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On the Need for State Regulation of Cryptocurrencies: Statistical Justification and Assessment

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ABSTRACT
The subject of the research is the statistical characteristics of the cryptocurrency market and the legal framework for its regulation. The purpose of the study is to identify the priority areas of state regulation of the digital cryptocurrency market based on the analysis of statistical data in the area under study. The following general scientific research methods were used in the work: deduction and induction; analysis and synthesis; analogy; description. Moreover, the method of textual information analysis, graphical and tabular methods of data presentation were used. The factors of establishing a system of state regulation of operations with cryptocurrency are identified: price volatility as an indicator of the profitability of cryptocurrency investors, the increasing scale of investments in the digital market, as well as the expansion of the number of professional participants in the digital market. The development trends of the national digital currency market are identified and the modern system of state regulation of cryptocurrency in Russia is analyzed. In the final part of the study, the author has developed the main vectors for the development of legal regulation of the cryptocurrency market.
Keywords: *Digital currencies, crypto exchanges, legal framework, investors, shadow economy*

1. INTRODUCTION

With the advent of blockchain technology in general and its most well-known practical implementation tools - cryptocurrencies, the regulation of the digital money market is becoming more and more relevant. Cryptocurrencies are virtual or digital currencies that do not have a centralized regulatory body, that is, they are created and transferred without the intermediation of national and commercial banks. Bitcoin, created in 2009, was the first decentralized cryptocurrency and it remains the most expensive virtual currency in the world. Ethereum was the most popular currency used in most daily transactions as of 2019.

Decentralized control over each cryptocurrency works through the blockchain, a public transaction database that functions like a distributed ledger. The size of the bitcoin blockchain is growing from year to year, and as of the third quarter of 2019, it has grown to about 242 gigabytes. However, implementing centralized control over digital currencies is nearly impossible. This circumstance is the main obstacle to ensuring the effective state control of the digital currency market, both for the purpose of fulfilling the norms of national and supranational law by market participants, and for fulfilling tax obligations as a consequence of transactions with cryptocurrency traces.

The value of cryptocurrency is not based on any tangible assets, and its use is increasingly becoming a priority choice for cybercriminals. Pursuant to the Kaspersky's Cryptocurrency Report 2019, almost a fifth (19%) of cryptocurrency users have suffered the hacker attacks on exchanges and (15%) have become victims of cryptocurrency fraud. Pursuant to S. Foley, J. Karlsen, T. Putniņs, 46% bitcoin transactions occur in the gray sector of economy (Foley et al., 2019) [1].

There are a number of other circumstances (in addition to the technical possibility of centralized control), which are the factors in the development of innovative approaches to state administrative, financial and tax regulation of digital money.

In this regard, the purpose of this study is to identify the priority areas of state regulation of the digital cryptocurrency market based on the analysis of statistical data in the area under study.

2. MATERIALS AND METHODS

To substantiate the theoretical provisions and practical results of the study, it is assumed that such methodological principles as scientific character, consistency, complexity, reliability, objectivity, continuity, efficiency, efficiency and effectiveness are observed.

Among the private scientific methods of cognition, the following were used:

1) for a brief overview of the current Russian system of state regulation of cryptocurrency - a tabular method, a method for analyzing textual information;

2) for statistical analysis of the cryptocurrency market - a comparison method, graphical and tabular data presentation methods.

The assessment of the degree of concentration of the market capitalization of the leading 1000 cryptocurrencies in the world was performed using the Herfindahl-Hirschman index (formula 1), which has a structure gradation scale.

$$HHI = S_1^2 + S_2^2 + S_n^2, \qquad (1)$$

where S is the share of the capitalization volume of the i-th cryptocurrency in the total population.
Due to the lack of systematized primary data on the global and Russian cryptocurrency market, the study resorted to manual collection of primary data from a number of well-known traditional media sources, as well as data from previous scientific research and cryptocurrency exchanges.

3. RESULTS

3.1. Factors of establishing a system of state regulation of operations with cryptocurrency, identified on the basis of analysis of statistical data

