Prospects for the Development of ICO
as an Alternative Financing Instrument

M. S. Shalneva, D. A. Egorova, and T. A. Provotorova

Financial University Under the Government of the Russian Federation,
Moscow, Russia
{MShalneva,DAEgorova}@fa.ru, taprovotorova@mail.ru

Abstract. The article investigates problems of evaluating the economic effect of ICO (initial coin offering) process as an alternative financing instrument in the field of corporate innovation for all stakeholders taking into account their interests and potential benefits. To create an index for ICO’s assessment, the correlation and regression analyses were held. A sample of 234 projects was formed, which presented groups of successful and unsuccessful ICO projects. This index allows to evaluate the project by the criteria which are vital for investors and could be implemented in the practice of the companies within financial planning of their innovation activities. Also, the article pays attention to the overview of the ICO’s perspectives in Russia and worldwide: modifications of the classic ICO scheme, ways of legislation and technical development in the sphere of cryptocurrency.

Keywords: Alternative financial mechanisms · Cryptocurrency · Initial coin offering · Innovation · Investment

1 Introduction

The initial placement of tokens as a financial mechanism for innovative projects first appeared in 2014, and gained its wide distribution only after 2016 [4]. The climax to development of this financial instrument was in 2018, when the volume of funds raised by ICO projects showed an increase of 230% compared to the previous year. Due to the strengthening of regulatory control by states worldwide, the use of the ICO model significantly decreased in 2019. The same trend can be observed at the beginning of 2020: for example, in January the amount of successfully completed ICO is 100 times less than for the same period in 2018 [9].

The ICO procedure is mostly recognized in the sectors related to finance, trading and infrastructure development. The United States, Singapore and the United Kingdom became the most active users of this financial mechanism [12]. Despite the growing popularity of ICO, still the amount of funds attracted by this financial mechanism is significantly lower, than that companies could cumulate using traditional financial instruments. Thus, the 10 largest IPOs attracted 22 times more investments than the 10 largest ICO projects. A similar situation can be observed with the capitalization of large companies compared to ICO startups. Therefore, the main goal is to increase an attractiveness of ICO projects for potential investors by creation of the assessment
methodology which would take into account interests and expected benefits of all stakeholders and make ICO process transparent and clear for participants.

2 Methodology

To analyze the effectiveness of ICO model, as well as to determine the factors affecting the level of attracted funds, a sample of 234 projects was formed, which presented groups of successful and unsuccessful ICO projects. The projects that collected more than 86% of the planned funding were the most numerous in the first group. In general, the observation data demonstrated the highest average, median, maximum and minimum values for all the main characteristics of the ICO, namely the price and number of issued tokens, as well as the purpose of the collection.

The geographic and industry characteristics of the sample confirmed general market distributions. The largest number of projects was implemented in the field of finance and trading in the countries of Western Europe and Southeast Asia. To attract potential investors, project teams actively use such non-financial drivers as bonus Airdrop and Bounty programs, as well as the KYC procedure: Bonus Airdrop program - free token distribution, which is the part of the advertising campaign; Bounty program - the process is similar to the Bonus Airdrop, but the participants of the program are chosen on the competitive basis; KYC procedure - “Know your customer” which stands for the verification of the identity of the ICO team to prevent asymmetries of information.

These factors were chosen as non-financial variables for the following analysis. As a financial factor, the provision of information on the future distribution of collected funds was chosen, while the services of an escrow agent are unclaimed among the projects presented in the sample. The representation of the document named “White paper” was used as a measure of the provision of information on the ICO project. “White paper” is a document which contains all the information about the future ICO project [16].

A correlation analysis revealed a significant connection between the level of funding received and various characteristics of ICO projects. The variables “Logarithm of difference (Logarithm of the difference between the maximum and minimum planned amount of attracted financing)” and “Logarithm of the number of issued tokens”, “White paper”, “KYC teams” and “Bounty program” were included in the regression model as independent variables, as they showed a positive correlation with the logarithm of the amount of funds raised by the projects. The final regression model is as follows (1):

\[
\text{Logarithm of funds raised} = -0.493 + 0.661 \times \text{Logarithm of the difference} + 0.049 \times \text{Logarithm of the number of issued tokens} + 0.113 \times \text{Bounty program} + 0.887 \times \text{White paper} + 0.081 \times \text{KYC teams}
\]

The results of the model quality assessment confirmed its statistical significance and reliability: the determination coefficient is more than 0.5, there are no multicollinearity, heteroskedasticity of the residues and their autocorrelation. Also, the
hypothesis that the coefficients of the regression model are equal to zero is not confirmed. Since the analysis indicates the inconsistency of the current methods for assessing ICO projects, the variables included in the regression model will become the basis for the development of a new index.

