

# ICObench Ratings and Initial Coin Offerings' Success

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## ABSTRACT

Initial coin offerings (ICOs)—commonly referred to as token sales or token offerings—are assisted by blockchain technology. This financing tool helps entrepreneurs finance early-stage ventures on a decentralized, global scale. Researchers have previously called for more research to be carried out vis-à-vis the role of information intermediaries in the ICO ecosystem. The main goal of this study was to analyze the correlation between ICO ratings and the financing success of ICOs. As a result, secondary microdata on 5,581 ICOs were collected from the ICObench website. The results reveal that ICO ratings issued by third parties have a positive influence on the fundraising campaign of these offerings. ICO ratings thus appear to function as an effective signal to buyers and to reduce information asymmetry between sellers and investors.

**Keywords:** Financial technology (fintech), initial coin offering (ICO), rating, early-stage investment, signaling theory.

**JEL codes:** G20; M13.

## I. Introduction

INITIAL COIN OFFERINGS (ICOS) are a recent phenomenon that is receiving increasing attention from entrepreneurs, investors, and financial regulators (Brochado and Troilo, 2021). ICOs offer blockchain technology-based new ventures an opportunity to raise capital in exchange for digital tokens (Chen, 2018; Howell et al., 2018). These offerings have empowered entrepreneurs and revolutionized finance by giving micro, small, and medium-sized companies an alternative fundraising tool (Brochado and Troilo, 2021; The Organization for Economic Co-operation and Development [OECD], 2019). The associated startups can be classified as both knowledge-intensive and technology-driven (Fisch, 2019), so experts believe that these firms have the power to drive public capital markets toward a more decentralized economy (Brochado, 2018; Fisch, 2019). ICOs are also known as token offerings or token sales because tokens are issued to raise

capital based on blockchain technology, which has increased financial globalization and decentralized network governance (Hacker and Thomale, 2019).

ICOs are mainly associated with new projects in early stages of the venture lifecycle (Fisch, 2019; Kaal and Dell’Erba, 2017). In addition, the ICO market is not yet regulated (Brochado and Troilo, 2021; Chen, 2019), so interested investors must deal with uncertainty and information asymmetries (Brochado and Troilo, 2021; Chen, 2019). These issues are the main reason ICO projects need to send strong, valuable signals to potential investors (Chen, 2019; Fisch, 2019; Giudici and Adhami, 2019). One of the most important signals is electronic documents with official announcements (Block et al., 2021) (i.e., a white paper or token sale terms and conditions) (Giudici et al., 2020). In these communications, promoters need to use plain language, provide as much information as possible, and keep an eye on regulatory guidance (Brochado and Troilo, 2021).

Campino et al. (2022) and Jong et al. (2018) also highlight the significant role of ICO ratings published by third parties that are part of the ecosystem of the offerings (Brochado and Troilo, 2021). These raters conduct systematic literature reviews of the ICO market and carry out additional research on ICO information intermediaries. The present study aimed to provide evidence of the connection between ICO ratings with the success of these offerings. The following research question was addressed: Do ICObench ratings (i.e., overall, team, product, vision, and profile indices) contribute to the financing success of ICOs?

To present this study more clearly, the remainder of this paper is divided into four sections. The next section presents the literature review conducted to clarify ICO-related concepts, success factors, and ratings as signals that reduce information asymmetry. The third section details the methodology, including the secondary data source, ICObench ratings, and microdata used. The results section discusses the main characteristics of the dataset and the data analysis carried out to address the research question. The conclusion provides a discussion of the findings and suggested avenues for future research.

