

Innovative financing channels: International evidence from initial coin offering and project start-up success factors
Canaux de Financement Innovants : preuves Internationales autour des ICOs et les Facteurs de succès des projets de start-up
Canales de Financiamiento Innovadores: Evidencia Internacional de la Oferta Inicial de Monedas y Factores de Éxito en el Arranque de Proyectos

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Les approches partenariales de l'innovation grâce aux développements récents des TIC : du local au global
Partnership approaches to innovation driven by recent ICT developments: From local to global
Enfoques asociativos de la innovación a través de los recientes avances de las TIC: de lo local a lo mundial

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Article abstract

This study investigates Initial Coin Offerings (ICOs) as an innovative financing channel, focusing on the factors influencing their success and the project start-up post-ICO. Using a hand-collected dataset of 410 ICOs from the 2016–2018 period, we analyze ICOs as a mechanism that enables startups to raise significant capital. We categorize the success factors into voluntary disclosure quality, team characteristics, deal characteristics, and country of issuance or geographic location. We also examine security and payment tokens to explore their differing impacts on ICO outcomes. Our study contributes to the extant literature by offering a comprehensive view of the factors that drive ICO success and those that explain post-ICO performance. Our study provides critical insights for investors, regulators, and entrepreneurs.

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ABSTRACT

This study investigates Initial Coin Offerings (ICOs) as an innovative financing channel, focusing on the factors influencing their success and the project start-up post-ICO. Using a hand-collected dataset of 410 ICOs from the 2016–2018 period, we analyze ICOs as a mechanism that enables startups to raise significant capital. We categorize the success factors into voluntary disclosure quality, team characteristics, deal characteristics, and country of issuance or geographic location. We also examine security and payment tokens to explore their differing impacts on ICO outcomes. Our study contributes to the extant literature by offering a comprehensive view of the factors that drive ICO success and those that explain post-ICO performance. Our study provides critical insights for investors, regulators, and entrepreneurs.

Keywords: Tokens, Success factors, post-ICO performance, Project start-up driver

JEL classification: E42, G32, M13

Résumé

Cette étude examine les Offres Initiales de Pièces (ICO) comme un canal de financement innovant, en se concentrant sur les facteurs influençant leur succès et le démarrage du projet après l'ICO. Utilisant un ensemble de données collecté manuellement de 410 ICOs de la période 2016-2018, nous analysons les ICOs en tant que mécanisme permettant aux startups de lever des capitaux importants. Nous catégorisons les facteurs de succès en qualité de divulgation volontaire, caractéristiques de l'équipe, caractéristiques de l'offre, et pays d'émission ou localisation géographique. Nous examinons également les tokens de sécurité et de paiement pour explorer leurs impacts différents sur les résultats des ICO. Notre étude contribue à la littérature existante en offrant une vue complète des facteurs qui entraînent le succès des ICO et de ceux qui expliquent la performance post-ICO. Notre étude fournit des perspectives critiques pour les investisseurs, les régulateurs et les entrepreneurs.

Mots-Clés : Tokens, Facteurs de succès, Performance post-ICO, Moteur de démarrage de projet.

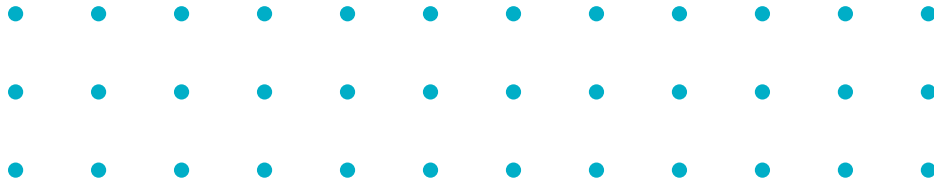
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Resumen

Este estudio investiga las Ofertas Iniciales de Monedas (ICO) como un canal de financiamiento innovador, centrándose en los factores que influyen en su éxito y en el arranque del proyecto post-ICO. Utilizando un conjunto de datos recopilados manualmente de 410 ICOs del período 2016-2018, analizamos las ICOs como un mecanismo que permite a las startups recaudar capital significativo. Categorizamos los factores de éxito en calidad de divulgación voluntaria, características del equipo, características de la oferta y país de emisión o ubicación geográfica. También examinamos tokens de seguridad y de pago para explorar sus diferentes impactos en los resultados de las ICOs. Nuestro estudio contribuye a la literatura existente ofreciendo una visión completa de los factores que impulsan el éxito de las ICOs y aquellos que explican el rendimiento post-ICO. Nuestro estudio proporciona perspectivas críticas para inversores, reguladores y emprendedores.

Palabras Clave: Tokens, Factores de éxito, Rendimiento post-ICO, Impulsor de inicio de proyecto

Clasificación JEL: E42, G32, M13



Firms are substantially faced with innovations of various natures, subjecting them to risk and uncertainty, and leading them to deal with a complex environment. Funding channels are one of the main challenges in the face of global competition and technological change, leading firms to seek external partners to develop different forms of inter-organizational alliances. Initial coin offerings (ICOs) are drawing increasing interest as an alternative to conventional funding channels, such as angel investors or venture capitalists. They represent a novel type of venture financing through cryptocurrencies and blockchain technology (Catalini & Gans, 2018; Roosenboom *et al.*, 2020). In the early stages of their business growth, blockchain-based companies raise funds from individual investors via information and communication technologies (e.g., websites or social media). In the context of the relationship between the ICO project team and ICO investors, the latter appear to exhibit characteristics similar to those of innovation adopters and contribute to the development of financing innovation. ICOs are considered to be a recent innovation that leads a firm to have an alliance with other partners, in order to allow ICOs to be accepted and tradeable. Factual observations show that the digital token selling mechanism based on blockchain technology is a breakthrough in start-up innovation financing that has spread globally. Given the high costs of research and development, this type of funding can be significant for highly innovative businesses.

