ICO Performance: Analysis of Success Factors

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Abstract
This study examines the success factors and their indicators in initial coin offerings (ICOs). Taking into consideration available data on ICO performance, we conduct an empirical analysis to test our hypotheses. More precisely, we argue that the specific nature of the ICO market and its actors impact the financial results of the projects, thus, their viability. Some of the characteristics we considered are the project duration, media and marketing activities, and team structure. We question how well the public ICO ratings reflect performance efficiency. In conclusion, we suggest possible strategies for projects to improve their perspectives, as well as for investors to identify promising companies to support.

Keywords
Initial Coin Offering (ICO), Blockchain, Token Sale, Investment Strategy

1. Introduction

Initial coin offering (ICO) results differ significantly from each other: some projects manage to reach the planned level of funding in a relatively short time while others fail after many attempts [1, 2]. Generally, the success of the project depends on a large number of characteristics and the current market state [3, 4, 5]. This project focuses on ICO success factors and aims to identify the significant ones.

Most experts name the innovative idea as the main factor and the team's ability to implement it [6, 7]. However, many startups face the problem of competencies lack within the team for the further project development due to the limited number of highly qualified people available for hire [8]. Besides the composition of the team, the previous experience of its members as a whole and each participant separately is often considered when assessing the investment attractiveness of the project [9]. Thus, this study aims to test the hypothesis, whether such factors as team structure and duration of the project can predetermine ICO success.

According to ICO rating platforms, ICO projects use social media as one of the leading marketing tools for promoting themselves. Startups create accounts mostly in such popular social networks like Facebook, Twitter, or Telegram. At the same time, the ICO market attracts different types of investors [4]. It causes another hypothesis, whether activity in social media influences ICO performance.

At this stage of the research project, we use correlation analysis to test several hypotheses. This statistical method shows the strength and significance of relations between the variables and allows to exclude those variables that do not affect ICO performance. For this study, a unique dataset has been compiled. Data has been retrieved from two ICO databases – Foundico and ICOmarks. It is suggested that subdividing the samples for companies' data and narrowing down the areas of their economic activities is essential for correct results. Besides such factors as the duration of the project, media and marketing activities, and team structure, we examine the relevance of some public ICO ratings. In conclusion, we suggest possible strategies for projects to improve their perspectives, as well as for investors to identify promising companies to support.

2. Empirical analysis of ICO success factors
2.1. Identification of factors affecting ICO success

Consider particular cases of public ICO ratings. On icomarks.com (called further ICOmarks), the overall score is calculated as the arithmetic mean of the ratings for the ICO profile, social activity of the project and the availability of confirmed information about its team. The foundico.com (called further Foundico) rating is based on points given for essential project information, finance, product, team, and marketing. Investments less than $100 thousand were considered as statistical outliers and removed from both samples. Projects that managed to collect more than $30 million were also excluded. Thus, the number of projects selected on the ICOmarks platform was 31, on foundico.com – 30 (the results are presented in Figures 1 and 2).

Spearman's rho			RaisedFunds	Rating on icomarks.com
	RaisedFunds	Correlation Coefficient	1,000	,051
		Sig. (2-tailed)	.	,785
		N	31	31
	Rating on icomarks.com	Correlation Coefficient	,051	1,000
		Sig. (2-tailed)	,785	.
		N	31	31

Figure 1: Spearman's correlation coefficient between the rating on ICOmarks and the volume of collected investments

Spearman's rho			Rating on foundico.com	Raised funds
	Rating on foundico.com	Correlation Coefficient	1,000	,355
		Sig. (2-tailed)	.	,054
		N	30	30
	Raised funds	Correlation Coefficient	,355	1,000
		Sig. (2-tailed)	,054	.
		N	30	30

Figure 2: Spearman's correlation coefficient between Foundico rating and the volume of collected investments

The correlation between the ratings and the ratio of collected investments to the soft cap is described in Table 1. Projects collected less than 10%, and more than 900% of the planned minimum investment were preliminarily excluded from the sample.

Table 1
Correlation coefficients between the ratings and the ratio of the volume of collected investments to their planned minimum

	Rating on Foundico	Rating on ICOmarks
Collected funds/soft cap	0.3009	0.0858

Consider now the hypothesis on the dependence of investments on the duration of the project creation process, taking into account the time allotted for ICO implementation. We sample projects from the Internet category on Foundico. The difference between the ICO end date and the date of idea creation was taken as an indicator of time spent on the working process. Projects were excluded from the sample if less than 100 days passed from the moment of their creation to ICO end. The limitations

on the number of collected investments remained the same as in the previous analysis. The results of the calculations are demonstrated in Figure 3.

