEX.nz, keeping the balance of the owners partly in money, partly in bond wrappers.

BTCchina

Chinese bitcoin exchange with trading in yuan. Since October 2013, twice ahead of MtGox in terms of trade, ahead of the former big three with trades for bucks. Once the price of bitcoin there was the highest, but after the Chinese authorities seriously afraid of a cue ball and began to strangle him became the lowest.

LocalBitcoins

Allows you to find a seller in your city. In fact, an ordinary market with a large number of cryptocurrency sellers accepting a large number of payment methods.

All of them

In addition, there are a couple dozen smaller exchanges, mainly tied to specific countries and local currencies.

And there is the Chinese bitcoin market. Judging from the data here, this is the second largest market after USD, and there are very large exchanges, but what really happens in the celestial Empire — the mystery behind the great wall of China.

Exchangers

Also called as fixed rate exchangers (electronic currency exchangers), which act as intermediaries between exchanges and their clients, taking them a certain Commission for their services. The advantages of such services include a simpler and faster purchase/sale procedure, and a greater choice of payment methods compared to exchanges, including local banks. There are exchange offices with the ability to buy bitcoin using credit cards, but with this method of payment will have to download additional documents proving that the real person because of the high risk of receiving cards exchanger. When this balance exchanges typically also subject to a significant Commission, in contrast to inside of stock exchange transactions in direct participation in the auction.[19]

To buy privately

People can find and get in touch with the seller through localbitcoins.com there buyers can find sellers of bitcoin from around the world, and you can easily find a dwelling in the area. In order not to be deceived online-use the internal escrow or mutual destruction service Kidal nashx.com Oh. In order not to be thrown when buying for cash IRL- check the receipt of money through an independent service, for example, it is easy to check the status of the account by entering the wallet ID blockchain.info Oh.

More can be find on bitcointalk.org all reputed and reliable sellers are there, and their history and reputation, it is easy to trace search.

For small amounts, there is a bot in Telegram, working on the principle of P2P, where users with themselves change into bits of any other money and back, and the bot acts as a guarantor.[20]

3.5 Situation in Czech Republic

The use of bitcoins will be limited in the Czech Republic. In the Czech Republic adopted a law that limits the use of bitcoins. The European Commission has also prepared proposals to identify users who trade digital currencies.

Citizens of the Czech Republic who exchange, buy or sell bitcoins, must be registered. According to the Ministry of Finance, anonymity in operations with cryptocurrency can become a loophole for tax evasion and criminal actions.In Prague, there are 80 places where bitcoin is accepted for payment. The number of cryptocurrency owners in the country already exceeds tens of thousands.The European Commission has also prepared proposals to identify users who trade digital currencies.

"If digital currency to bring within the scope of the Directive to combat money laundering, crypto currency exchange needs will require documents to verify the identity of their customers, in accordance with the policy "Know your customer (KYC)"," reads a press release of the EC.[21]

4 Practical Part

What is known about cryptocurrencies? When the most people are hearing the term, the first thing that comes to mind is bitcoin, the most popular cryptocurrency these days. However, there are a great many other cryptocurrencies, which cause much interest among people as they are more affordable in price.

In the practical part, will be compared the most popular cryptocurrencies, consider what is associated with the growth and fall of bitcoin, what currencies are able to compete with this cryptocurrency and try to make predictions about what bitcoin expects, as well as other cryptocurrencies, find out how stable this market and its future is and consider what are the reasons for investing in cryptocurrencies . And also will be considered other types of electronic currencies. Find out what is better to use in our time, what is considered the safest service and how to change preferences depending on age and needs.

4.1 Analysis of bitcoin

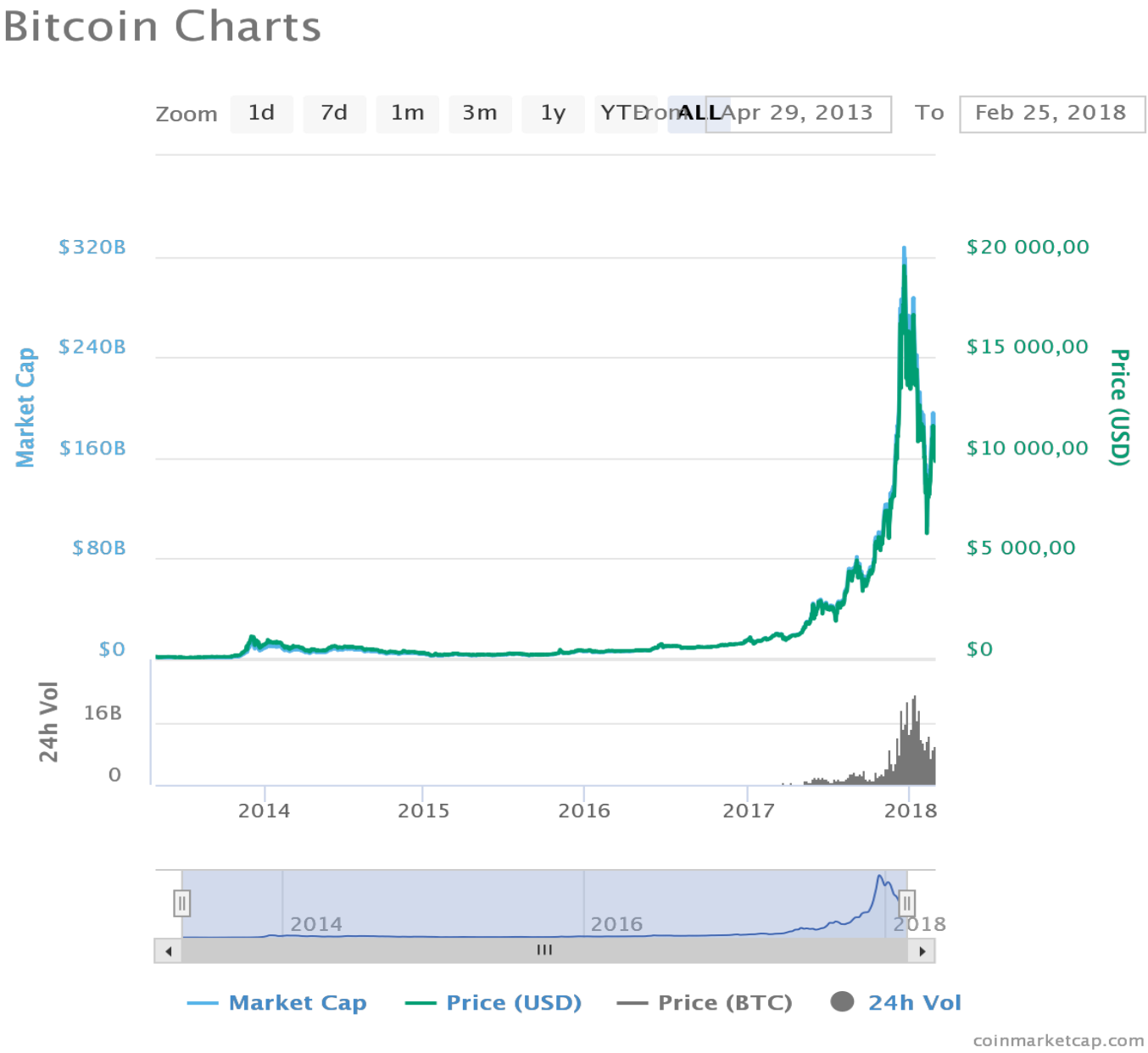
This table shows the most popular cryptocurrencies. In the first place Bitcoin with a large margin for capitalization on the market and the price per piece

