

CRYPTOCURRENCY USE IN MEDICAL TOURISM

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ABSTRACT: Currently a cryptocurrency comes to replace traditional money that the state issues. This means of payment is already gaining momentum in use in the developed countries of the world. Since the healthcare sector is one of the most important for humanity, and medical tourism is at the peak of development under the influence of globalization processes, it becomes very important to improve and introduce new technologies not only at the stage of diagnosis and treatment, but also payment for services. Therefore, it is important to analyze and predict the development of a new currency in order to recognize it as a global means of payment.

Today, the global medical services market has emerged with its specific structure - medical management, accrediting bodies, medical tourism agencies, tour operators, lawyers specializing in this field, etc. Medical tourism forced not only the patients, but also the doctors to treat the organization of the medical care system in a new way. The motto of modern medicine "Patients Without Borders!" is truly justified. After not being able to solve a health problem, the patient chooses a country, a medical or health institution, and even a specific specialist who can offer the necessary examination, treatment or rehabilitation at his own discretion.

The main factors affecting the rapid growth of a relatively new industry are the process of globalization, the development of the health system of individual countries, technological progress, and the development of information technology. Bitcoin and modern medicine have much more in common than it might seem at first glance. Since most countries have a patient's statutory confidentiality right, the medical record must contain a minimum of patient data and access to it must be limited.

However, the use of a credit card as the most popular means of payment, especially in a foreign country, leads to the fact that the bank receives information about the provision of medical services to its client. Moreover, the bank is allowed to find out the details of the services provided in the case of checking the validity of the transaction. This entails consequences, as the patient's personal information becomes available to third parties. In the case of using Bitcoin, no medical information can be transferred to third parties, respectively, medical secrecy will indeed remain confidential.

Today the market of so-called "virtual" or "electronic" money is overflowing with various cryptocurrencies. It functions successfully and makes it possible to analyze the dynamics of cost, supply and demand of about 90-100 different cryptocurrencies.

The main advantage of virtual currency is decentralization, as well as the fact that all involving operations are anonymous. An important aspect that affects the rapid development of cryptocurrency is the lack of a center that regulate the cryptocurrency and the way it is emitted. The cryptocurrency emission is called "mining" and meaning that the computers of users, who are located in different parts of the planet, are installed with special software that generates a unique character set that forms the cryptocurrency. For example, a Bitcoin address looks like

1DSrfJdB2AnWaFNgSbv3MZC2m74996JafV. It consists of a string of letters and numbers, starting with "1". The Bitcoin network is based on the block chain technology, which is a public register that stores data on all transactions of the system. These transactions are protected by digital signatures of users who participate in the network, who produce bitcoins or carry out any operations with them. In this case, the branching of the process of creating and distributing bitcoins ensures their security.

Trading transactions with cryptocurrencies are conducted only in digital format, and sales transactions can be made through online exchanges (for example, BTC-E). Cryptocurrency can be exchanged for the main currencies of the world, using special exchange points in online networks (WebMoney) or by means a broker in Forex (FXOpen). Cryptocurrency can be obtained by means of accepting payment for the goods or provided , or the purchase directly from another owner. The latter option is the most profitable, since it does not have commission inherent in the exchange office. Bitcoins are similar to electronic money, but it applies the principles of complete anonymity, lack of control and limited release that distinguishes it from the operation of electronic payment systems.