## **II. Literature Review**

### **A. ICO**

ICOs are often referred to as token sales or token launches (Deloitte, 2018), which are an emerging alternative approach to raising capital from global investors by issuing and selling digital tokens (Giudici et al., 2020). In this way, ICOs offer entrepreneurs direct access to the capital market (Brochado and Troilo, 2021). These offerings are built on blockchain technology that facilitates financing on a worldwide scale of projects still in an early stage (Brochado and Troilo, 2021; Hacker and Thomale, 2019). ICOs are thus characterized by decentralized governance mechanisms (Hacker and Thomale, 2018), as no trusted central authority or intermediary is needed to exchange value.

According to Kranz et al. (2019), the lifecycle of token sales involves three principal phases: pre-token sale, token sale, and post-token sale. ICO promoters start by determining the type of token to be issued and its characteristics based on the project's objective (Howell et al., 2018; Kranz et al., 2019) and choosing between donation, currency, utility, security, or mixed tokens (Brochado, 2018). An ICO launch is preceded by a disclosure in specialized forums (e.g., Reddit) of the project's description and the promotion team (Kaal and Dell'Erba, 2017). Issuers also use GitHub to publish in part or full the prototype source code—usually in an alpha or beta version—to enable investors to evaluate the technology solution offered (Kranz et al., 2019).

In the pre-token stage, the entrepreneurs decide if their project should be capped (i.e., no cap, soft-cap, or hard-cap) and establish the pricing model of the tokens (i.e., fixed or floating), percentage of tokens offered in the ICO (i.e., public float), and price mechanism (i.e., fixed price, auction, or price increase campaign). The promoters must also define the rights conferred by the tokens (i.e., consumption rights, future cash flows, and/or voting rights) and token sales schedule (Brochado, 2018). This stage further includes the development of a smart contract, white paper disclosures, and the promotion of the ICO using social media tools.

In the token sales phase, the official sale occurs backed by the previously activated smart legal contract. The last stage is the distribution of the tokens to the investors' wallets based on their contract (Campino et al., 2020). The issuers need to concentrate on developing the promised products or services while continuously providing information to investors to ensure that they are kept up to date.

ICOs offer investors a chance to diversify their portfolio (Adhami and Guegan, 2019) by investing in early-stage projects around the world (Chen, 2018; Kaal and Dell'Erba, 2017). One of the main advantages of ICOs for investors is the chance to invest in net assets transacted in electronic secondary markets (Adhami et al., 2018; Giudici et al., 2020). Crypto exchanges are classified as trusted intermediaries in the crypto market (Boreiko et al., 2019).

As ICOs are mainly associated with early-stage investments (Giudici and Adhami, 2019), buyers need to be aware of the main advantages of these offerings. Investors are buying tokens in early-stage investments (Ernst & Young [EY], 2017), so no tangible product, software, or visible service is available (Kaal and Dell'Erba, 2017). The ICO market is thus characterized by asymmetric information between buyers and issuers (Block et al., 2021).

Investors have to base their decisions on white papers (EY, 2017) or token sale terms and conditions, which include all the information technology protocols, selected blockchain technology, token prices, and distribution mechanism. A white paper is an unaudited paper (Giudici et al., 2020) developed by the team responsible for the venture, which includes the project's goals, and its business plan, team characteristics, and advisors (Giudici et al., 2020). This paper helps to minimize information asymmetries (Howell et al., 2018), potentially serving as an effective signal of eventual success (Fisch, 2019).

However, even if a project is clearly documented in its white paper, investors should be alert to the risks of fraudulent (Brochado and Troilo, 2021; Tiwari et al., 2020) and zombie tokens (Brochado, 2018), which have an extremely small chance of successfully attracting buyers (Kaal and Dell'Erba, 2017). The primary market can be uncertain, but the secondary market can also be quite volatile because of a lack of information on embryonic ventures (Kaal and Dell'Erba, 2017). Other ICO-related risks include cyberattacks on crypto wallets and exchanges (Brochado and Troilo, 2021).