Benedetti and Kostovetsky (2021) showed that in the 16 months since January 2017, ICOs were able to raise more than \$12 billion. For each ICO, entrepreneurs release a whitepaper that contains information related to their ICO to provide information and attract potential contributors. During ICOs, entrepreneurs seek to raise funds for their own ventures by creating tokens¹ and selling them to investors in exchange for cryptocurrencies (e.g., Bitcoin and Ethereum) or fiat currency (e.g., US Dollars). The collected funds are used to finance projects that are still in the idea stage. After completion of the ICO, tokens may be traded on an online exchange platform, and investors have the choice to sell or hold on to these tokens. There is no rule defining how long an ICO should last. Some ICOs last less than one day, whereas others continue for more than a year. Apart from the fact that ICOs were banned in South Korea and China toward the end of 2017, ICO regulations around the world are not comprehensively defined. Each country is free to decide whether to regulate ICOs or not. However, ICOs present some risks (e.g., scams, hacking) that are considered a real danger for investors and entrepreneurs.

Nevertheless, ICOs are showing rapid growth on a global scale and help raise funds in support of small- and medium-sized enterprises (SMEs) and start-ups. Hence, this innovative financing channel deserves research focus. In particular, several issues related to ICOs require investigation as they have implications on the decisions of market investors and the process of raising alternative funds serving SMEs and start-up

managers. A strand of literature is dedicated to elucidating the distinct nature of ICOs as compared to other entrepreneurial financing channels like crowdfunding. Lipusch (2018) delved into the definition of ICOs and contrasted them with other traditional fundraising channels, including crowdfunding, venture capital, and Initial Public Offerings (IPOs). Complementing this work, Block *et al.* (2021) elaborated on the nuanced differences between ICOs and crowdfunding, focusing on aspects such as stakeholder participation, platform utilization, market operations, and regulatory oversight. As several companies have successfully raised funds through ICOs, with some of their tokens being traded on online exchange platforms, the literature has evolved to investigate the factors driving the success of ICOs, focusing on different perspectives. Varnaité (2018) examined the factors contributing to the success of ICOs, from investors' perspective. Through interviews with ICO experts, the study revealed that investors are solely driven by the objective of achieving a profitable financial return on their investment. Their results showed that ICO experts ascribe a greater probability of success to the qualities of the management team and specific team attributes, rather than to the inherent merits of the business itself. For example, Adhami *et al.* (2018) investigated the determinants of ICO success and identified them to be code source availability, the organization of the token presale, and the offering of specific services for contributors. Burns and Moro (2018) reported that team quality influences the success of ICOs. Fisch (2019) found that a high-quality source code stimulates the increase in the amounts of funds raised through ICOs. Howell *et al.* (2020) highlighted credible project commitment, quality signals, and disclosure as the main success factors of ICOs. Belitski and Boreiko (2022) showed that the presale of tokens, bonus sales, and funders' ownership contribute to ICO performance. Meanwhile, Gächter and Gächter (2021) identified lucky timing as a crucial success factor.

As ICO might be successful only in the short term, the literature has evolved to assess the factors driving long-run post-ICO performance. Roosenboom *et al.* (2020), based on the 630 ICOs ranging from 2015 to 2017, showed that disclosure quality to investors, higher quality rating, bonus or a discount to early investors, and size of venture team are the factors that matter. Ahmad *et al.* (2023), based on 503 ICOs ranged between 2015 and 2018, showed that the main factors driving the success of the post-ICO performance are insider retention, resource-related signals, such as the number of team members and advisors, bonus or discount to early investors, presale offers, and country's financial system development. Aslan *et al.* (2023) investigated the ICO success factors and aftermarket performance of ICOs. In addition to higher ratings, shorter planned token sale duration, smaller share for token sale, and larger number of experts, the authors showed that market sentiment significantly explains the post-ICO performance. Sapkota and Grobys (2023) found that ICO investors are guided by emotions when making investment decisions rather than the quality and readability of ICO white papers. Other studies have investigated the success factors explaining post-ICO performance.

1. Tokens denote cryptocurrencies that serve as currencies in the venture ecosystem.

The literature dealing with ICO success factors and those explaining the post-ICO performance are scarce and inconclusive. These studies employ various factors and look at the different perspectives of ICO success factors from investors perspective (Adhami *et al.*, 2018; Varnaité, 2018), agility perspective (Lipusch, 2018), governance perspective (Giudici & Adhami, 2019), team characteristics (Ahmad *et al.*, 2023; Amsden & Schweizer, 2018; Roosenboom *et al.*, 2020), and voluntary disclosure quality (Chitsazan *et al.*, 2022; Fisch, 2019; Lyandres *et al.*, 2022; Momtaz, 2021; Sapkota & Grobys, 2023).