Cryptocurrency is an alternative expression of the usual currency and has several advantages:

1) Operations with cryptocurrency are anonymous and confidential. All information about transaction is encrypted in the set of character; personal data is not attached to the cryptocurrency wallet;

2) Each cryptocurrency unit has a unique code protected from forgery;

3) The cryptocurrency is decentralized, it does not have a control center that is why the founder of digital money or any financial institution cannot influence its existence. Rate and operations are fully regulated by e-wallet users;

4) The cryptocurrency is not integrated to any of the banks, which significantly reduces the size of the commission for carrying out operations. The cost of commission is usually the cost spent for energy resources on the transaction;

5) The absence of binding to banks contributes to a significant reduction in the time spent on performing cryptocurrency operations;

6) Operations are carried out directly between the owners of electronic wallets, which contributes to increasing the speed of operations and reducing the commission;

7) The emission of most types of cryptocurrency has a maximum threshold. This is due to the restriction of all possible combinations of symbols that form each new unit of cryptocurrency. This fact contributes to the reduction of unjustified money supply in circulation and lower inflation. “

Bitcoin is the first and most expensive cryptocurrency. The merger of the words “bit” (computer memory unit) and “coin” (piece of money) forms the term “bitcoin”. Despite the fact that at the beginning of its development, Bitcoin was a local cryptocurrency, which was used only by a limited number of people (its founders and persons associated with them), in a few years it turned into a world-class system. Today, in addition to exchanges, exchangers and Internet resources, some shops and service centers carry out bitcoin operations. It accepted in many restaurants and hotels in different countries around the world. There are even cases of salary payments to US civil servants in bitcoins. In some Asian countries, bitcoins are used as an

alternative to bank accounts and plastic cards, since banking services in these countries are quite expensive.

The development path of Bitcoin was not smooth. Bitcoin rate is very volatile, look at its dynamics in Fig. 1.

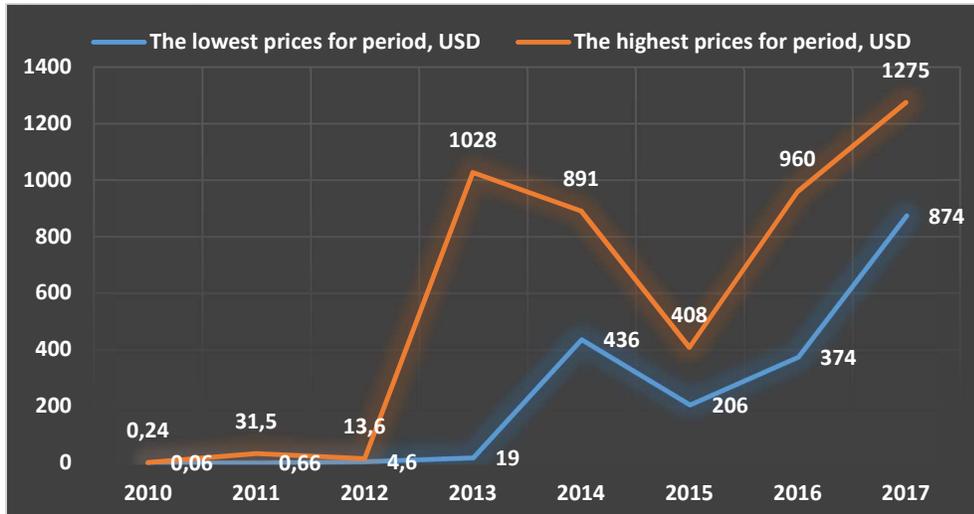


Fig. 1. Dynamics of the dollar to bitcoin 2010-2017

In fig. 1, we can see the best price for buying and selling bitcoin for a certain period (curve 1 - the lowest prices, curve 2 - the highest prices). After analyzing this chart, we can understand that the rate fluctuations occur very sharply, for example, if in June 2013 the purchase of one bitcoin cost \$ 19, then in November of this year, the rate was 1028 USD for one bitcoin. That is, for 1 year the bitcoin rate has grown more than 54 times. Similarly, recessions occur, for example, in 2014, the rate went down: June - 891 USD, November - 436 USD for one bitcoin. In 2015, the downward trend continued and, in June 2015, bitcoin was already bought for 206 USD. In 2016-2017, the rate began to grow rapidly, and already in December 2017, the cost of one bitcoin was 1275 USD.