Table 2.Cryptocurrency Market Capitalizations best 10.

#	Name	Market cap	Price	Circulating Supply	Change (3month)
1	Bitcoin	€134 728 152 066	€7 979,46	16 884 375 BTC	-4,76%
2	Ethereum	€66 879 705 130	€683,68	97 823 497 ETH	-2,57%
3	Ripple	€30 389 850 424	€0,777337	39 094 802 192 XRP *	-4,62%
4	Bitcoin Cash	€16 470 502 460	€969,67	16 985 663 BCH	-6,47%
5	Litecoin	€9 459 028 855	€170,85	55 366 108 LTC	-0,78%
6	Cardano	€6 810 038 658	€0,262661	25 927 070 538 ADA *	-6,34%
7	NEO	€6 274 894 118	€96,54	65 000 000 NEO *	-2,55%
8	Stellar	€5 344 136 261	€0,289375	18 467 829 230 XLM *	-6,59%
9	EOS	€4 605 778 077	€6,67	690 462 728 EOS *	-4,36%
10	IOTA	€3 987 920 686	€1,43	2 779 530 283 MIOTA *	0,36%

Source: coinmarketcap.com (on date 25.02.2018)

Figure 6. Bitcoin Chart.



Source: coinmarket.com

Bitcoin started in may 2010 when in a world was a first exchange of bitcoins for real goods . As it shown on the chart, the price of bitcoin gradually grew and the higher price was €16249 apiece it was December 17, 2017. But after that, the price of bitcoin fell more than 2 times (25.02.2017 - €7 979.46) as well as other popular cryptocurrencies. The question is why it is happened?

Pay attention to this table, can be concluded that the emergence of new cryptocurrencies, which in turn aroused interest among people. The interest was that the currencies were new and only began to grow, respectively,more people could afford to buy cryptocurrency,people believe on the fact that in the future its prices will increase tenfold. This leads to the conclusion about the price and demand for bitcoin, with the emergence of new cheaper.

Table 3.Cryptocurrency Market Capitalizations 10 with the biggest changes.

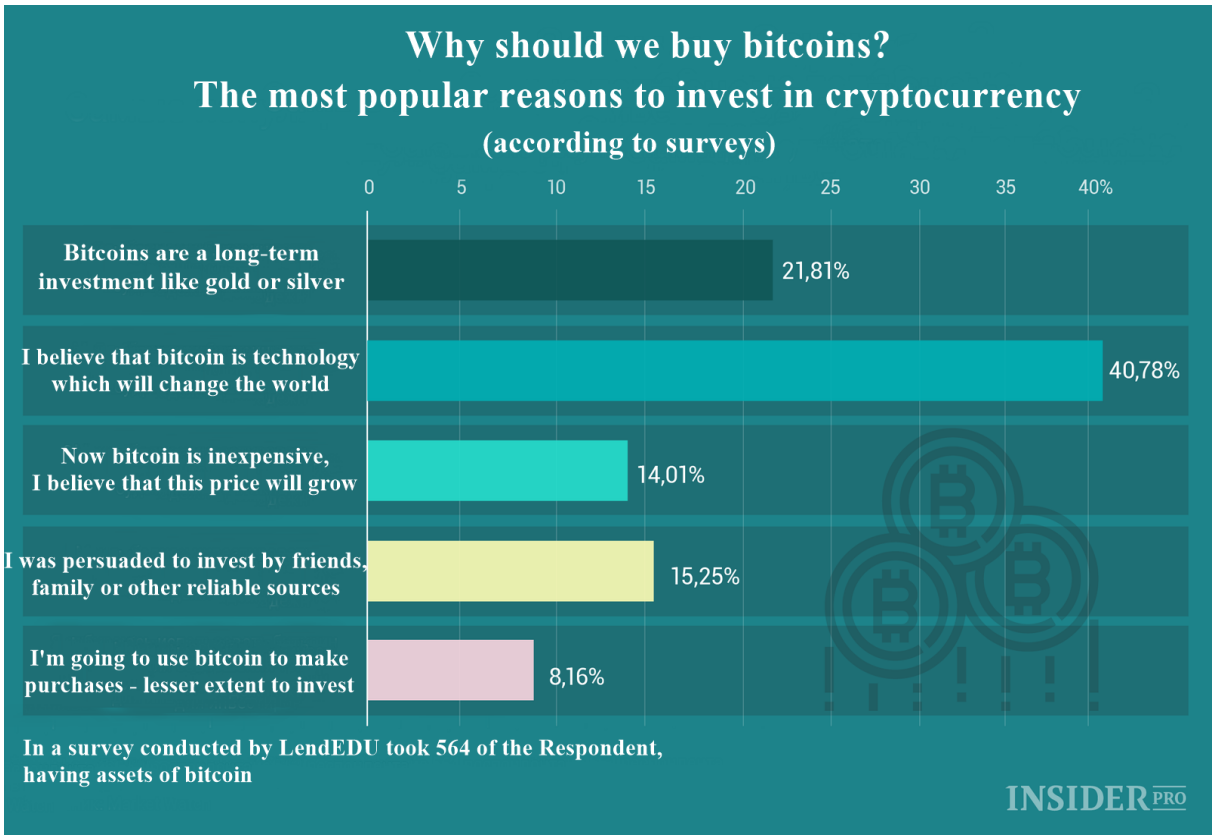
#	Name	Market Cap	Price	Circulating Supply	Change (3month)
75	SALT	€201 290 308	€3,71	54 236 334 SALT	9,78%
21	Nano	€1 533 423 290	€11,51	133 248 289 NANO	8,82%
62	ReddCoin	€247 969 017	€0,008620	28 766 128 693 RDD	8,12%
70	Byteball Bytes	€227 965 233	€353,31	645 222 GBYTE	7,86%
87	SmartCash	€165 999 146	€0,225807	735 136 290 SMART	5,39%
52	Loopring	€311 933 592	€0,555826	561 207 157 LRC	2,53%
13	Ethereum Classic	€3 165 906 843	€31,63	100 097 238 ETC	1,97%
10	IOTA	€3 987 920 686	€1,43	2 779 530 283 MIOTA	0,36%
17	Tether	€1 809 436 301	€0,816112	2 217 140 814 USDT	0,36%
39	Waltonchain	€434 279 437	€17,44	24 898 178 WTC	0,26%