Our study aims to extend this recent and scarce literature by investigating both the factors driving ICO success as well as the factors explaining post-ICO performance. More practically, as previous literature used various factors, this study attempts to disaggregate factors across four strands: voluntary disclosure quality, team characteristics, deal characteristics, and country of issuance or geographic location of ICO. In our analysis, we consider two types of tokens—security and payment. Our sample comprises 410 completed, traded, and nontraded ICOs that have different types of tokens and are from different countries in the 2016–2018 period. Our data are handpicked from different databases, especially the ICObench website. As our dependent variables are dummy and quantitative variables, we apply ordinary least squares (OLS) and logistic regressions depending on the type of variable used in the analysis. Our study contributes to the emerging literature on ICOs in at least three ways. First, it proposes a comprehensive typology of potential determinants of ICO's success. Second, our study provides new empirical results about the success of project start-ups. From the perspective of reducing asymmetric information and investor adverse selection, our study shows the significant effect of expert and transparency ratings on ICO success and project start-up success. All the other voluntary disclosure quality variables point in the same direction. Third, this study shows the importance of project team, in particular, the negative perception of the gender factor. Investors do not seem to appreciate women's low-risk profile when launching and running a start-up.

The remainder of this article proceeds as follows. Section 2 reviews the literature on the determinants of ICO success. Section 3 describes the sample and methodology. Section 4 reports the summary statistics, empirical results, and robustness checks. Section 5 concludes the paper.

Literature review

In the following section, we offer an analytical review of empirical findings organized according to the categorization of success factors employed in our research: voluntary disclosure quality, team characteristics, deal characteristics (both supply and demand aspects), and country of issuance. ICOs are characterized by a high level of information asymmetry because ventures issuing ICOs are generally in the early stages. The lack of formal disclosure mandates, coupled with a heightened preference for anonymity, exacerbates this issue by limiting access to reliable information, thereby escalating the risk of fraudulent activities (Shifflett & Jones, 2018). To elucidate the driving factors behind ICO success, we draw upon signaling theory (Spence, 1973). As emphasized by Chitsazan *et al.* (2022) in their systematic analysis of 78 empirical studies, most studies on ICO success used signaling theory to examine its determinants. This theoretical setting provides an appropriate framework for determining how firms can minimize information asymmetry

between the key players (founders and investors) in the ICO process. Elevated levels of information asymmetry typically necessitate stronger signaling mechanisms. Within this context, the principles of voluntary disclosure and signaling theory serve as effective frameworks for understanding how firms can mitigate information asymmetry by strategically deploying voluntary disclosures and other signaling methods to attract increased capital (e.g., Bourveau *et al.*, 2022; Chitsazan *et al.*, 2022; Momtaz, 2021; Chod & Lyandres, 2021; Howell *et al.*, 2020; Giudici & Adhami, 2019; Yermack, 2015). Resource-based theory complements this theoretical framework as it provides a lens through which various success factors of ICOs and project start-ups post-ICO can be analyzed. It considers how the unique resources, capabilities, and competencies of these ventures contribute to their competitive advantage, sustainability, and ability in a rapidly changing environment (Fisch & Momtaz, 2020; Hackober & Bock, 2021; Schaefer & Strese, 2021; Xu *et al.*, 2021). This perspective offers a unifying framework to understand how projects navigate the complexities of both the ICO phase and the post-ICO operational phase.

Voluntary disclosure quality

The literature on the voluntary disclosure of fundraising activities stresses that firms are inclined to provide information voluntarily to stakeholders and investors to reduce information asymmetry regarding the quality of the project supported by the management team (adverse selection), which reduces risk-taking by these investors and increases the probability of ICO success. Roosenboom *et al.* (2020) explored the determinants that influence ex-post-ICO success. Their results indicate that ICOs with higher expertise and transparency ratings² significantly influence success post-ICO. The authors showed that having deposits on GitHub prior to the ICO significantly and positively affects ex-post-ICO success. Cohnney *et al.* (2018) argued that having a code published online on GitHub, an open-source community platform for programmers that allows investors to monitor the progress of codes, could signify technological capabilities that positively impact ICO success. Furthermore, Cohnney *et al.* (2018) considered that social media presence facilitates access to information required by investors and reduces information asymmetry. Belitski and Boreiko (2022), Fisch (2019), and Howell *et al.* (2020) showed a positive and highly significant association between the issuance of a whitepaper (e.g., information about a project's business plan, blockchain platform, founding team profile), in which information is disclosed voluntarily, and ICO success. Fisch (2019) and Amsden and Schweizer (2018) documented the positive effect of the length of the whitepaper on ICO success. Features such as the Know Your Customer³ (KYC) procedure and the process of whitelisting⁴ have been implemented to secure the ICO market from fraudulent activities. Chen (2019) examined the nature and impact of signals disseminated through various channels at different stages of an ICO to explore the relationship between signal quality and information asymmetry. The study finds that during the crowd sale phase, highly credible and easily interpretable signals exert a significant influence on token sales. Conversely, during the listing stage, signals that are of lower credibility yet easily interpretable have a marked impact on token trading. Notably, highly credible but

2. From the ICObench website.

3. The Know Your Customer (KYC) procedure was set up to help recognize scams and dishonest teams. Although it is voluntary, it is obligatory for some ICOs that appear suspicious.