Factor 1. Price volatility as an indicator of the profitability of cryptocurrency investors.
Cryptocurrency prices are quite volatile and highly dependent on market sentiment. The price of bitcoin, for instance, experienced a rise from about USD 371 in January 2016 to its highest value of over USD 13,000 by December 2017 (an increase exceeded 35 times!). In just one day (August 1, 2020), the growth in the value of individual cryptocurrencies, pursuant to coinmarket.com, was more than 57%, and the weekly fluctuation in the price of cryptocurrencies is from -49 to +57.29 percent.
Moreover, there is a convergence of prices for cryptocurrencies, which further leads this market to a state of uncertainty. In particular, scientists examined the asymmetric effect and dynamic interrelations between bitcoin and other cryptocurrencies [2]. Empirical analysis has shown a dynamic conditional correlation between the profitability of Bitcoin and other cryptocurrencies and a dynamic side effect [3]. The results, in particular, indicate that positive economic shocks increase volatility more than negative ones.
Moreover, we note that cryptocurrency prices are differentiated depending on the exchange on which they are quoted. In particular, Chinese scientists analyzed the structure of the cryptocurrency market based on the correlation agglomeration hierarchical clustering [4]. It has been proven that on large exchanges there is a significant dependence of the price of low-capitalized cryptocurrencies on the price of bitcoin and ethereum, while on small exchanges there is no such connection.
Factor 2. Increasing investment in the digital market.
For instance, the market capitalization of Bitcoin alone has experienced rapid growth in the last 2-3 years. As of August 1, 2020, the total capitalization of existing digital currencies is more than 355 billion US dollars. The authors assessed the degree of concentration of the cryptocurrency capitalization market (pursuant to the Herfindahl-Hirschman index).
The actual value of the criterion was 3804 units, which, pursuant to the criterion scale, indicates a high degree of capital concentration (Table 1). In fact, only 2 types of cryptocurrencies (Bitcoin and Ethereum) make up 71.6% of the market (60.4% and 11.2%, respectively).

Table 1 Herfindahl-Hirschman index scale

Scale	Concentration
Up to 1,000	Low
1,000-1,800	Average
1,800-10,000	High

Factor 3. Expansion of the number of professional participants in the digital market (including individuals and legal entities).
Rapidly growing prices in this market lead to a geometric expansion of its participants (both among legal entities and individuals) (Figure 1).

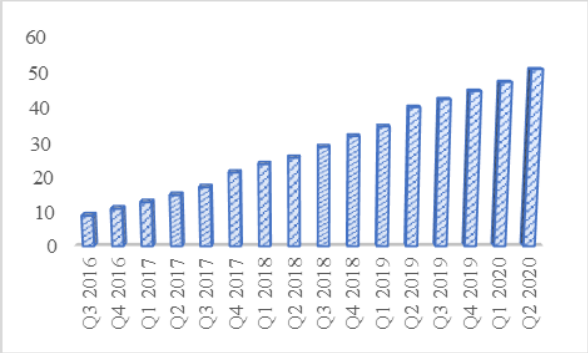

Figure 1 The number of blockchain wallet users around the world in 2016-2020, mln units Source: compiled by the author based on statista.com data (date accessed: 08/01/2020)

The opportunity to participate in the exceptionally high returns offered by the cryptocurrency market has generated tremendous investor interest. The number of users of Coinbase, one of the USA leading cryptocurrency exchanges, grew from 0.4 mln in January 2017 to 5.6 mln by June 2018. As of March 6, 2020, the number of cryptocurrency users, pursuant to the head of the Coinbase trading platform Brian Armstrong, is about 50 mln, but over time, their number may increase to 5 mln.
Cryptocurrencies became so popular that governments and banking regulators decided to step in and warn that bitcoin could be the next economic bubble. Some governments have even banned cryptocurrency trading due to the lack of control and market volatility.
The most interesting, from the point of view of regulation, is the question regarding the composition of the owners of

the cryptocurrency: legal entities or individuals; as this is a priority factor determining the instruments of administrative, financial, and tax regulation.

3.2. Cryptocurrency market trends in Russia

The Russian Federation, despite the incomplete legislative recognition of cryptocurrency, is one of the largest consumer markets for this product. In particular, it is in the top 10 countries where bitcoin nodes operate, where the USA traditionally takes the 1st place (2,625 nodes), Germany - the 2nd place (2,016 nodes), France - the 3rd place (698 nodes), and Russia - the 9th place (276 nodes). Pursuant to economists' estimates, at the moment Russian projects account for at least 10% of the global turnover of the cryptocurrency market, which is estimated at USD 15 bln. per day. Thus, the widespread use of digital currencies in Russia leads to the need for the development of state regulation of this sector.

In support of this thesis, we present the results of a study by the Institute of Public Opinion "Questionnaire" published in January 2020, which demonstrate the following conclusions: awareness and readiness to perform operations with cryptocurrency are significantly higher among the wealthiest citizens (in terms of income) (Figure 2) and the youngest (by age) (Figure 3).