### ***B. ICO Success Factors***

The existing literature has primarily focused on the success of ICOs in the primary market by identifying determinants of the positive outcomes of token sale fundraising (see Brochado and Troilo [2021] for a review). Campino et al. (2022) classify these success factors into four groups: project characteristics, campaign features, social media activities, and project team. Project characteristics include the sector associated with an ICO (Davies and Giovannetti, 2018), the location and/or geography of startups (Huang et al., 2020), the existence of a white paper, and the latter's contents (i.e., team disclosure, word count, and technicality) (Campino et al., 2022). Another key feature is the expected liquidity of the tokens in the secondary market (i.e., crypto exchanges) (Lyandres et al., 2019).

Campaign characteristics identified by previous studies include a pre-sale phase (Giudici and Adhami, 2019), funding threshold (e.g., soft cap or no cap) (Campino et al., 2022), token sale duration (Roosenboom et al., 2020), token prices (Campino et al., 2022), and cryptocurrencies accepted as payment (Campino et al., 2022). Project teams have also been examined in previous research (An et al., 2019; Campino et al., 2021a, 2021b, 2021c, 2022), which has highlighted team size, management experience, relevant quantifications, activity in social media networks (Campino et al., 2021b; Giudici and Adhami, 2019), and an advisory team (Brochado, 2018; Campino et al., 2022). In addition, project promoters' networks are crucial for a strong campaign (An et al., 2019) since they help publicize start-ups and provide brands with wider exposure, as well as strengthening the possibility that the value of the tokens will increase and thus provide a greater return on investment. Human capital can even help entrepreneurs overcome any eventual lack of financial capital.

Social media activity determinants include the project's presence on social networks (Albrecht et al., 2020), its source code in GitHub (i.e., code repositories), and digital campaigns (Campino et al., 2022). An ICO website with constantly updated social media activity helps confirm the legitimacy of these offerings. Team members must continually post fresh information about the campaign in both a well-managed website and different social media networks to send a positive signal to investors and thus improve their project's chances of financing success.

### **C. Signaling Theory and ICO Ratings**

The ICO market is characterized by information asymmetries between entrepreneurs and investors due to the relatively unregulated ICO ecosystem, projects' technological orientation, and decision-making processes affected by the uncertainty associated with the early stage of startups. Due to the information gaps between buyers and sellers, investors have less data on projects and teams than the entrepreneurs have, as seen from a signaling theory perspective. This asymmetry increases the need to send the right signals (Fisch, 2019), which are of the utmost importance since investors must be provided with high quality information.

Signaling theory identifies three key entities: signalers with access to privileged information, receivers who receive the information sent by signalers, and signals based on the format and content of the information. Blockchain ventures can reduce information asymmetries by using signaling mechanisms that transmit effective signals to the relevant receivers. These signals can include the disclosure of patents and detailed white papers (i.e., technological infrastructure, business plan, and existing investment) and the release of a high-quality source code (Fisch, 2019).

Signals that reduce information asymmetries may also be sent by third-party sources. Websites such as CoinDesk and ICObench post ratings, news, and notices of upcoming token sales (Kranz et al., 2019). The ratings of external parties can be produced based on the databases of dedicated ICO websites (Giudici and Adhami, 2019) and perceptions of ICOs shaped by the signals of different sources.

## **III. Methodology**

The present study collected secondary data from the ICObench website, which was extracted via a premium subscription that provided access to an application programming interface. The final sample comprised 5,581 ICO projects. ICObench presents itself as the top analytical platform in the market and a free review platform for ICOs. Besides joining together the relevant blockchain community, this website provides analytical, legal, and technical information related to ICO campaigns (ICObench, 2021).

The ratings presented by ICObench are based on evaluations performed by the platform's analyzer bot, Benchy, and various independent experts. The latter are basically active members of the ICObench community who can vote by following the website's rating methodology guidelines. Benchy, in turn, is an artificial intelligence-powered bot created by ICObench solely to provide information. The bot's algorithm focuses mainly on four major categories of data: project team, ICO information, product presentation, and marketing and social media.