Source: coinmarketcap.com (on date 25.02.2018)

Who are these people who use bitcoins and for which purposes ? In the chart provided by the data from LendEDU, can be seen what is associated with investing in cryptocurrency, the most popular answer among respondents (40.78%) believe that bitcoin is a technology that is able to change the world,the second most popular answer (21.81%)- people invest in cryptocurrency,as it is considered a long-term investment as gold or silver and the third (14.01%) are confident that the price of bitcoin will only grow and only 8% of respondents use bitcoin as a method of payment for goods or services .

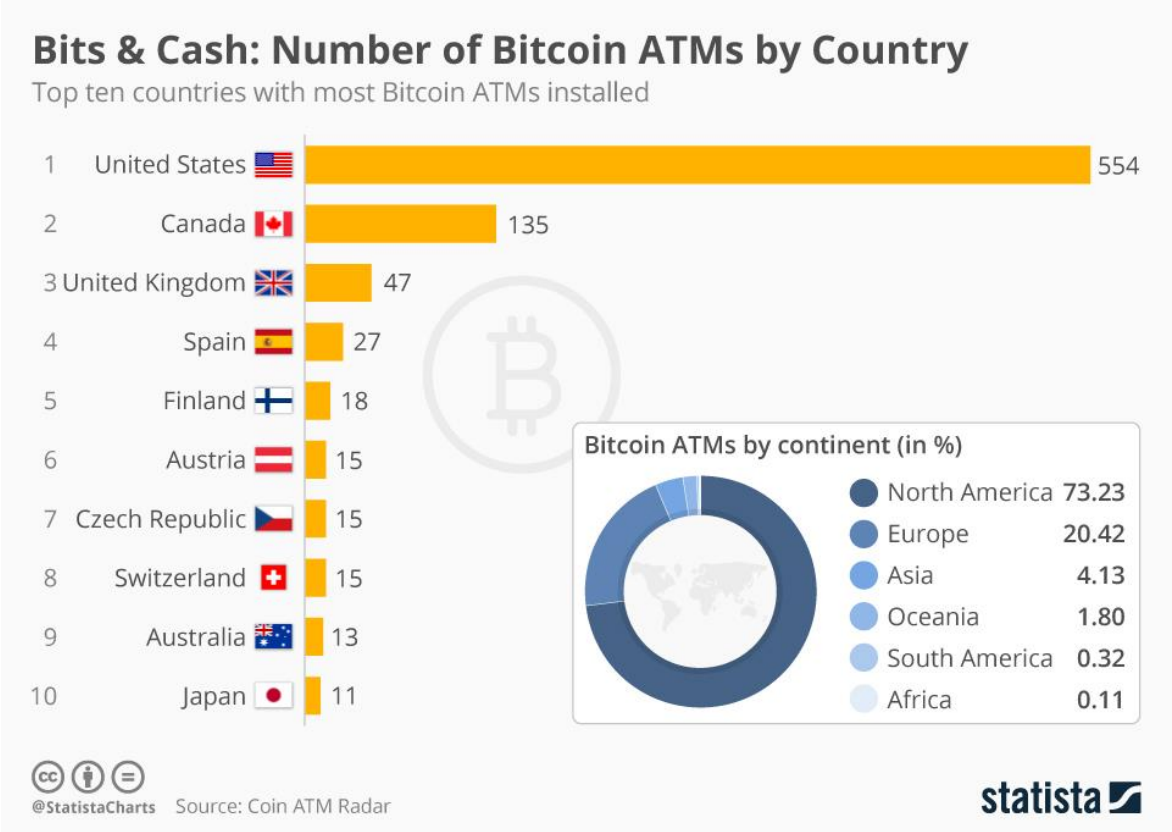
My opinion, it is bad idea at this moment to buy bitcoin, most likely it will not be able to take its former place in the market, now there are a lot of new and cheaper currencies, and as it known,people often choose exactly what is more practical and less costly for them.

Figure 7. Why should we buy bitcoin?



Source: InsiderPro

Figure 8. Bits & Cash: Number of bitcoin ATM by country.



Source: Coin ATM Radar

On the next graph is shown the ATM around the world. It is helpful for bitcoin holders that people can change it to fiat money.

Also, a survey was conducted among users of the social network Vkontakte, which in their opinion will be the price of Bitcoin by 2020. Most of the respondents are sure that the price will fall to the Internet between $ 100 and $ 9,000.