4. In whitelisting, "the interested investor has to register beforehand in order to be able to participate in the desired ICOs, especially for popular ICOs having a small coin number to offer."

difficult-to-interpret signals, which often convey fundamental project information, lose their efficacy in both stages, thereby contributing to information asymmetry within the ICO environment. Bourveau *et al.* (2022) explored the influence of disclosure practices and information intermediaries within the unregulated crypto-token market, focusing their analysis on a sample of 2,113 ICOs. Their findings indicate that firms with more comprehensive disclosure practices are more likely to successfully raise funds. Intriguingly, this relationship is amplified when credibility-enhancing mechanisms are in place, such as robust internal governance structures or external validation from information intermediaries.

Team characteristics

Another corpus of studies is interested in team quality, such as team size, years of experience, and the gender of members. Sapkota and Grobys (2023), Lyandres *et al.* (2022), Ahmad *et al.* (2023), Roosenboom *et al.* (2020), Amsden and Schweizer (2018) showed that a larger team size and token retention are positively related to ICO success. Johnson *et al.* (2018) found that the presence of a female entrepreneur is positively related to the amount of funds raised. Howell *et al.* (2020) provided evidence that “the issuer entrepreneurial experience” has a positive and significant relationship with ICO success. Ahmad *et al.* (2023), while investigating the factors of post-ICO success, found that a large number of advisors and staff members is significantly and positively associated with the probability of successful ICO post-performance. Lyandres *et al.* (2022) investigated the case of 7,514 unique merged projects in 133 countries for both ICO success and post-ICO success. They showed that size of venture team is among the main factors driving the ICO success. However, Sapkota and Grobys (2023) showed that team size marginally impacts the ICO success.

Deal characteristics

Many scholars have investigated the determinants of ICO success. Some of these works have indicated that the major determinant of success is the completion of a pre-ICO phase (ICO presale). Presales often serve to cover upfront costs, such as the cost of paying for promotional ads. However, Ahmad *et al.* (2023), and Amsden and Schweizer (2018), found a negative relationship between presale activities and ICO success and suggested that a presale may indicate that the venture team holds insufficient funds to cover their costs. By contrast, Roosenboom *et al.* (2020) and Adhami *et al.* (2018) showed that the probability of ICO success is higher if a presale is conducted. Meanwhile, Lyandres *et al.* (2022) found that a presale has an insignificant effect on ICO success. Another factor that could potentially influence the success of ICOs is the implementation of a bonus scheme, where discounts are offered to investors during the ICO phase. In the context of crowdfunding, Lyandres *et al.* (2022) and Amsden and Schweizer (2018) argue, in line with Hornuf and Schwenbacher (2018), that such bonus schemes have a significantly positive relationship with token tradability. These studies suggest that bonus schemes may encourage early investment, thereby increasing the liquidity of the token once it is tradable. Meanwhile, Ahmad *et al.* (2023) and Roosenboom *et al.* (2020) presented a contrasting view, asserting that the absence of a bonus structure during the ICO phase is positively and significantly correlated with ICO success. These studies argued that not offering bonuses may signal to investors that the ICO is confident in its value proposition and does not need to rely on incentives to attract capital. The absence

of a bonus scheme may also reduce the risk of “pump-and-dump” schemes, where investors take advantage of bonuses by selling immediately, once the token becomes tradable, thereby undermining its long-term value.

The existent ICO literature also considers the price of tokens and the total token supply as factors influencing ICO success. Benedetti and Kostovetsky (2021), Burns and Moro (2018), and Roosenboom *et al.* (2020) showed a negative association between token price and ICO success, which suggests that lower token prices during ICOs serve as a good signal for investors. In terms of token supply, Fisch (2019) provided evidence that unexpectedly, ICOs issuing a higher number of tokens lead to ICO success. A possible explanation is that a high supply may have similar characteristics to a lottery and thus attract more investors and funds.

Regarding the number of cryptocurrencies, Amsden and Schweizer (2018) emphasized that the acceptance of fiat currencies for payment is considered a determinant of success. They argued that ICOs accepting several currencies need significant expertise to incorporate functionalities between them. Accepting fiat currencies for payment positively and negatively affects success. The positive association with the funds raised is explained by the fact that the acceptance of fiat currencies shows the link between ICO funding channels and the conventional banking system. Amsden and Schweizer (2018) supported the positive effect of using fiat currencies on ICO success. A possible explanation for the negative impact on token tradability is that fiat currencies can carry a cost for the venture. The authors argued that more accepted currencies increase the chances for a higher score from ICObench because of their variety and availability for investors. The duration of the ICO is also considered a principal determinant of ICO success. It represents the length of the ICO phase. Fisch (2019) and Roosenboom *et al.* (2020) stated that planning a shorter duration for the ICO positively and significantly impacts ICO success, as reported in the literature on crowdfunding (Courtney *et al.*, 2017; Mollick, 2014).