When a subscriber selects an ICO on the platform, the website shows details about that offering including, among other items, information about the team, history, financials, sector, rating, and white paper of the ICO. ICObench warns

that their ratings should not be considered as advice regarding investments, but rather as an informative indicator. The ratings use a scale ranging from 1 to 5, on which 1 is the lowest rating and 5 the highest.

The current research used the five rating categories available on the ICObench website: global, team, vision, product, and profile indices. The data extracted also covered other variables, namely, sector, soft cap achieved, hard cap achieved, and financing amount. Twenty-nine sectors are listed in the database (e.g., sports, art, artificial intelligence, tourism, banking, bid data, communication, and education).

This study treated the financing success of ICOs as a binary variable so that 1 represents that a project has reached its own soft-cap threshold (Roosenboom et al., 2020) and 0 stands for other outcomes. The data analyses included descriptive statistics, correlation analysis, and hypothesis testing.

## IV. Results

### A. ICObench Database

The present research considered all ICO projects until the end of 2019, with a total of 5,581 offerings. The majority of ICOs were launched in 2018 (59.3%), with 2017 coming in at a distant second (21.7%). This finding is in line with the extant literature, which reports that ICOs have been able to gather huge amounts of capital due to the novelty of this funding tool and the rising value of cryptocurrencies—mainly Bitcoin—during 2017 and 2018 (OECD, 2019).

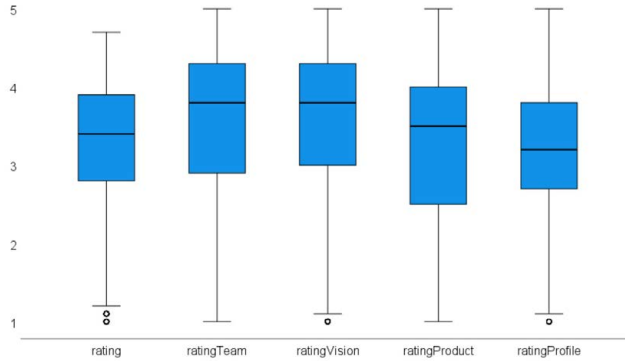
The projects are from a variety of sectors, but over a third are concentrated in one sector (34.3%). The ICOs are mostly not restricted to any specific country (59.1%). The majority of ICO teams have 4 to 15 members (60.8%). The promoters appear to understand the importance of a social media presence, which has already been shown to influence the success of ICOs, as close to two-thirds of the projects have promoters active on 8 to 11 social media platforms (58.4%). The maximum number of social media platforms recorded for any one ICO is 13.

The ICOs usually accept only one currency for transactions (36%). The Ethereum platform is used the most often, with 87.1% of the offerings examined running their operations there. Ethereum's blockchain technology facilitates the execution of smart contracts by calculating the amount of funds raised, verifying and confirming transactions, and distributing new tokens after sales (Giudici et al., 2020).

### B. Overall Ratings and Subindices

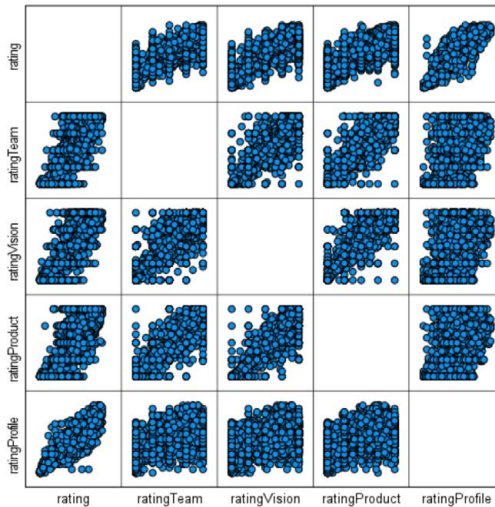
ICObench's average overall rating of all the projects is 2.96 (standard deviation [SD] = 0.77). The sub-ratings with the highest averages are vision (mean [M] = 3.47; SD = 1.18) and team (M = 3.42; SD = 1.20). The lowest ICObench ratings are associated with profile (M = 2.92; SD = 0.74) and product (M = 3.21; SD = 1.18) (see Figure 1).