Separately, we singled out the 2018 year, since due to a significant jump in January (the rate rose from 1275 USD to 17542 USD for one bitcoin), it is difficult to clearly demonstrate the general trend of Bitcoin development over the entire period (Fig. 2).



Fig. 2. Dynamics of Bitcoin exchange rate in 2018 in the monthly section

According to the logarithmic graphs, it is much easier to evaluate results in the long term than linear ones. In a line chart, a rise from \$ 1 to \$ 20 looks almost invisible, than, for example, from 100 to \$ 200, although in the first case we are talking about the growth of 20 times, and the second - just 2. When we use the logarithmic graph of such problems does not arise. That is why we consider that it is appropriate to analyze this indicator using a logarithmic function (shown in Fig. 3).



Fig. 3. Dynamics of Bitcoin 2010-2018

According to the graph, which shows the dynamics of Bitcoin price change since 2010, we can see, that it is in the stable growth phase, but it is the subject to strong fluctuations. The price change chart became parabolic, that is, the line went up almost vertically three times in the entire history of Bitcoin. This is difficult to achieve, because the rate must be changed very much for that. There are three such precedents so far: in 2011 and twice in 2013. In all three cases, the price of Bitcoin increased by 100 and more times. As you can see, the rise in 2017 did not leave a

parabolic section on the chart. In order for this to happen, the cost must take off more than \$ 100,000.

Cryptocurrency of its kind is "information in the network", but since it is not freely available, it therefore has some value. Bitcoins do not have gold reinforcement in the state fund and do not depend on the country's GDP. Bitcoin quotation depends solely on the interaction of his supply and demand, which in turn confirms the fact that nobody regulates the price. Thus, neither a huge increase nor a huge drop is limited, which is typical and often occurs on stock exchanges by stopping trading.

Based on the theory of the value of money over time, cryptocurrency also tends to increase its value due to various factors over time.

Now, one of such driving factors is the great interest of the public in the new form of cashless payment. In addition, we should not forget that the value of any money and their value changes over time. Inflation is evidenced about it. One of the main advantages of this currency is that it protected from inflation, since the issue procedure programmed to reduce the amount of virtual money in circulation. It planned to "get" 21 million units of this cryptocurrency. The fact that the rate of bitcoins is not affected by political conditions or the activities of the Central banks is attractive for investors.

In the global economy, the cryptocurrency appeared just in time. Due to the global economic crisis, the image of traditional investment methods has suffered; in the result, investors lose billions of dollars and confidence in leading national currencies. All of this together contributes to an increase investor interest in cryptocurrency, which every year strengthens its position in the global financial system.

As analysts from Gartner define that, the most of new technologies that appear in the world go through a certain development cycle (Fig. 4). The technology trigger, the peak of inflated expectations, trough of disillusionment, slope of enlightenment and a plateau of productivity are the main stages that the technology goes through. Cryptocurrency and related technologies demonstrate very well the existing relationship with this curve [5].



Fig. 4. Main stages of the Gartner Hype Cycle

After having compiled a statistical forecast for the next 3-4 years (Fig. 5) and having compared it with the Gartner Hype Curve, it becomes clear that, most likely, in 2015-2017, Bitcoin was in the “Peak of Inflated Expectations” phase. During this period, everyone actively began to get acquainted with technology and try to get business benefits from it. Bitcoin moves to the “trough of Disillusionment” stage, because users are disappointed after a significant drop in the course, and this trend may drag on. But since the technology has many strengths, it is likely that the “Slope of Enlightenment” stage will follow in parallel. Starting from the end of 2019, we can say that bitcoin can go into the “Plateau of Productivity” stage.

One of the most popular methods for predicting the dynamics of market indicators is the compilation of a trend model that shows “What will happen if there is something that has already been”. To build a statistical forecast, we used the average values of the Bitcoin exchange rate for 2010-2017. (Fig. 5).