For the indicator of time spent on the project, the analysis was performed with the ratio of the collected investments to soft cap, which was 0.2534. We did not include the projects that attracted less than 10% and more than 900% of the soft cap.

Moving to the next step of the study, we tested the dependence of investments on the project's popularity in social networks. In [10], it was proposed that the popularity and intensity of project's Twitter is associated with positive returns around dates of ICO and connected to the immediate reaction of the market. On ICOmarks, data on social activity is presented for most of the projects, namely: the total number of subscribers on Telegram, Twitter, Facebook, and links to accounts in various social networks. We used a sample of projects from the Internet category published on ICOmarks with data on social activity. The initial sample was adjusted depending on the availability of the necessary information about the project in the open sources. In this case, the amount of collected investments ranges from $1 million to $30 million. The total number of project subscribers in the sample does not exceed 70,000 and is not less than 2000. The correlation between investments and the number of social networks in which the project has valid accounts was also assessed (the results can be seen in Figure 4 and Table 2).

			Raised funds	Total duration
Spearman's rho	Raised funds	Correlation Coefficient	1,000	,376[*]
		Sig. (2-tailed)	.	,049
		N	28	28
	Total duration	Correlation Coefficient	,376[*]	1,000
		Sig. (2-tailed)	,049	.
		N	28	28

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 3: Spearman's correlation coefficient between the duration of the project and the volume of collected investments

			RaisedFunds	All followers	Links to social media
Spearman's rho	RaisedFunds	Correlation Coefficient	1,000	,140	-,098
		Sig. (2-tailed)	.	,389	,549
		N	40	40	40
	All followers	Correlation Coefficient	,140	1,000	-,141
		Sig. (2-tailed)	,389	.	,384
		N	40	40	40
	Links to social media	Correlation Coefficient	-,098	-,141	1,000
		Sig. (2-tailed)	,549	,384	.
		N	40	40	40

Figure 4: Spearman's correlation coefficient between indicators of activity in social networks and the volume of collected investments

Table 2
Coefficients of correlation between indicators of social activity of the project and the ratio of the volume of collected investments to their planned minimum

	Number of links to accounts in social networks	Number of followers
Collected funds /soft cap	0.3189	0.1848

Thus, Spearman's correlation coefficients between the number of investments collected and the rating on ICOmarks and Foundico, the number of followers on social networks, and the number of social media accounts do not indicate a strong relationship between the corresponding variables and investments. The correlation coefficients are positive for all parameters except the number of links to accounts in social networks. In the case of the rating on ICOmarks, the number of links, and the number of subscribers, a very weak correlation is noticeable. The correlation coefficient of investments with the rating on Foundico ranges from 0.3 to 0.5. Nevertheless, the correlation of these parameters is not significant at the levels of 0.05 and 0.01, which does not allow us to conclude that there is a dependence of investments on the specified characteristics of the project.

The result for investments and project duration looks different. There is a weak positive relationship between the variables: the more time has passed from the start of the project to the ICO end date, the more investments were collected. It might be associated with the increased reliability of a team that has been working together for a long time.

Our analysis also revealed the relationship between the above-mentioned ICO characteristics and the collected investments' share. In all cases, the correlation turned out to be positive but different in strength. For example, the coefficient with the rating on ICOmarks (0.0858) is very close to zero. Accordingly, there is no actual relationship between this variable and the share of collected investments in the particular sample. The correlation between the number of followers and the time of the working process is also insignificant. The percentage of collected investments increases under their influence for all other parameters and the ratio of collected investments to the soft cap.

2.2. Intellectual capital of the team as a critical performance factor

In the previous studies [6, 11], such factors as the number of team members and the project methodology were considered. We suggest focusing on the composition of the team members, dividing them into two groups: "managers" and "developers". All the roles involved in the technical part of the project are defined as developers. The group of managers includes specialists in the areas of management, finance, law. To narrow the analysis, we use the "Internet" category (data taken from the ICOmarks portal). This category was chosen for the analysis because the startups belonging to it represent relatively homogeneous products and, accordingly, require similar competencies of team members.

The sample was taken from the section "Funded" on ICOmarks and cleaned from outliers. Projects that raised less than $1 million and more than $40 million during the ICO were not included in the analysis. Projects with the number of developers less than 10% and more than 70% of the team were also excluded from the sample. In total, the number of projects that are not outliers and provide sufficient information about the team was 55. The results of the calculations are presented in Figure 5.