**Figure 1**  
**Overall Ratings and Sub-ratings (Boxplot)**



All the correlation coefficients for the relationships between the overall rating and each sub-index are positive and statistically significant. The strongest link is between the overall and profile ratings (correlation coefficient  $[r] = 0.92$ ; probability value  $[p] = 0.00$ ), followed by the overall rating connection with the team ( $r = 0.90$ ;  $p = 0.00$ ), product ( $r = 0.77$ ;  $p = 0.00$ ), and vision ratings ( $r = 0.76$ ;  $p = 0.00$ ). With regard to the relationships between the sub-indices, the product and vision ratings ( $r = 0.88$ ;  $p = 0.00$ ) and product and team ratings ( $r = 0.87$ ;  $p = 0.00$ ) exhibit the strongest pairwise correlations. In comparison, the profile and vision ratings ( $r = 0.47$ ;  $p = 0.00$ ) and profile and product ratings ( $r = 0.48$ ;  $p = 0.00$ ) have a lower correlation (see Figure 2).

**Figure 2**  
**Ratings and Sub-ratings (Correlation Coefficient)**



### C. Ratings by Sector

The projects from three sectors received the higher ICObench's average ratings: artificial intelligence (M = 3.33), legal services, and big data (both M = 3.30). The ICOs from two other sectors were given the lowest average ratings, that is, manufacturing (M = 2.96) and casino and gambling (M = 2.95).

Virtual reality and artificial intelligence ICOs were assigned the highest average scores for the team (M = 3.78 and M = 3.75, respectively), vision (M = 3.83; M = 3.80), and product sub-indices (M = 3.52; M = 3.50). The ICOs related to the Internet (M = 3.59) and artificial intelligence (M = 3.29) have the highest scores for the profile sub-rating (see Table I).

**Table I**  
**ICObench Ratings by Sector**

<b>Industry</b>	<b>rating</b>	<b>ratingTeam</b>	<b>ratingVision</b>	<b>ratingProduct</b>	<b>ratingProfile</b>
Art	3.12	3.62	3.63	3.35	3.10
Artificial intelligence	3.33	3.75	3.80	3.50	3.29
Banking	3.10	3.52	3.57	3.32	3.06
Big data	3.30	3.66	3.70	3.42	3.25
Business services	3.15	3.55	3.60	3.33	3.11
Casino and gambling	2.95	3.29	3.26	3.08	2.91
Charity	3.06	3.33	3.33	3.02	3.08
Communication	3.19	3.57	3.61	3.38	3.15
Cryptocurrency	3.04	3.45	3.50	3.25	3.02
Education	3.24	3.69	3.78	3.41	3.21
Electronics	3.15	3.41	3.53	3.08	3.16
Energy	3.13	3.54	3.56	3.13	3.12
Entertainment	3.09	3.46	3.49	3.29	3.07
Health	3.08	3.48	3.61	3.13	3.04
Infrastructure	3.27	3.69	3.78	3.50	3.20
Internet	3.18	–	3.55	–	3.59
Investment	3.03	3.30	3.33	3.08	3.02
Legal services	3.30	3.46	3.61	3.29	3.27
Manufacturing	2.96	3.09	3.22	2.80	3.02
Media	3.26	3.69	3.66	3.38	3.23
Other	2.97	3.54	3.59	3.27	2.94
Platform	3.06	3.52	3.57	3.30	3.02
Real estate	3.04	3.44	3.47	3.21	3.02
Retail	3.23	3.65	3.65	3.35	3.20
Smart contracts	3.27	3.65	3.70	3.41	3.23
Software	3.23	3.58	3.66	3.39	3.19
Sports	3.10	3.36	3.37	3.13	3.09
Tourism	3.06	3.44	3.42	3.13	3.06
Virtual reality	3.29	3.78	3.83	3.52	3.24