Roosenboom *et al.* (2020) analyzed target amounts (soft cap and hard cap) as an explanatory variable as they may influence ICO success and post-ICO performance. They reported that setting greater target amounts negatively impacts ICO success. Furthermore, Fisch (2019), Howell *et al.* (2020), and Amsden and Schweizer (2018) showed that there is a significant and positive correlation between tokens based on the Ethereum platform and ICO success. However, Burns and Moro (2018) documented that the use of the Ethereum platform is significantly and negatively associated with success as the largest ICOs have to establish their own platforms.

Fisch (2019) reported that intense Twitter activity during the ICO is related to a higher amount of funding raised, thereby serving as a measure of ICO success. In the same vein, Howell *et al.* (2020), Benedetti and Kostovetsky (2021), and Burns et Moro (2018) found a positive correlation between the number of Twitter followers and ICO success. Yadav (2017) explained that the process of KYC is a crucial indicator of success in the ICO context. In line with this, Lyandres *et al.* (2022) identified a positive effect of using the KYC process on ICO success.

Country of issuance or geographic location of ICO

Few empirical studies have investigated the drivers of ICO activities across countries and assessed their impact on ICO success. For entrepreneurs and project owners, understanding ICOs’ geographic locations helps determine where to initiate an ICO

as it leads to the identification of the most appropriate regulatory, fiscal, economic, and financial environments to raise funds. According to the existing literature, innovative activities evolve in tandem with capital markets and financial systems, as well as the technological and legal environments. Ahmad *et al.* (2023) found a strong and positive relationship between legal friendliness and ICO activity. Similarly, Huang *et al.* (2020) argued that countries with ICO-friendly regulations have more ICOs and that tax regimes are not clearly related to ICOs. They also emphasized that ICOs take place more frequently in countries with developed financial systems, public equity markets, and advanced digital technologies.

Authors	Study context & sample	Study period	Dependent variable	Tested factors	Main significant factors
Sapkota and Grobys (2023)	5033 ICOs	2014–2019	ICO success	37 explanatory factors	<ul style="list-style-type: none"> - ICO investors psychological sentiment - Team size - High media attention (Twitter activity and followers)
Aslan <i>et al.</i> (2023)	5579 ICOs	2015–2020	ICO success & Post-ICO success	16 explanatory factors	<ul style="list-style-type: none"> - Venture team - ICO duration - Higher quality rating. - Offer price - Market sentiment
Lyandres <i>et al.</i> (2022)	7514 unique merged projects in 133 countries	2013–2019	ICO success & Post-ICO success	41 explanatory factors	<ul style="list-style-type: none"> - White paper availability & informativeness. - Pre-ICO initiated social media activity. - Bonus or a discount to early investors. - ICO transparency. - Size of venture team
Ahmad <i>et al.</i> (2023)	503 ICOs from 60 countries	2015–2018	ICO success & Post-ICO success	23 explanatory factors	<ul style="list-style-type: none"> - Insider retention - Resource-related signals. such as the number of team members and advisors - Bonus or a discount to early investors. - Presale offers - Country's financial system development
Benedetti and Kostovetsky (2021)	2390 completed ICOs	2016–2018	ICO success	13 explanatory factors	<ul style="list-style-type: none"> - Pre-sales also called pre-ICOs - ICO price - Capital raised - ICO duration
Belitski and Boreiko (2022)	166 ICOs	2013–2017	ICO success	10 explanatory factors	<ul style="list-style-type: none"> - Bonus or a discount to early investors. - Presale offers - Disclosure quality to investors - Pre-sales also called pre-ICOs

In Table 1, we present a summary of the main literature on the determinants of successful ICOs based on the proposed typology.

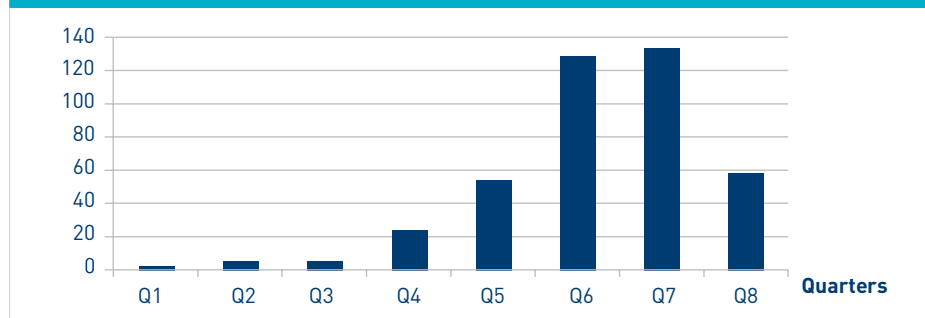
Authors	Study context & sample	Study period	Dependent variable	Tested factors	Main significant factors
Montaz (2021)	302 ICOs	2015–2018	ICO success	13 explanatory factors	<ul style="list-style-type: none"> - Management Team - Market Sentiment - ICO Duration - Pre-sales also called pre-ICOs - Country Jurisdiction & Restrictions
Roosenboom <i>et al.</i> (2020)	630 ICOs	2015–2017	ICO success & Post-ICO success	11 explanatory factors	<ul style="list-style-type: none"> - Disclosure quality to investors - Higher quality rating. - Bonus or a discount to early investors. - Size of venture team
Howell <i>et al.</i> (2020)	1 500 ICOs	2014–2018	ICO success	4 explanatory factors	<ul style="list-style-type: none"> - Deal characteristics - Founder/CEO characteristics - Disclosure quality to investors - ICO process characteristics
Amsden and Schweizer (2018)	1009 ICOs	2015–2018	ICO success	12 explanatory factors	<ul style="list-style-type: none"> - Bonus or a discount to early investors. - Size of venture team and advisors - Disclosure quality to investors - Pre-sales also called pre-ICOs - Accepted currencies
Fisch (2019)	423 ICOs	2016–2018	ICO success	6 explanatory factors	<ul style="list-style-type: none"> - Geographic location - Disclosure quality to investors - ICO duration - White paper availability & informativeness.
Adhami <i>et al.</i> (2018)	253 ICOs	2014–2017	ICO success	18 explanatory factors	<ul style="list-style-type: none"> - Pre-sales also called pre-ICOs - Country Jurisdiction & Restrictions - Token characteristics
Chitsazan <i>et al.</i> (2022)	78 empirical studies	2017–2022	ICO success	Complete set of explanatory factors	<ul style="list-style-type: none"> - Founder characteristics - Teams of founders - Behavioral Factors [Sentiment in social media] - ICO characteristics (ICO Structure, White paper framework, Governance) - Venture-related factors - Market-related factors (cryptocurrencies' behavior) - Investors-related factors (sentiment) - Contextual factors