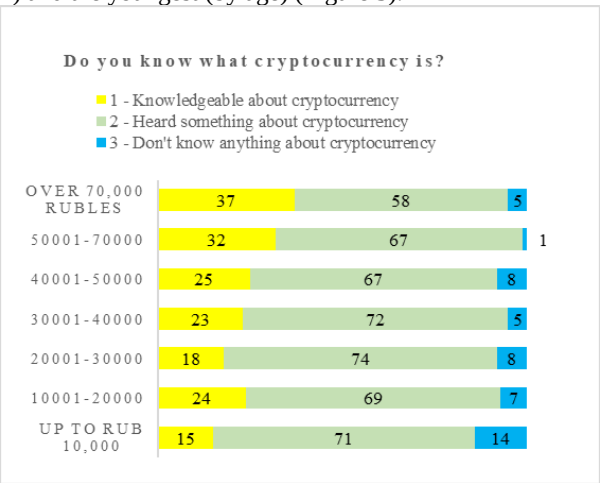

Figure 2 Digital Currency Awareness Statistics by Income

37% of citizens with monthly incomes over RUR 70,000 are well aware of digital currencies, while the share of this population among citizens with incomes less than RUR 10,000 was only 15%. This allows to draw 2 important conclusions: firstly, the digital market seems to be of little interest for the population with low incomes, and secondly, the high level of awareness of cryptocurrencies among the richest segments of the population indicates their interest in making transactions in the digital market in order to generate income. Wealthy people are not ready to lose sight of such a significant source of income and form a tendency to diversify their investment portfolios.

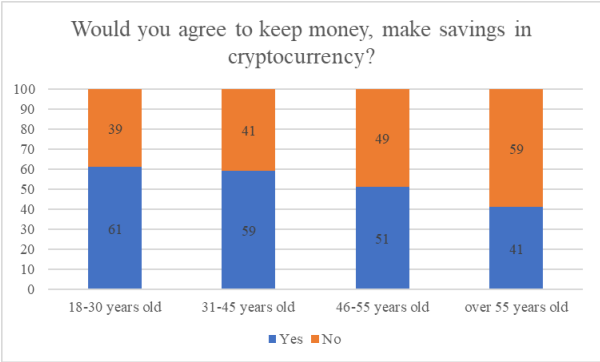

Figure 3 Statistics of digital currency preferences broken down by age

Finally, another, but not less important conclusion is the promising distribution of cryptocurrencies among the population of generations y and z, among which digital sources of income are of the greatest interest among citizens younger than 30. The data in Figure 3 suggest the ever-increasing popularity of cryptocurrencies not only among generations y and z, but also among generation a (alpha). Pursuant to the Kaspersky Lab estimates, at the beginning of 2020, 9% of residents in Russia used or owned digital assets, while about 15% of Russians who have not yet bought cryptocurrencies are ready to do so in the near future. Thus, this indicates a potential growth in the number of crypto investors.

The "generational preferences" theory in the cryptocurrency market has been confirmed by foreign studies. In particular, in South Korea, one of the most active groups of investors are citizens aged 20-25. There were 22.7% of crypto-investors among this group. Similarly, in Germany, 28% of respondents aged 18-29 admitted that they could buy cryptocurrencies.

3.3. Modern state regulation of cryptocurrency in Russia

In 2016 and 2017, Russia took active steps to transition to a digital economy format, which is associated, among other things, with the need to increase the country's investment and business attractiveness. At the end of July 2017, Dmitry Medvedev approved the program for the development of the digital economy in the Russian Federation "Digital Economy of the Russian Federation". The program consists of five areas dedicated to regulation, education, human resources, the formation of research competencies, IT infrastructure, and cybersecurity with a planning horizon until 2024 [5].

The Russian system of legislative regulation of the digital market is at the stage of its formation. Currently, this system includes three documents designed to determine the legal status of cryptocurrencies, ICOs, mining, and smart contracts in Russia (Table 2). All of them were submitted to the State Duma for consideration almost simultaneously in March 2018.

Table 2 The system of legislative regulation of the digital market in Russia

Item No.	Document name	Status	Main purpose	Unsettled aspects in the document
1	Civil Code of the Russian Federation (Art. 141.1, 160, 181.2, 309, 434)	Entered into force on October 1, 2019	The basic provisions concerning the circulation of digital rights have been formed. In particular, digital rights are equated to civil rights.	The law does not disclose the content of digital rights. Assumes regulation of rights to tokens and cryptocurrency, but does not directly disclose this anywhere.
2	Federal Law No. 259-FZ dated 08/02/2019 "About investment attraction with use of investment platforms and about modification of separate legal acts of the Russian Federation"	Entered into force on January 1, 2020	The law defines what crowdfunding is (without using the term in law). It establishes requirements for an investment platform, its operator and participants; obligatory registration of sites in the register of the Central Bank was established; methods, procedure and general conditions for investing using the investment platform have been determined.	The law introduces restrictions that hinder the development of the shadow economy using crowdfunding, but significantly increases the thresholds for entering the market.
3	Federal Law No. 259-FZ dated July 31, 2020, "On Digital Financial Assets, Digital Currency and on Amendments to Certain Legislative Acts of the Russian Federation"	Published on July 31, 2020, effective since January 1, 2021	The law introduces definitions of digital currency (the concepts of token and mining will be disclosed in another law), a digital financial asset. A digital asset and currency are not recognized as a means of payment when conducting transactions on the territory of Russia. They are recognized as property, and therefore can be an object of pledge, purchase and sale transactions, exchange. The possibility of challenging transactions with cryptocurrency has been established, provided that they are declared and the rights to them are legally declared.	The law is not core to digital currency transactions. Foreign cryptocurrencies are not subject to legislative regulation (they are actually prohibited in Russia, but not prohibited when trading through foreign platforms). The law is limited to classic payment money (bitcoin, etc.), but does not include the regulation of stablecoins, high-value paper tokens. Moreover, the law creates new opportunities for legal entities, but limits the activity of individuals.