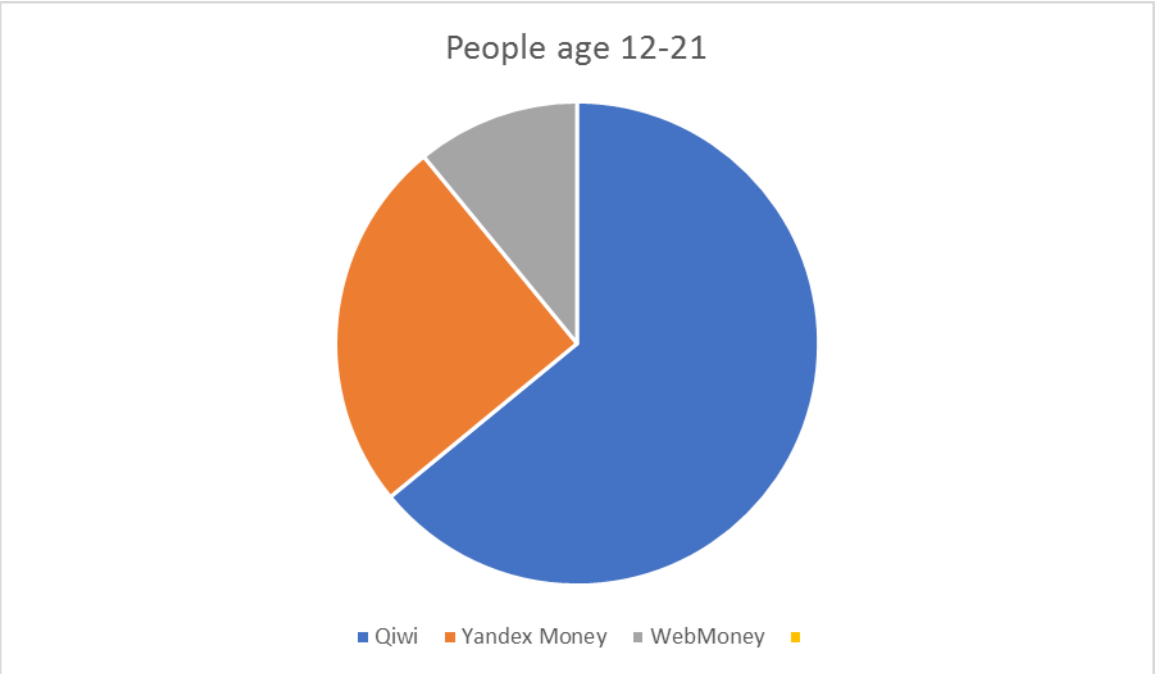
Figure 9. What will be the bitcoin rate in 2020?

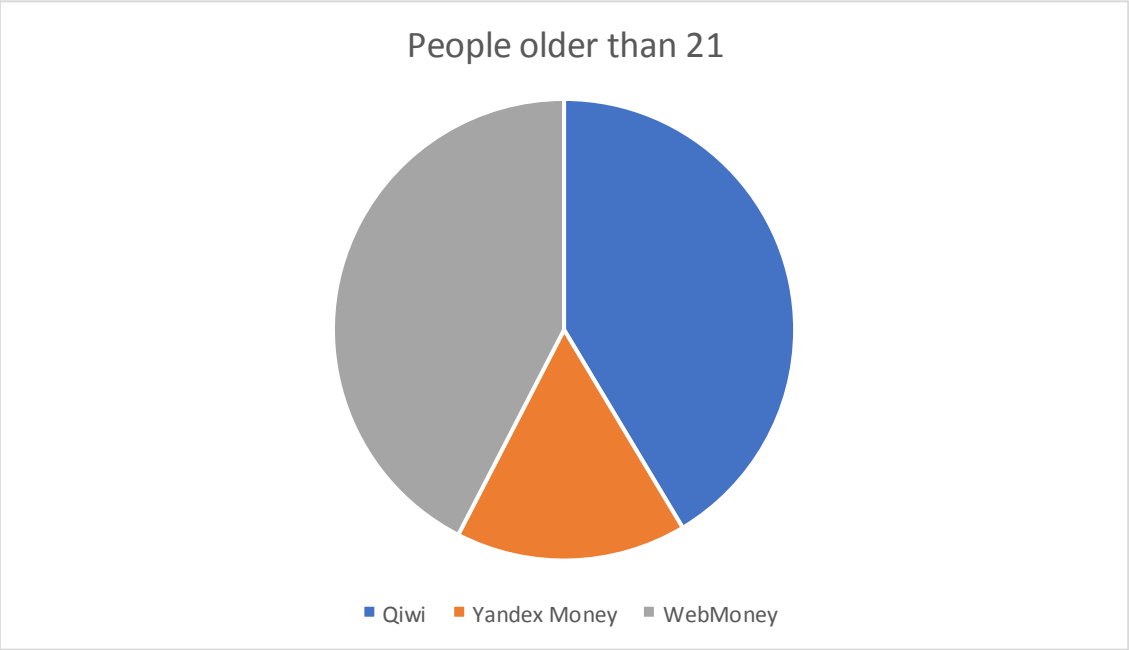
Source: vk.com

4.2 Virtual currencies WebMoney,Yandex and QIWI

The survey was proveded through pages on the Internet which are engaged in sale the products through groups on vk.com and facebook.com . The research below shows the results of survey .Will consider three of the most popular electronic currency QIWI, Yandex money, Webmoney.

Figure 10. Usage of virtual currencies by age.





Source: vk.com

According to the results of the investigation, it can be concluded about the age category, who and what often uses. So, Qiwi is considered to be the simplest payment system where is not needed to upload documents,and registration takes only 2 minutes , only need to have a phone number that everyone has today. Who is comfortable using such

a system? First of all,minors and people who do not want to identify their identity. The second group of people, most often elderly people who are afraid to provide personal data to the Internet. In my experience, this service is used by people to pay for minor expenses via the Internet, such as payment of housing and communal services or fines in the traffic police.

Yandex Money, prefer people who in everyday life use Yandex services. Yandex and Qiwi have similar characteristics such as Commission,security, but Yandex Money includes one currency is Russian rubles,respectively, this service is used only in Russia.