Data and methodology

Sample selection and data

Our initial sample comprised 410 completed ICOs listed predominantly on the ICObench website and other websites over the 2016–2018 period. Figure 1 shows the distribution of ICOs across time.

FIGURE 1
Distribution of ICOs across time

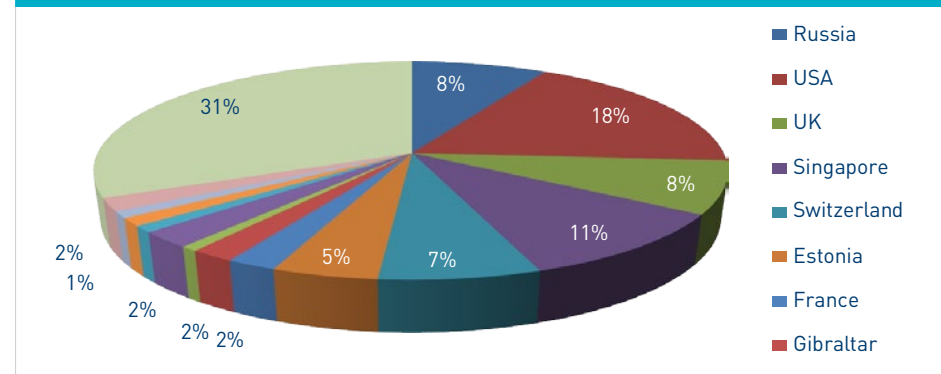


As there is no single database that contains all information relative to ICOs, we hand-picked our ICO data across 12 different databases⁵. Data were gathered initially from ICObench and ICOmarks and then cross-checked against those in other databases. ICObench is the database that provides most of the high-quality data and information on ICOs and may thus be considered as the “core of our sample.” Although databases are considered comprehensive (taken together), they still lack key information that we compiled manually from ICOs’ websites and whitepapers. After the completion of a public sale, many ICOs remove information from databases and even disable their websites and social media accounts (e.g., Twitter). This can be a sign of failure. As we could find sufficient information on some ICOs, we were forced to omit them.

Our sample comprised listed ICOs on an online exchange platform for trading and non-listed ICOs. We used the website CoinMarketCap (CMC) to distinguish tradable ICOs from nontradable ones. Figure 2 hereafter shows the geographical distribution of our selected ICOs. The USA has the highest number of ICOs (74 of 410 ICOs) and thus represents 18% of our sample. It is followed by Singapore with the second-highest percentage of 10.5% of the ICOs from our sample (43 of 410 ICOs). Russia comes in third with 8% of the ICOs (33 of 410 ICOs). The other ICOs are in the UK (7.8%), Switzerland (7.07%), Estonia (4.63%), and so on. The remaining ICOs (31.5%) are distributed over several countries worldwide with very low rates.

5. The databases are: 1) www.icobench.com/ico, 2) www.icomarks.com/ico, 3) www.icodrops.com, 4) www.coinschedule.com/cryptocurrency, 5) www.coincheckup.com/coins, 6) www.coinmarketcap.com/currencies, 7) www.tokendata.io, 8) www.icoholder.com, 9) www.coingecko.com, 10) www.icodata.io, 11) www.trackico.io/ico, and 12) www.etherscan.io.

FIGURE 2
Location of ICOs



Methodology

Dependent variables

Our study investigates the determinants of ICO and project start-up success. For ICO success, we considered the following four measures of ICO success as dependent variables, based on prior studies:

Soft cap hit: A dummy variable indicating whether the minimum goal (soft cap) is reached,

- Funding percentage: The percentage of the raised amount from the maximum goal (hard cap),
- Ln (amount initially raised during the ICO): The natural logarithm of the raised amount,
- Token tradability: A dummy variable indicating whether the ICO is listed in an online exchange platform tracked by CMC⁶.
- For post-ICO success, we considered the following four measures as dependent variables:

Website online status: Indicates whether the ICO website is online in the six months following the end of the ICO,

- Tweets per week: The number of tweets per week over the period between the start of the ICO and six months later,
- Twitter activity: A dummy variable that indicates whether the ICO’s Twitter account is active over the period between the start of the ICO and six months later,
- GitHub activity: A dummy variable indicating whether there are contributions to repositories on GitHub in the last period.