4. DISCUSSION

Some of the more vocal opponents, notably Joseph Stiglitz, the Nobel laureate, are calling for a complete ban on cryptocurrencies, while other economists advocate the development of a flexible regulatory framework (Atzori, 2017) [6]. The general relevance of cryptocurrency regulation in the vast majority of cases is confirmed by the fact that even the Bank for International Settlements periodically publishes thematic articles on this topic.

On the other hand, there is also a position that cryptocurrencies shall not be regulated at all (Davidson and Block, 2015) [7]. Specifically, academics have proven that tighter regulation and a more active government role are driving down cryptocurrency prices, suggesting that potentially lower risks and wider implementation of government regulatory frameworks do not offset the corresponding losses in business and market consumer utility for investors. Another article on the market response to cryptocurrency regulation (Auer and Claessens, 2018) examines the price response of bitcoin to 151 regulatory events [8]. It was revealed that the market responds positively to the achievements in creating a regulatory framework for cryptocurrencies and to the legal recognition of cryptocurrencies as special asset classes, while bans, restrictions on their use and circulation cause negative price movements. Thus, the authors provide evidence in favor of a balanced approach to cryptocurrency regulation. More recent research draws

similar conclusions that overregulation of cryptocurrencies is counterproductive, at least at the current stage of their development, and government laissez-faire may be more appropriate for the cryptocurrency market [9]. An example is the recent Chinese experience, when, as a result of the imposition of severe restrictions on bitcoin trading, an unprecedented drop in trading volume in the Chinese cryptocurrency market was documented [10].

The non-homogenuity of opinions on this issue and the lack of consensus are easily explained by the fact that cryptocurrencies represent both significant technological advantages and sources of consumer value, as well as notable and non-trivial problems and risks [11].

5. CONCLUSION

A review of Russian legislative acts in the field of regulation of the cryptocurrency market, already at the initial stage of their implementation, made it possible to determine the main axis of the approach chosen by Russia. Among the three scenarios previously possible for the development of cryptocurrency regulation in Russia (the utopia of crypto legalization; a complete ban on open blockchains; supervised permission), the third, in our opinion, is optimal. Despite the clear positive assessment of the beginning of the formation of Russian digital law, we note that it regulates only the tip of the iceberg. These regulatory legal acts disclose only general approaches to the formation of the digital market; are not specialized for the regulation of private issues on transactions with cryptocurrencies, moreover, they limit the opportunities for individuals to participate in investment.

The latter is a deterrent to the development of the national digital economy. In support of this, we note the main characteristics of the digital market, identified in the analysis of statistical data of crypto users in Russia:

1. High investment attractiveness and economic potential of the digital market for the population with a high level of income, as well as for citizens aged 20 to 30 and 30 to 45 years, constituting the "core" of the national labor force (with their limited access to the crypto market in accordance with the adopted Russian legislation!);
2. A huge amount of capitalization of digital assets (cryptocurrencies) of Russian investors (in the absence of specialized financial, currency, and tax regulation of transactions with cryptocurrencies);
3. Large volumes of investment by national economic agents in foreign digital currencies that do not fall under the norms of Russian law.

Firmly convinced that only progressive jurisdiction and state regulation of cryptocurrency activities will create conditions that ensure the implementation of legal and secure cryptocurrency relations, in the aggregate, all of the above made it possible to formulate the main vectors of development of legal regulation of the cryptocurrency market:

- mandatory harmonization of the norms of national and supranational law, due to the transterritoriality of the digital currency market (starting with the formation of identical terms used to describe various products included in the scope of the cryptocurrency market);
- development of legislative norms expanding the legal access of individual investors to crypto-assets, considering their financial potential;
- the formation of specific mechanisms and rules for taxation and tax administration of transactions with digital currencies (in particular, amendments to the Tax Code on the procedure for declaring cryptocurrencies in tax authorities, officially prescribed in Federal Law No. 259, are already required).

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