WebMoney-is considered the most secure service, includes many different currencies, small commissions, requires a more rigorous registration, with documents to identify the individual. This service is more suitable for people engaged in money transfers via the

Table 4. Limits on a transactions for virtual currencies.

Parameters	Yandex Money	WebMoney	QIWI
Minimum limits (for unidentified users)	€215	€647	€215
Maximum limits (for users with the maximum level of identification)	€7199	€129593	€8639
Cash withdrawal for anonymous participants of the system	€72 per day	unavailable	€72 per day
Transfers within the system for anonyms	Unavailable	€1295 per month	€575 per month
Available currencies	Rubles	Rubles, dollars, euros, hryvnias, Belarusian rubles, tenge, bitcoins, gold equivalent, Vietnamese Dong	Rubles, dollars
Level of protection	SMS passwords; emergency passwords generated by the system; possibility of enhanced authorization (paid function)	SMS-confirmation of operations, ENUM, electronic keys	Pin-code, IP-address blocking, confirming the call (paid service)

Source: profi-forex.com

Table 5.Commissions for virtual currencies.

Parameters	Yandex Money	WebMoney	QIWI
Refill	0,5%	0,8%	Less than €8-0,3% ; More than €8-0%
Withdrawal	3% + €1	0,8%	2%+€1
Transfer within the system	1,5%	0,8%	0%

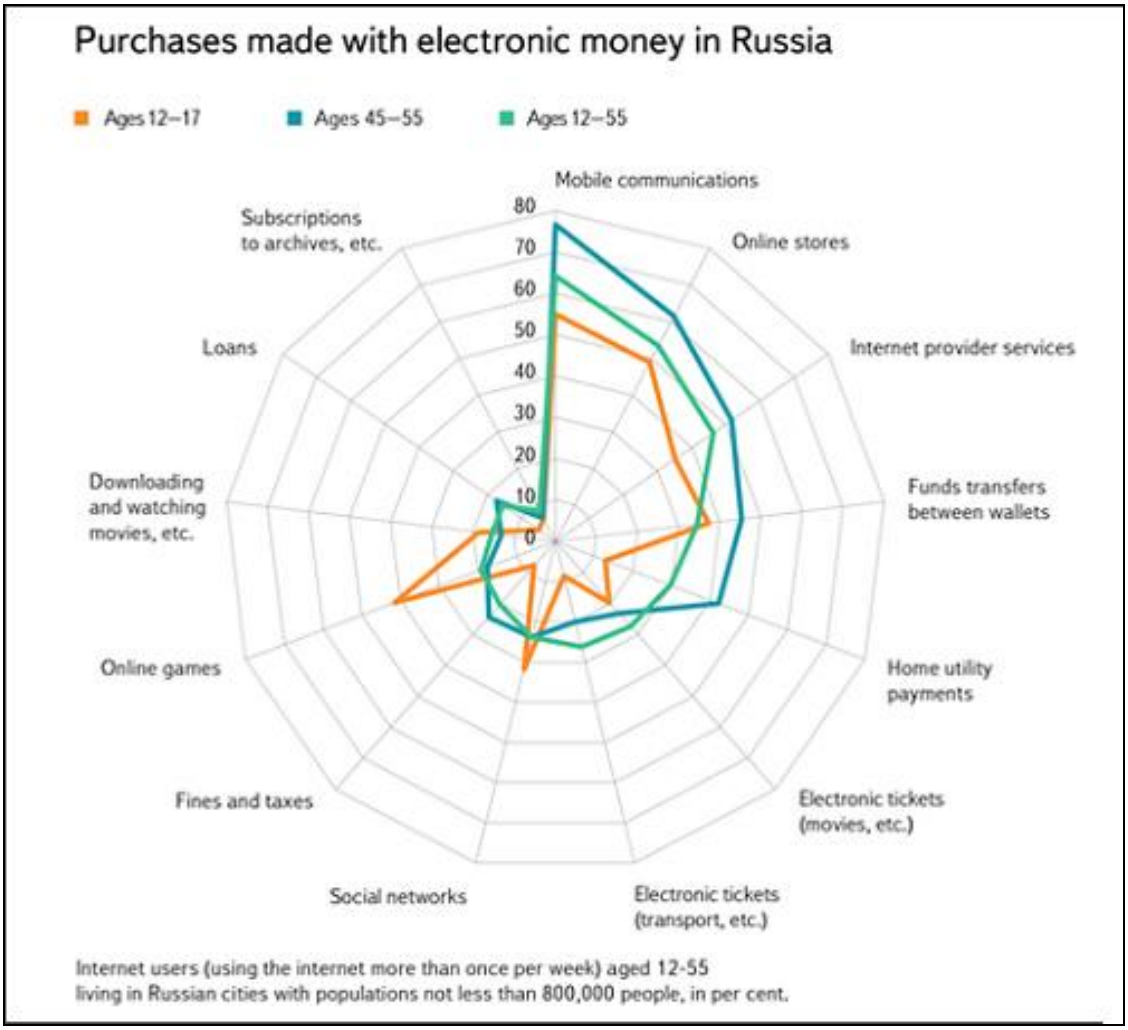
Source: profi-forex.com

From the previous table, can be concluded that the most profitable service for customers is webmoney because of the possibility of using many currencies and a high degree of protection and large limits

The graph below shows data from the official site of Yandex where can be seen for what people, who live in Russia are paying by means of electronic money

Let's look at the table : two most important age categories of people .The first place on the use of electronic money in these categories is blocked by mobile communications ,then online stores are two criteria that unite these groups . Since people of different ages they have different needs the rest of the teenagers spend in online games or social networks at this time the elderly prefer to pay for community services, fines, taxes and loans.

Figure 11. Purchases made with electronic money in Russia.



Source: money.yandex.ru

The table below shows the results of the frequency of search of certain virtual payment systems in the search engine Yandex taken from the site wordstat.yandex.ru

Table 6.Frequency of search for certain virtual payment systems in the search engine Yandex.