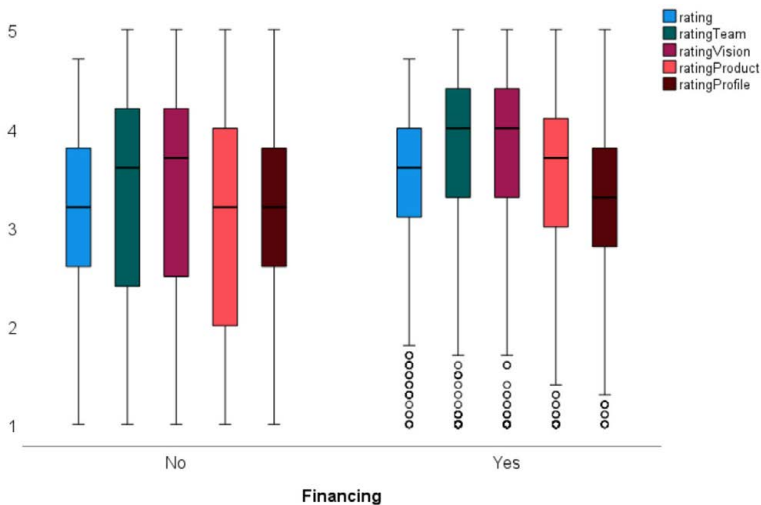


### D. Ratings and ICO Financing Success

The fixed-effects analysis of the variance's results reveals varying statistical differences between the average rating of projects that received financing and those that failed to reach their soft cap. For both the overall rating and sub-ratings, the highest values appear to be associated with successful projects as follows (see Figure 3):

- Overall rating (financing = no [2.87]; financing = yes [3.23]; F-statistic [F] = 235.67;  $p = 0.00$ );
- Team sub-rating (3.25, 3.75;  $F = 113.937$ ;  $p = 0.00$ );
- Vision sub-rating (3.32, 3.76;  $F = 90.088$ ;  $p = 0.00$ );
- Product sub-rating (3.06, 3.51;  $F = 96.172$ ;  $p = 0.00$ );
- Profile sub-rating (2.85, 3.12;  $F = 143.243$ ;  $p = 0.00$ ).

**Figure 3**  
**ICObench Ratings by Financing Success**



## V. Conclusion

This study aimed to answer the following research question: Do ICObench ratings (i.e., overall, team, product, vision, and profile) contribute to the financing success of ICOs? Secondary data were collected from the ICObench website (i.e., microdata on 5,581 projects from 29 sectors), which publishes ICO ratings by third parties. ICObench combines information gathered by the analyzer bot,

Benchy, with input from experts in order to assign the five aforementioned ICO ratings.

The hypothesis testing confirmed that ICOs that successfully complete their fundraising campaign have received higher ICO ratings compared with unsuccessful ICOs. These ratings are evidently an effective signal that contributes to reducing information asymmetry between sellers and buyers. The present findings thus expand the existing knowledge about this kind of financial technology innovation. Based on a conceptual framework that applied signaling theory to ICOs (Fish, 2019; Giudici and Adhami, 2019; Roosenboom et al., 2020), the current results show that positive third-party signals (i.e., ICObench ratings) contribute to the success of these offerings.

The above findings have practical implications for ICO promoters. Detailed information must be disclosed about each token sale in a white paper, social media platforms, and code repositories, and all these data should be available not only to investors but also rating platforms. In terms of possible future research, the approach adopted in this study offers advantages to those who aim to carry out similar research vis-à-vis the influence of ICO ratings on the performance of these offerings in the secondary market.

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