			RaisedFunds	D/T
Spearman's rho	RaisedFunds	Correlation Coefficient	1,000	,345**
		Sig. (2-tailed)	.	,010
		N	55	55
	D/T	Correlation Coefficient	,345**	1,000
		Sig. (2-tailed)	,010	.
		N	55	55

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 5: Spearman's correlation coefficient between the volume of collected investments and the share of developers in the team

The weak positive correlation coefficient 0.345 shows that the share of developers has a particular impact on the investment attractiveness of projects: the more significant the share of technical specialists in the team, the greater the investments. The significance coefficient at level 0.01 allows concluding that the obtained correlation coefficient is not random. The correlation coefficient was also

calculated for the share of developers, and the ratio of the collected investments to soft cap and amounted to - 0.0698. Only 26 projects from the initial sample set the soft cap and made it publicly available.

This result can be explained by the fact that all projects differ from each other on the idea and the corresponding complexity of its implementation. However, they belong to the same category. Nevertheless, it is always crucial for an investor to assess the skills of team members in order to be confident in the possibility of subsequent project implementation. Analysis of projects also reflects that the availability of detailed information about the composition of the team, its verification on rating portals and links to the profiles of participants play an essential role in the success of the project. Extensive experience in conducting ICOs, entrepreneurship in the field of IT, development or business management can also serve as an advantage. It should be noted that when setting a rating, many portals and experts take into account the composition of the team as one of the decisive factors for the assessment. For example, on Foundico, projects with team members with verified accounts, the experience of participation in an ICO or a detailed career profile receive noticeably higher ratings. The same procedure is on icobench.com where, among other factors, experts give their marks. In their comments on projects, most of the experts pay attention to the composition of the team and the availability of information about it.

3. Discussion

In this paper, we considered two performance characteristics: investment amount and its ratio to soft cap. For both cases, the correlation coefficients with the rating on Foundico are larger than 0.3. For ICOmarks, correlations tend to zero. Spearman's correlation coefficient is noticeably less significant than with the rating on Foundico. This result may be related to the quality of the given rating. They use different sets of parameters; for example, ICOmarks does not take into account such a significant indicator as marketing. On Foundico, a score for marketing is based on assessing the number of channels for promoting a project and their quality, as well as depending on the availability of a video presentation of the product. The ICOmarks platform gives a score for social activity, evaluating the number of followers in the largest social networks and updates on the project accounts.

Previously, the hypothesis about the dependence of the share of collected investments on the rating has already been tested in studies. For example, a significant positive correlation with the rating on the icoholder.com platform has already been identified [12]. Nevertheless, the obtained coefficient is extremely close to zero, which indicates a very weak relation between the variables.

From the correlation analysis of social activity parameters, it can be concluded that they do not significantly impact the investment attractiveness of the project. This fact may partly explain why the rating on ICOmarks, which is based on assessing the popularity of the project in social networks, has a very weak and insignificant correlation with investment indicators. The absence of significant relations between the social activity of the project and its investment attractiveness may indicate that the ICO market is not as free as, for example, the market of crowdfunding projects. Crowdfunding projects often receive financial support from small investors interested in implementing an idea, when ICO investors can be of different categories, pursue different goals, and invest different amounts of funds.

Investors in ICOs can be conditionally divided into three categories: mass investors, who make up the absolute majority, cryptocurrency funds and venture funds. Mass investors tend to hold relatively small amounts of cryptocurrency. They often pursue speculative goals. Holders of large volumes of cryptocurrency are united in cryptocurrency funds and focus on profitable investments of relatively large amounts. Venture capital funds are professional stock market participants who aim at the very high profitability of a startup in the future and are ready to take significant risks at the same time [13].