№	Payment system	Frequency of words for Yandex Direct, in month		Changes (+/-)	Number of mentions of words for Yandex News ,in month		Changes (+/-)
		November	October		November	October	
1	QIWI	2713004	2674070	38934	377	257	120
2	WebMoney	517323	507047	10276	122	70	52
3	YandexMoney	355639	345209	10430	297	64	233
4	PayPal	191506	176037	15469	112	73	39
5	W1	25914	25063	851	0	0	0
6	RBKMoney	6287	6319	32	19	5	14
7	LiqPay	5289	4945	344	0	0	0
8	PerfectMoney	3632	4756	-1124	0	0	0
9	Moneybookers	4507	4637	-130	0	2	-2
10	MoneyMail.ru	3804	3690	114	4	1	-3

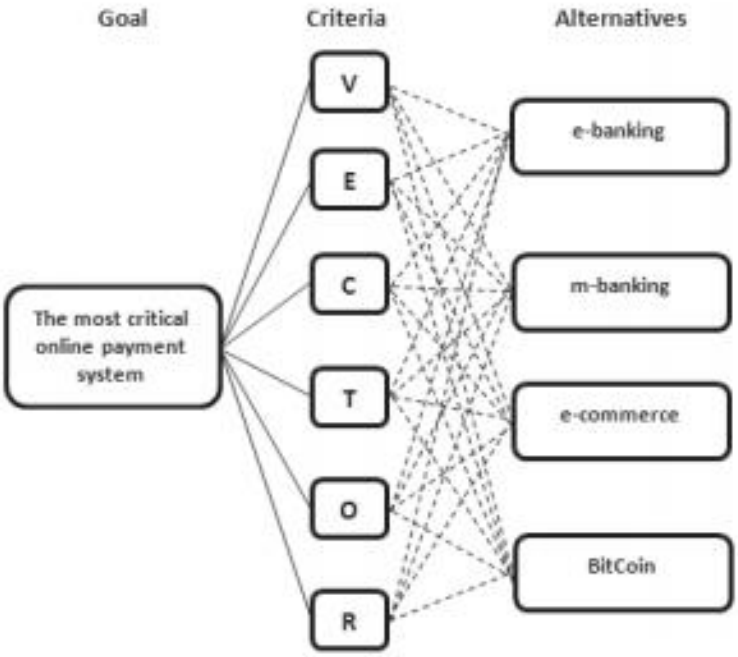
Source: wordstat.yandex.ru

4.3 Comparison of virtual currency and cryptocurrency security on the example of bitcoin

4.3.1 Basic explanation about AHP model

In order to determine the safety of services usage such as bitcoin, the analysis will be carried out using the AHP (analytic hierarchy process). This method helps the interested person to find the most favorable alternative to themselves in solving the desired issue. Analysis of the problem of decision-making in AHP, should begin with the construction of a hierarchical structure, which should include : purpose, criteria, alternative factors that affect the choice. To conduct this analysis, data on the ranking from UniCredit Bank were used.

Figure 12. The AHP model with VECTOR criteria for evaluation of online transaction systems



Source: hrcak.srce.hr

4.3.2 AHP method calculation step by step

The model of calculation step by step:

1.Development of ratings for each variant of the solution for each criterion

1.1. To distribute the tasks of decision-making hierarchies

1.2. To make comparisons and establishpriorities among elements of the hierarchy

1.3. To synthesize judgment

1.4. Evaluation and verification of conformity of the obtained results to

2.Develop the weights for criteria the creation of a matrix of pair comparison for each criterion

*normalization of the resulting matrix

* obtaining the average arithmetic in each row

*calculating and checking the consistency ratio CR = CI / RI

3.Calculate the weighted average rating for eachdecision alternative.

A method that has been developed to assist in identifying risks, including information security risks. This method allows users to easily identify and visually present all possible alternativesrisks'. The vector method of risk assessment is determined in the following the formula RISK = V+E+C+T+O+RVECTOR is the acronym derived from the following English words:

V = Vulnerability,

E = Ease of Execution,

C = Consequence,

T = Threat,

O = Operational-Importance,

R = Resiliency

4.3.3 Own calculation of risk by AHP model

The reason for choosing AHP method is finding the percentage ratio to solve the problem in conditions of uncertainty identifying the risks that Internet services bear when they are used. One of the main goals is to assess the security of Bitcoin cryptocurrency compared to other commonly used online systems and transactions. The ranking criteria for alternatives in each AHP model are determined by set goal.

Table 7. VECTOR matrix pairwise comparisons

	v	**e**	**c**	**t**	**o**	**r**
v	1	0,5	0,2	2	0,25	0,333
e	2	1	0,25	5	0,333	0,5
c	5	4	1	6	2	3
t	0,5	0,2	0,1667	1	0,2	0,25
o	4	3	0,5	5	1	2
r	3	2	0,333	4	0,5	1
sum	15,5	10,7	2,4497	23	4,283	7,083

Source:own calculation

The main was calculated – derived from VECTOR criteria pairwise matrix. In order to calculate the eigenvector it is necessary to sum up the rows, and in the end it is needed to make a normalization of the matrix. The result is the required eigenvector of VECTOR matrix criteria.

Table 8. Weights for VECTOR matrix criteria

	v	**e**	**c**	**t**	**o**	**r**	**total**	**average**	**Consistancy Measure**
v	0,065	0,047	0,082	0,087	0,058	0,047	0,385	**0,064**	6,114
e	0,129	0,093	0,102	0,217	0,078	0,071	0,690	**0,115**	6,103
c	0,323	0,374	0,408	0,261	0,467	0,424	2,256	**0,376**	6,297
t	0,032	0,019	0,068	0,043	0,047	0,035	0,244	**0,041**	6,068
o	0,258	0,280	0,204	0,217	0,233	0,282	1,476	**0,246**	6,325
r	0,194	0,187	0,136	0,174	0,117	0,141	0,948	**0,158**	6,276
sum	1	1	1	1	1	1		**cl**	0,039
								ri	1,240
								c.ratio	0,032

Source:own calculation

The relative importance of VECTOR criteria was done with the help of expert judgments – VECTOR matrix table of pairwise comparisons was obtained. Consistency Ratios (CR) for every information security expert judgment and for each comparison were calculated and all were in the acceptable range (CR < 0.1)

Table 9. Alternatives matrix pairwise comparisons by Vulnerability

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	2	0,5	3
m-banking	0,5	1	0,333	2
e-commerce	2	3	1	4
bitcoin	0,333	0,5	0,25	1
sum	3,833	6,5	2,083	10

Source:own calculation

Continue doing the same calculation as from “table 7” and “table 8” but now for Alternatives by criterias.

