Conference Paper

Formation of a National Assessment of the Probability of Investing in Fraudulent ICOs

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Abstract

The study covers such concepts as ICO and IPO, their characteristics, similarities and differences. A national estimate of the probability of investing in fraudulent ICOs has been formed. Also, the work is about comparing the likelihood of investing in fraudulent IPOs and ICO.

Keywords: cryptocurrency, block technology, ICO, IPO

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1. Introduction

Cryptocurrency is virtual money, which, unlike fiat funds, does not have physical expression. The most common cryptocurrency today is Bitcoin. Its main features are decentralization and anonymity: all participants in the transaction are equal and are not required to provide data in an amount sufficient to fully identify the individual.

In the field of cryptocurrency, risks exist, primarily related to the anonymity of the system. Since the participants in transactions are not required to provide data sufficient to fully identify a person, there are high risks of money laundering and terrorist financing with the help of cryptocurrency.

In addition, there are other risks associated with cryptocurrencies.

By analogy with the IPO (the first public sale of shares in the joint-stock company), ICO (Initial With Coin Offering) is a mechanism for attracting financing for projects or companies with the purpose of developing and releasing a product (service) to the market.

Attraction of investments takes place in the cryptocurrency (bitcoins, air, lightcoins, etc.). In contrast to the IPO (public offering), the process of placing tokens cannot be adjusted: for this conduct financial investments are not need, no minimum requirements for the issuer, audit and other related IPO procedures.

The report was prepared in 2018. The Wall Street Journal (WSJ) [1] 1450 proposals for cryptocurrency were studied and 271 suspicious cases were discovered when start-ups used plagiarism in documents, promised guaranteed profits or invented their managers using photos of people from the Internet. Investors invested more than $1 billion in these suspicious ICOs.

According to Satis Group [2], worldwide, since 2017, investors have invested more than $9 billion in token-hosting firms. The start-ups whose ICO studied the WSJ generally managed to get a minimum of $5 billion. Some of them still raise funds, while others, having received them, they simply closed. Investors have already announced a loss of $273 million from investments in these projects.

The Securities and Exchange Commission (SEC) in February warned that many transactions in the booming private cryptocurrency market may be illegal. Since December, the SEC has four times brought charges against legal entities and individuals about the ICO. More than 10 companies suspended their plans to place the cryptocurrency after the agency asked them questions, his representative said in February.

2. Comparison of ICO and IPO

Primary public offering, initial public offering, IPO (Initial Public Offering) – the first public sale of shares in the joint-stock company, including in the form of the sale of depositary receipts for shares, to an unlimited number of persons. The sale of shares can be carried out either by placing an additional share issue through an open subscription or by publicly selling the shares of an existing issue.

As explained in [3], the primary allocation of coins, ICO (Initial Coin Offering) is a mechanism for attracting financing for projects or companies with the purpose of developing and releasing a product (service) to the market. Attraction of investments takes place in the cryptocurrency (bitcoins, air, lightcoins, etc.). Unlike IPO (public offering of shares), the process of placing tokens is not regulated: almost no financial

investments are required to conduct it, there are no minimum requirements for the issuer, audit and other related IPO procedures.

ICO and IPO have their similarities and differences. In accordance with [4], the main similar features of ICO and IPO are:

1. Both models are a kind of fundraising – raising funds from outside to develop the project.

2. The investor in both cases can become an outsider – regardless of how much he is familiar with the company's activities.

3. Both tokens and shares can be a speculative instrument on the stock exchange.

4. Both tokens and shares can be sold by the investor, returning their money and making a profit if the value of the token or shares on the market has increased since the moment of purchase.

5. The greatest demand for investors in both cases is used by projects and companies that offer something innovative or useful for the market.

But there are notable differences between these models. The main differences are as follows:

1. The ICO project is not required to have an official registration. Block project is not an income-generating company, and in general, it is not always a company.

2. ICO does not operate under any legal rules.

3. Ease of investing. ICO can invest any person. Accordingly, since the investor in the ICO is not required to provide documents that uniquely identify its identity, this can be exploited by intruders, receiving from the successful ICO super-profits for their criminal purposes.

4. The cost. Tokens are usually cheaper than stocks. And in the case of successful ICO, the cost of tokens grows to hundreds or even thousands of percent. Accordingly, it can also allow attackers to make huge profits for their own purposes.

But the main difference between ICO and IPO is the profitability and safety of these models.

ICO versus IPO: profitability of projects.