At the first stages of the development of the ICO phenomenon in 2016 and 2017, unexperienced mass investors who only needed to evaluate the idea of the project made the primary investments [13]. From this category of investors, the so-called early adopters came from. Early adopters were primarily over-motivated clients who were very interested in the idea of the project, even if the project itself was still not perfect [14]. The importance of early adopters for the ICO market cannot be underestimated. With the development of the market, the requirements for projects have increased, and the composition of investor categories has dramatically changed [13]. For example, by the end of 2018, there was a

decline in the ICO market (Fig. 6). Some experts see the reason for this in an outflow of early adopters who have already gained the planned level of income from projects.
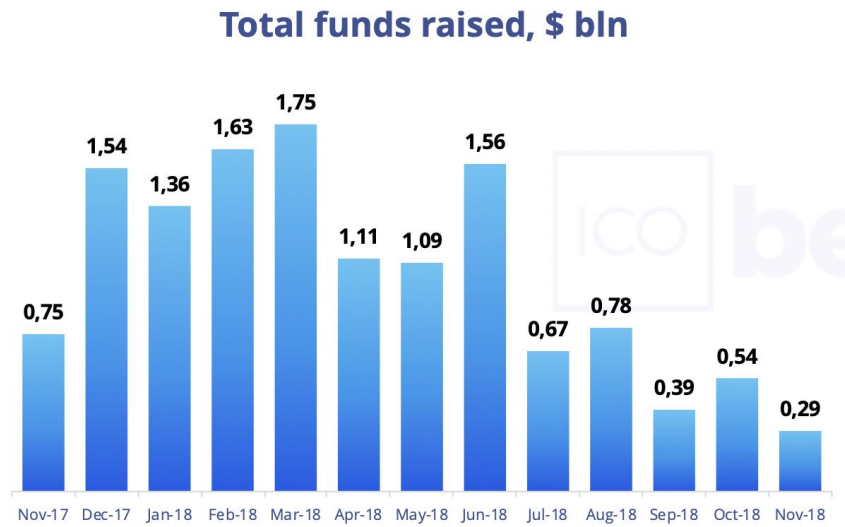
Total funds raised, $ bln

Figure 6: Dynamics of the ICO market for the period of November 2017 - November 2018 [15]

The above-mentioned facts explain why the dependence of investments on the social activity of the project is insignificant. As a rule, the largest investors are funds or mass investors who have interacted with the ICO mechanism for a long time and find projects not through social networks but more likely on specialized platforms. Besides, it should be noted that with the popularization of ICO, the strategies for promoting projects have also changed. Due to the gradual increase of venture funds share among other investors, startups switched to personal communication with such large investors instead of advertising on social networks.

Another crucial fact is that the success of the project largely depends on the current situation in the ICO market. For example, there is an upward and downward trend in the total investment collected by all ICOs in a particular period depending on the rise and fall of the bitcoin rate, respectively (see, e.g., icobench.com market review; Figs. 7, 8). The dependence of the project's success on the current bitcoin rate has been studied more than once before. It was empirically proven in one of the studies that ICO's profitability discounted on the bitcoin rate is the most informative indicator of investor's income [12].
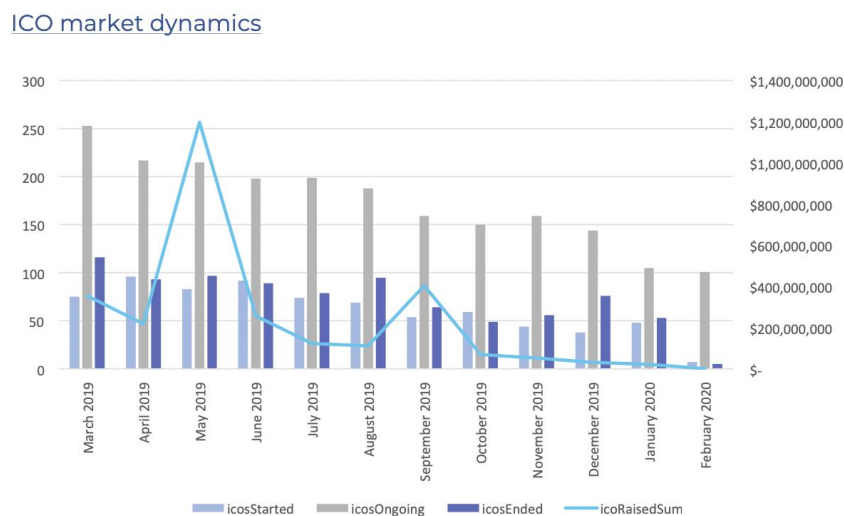

Figure 7: Dynamics of the ICO market for the period of March 2019 - February 2020 [16]

Figure 8: Bitcoin price dynamics for the period of March 2019 - February 2020 [17]

One of the essential characteristics of the project is its financial performance. At the same time, special attention is paid to such factors as the minimum and maximum value of investments that must be collected during the ICO - soft cap and hard cap. If the soft cap is not reached, the money is going to be returned to investors. When the hard cap is reached, if it was initially established, the ICO ends, and further investment is impossible. By setting a top financial goal, a startup limits the number of potential investors. This reduces the risks of a decrease in the coin value due to the lack of unlimited supply [1, 9]. As an example, startup Bancor raised $150 million in three hours of ICO without setting a maximum investment bar. As a result, the ROI of the project at the end of the ICO was 95.81%. In addition to the fact that the absence of a hard cap makes coins less rare and thereby reduces their cost, it may also indicate that the startup does not have a clear plan of distributing the budget after the ICO [9].