3 Results

The analysis indicates the need to create an index to evaluate ICO projects in terms of significant factors for investors in the decision-making process [15]. The presence of these characteristics contributes to the achievement of the goals set by the project team. First of all, among the parameters, it is necessary to highlight the presence of the White Paper as an aggregator of all information about the project, which is necessary for analysis by interested parties. In addition, the logarithm of the difference between the planned minimum and maximum investment volumes is important: the larger this indicator, the more successful the outcome of the ICO. The implementation of the Bounty program and KYC, the value of the logarithm of the number of issued tokens also have a positive impact on attracting financing. The calculation of the index will occur according to the following algorithm [8]:

1. For each factor, it is necessary to calculate the value of its individual index (IIn) according to the formula (2):

\[
IIn_i = \frac{x_i}{x_m}
\]

where \( x_i \) is the value of the \( i \)-th indicator of the ICO of the project, \( x_m \) is the reference value of the \( i \)-th indicator.

The reference value for dichotomous indicators is 1, which means that the ICO project has this characteristic. As for the logarithmic variables, it is possible to use the median values of successful projects that were analyzed in the sample as a reference. This means that the index can be greater than 1.

2. After calculating the individual indexes, it is necessary to calculate the total index (GIn) of the ICO assessment according to the formula:

\[
GIn_i = \sum_{i=1}^{IIn} IIn_i * w_i
\]

where \( IIn \) is the value of the \( i \)-th individual index, \( w_i \) is the weight coefficient of the \( i \)-th individual index.

When calculating the total index, the products of all the values of individual indices by their weight coefficient are summed up. The weight of each index was determined by a qualitative expert method, taking into account the results of the analysis. Using the obtained index value, it is possible to determine which type an ICO project belongs to. As already mentioned, the calculated index can be greater than one, since the median value of successful projects in the sample is taken as the standard for logarithmic indicators. Given this fact, the following categories of projects were identified (Table 1).
The maximum threshold value of a high-quality projects was calculated also based on the observation sample. Thus, when obtaining a result exceeding these parameters, it is necessary to conduct additional analysis before including the project in any group. Testing the use of the developed index was carried out on a small array of collected samples (Table 2).

After that, according to formula (2), individual indices for each indicator were calculated (Table 3). For the “Logarithm of difference” factor, the reference value was 4.18, and for the “Logarithm of the number of issued tokens” –5.34.

### Table 1. Interpretation of the index of evaluation of ICO projects

| Type of project            | Index value          |
|----------------------------|----------------------|
| High quality project      | $0.85 < \text{Gln} \leq 1.2$ |
| Medium quality project    | $0.5 < \text{Gln} \leq 0.85$ |
| Low quality project       | $0 \leq \text{Gln} < 0.5$  |

Source: authors.

### Table 2. Initial characteristics of ICO projects for calculating the index

| The name of the project | Logarithm of difference | The logarithm of the number of tokens | KYC | Bounty program | White paper |
|-------------------------|-------------------------|---------------------------------------|-----|----------------|-------------|
| Cryptune                | 4.32                    | 7.00                                  | 1   | 1              | 1           |
| Inlock                  | 4.05                    | 6.52                                  | 1   | 1              | 1           |
| Snapparazzi             | 4.00                    | 5.71                                  | 1   | 1              | 1           |
| Zethereum               | 1.41                    | 5.70                                  | 0   | 0              | 1           |
| Agate                   | 3.09                    | 5.50                                  | 0   | 1              | 1           |
| Dylyver                 | 2.24                    | 3.30                                  | 1   | 0              | 0           |
| Ultra travel pay        | 3.11                    | 6.00                                  | 1   | 1              | 1           |
| Lendsbay                | 2.28                    | 4.88                                  | 1   | 1              | 1           |

Source: authors.

### Table 3. Individual indices of each indicator of ICO projects

| The name of the project | IIn1 | IIn2 | IIn3 | IIn4 | IIn5 |
|-------------------------|------|------|------|------|------|
| Cryptune                | 1.04 | 1.31 | 1    | 1    | 1    |
| Inlock                  | 0.98 | 1.22 | 1    | 1    | 1    |
| Snapparazzi             | 1.12 | 1.07 | 1    | 1    | 1    |
| Zethereum               | 0.48 | 1.07 | 0    | 1    | 0    |
| Agate                   | 1.04 | 1.03 | 1    | 1    | 0    |
| Dylyver                 | 0.79 | 0.83 | 0    | 0    | 1    |
| Ultra travel pay        | 1.06 | 1.12 | 1    | 1    | 1    |
| Lendsbay                | 0.74 | 0.91 | 1    | 1    | 1    |

Source: authors.
Weighting coefficients obtained as a result of correlation and regression analyzes, taking into account expert adjustments, have the following values: \( \alpha = 0.358; \beta = 0.096; \gamma = 0.153; \delta = 0.257; \epsilon = 0.136. \)

To calculate the overall assessment index, it is necessary for each project to make calculations according to formula (2), using the individual indices obtained and their weights (Table 4). The calculated G\( \text{In} \) values were in the range from 0.50 to 1.04; most of the projects under consideration fell into the high-quality category. This type of project is characterized by the presence of all dichotomous features that were taken into account when calculating the index.