The profitability of a successful ICO is far ahead of the profitability of a traditional IPO. For example:

1. Tokens Spectercoin for 14 months increased by 325,717%.

2. The price of NEO tokens for more than two years rose by 397,510%.

3. Ethereum since the ICO showed an increase of 320,560%.

3. Forming an Estimate of the Probability of Fraudulent ICO

As part of this work, the ICO security assessment system is as follows:

Stage 1: Defining the criteria by which the probability of fraud in the conduct of the ICO will be assessed.

Stage 2: Assignment to each criterion of specific gravity in accordance with its significance and bringing the gradation of each criterion.

Stage 3: Formation of the formula for calculating the probability of fraud.

Step 4: Calculating the likelihood of fraud on several already successful and fraudulent ICOs.

Despite the fact that the phenomenon of ICO has emerged relatively recently, at the moment based on the results of legal and fraudulent ICO, we can conclude that there is a common legal conducted ICO and fraudulent. Accordingly, select the parameters that are the most significant indicators that the ICO conducted with a high degree of probability will be fraudulent.

Following are the selected parameters, which in my opinion are the most obvious indicators that a specific planned ICO has a high probability of fraud.

Indicators:

1. Rationality of whitepaper content and project road map (Rat _ C)
2. Accuracy of description of the desired result and stages of its achievement (Acc _ D)
3. The presence of a minimum and maximum amount and a description of the distribution of the total amount (Min _ Max _ S)
4. The percentage of tokens available to the team after the ICO (Per _ T)
5. The cost of tokens (Cos _ T)
6. Professionalism of the team (Prof _ C)
7. The quality of the advertising campaign (Qual _ A)
8. Reviews (Rev)

4. Creating a Training Sample

In the course of the work, a test sample of 10 fraudulent ICO and 10 legally conducted ICO:

Fraudulent ICO:

1. ZeroEdge
2. DeClouds
3. Confido
4. Opair
5. Razormind
6. PlexCorps
7. Diamond Reserve Club World (DRC World)
8. Denaro
9. Prodeum
10. Matchpool

Legal ICO:

1. Bankor
2. Sirin Labs
3. The DAO
4. Tezos
5. Filecoin
6. Hdac
7. Huobi Token
8. Dragon
9. Petro
10. Pincoin

All fraudulent and legally conducted ICO were considered. For each criterion, all ICOs was given military weight, as shown in Tables 1 and 2.

In order to determine whether an ICO belongs to a particular class, it is necessary to calculate the coefficients of linear discriminant Fisher functions (Figure 1).

Table 1: Training sample ICO.

No.		Rat _C	Acc_ D	Min_M ax_S	Per_ T	Cos_ T	Prof_ C	Qual_ A	Rev	Σ	P
1	ZeroEdge	2	2	3	2.5	2	2	3	2	18.5	0.771
2	DeClouds	2	1.5	2	2	2	2	2	1	14.5	0.604
3	Confido	1	1	2	1.5	1	1	1.5	1	10	0.417
4	Opair	1	1.5	2	2	1	1	1.5	2	12	0.5
5	Razormind	2	2	3	2.5	2	2	2	2	17.5	0.729
6	PlexCorps	1	1.5	2	1.5	1	1	1.5	1	10.5	0.438
7	DRC World	3	2	2	2	2	1.5	2	2	16.5	0.688
8	Denaro	2	2	1	1.5	1	2	2	1	12.5	0.521
9	Prodeum	1	1.5	2	2	2	1.5	1.5	2	13.5	0.563
10	Matchpool	2	1.5	2	1	1	2	1.5	1	12	0.5
11	Bankor	0	0.5	1	1	1	0	0	0	3.5	0.146
12	Sirin Labs	0	0.5	1	0.5	0	0	0.5	0	2.5	0.104
13	The DAO	0	0	1	1	0	0	0	0	2	0.083
14	Petro	0	0	2	1	1	0	1	0	5	0.208
15	Filecoin	0	0	1	1	0	0	0.5	0	2.5	0.104
16	Hdac	1	0.5	0	0.5	1	0	0.5	0	3.5	0.146
17	HuobiToken	1	0	0	1	0	0	1	1	4	0.167
18	Dragon	0	0	1	0.5	0	0	0.5	0	2	0.083
19	Tezos	1	1	1	0.5	1	0	1	0	5.5	0.229
20	Pincoin	0	0.5	0	1	0	0	0.5	0	2	0.083

	Classification Functions	
Variable	**G_1:1 p=,50000**	G_2:2 p=,50000
Rat_C	0,9390	4,69521
Acc_D	12,6080	3,05123
Min_Max_S	5,3699	2,12055
Per_T	8,3395	12,40669
Cos_T	-6,3016	-3,49448
Prof_C	9,5586	-7,54100
Qual_A	-0,8265	0,84049
Rev	2,3830	-8,24982
Constant	-29,1888	-6,78575