In terms of financial issues, startups are recommended to correctly set soft and hard caps for the expected number of users and justify the established values in the whitepaper. Setting soft and hard caps, which will be enough to implement the project, the startup should not overestimate its potential at the same time and prepare a plan of project development for different outcomes of the ICO. The whitepaper should give a clear understanding of how the startup plans to develop with a given amount of collected investments, how much time and money will be spent on development. It is imperative to reflect this if the planned minimum is much less than the maximum.

It is crucial to indicate in the whitepaper how funds will be distributed after the ICO: what percentage of investments will be spent on development, marketing, employee salaries. [1]. It should be emphasized that our analysis of projects published on different platforms showed that whitepapers of most startups lack a description of the cost structure and justification of soft and hard caps. Moreover, technical documents usually do not contain information on the estimated number of users of the service and, as a result, on the number of funds allocated per user. This makes it difficult to understand how reasonable and realistic the financial goals of the project are. The lack of publicly available information on these financial indicators is a significant limitation for assessing the investment attractiveness of a project entering an ICO.

Investors should pay attention to the justification of soft and hard cap amounts, estimate the probability of project implementation in case of different amounts of collected investments and the number of funds allocated per each user.

An important role in evaluating ICOs is assigned to such factors as a breakthrough idea, the final product and problems of users that this product is going to solve, and skills of team members [8]. It is noticeable that projects that managed to attract many times more investment than other projects on the ICO market are often distinguished by innovative ideas that are understandable to users in terms of their practical application at the same time. A project that has no practical significance, even with a unique idea, risks that the final product will not be in demand. It can be assumed that this may lead to an increase in the number of investors purchasing tokens only for their subsequent resale at a more beneficial price.

Depending on the idea of the project and the technical complexity of its implementation, investors should take into account the volume of funds allocated for development.

To implement an innovative concept, the appropriate competencies of team members are required. In this case, the absence of developers in the team can jeopardize the creation of the finished product. The relation between the number of developers in the team and the success of the ICO has been empirically proven in this work. The relation between the ICO result and the duration of the project development revealed in this paper may indicate that the factor of having extensive experience of working together within the team increases the investor's confidence in the startup and, accordingly, has a positive effect on the success of the project.

Thus, for the right team composition, startups are recommended to correctly assess the necessary competencies of team members depending on the idea and the technical complexity of its implementation and to reflect information about team members and their experience and skills in the whitepaper. As for investors, it would be important to look at the information about the team and evaluate its composition in terms of necessary competencies.

In conclusion, the assessment of the investment attractiveness of a project depends on a number of its characteristics. A big problem of many startups, which complicates this assessment, is the lack of public information, primarily about financial performance and the team [12]. In order to increase investor confidence in the project and, as a result, attract more investment, the whitepaper of the project should include a detailed explanation of the financial goals, the uniqueness of the idea and its practical significance, the cost structure as well as the description of the competencies of the team members and their experience. The availability of detailed information about the above characteristics of the project is a prerequisite for further research on the degree of their influence on the ICO result.

Summarizing our conclusions, we present the set of recommendations for startup companies and investors in Figure 9.
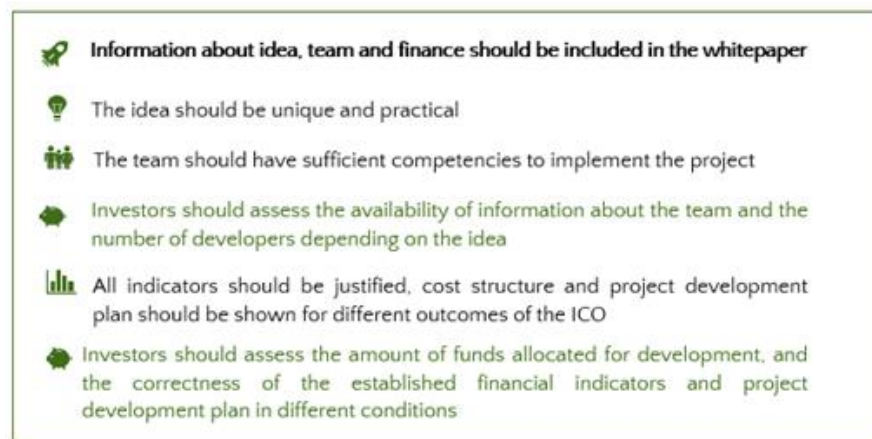