Explanatory variables

According to the previous literature, this study proposes a comprehensive analysis of all potential determinants of ICO success and a typology of these factors: i) voluntary disclosure quality, ii) team characteristics, iii) deal characteristics (offer and demand characteristics), and iv) country of issuance or geographic location of ICO.

6. CoinMarketCap.com

Table 2 presents all variable definitions and the expected sign of the different explanatory variables.

TABLE 2 Variable definitions and expected signs				
	Variables	Definitions	Source of data	Expected sign
Dependent variables (ICO success)				
	Soft cap hit	A dummy variable taking the value of 1 if the soft cap is reached and 0 otherwise	ICObench	
	Funding percentage%	The percentage of funding raised in hard cap	ICObench	
	Funding raised \$	The amount of funding raised in millions of dollars (log transformed)	ICObench	
	Token tradability	A dummy variable taking the value of 1 if the ICO is traded on an online exchange platform and 0 otherwise	CoinMarketCap (CMC)	
Dependent variables (Project start-up success)				
	Website online	A dummy variable taking the value of 1 if the project's website is still working at the time of data collection	Google	
	Tweets per week	The number of tweets per week during the period starting from the beginning of the ICO until the time of data collection	SocialBlade	
	Twitter activity	A dummy variable taking the value of 1 if there are any tweets in the 3 last months from the time of data collection and 0 otherwise	Twitter/SocialBlade	
	GitHub activity	A dummy variable taking the value of 1 if there are any contributions to any of the project's GitHub repositories in the last 3 months from the time of data collection and 0 otherwise	GitHub	
Explanatory variables				
	Expert rating	The equally weighted average of ratings on product quality, vision quality, and team quality by expert reviewers (from 1 to 5)	ICObench	+
	Transparency rating	Based on a computer algorithm, this rating reflects the disclosures of ICOs on database ICObench database for 31 different elements (from 1 to 5) with consideration of whether the project - Has an account on Twitter, GitHub, Reddit, Telegram, Facebook, Bitcointalk, and Bitcoinwiki - Has a whitepaper or/and a video online, a prototype or product mentioned, and listed milestones - Reveals the full names, LinkedIn profiles, identities, and photos of team members - Posts the start and end dates of the ICO, the country, the ticker, soft caps and hard caps if fixed, the platform used, accepted cryptocurrencies, ICO price, bonus structure	ICObench	+
Voluntary disclosure quality	GitHub pre-ICO	A dummy variable taking the value of 1 if the project has a GitHub repository before the ICO and 0 otherwise	GitHub	+
	Whitepaper (WP)	A dummy variable taking the value of 1 if the ICO disposes of a WP online and 0 otherwise	ICObench/ICOdrops/coincheckup/ICOMarks/tokendata	+
	WP pages	The number of pages in the whitepaper if it exists	Whitepaper	+
	Telegram	A dummy variable taking the value of 1 if the token in the ICO has a messenger account on Telegram and 0 otherwise	ICObench	+
Team characteristics	Team members	The number of project team members	ICObench/ICOMarks/WP	+
	Insider token retention	The percentage of tokens given to the project team	ICOMarks/ICOdrops/WP	+
	Gender	A dummy variable taking the value of 1 if there is a female member in the ICO team and 0 otherwise	ICObench/WP	+/-
	Leadership	The number of years that the project CEO has worked as a CEO or COO	Coincheckup	+

TABLE 2
Variable definitions and expected signs

	Variables	Definitions	Source of data	Expected sign
Deal characteristics	Tokens sold%	The percentage of tokens sold during the public sale	ICObench/ICOMarks/WP	–
	Bonus scheme	A dummy variable taking the value of 1 if there are bonus schemes in the public token sale and 0 otherwise	ICObench/WP	+/-
	Presale	A dummy variable taking the value of 1 if there is an organized pre-ICO phase and 0 otherwise	ICObench/WP	+/-
	Duration	The number of days planned for the ICO	ICObench	–
	Soft cap \$	The minimum goal amount in millions of dollars (log transformed)	ICObench/Coincheckup/ICOholder	–
	Hard cap \$	The maximum goal amount in millions of dollars (log transformed)	ICObench/Coincheckup/ICOholder/ICodata	–
	Accepted currencies	The number of cryptocurrencies accepted as payment for tokens	ICObench/WP/ICOcheckup	+
	Fiat currency	A dummy variable taking the value of 1 if a fiat currency is accepted as payment for tokens and 0 otherwise	ICObench/WP/ICOcheckup	+/-
	Ethereum platform	A dummy variable taking the value of 1 if the project is using the Ethereum blockchain and 0 otherwise	ICObench	+
	Token price	The price of the token in USD cents (log transformed)	ICObench	+/-
	Total tokens	Total number of tokens in millions (circulating and retained) (log transformed)	ICOMarks/WP/coinmarketcap	+
	KYC	A dummy variable taking the value of 1 if the project is using a Know Your Customer process and 0 otherwise	ICObench	+
	Whitelist	A dummy variable taking the value of 1 if the project is using a whitelist and 0 otherwise	ICObench	
	Twitter followers	The number of followers for each ICO account on Twitter	Twitter	
Geographic location of ICO	USA	A dummy variable taking the value of 1 if the ICO country is USA and 0 otherwise	ICObench	+/-
	Russia	A dummy variable taking the value of 1 if the ICO country is Russia and 0 otherwise		+/-
	UK	A dummy variable taking the value of 1 if the ICO country is UK and 0 otherwise		+
	Singapore	A dummy variable taking the value of 1 if the ICO country is Singapore and 0 otherwise		+
	Switzerland	A dummy variable taking the value of 1 if the ICO country is Switzerland and 0 otherwise		+
	Estonia	A dummy variable taking the value of 1 if the ICO country is Estonia and 0 otherwise		+