Table 10. Weights for alternatives matrix criteria by Vulnerability

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**	**Consistancy Measure**
e-banking	0,261	0,308	0,240	0,300	1,109	**0,277**	4,041
m-banking	0,130	0,154	0,160	0,200	0,644	**0,161**	4,016
e-commerce	0,522	0,462	0,480	0,400	1,863	**0,466**	4,051
bitcoin	0,087	0,077	0,120	0,100	0,384	**0,096**	4,015
sum	1,000	1,000	1,000	1,000		**cl**	0,010
						ri	0,9
						c.ratio	0,01131

Source:own calculation

After the calculation of table 9 and table 10 ,can be seen the Consistency Ratio (CR)which is lower then 0,1that the calculation is right, if it’s not than needed to be recalculated .

Table 11. Alternatives matrix pairwise comparisons by Ease of Execution

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	2	0,5	3
m-banking	0,5	1	0,333	2
e-commerce	2	3	1	4
bitcoin	0,333	0,5	0,25	1
sum	3,833	6,5	2,083	10

Source:own calculation

CR will be the same for all last tables becaused the data of them are pretty same but by the method is needed to calculate all average by criteria ,to have then the matrix.

Table 12. Weights for alternatives matrix criteria by Ease of Execution

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**
e-banking	0,261	0,308	0,240	0,300	1,109	**0,277**
m-banking	0,130	0,154	0,160	0,200	0,644	**0,161**
e-commerce	0,522	0,462	0,480	0,400	1,863	**0,466**
bitcoin	0,087	0,077	0,120	0,100	0,384	**0,096**
sum	1,000	1,000	1,000	1,000		

Source:own calculation

Table 13 Alternatives matrix pairwise comparisons by Consequence

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	3	2	4
m-banking	0,333	1	0,5	2
e-commerce	0,5	2	1	3
bitcoin	0,25	0,5	0,333	1
sum	2,083	6,5	3,833	10

Source:own calculation

Table 14. Weights for alternatives matrix criteria by Consequence

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**
e-banking	0,48	0,46	0,52	0,40	1,86	**0,47**
m-banking	0,16	0,15	0,13	0,20	0,64	**0,16**
e-commerce	0,24	0,31	0,26	0,30	1,11	**0,28**
bitcoin	0,12	0,08	0,09	0,10	0,38	**0,10**
sum	1,000	1,000	1,000	1,000		

Source:own calculation

Table 15. Alternatives matrix pairwise comparisons by Threat

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	2	3	4
m-banking	0,5	1	2	3
e-commerce	0,333	0,5	1	2
bitcoin	0,25	0,333	0,5	1
sum	2,083	3,833	6,5	10

Source:own calculation

Table 16. Weights for alternatives matrix criteria by Threat

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**
e-banking	0,480077	0,521785	0,461538462	0,4	1,8634	**0,46585**
m-banking	0,240038	0,260892	0,307692308	0,3	1,108623	**0,277156**
e-commerce	0,159866	0,130446	0,153846154	0,2	0,644158	**0,161039**
bitcoin	0,120019	0,086877	0,076923077	0,1	0,383819	**0,095955**
sum	1	1	1	1		

Source:own calculation

Table 17. Alternatives matrix pairwise comparisons by Operational-Importanc

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	2	3	4
m-banking	0,5	1	2	3
e-commerce	0,333	0,5	1	2
bitcoin	0,25	0,333	0,5	1
sum	2,083	3,833	6,5	10

Source:own calculation

Table 18. Weights for alternatives matrix criteria by Operational-Importance

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**
e-banking	0,480077	0,521785	0,461538462	0,4	1,8634	**0,46585**
m-banking	0,240038	0,260892	0,307692308	0,3	1,108623	**0,277156**
e-commerce	0,159866	0,130446	0,153846154	0,2	0,644158	**0,161039**
bitcoin	0,120019	0,086877	0,076923077	0,1	0,383819	**0,095955**
sum	1	1	1	1		

Source:own calculation

Table 19. Alternatives matrix pairwise comparisons by Resiliency

	e-banking	**m-banking**	**e-commerce**	**bitcoin**
e-banking	1	2	3	4
m-banking	0,5	1	2	3
e-commerce	0,333	0,5	1	2
bitcoin	0,25	0,333	0,5	1
sum	2,083	3,833	6,5	10

Source:own calculation

Table 20. Weights for alternatives matrix criteria by Resiliency

	e-banking	**m-banking**	**e-commerce**	**bitcoin**	**total**	**average**
e-banking	0,480077	0,521785	0,461538462	0,4	1,8634	**0,46585**
m-banking	0,240038	0,260892	0,307692308	0,3	1,108623	**0,277156**
e-commerce	0,159866	0,130446	0,153846154	0,2	0,644158	**0,161039**
bitcoin	0,120019	0,086877	0,076923077	0,1	0,383819	**0,095955**
sum	1	1	1	1		

Source:own calculation

Eigenvectors for each proposed alternative are derived regarding each observed VECTOR criterion, according to the same procedure as for obtaining the eigenvector of the VECTOR matrix criteria.