Figure 9: General recommendations on ICO success evaluation

In the prospective research, the statistical method of multiple linear regression can be applied. This method allows investigating if the association between the variables exists and how strong this relationship is and shows the significance of the model itself. The method of regression is widely used in studies on ICO performance factors [12].

4. References

[1] M. Adams,: ICO Investing: The Beginners' Guide To Investing In ICOs, CreateSpace Independent Publishing Platform, South Carolina, 2018.
[2] G. Fenu, L. Marchesi, M. Marchesi, R. Tonelli, The ICO phenomenon and its relationships with ethereum smart contract environment, in: 2018 International Workshop on Blockchain Oriented Software Engineering, IWBOSE, IEEE Press, New York, 2018, pp. 26-32. doi: 10.1109/IWBOSE.2018.8327568.

[3] S. Adhami, G. Giudici, S. Martinazzi, Why do businesses go crypto? An empirical analysis of initial coin offerings, Journal of Economics and Business 100 (2018) 64-75. doi: https://doi.org/10.1016/j.jeconbus.2018.04.001.

[4] R. Fahlenbrach, M. Frattaroli, ICO investors, Financial Markets and Portfolio Management 35 (2021) 1–59. doi: https://doi.org/10.1007/s11408-020-00366-0.

[5] S.H. Wu, H.C. Sung, T.C. Cheng, Measuring ICO performance indicators: An empirical study via white papers, in: 2019 IEEE international conference on blockchain and cryptocurrency, ICBC, IEEE Press, New York, 2019, pp. 128-132. doi: 10.1109/BLOC.2019.8751390.

[6] A. Panin, A multiple case study on factors affecting ICO success, Master's thesis, University of Jyväskylä, Jyväskylä, Finland, 2019.

[7] C. Fisch, P. P. Momtaz, Institutional investors and post-ICO performance: an empirical analysis of investor returns in initial coin offerings (ICOs), Journal of Corporate Finance 64 (2020) 101679. doi: https://doi.org/10.1016/j.jcorpfin.2020.101679.

[8] I. Takashima, ICO: The Ultimate Guide To Investing In ICOs, North Charleston: CreateSpace Independent Publishing Platform, South Carolina, 2018.

[9] G. Yuryev, What can explain the performance of Initial Coin Offerings?, Master's thesis, University of Stavanger, Stavanger, Norway, 2018.

[10] H. E. Benedetti, L. Kostovetsky, Digital Tulips? Returns to Investors in Initial Coin Offerings, Journal of Corporate Finance 66 (2021) 101786. doi: http://dx.doi.org/10.2139/ssrn.3182169.

[11] S. Ibba, A. Pinna, G. Baralla, M. Marchesi, ICOs Overview: Should Investors Choose an ICO Developed with the Lean Startup Methodology?, in: J. Garbajosa, X. Wang, A. Aguiar (Eds.), Agile Processes in Software Engineering and Extreme Programming, volume 314 of Lecture Notes in Business Information Processing, Springer, Cham, 2018. doi: https://doi.org/10.1007/978-3-319-91602-6_21.

[12] T. Dean, D. Jayasuriya, A. Marsden, Predictability of ICO Success and Returns, 2019. URL: https://www.arx.cfa/-/media/regional/arx/post-pdf/2019/11/19/predictability-of-ico-success-and-returns.ashx.

[13] S. Y. Pertseva, Modern Tendencies of ICO Market Development, Problems of the National Strategy 6 (2018) 161.

[14] E. M. Rogers, Diffusion of Innovations, 4th ed., Simon and Schuster, New York, NY, 2010.

[15] Icobench.com, ICO Market Monthly Analysis November 2018, 2018. URL: https://icobench.com/reports/ICObench_ICO_Market_Analysis_November_2018.pdf.

[16] Icobench.com, ICO Market Weekly Review, 2020. URL: https://icobench.com/reports/ICO_Market_Weekly_Review-04_2020.pdf.

[17] Coinmarketcap.com, Bitcoin Chart, 2020. URL: https://coinmarketcap.com/currencies/bitcoin/.