Figure 1: Coefficients of Linear Discriminant Fisher Functions. Thus, the linear discriminant Fisher functions have the form: $f_1(x_1,...,x_8) = -29.19 + 0.94x_1 + 12.61x_2 + 5.37x_3 + 8.34x_4 - 6.3x_5 + 9.56x_6 - 0.83x_7 + 2.38x_8$; $f_2(x_1,...,x_8) = -6.79 + 4.7x_1 + 3.05x_2 + 2.12x_3 + 12.41x_4 - 3.49x_5 - 7.54x_6 + 0.84x_7 - 8.25x_8$

To obtain a complete picture of the classification, we calculate the squares of the Mahalanobis distance from the objects to the centers of each of the classes (Figure 2).

Table 2: Sample of not-yet conducted ICO.

No.		Rat _C	Acc_ D	Min_Max_S	Per_ T	Cos_ T	Prof_ C	Qual_A	Rev	Σ	P
21	Aenco	0	0.5	2	0	1	0	0.5	0	4	0.167
22	Konios	0	1	0	0.5	2	0.5	1.5	1	6.5	0.271
23	IAME Identity	1	0.5	0.5	0	1	1	0.5	0	4.5	0.188
24	Ubanx	0	1	1	1	1	0.5	1	0	5.5	0.229
25	Bettium	2	1.5	2	1.5	1	1	0.5	1	10.5	0.438
26	Verifier	1	0	0	0.5	2	1	1	0	5.5	0.229
27	AllSparkChain	0	0	1	0.5	1	0.5	1	1	5	0.208
28	Delicia	0	0.5	1	0	0	0	1.5	0	3	0.125
29	GAMB	2	2.5	1.5	1	1	1.5	0.5	1	11	0.458
30	KIRIK	1	1	0	0	0	1.5	1	0	4.5	0.188
31	Bidipass	0	1.5	0.5	0.5	0	1	0.5	0	4	0.167
32	Azbit	0	0	1	1	1	0.5	0	1	4.5	0.188
33	Quantor	2	2	1.5	1	2	1	1.5	1	12	0.5
34	BlocFormGlobal ITO	1	0	0.5	1	1	0.5	0	1	5	0.208
35	True Play	2	2	1.5	2	2	1	1	2	13.5	0.563
36	Xsure	0	0	1	0.5	1	0	0.5	1	4	0.167
37	Aqua Token	0	1	0.5	0.5	0	1.5	0	1	4.5	0.188
38	SwissRealCoin	0	0.5	0	1	0	0.5	1	0	3	0.125
39	Value Ticket	1	1	0.5	0	0	1.5	0.5	1	5.5	0.229
40	EnergyPremier	0	1	0	0	1	0	0	1	3	0.125

The object should be assigned to that class, the distance to which is the least. For example, the 21st ICO should be attributed to the second class, since the distance from this object to the center of the second class is less than to the center of the first class (24.84329 < 54.3763).

Based on the tables shown in Figures 7–8, ICO, not included in the training samples, can be classified as follows:

1. ICO numbers 25, 29–31, 33, 35, 37, 39 refer to the ICO group highly susceptible to fraud, along with ICO numbers 1–10.
2. ICO with numbers 21–24, 26–28, 32, 34, 36, 38, 40 belong to the group of legal ICOs, along with ICO with numbers 11–20.

Thus, on the basis of the analysis, ICO was identified, with a high degree of probability associated with fraud and ICO, with a high degree of probability of legal.

Case	Squared Mahalanobis Distances fr Incorrect classifications are marke **Observed Classif.**	G_1:1 p=,50000	G_2:2 p=,50000
7	G_1:1	9,8019	53,34812
8	G_1:1	8,2002	58,27548
9	G_1:1	11,6649	62,34605
10	G_1:1	11,1101	63,86141
11	G_2:2	48,4777	5,97861
12	G_2:2	38,6483	4,16369
13	G_2:2	52,2574	5,81582
14	G_2:2	56,4472	7,55615
15	G_2:2	50,7254	2,61680
16	G_2:2	60,4570	6,34694
17	G_2:2	53,9513	11,43028
18	G_2:2	46,7649	2,72348
19	G_2:2	47,6600	7,93853
20	G_2:2	51,4216	6,37106
21	---	54,3763	24,84329
22	---	101,3988	93,77488
23	---	43,9008	31,30630
24	---	32,6265	13,44988
25	---	31,5097	49,32871
26	---	92,1752	55,42612
27	---	60,6493	47,69174
28	---	61,7398	27,98842
29	---	33,9906	88,84055
30	---	33,4961	48,25604

Figure 2

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