**Table 4.** Individual indices of each indicator of ICO projects

| Name of the project | G\( \text{In} \) | Interpretation of the result | ICO Results |
|---------------------|----------------|-----------------------------|-------------|
| Cryptune 1,04       | High quality project | 880.00%                  |
| Inlock 1.01         | High quality project | 75.00%                   |
| Snapparazzi 1.05    | High quality project | 100.00%                  |
| Zethereum 0.53      | Medium quality project | 24.45%                 |
| Agate 0.88          | High quality project | 61.27%                   |
| Dylyver 0.50        | Low quality project  | 8.77%                    |
| Ultra travel pay 1,03 | High quality project | 43.33%                 |
| Lendsbay 0.90       | High quality project | 76.33%                   |

Source: authors.

Only two projects showed indicators close to the threshold values of low-quality projects, which was confirmed by the level of effectiveness of these projects in the implementation of ICOs. Projects that fell into the low and medium quality group were not able to attract more than 25% of the initial level of planned funding. Thus, the developed index can be used to assess the quality of ICO projects, as well as their selection for further analysis in the decision-making process by investors on the distribution of funds.

**4 Discussion**

According to the held analysis it’s obvious that the creation of the assessment methodology which would take into account interests and expected benefits of all stakeholders and make ICO process transparent and clear for participants is vital but not totally comprehensive step. It’s necessary to make an overview of barriers and perspectives of the ICO market in Russia and worldwide.

The emergence of the cryptocurrency and the ICOs market was the result of a technological revolution caused by the new needs of economic agents, which became the catalyst for the development of cryptographic encryption methods and blockchain technology [10]. These innovations provide an opportunity to solve certain problems of the current monetary system: the duration and high cost of transactions, their low level of transparency, as well as the availability of intermediaries.
Despite such obvious advantages in using cryptocurrency as direct interaction between the parties to a transaction with a high level of transparency, the ways of development of ICO process should be mentioned, such as significant changes and improvements required in the legal field and in the technological sphere. An increase in transparency of both the ICO process itself and the mechanism for the subsequent distribution of the raised funds should be expected. In accordance with current trends, the number of projects entering an ICO with an existing product prototype should increase by an average of 7–10% per year [11].

Already at this stage of development, the following modifications of the primary token placement can be distinguished: Initial Exchange Offering (IEO, Initial Exchange Offering) is a mechanism when the ICO of a project is managed by the exchange, on the platform where the tokens were placed. The project team pays a commission for exchange services in the form of a listing fee, and investors who want to participate in ICO create accounts on the platform and make cash investments using exchange wallets. Comparative characteristics of IEO and ICO are presented in Table 5.

| Parameters                | IEO                                           | ICO                                           |
|---------------------------|-----------------------------------------------|-----------------------------------------------|
| Fundraising place         | Exchange platform                             | Project site                                  |
| Control                   | Stock exchange                                | The project team                              |
| KYC Procedure             | Implemented for each project by the exchange  | The project team itself determines the need for the procedure |
| Marketing campaign        | The exchange independently engages potential investors | The project team requires significant financial and time investments to advance the project |
| Project Verification      | Each project, before launching on the platform, undergoes a procedure for checking the accuracy of information | There is no need to undergo screening procedures before starting the project |

Source: authors.

Thus, the main advantage of the initial public offering for investors is a higher level of security compared to investing in ICO projects. For the project team, the implementation of this procedure can serve as an effective way to attract investment due to the lack of high advertising costs and the presence of a formed customer base at the exchange. However, the IEO model also has certain drawbacks: the project submission procedure is complicated due to the list of requirements for them; the process of attracting financing is becoming longer; there is a risk of personal data leakage, as both investors and project participants go through the identification procedure.

Security Token Offering (STO, Placement of security tokens) is a procedure for attracting investments by issuing tokens that are backed by securities [14]. This feature allows investors to rely on a wide range of rights, including the payment of dividends and the right to vote.
Linking tokens to real securities makes it possible to smooth out the problems of regulation by implementation of laws and acts that control securities. In addition, the obvious benefit for the investor is associated with high regulatory requirements for reporting on securities, which reduces the risks of fraud. Thus, if the ICO mechanism involves the obtaining of income by investors from the growth of the exchange value of tokens, then investing in STO allows them to obtain rights related to the ownership of securities. Also, the sale of security tokens, in contrast to utility tokens, allows to protect investors’ rights in case of bankruptcy of an organization [13]. Using the considered financing tools is already quite common among startups and projects that have investment needs. At the same time, new mechanisms are entering the market, which also represent possible forms of ICO development.