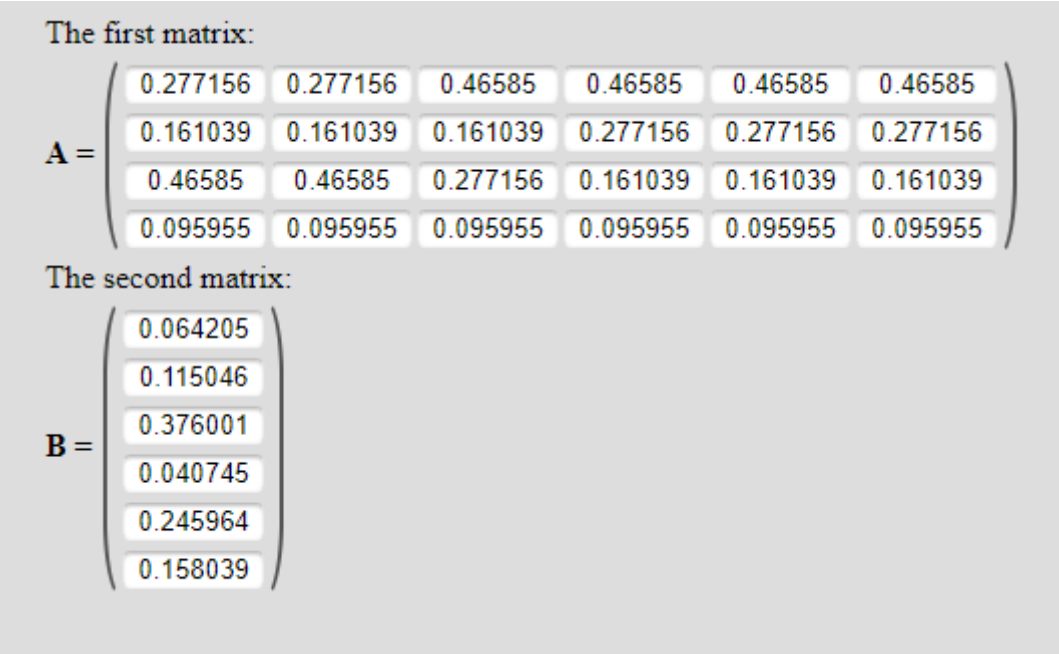
Table 21. Eigenvectors of alternatives

	v	**e**	**c**	**t**	**o**	**r**
e-banking	0,277156	0,277156	0,46585	0,46585	0,46585	0,46585
m-banking	0,161039	0,161039	0,161039	0,277156	0,277156	0,277156
e-commerce	0,46585	0,46585	0,277156	0,161039	0,161039	0,161039
bitcoin	0,095955	0,095955	0,095955	0,095955	0,095955	0,095955

Source:own calculation

The obtained eigenvectors in the ranking of alternatives are needed to multiply with the eigenvector resulted from VECTOR matrix criteria comparisons.

Figure 13. Obtaining the most secure online payment system



$$= \begin{pmatrix} 0.432026411806 \\ 0.212681803516 \\ 0.259336784678 \\ 0.095955 \end{pmatrix}$$

Source:own calculation

The last table shows that e-banking is the most dangerous system (43,20%), then the second-E-Commerce (25,93 %),this is followed by m-banking (21.26 %) and cryptocurrencies on the example - Bitcoin, which is the least risky with 9.59% risk. e-banking continues to dominate online payment systems, where a significant portion of virtual payments are fraud occurred over the past couple of years. The reasons for security problems are often the lack of time and resources to effectively deal with them, the priority of risks and the decision of the most important of them is considered to be extremely important. In the created model represented the interest of the safety assessment. The model is based on a vector matrix.

5 Results and Discussion

During the practical part, conducted research among cryptocurrency,find out what attracts people to investment of money in cryptocurrencies, as they changed the price on the most popular currency - bitcoin, what are these jumps in price. From our research, it is possible to answer the question, why do people buy bitcoin and other cryptocurrencies? Everything is simple, most of the people surveyed see it as a logical investment of money on an equal basis with the purchase of gold or silver,as for the rest of the people, they believe that the future for the use of cryptocurrency.What are the jumps in the price of bitcoin? Every day in our world there are new inventions that are able to displace old ones as they have qualities that are necessary and practical for modern man.And cryptocurrencies, every day there are new ones that are able to compete with bitcoin. New currencies have a lower amount due to the fact that they are new and are not yet known to anyone, and are more affordable. What about bitcoin in this situation? Demand for it falls, respectively, and the price of this currency falls.

As for the rest of the Internet services, it is also gaining popularity and nowadays almost every second uses a convenient service for making purchases or payment via the Internet. Yandex Money is the leader among the services in Russia – since many people use Yandex services,Qiwi service is also popular, as It does not require special registration costs and is easy to use. If people make purchases or transfers in different currencies, it is easiest for them to use WebMoney, which is more advanced and affordable. Of course, the Internet service is not enough, it was considered by the most used in my country and compared the example of the needs of people, which service is more suitable for them. Also have been used different tables to find out what most people get over the Internet. In the course of these tables, we found out that depending on the growth and needs, change and the goods and services.

6 Conclusion

By qualities, electronic money can partially replace or even completely displace cash in the calculations. The Central banks of most countries are very wary of the development of electronic money, fear of uncontrolled emissions and other possible abuses; although the electronic cash can provide many advantages (speed, ease of use, greater safety, lower transaction fees). In addition, rather complex technologies are used for the circulation of electronic money, and commercial banks do not always want and are able to independently develop new products. Complete displacement of real money from circulation and the introduction of a full - fledged virtual currency-it's not the farthest future. Now that there is technology to create a decentralized, fully distributed currency, there is no doubt: systems like Bitcoin have definitely come to stay.

Thus, can be concluded that the best option today is to use cryptocurrency to buy or sell anything. Since today it is the safest currency and do not necessarily authorize your identity and it is much faster. But there is one big thing : the cryptocurrency market is not stable and no one knows what will happen tomorrow . So my advice today is do not invest in any well-known cryptocurrency because it just might fall off if you want to own cryptocurrency it is better to buy the kind which has just been published . Because judging by the results, new cryptocurrencies are growing in price. I believe that in the future world will go to a new level and all will use the cryptocurrency as it is convenient and fast , and the currency market should become more stable , I also believe that bitcoin will fall in price because every day there is some new cryptocurrency and people invest in it money and potetomu it quickly begins to grow. But if in the future world will use cryptocurrency, it should somehow be rigged by the state because authorization is not needed and no one will know that it is yours transfer of money , anonymity is good , but still if it turns out to be terrorists or what kind of people are hiding from taxes and so on. If it is not regulated in any way then it will do more harm than good

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