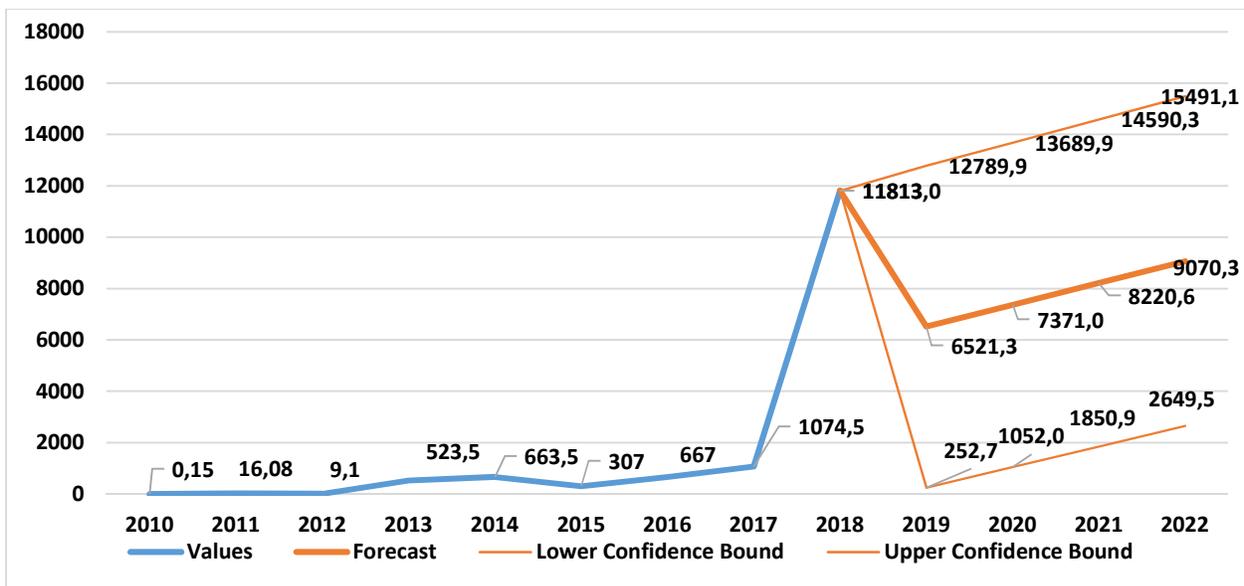


Fig. 5. Prediction of the Bitcoin exchange rate to USD for 2019-2022

From the study, we can conclude that, despite the fact that Bitcoin has recently demonstrated impressive growth dynamics, it is a consequence of the rapidly growing interest in cryptocurrencies, which provokes market demand, while limiting supply. It is important to note that most likely the peak of rush demand has already been reached. Until the end of 2019, a certain fall will continue, but the predicted values for the next 3-4 years show that the course of Bitcoin will stability grow. According to the forecast, in 2019 the average price for 1 Bitcoin will be 6521.3 USD. According to the optimistic forecast, the Bitcoin rate in 2019 is 12789.9 USD, at the same time, the pessimistic allows even 252.7 USD for 1 Bitcoin.

Cryptocurrency has already become a significant player in the modern financial market, and the object of investment of many market players that have leverage to support it. Therefore, even after the inevitable drop in rate, the development of cryptocurrency will continue, but the volatility is likely to subside.

Virtual currency involves a huge amount of computing power and digital assets. At this stage of technological development of mankind, cryptocurrency is gaining a stable position in the international market. The rapid development causes a further increase in capacity and interest of the masses, but on the other hand, it can lead to collapse. Health care is one of the areas that has not use properly the virtual currency yet. But some companies are starting to integrate Bitcoin with online health care, and medical tourism is a big step forward in the development of this area.

When price stability of cryptocurrency is achieved, it will be possible to talk about using it in international transactions, and not just for speculative gain. However, this issue will already be directly related to the legalization of the new currency and its recognition by central banks as a means of exchange, or storage of the value of money.

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