One of these is the Decentralized Autonomous Initial Coin Offering (DAICO, Decentralized Autonomous Public Placement of Tokens), which is a synergy of a decentralized autonomous organization, functioning in accordance with a set of agreed, formalized rules, and traditional ICO [7]. Investors gain more control over the distribution of funds that were invested in the project using smart contracts [2]. This tool allows you to regulate payments to the project team since during the implementation of the ICO the team do not have an access to already raised funds, and all the decisions on operations are submitted to the general vote of investors. In case of violation of the project implementation and failure to fulfill their obligations, investors have the right to terminate the smart contract with the return of the remaining investment. Increasing the level of control over the implementation of the project reduces the risk of loss for investors. However, this model assumes the proactive behavior of investors based on professional competencies, as well as the need for a basic level of knowledge of the product development process.

At the moment, a uniform standard for the implementation of a decentralized autonomous ICO has not yet been developed, so the practice of its use is based on the experience of several pilot projects. In general, DAICO in the future is one of the main alternatives to the traditional initial placement of tokens, which will strengthen the reputation of cryptocurrency and blockchain technology in the financial market.

The development of technologies and their integration with the financial services market are becoming catalysts for the need to adapt the regulatory environment to the modern realities of technological entrepreneurship. Due to the analysis of the international experience we could distinguish several options for including ICO in the legal field of economic relation [5]:

Option 1. Regulation of the ICO mechanism through the application of existing legislation. For this, it is necessary to determine the circle of participants in the process of ICO and the relationships between them, mutual rights and obligations. For the first time such an option in practice been used in the United States, while accepting tokens project DAO securities in 2017. Therefore, US token-issuing projects and investors are required to comply with US securities laws. The same concept was supported by Germany, Canada, Singapore [1].

Option 2. Formation of a separate legislative base, which would specialize in digital instruments for attracting financing, taking into account existing regulatory legal acts. When using this approach, special attention should be paid to resolving the issue of distinguishing between the current laws and specially created norms in order to prevent
legal conflicts. In addition, these features should be explained to companies issuing tokens in order to be able to organize their activities within the framework of the norms established by legislature. This option is used in France and Australia, and it is Russia that is leaning towards it, given the project of act “On financial digital assets,” which is being approved in the State Duma in the second reading [6]. Thus, both options allow you to regulate the procedure for issuing a token, as well as protect investors’ rights.

In general, government policy in relation to cryptocurrencies and alternative financing mechanisms should be built on the basis of a permissive nature, which will reduce the level of the shadow economy. These measures, in turn, can become another source of replenishment of the state budget by taxing the activities of the crypto sector, and also become the basis for the further evolution of the digital economy.

5 Conclusion

To assess the quality of the ICO project an index was developed. It includes the main characteristics that affect the investor’s decision. As components of the index, indicators from the regression model were included. The calculation of the general index is carried out in several stages. Firstly, it is necessary to calculate individual indexes by dividing the values of the characteristics of a particular project into reference values. Secondly, multiply the results by the weight coefficients obtained during the synthesis of the analysis and the expert method. The last stage is the interpretation of the result. The developed index was tested on a small sample array and can be used to assess the quality of ICO projects.

As for the further spread of ICO’s usage to attract financing, despite the objective advantages, there are some difficulties in both legal and technological ways [3]. We should expect an increase in the number of projects entering an ICO with an already developed prototype product. This fact would lead to increasing of the transparency of this process and tightening of the regulatory requirements in order to gain more confidence in digital assets among ICO participants. There are some steps already been taken in the modern ICO market such as exchange placement, as well as the placement of security tokens. The advantages of these tools partially allow to solve the problems of high risk of fraud and to protect the rights of investors. At the same time, new mechanisms are entering the market that represent future forms of ICO development. Among them, the most promising is a decentralized autonomous public offering of tokens. Investors gain more control over the distribution of funds, and in case of violation of obligations by the project team they have the right to terminate the smart contract with the return of the remaining investment.

The growing popularity of alternative financing mechanisms among Russian companies leads to the question of legal regulation of digital assets and related financial transactions in the Russian market. To legalize this process, it is necessary to consider the following aspects:

- regulation object (cryptocurrency, utility and security tokens),
- approaches to regulation (application of existing legal acts or development of new legislation),
– an information policy designed to clarify the practice of applying legislation in order to reduce violations of investor rights,
– use of tax and accounting,
– anti-fraud measures.

The adoption of the draft law “On Digital Financial Assets” should be the beginning of the integration of the use of digital assets in the process of attracting financing within the existing Russian financial market. These measures are particularly relevant in connection with current economic problems caused by business disruptions due to the COVID-19 pandemic.

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