Note: In the absence of data on ICObench (ICObench is considered as a rating website), we referred to additional websites such as www.icomarks.com/ico, www.icodrops.com, www.coinschedule.com/cryptocurrency, www.coincheckup.com/coins, www.coinmarketcap.com/currencies, www.tokendata.io, www.icoholder.com, www.coingecko.com, www.icodata.io, www.trackico.io/ico, and www.etherscan.io. Some data missing in ICObench were extracted from the ICO WP and ICO website.

Econometric models

Based on the correlation matrix (unreported) and variance inflation factor (VIF), we considered two sets of models to avoid issues related to multicollinearity. The first set of models is dedicated to expert and transparency ratings as independent variables that are highly related to other variables. We chose to test their impact on ICO and project start-up success in a univariate framework, presented in models (1) and (2), respectively.

$$ICO\ success_i\ (Project\ startup\ success_i) = \alpha_0 + \alpha_1 * Expert\ rating_i + \varepsilon_i \quad (1)$$

$$ICO\ success_i\ (Project\ startup\ success_i) = \beta_0 + \beta_1 * Transparency\ rating_i + v_i \quad (2)$$

Our second set of models is dedicated to the explanatory variables in a multivariate analysis framework. We estimated the following model to examine the determinants of ICO and project start-up success, as presented in models (3) and (4) respectively.

$$ICO\ success_i = \alpha_0 + \alpha_1 * Voluntary\ disclosure\ quality_i + \alpha_2 * Team\ characteristics_i + \alpha_3 * Deal\ characteristic_i + \alpha_4 * ICO\ Geographic\ location_i + \varepsilon_i \quad (3)$$

$$Project\ startup\ success_i = \beta_0 + \beta_1 * Voluntary\ disclosure\ quality_i + \beta_2 * Team\ characteristics_i + \beta_3 * Deal\ characteristic_i + \beta_4 * ICO\ Geographic\ location_i + v_i \quad (4)$$

We used OLS regressions for the quantitative dependent variables and logistic regressions for the dummy dependent variables.

Summary statistics and empirical results

Summary statistics

Table 3 reports the summary statistics. It shows that the average raised amount is \$21.9 million with a minimum amount of 0 and a maximum amount of \$2,248.750 million related to an ICO entitled "ClearPoll" in October 2017. In our sample, 73.66% of the ICOs had tradable tokens. Table 1 also indicates that 259 ICOs, representing 63% of our sample, fixed their soft caps. The average soft cap equals \$8.75 million with a maximum of \$346 million. The average hard cap is \$48.5 million, with the maximum and minimum being \$3.21 billion and \$300,000, respectively. Of the 410 ICOs, 365 (89%) had online websites in February 2019. The average number of tweets per week in the period between the start of the ICO and February 2019 was 11.76 tweets. Out of our sample of ICOs, 81.22% or 333 ICOs were active on Twitter while only 32.2% or 132 ICOs were active on GitHub from November 2018 to February 2019.

Regarding the independent variables, Table 3 shows that the average expert rating is 3.53 and that the median equals 3.6. The average transparency ratings equal 3.44, and the median is 3.7. Half of the ICOs in our sample had repositories on GitHub before launching their public sale. The teams retained 13.77% of the issued tokens on average, with the maximum and minimum being 50% and 0%, respectively. The percentage of sold tokens was 56.15% of the issued tokens on average, with the maximum and minimum being 100% and 3%, respectively. Presales were noted in 67.32% of our sample. Bonus schemes were set up in 251 cases (61.22% of the sample). Table 3 shows that the planned duration of ICOs is almost 32 days with a median of 30 days. Team size ranged from 2 to 132 members, with the average being 11 members. Finally, female team members were noted in 69.15% of our sample.

Empirical results

Univariate analysis: The effect of expert and transparency ratings

We investigated the effect of expert and transparency ratings on ICO and project start-up success. We conducted OLS and the logit regressions by using expert and transparency ratings separately as independent variables.⁷ Tables 4 and 5 report the results of our models for ICO success and project start-up success, respectively.

The results showed that the expert rating (Panel A, Table 4) and transparency rating (Panel B, Table 4) are not significant determinants of ICO success, except when using the funding raised as a proxy for ICO success with coefficient equal to 0.3265 significant at 5%. A possible explanation for our results is that the ratings change every few hours (during the ICO). We also note that our selected ICOs are completed ICOs. Thus, we conclude that these ratings are appropriate for the post-ICO period. This is shown in the results provided in Table 5, which reports the effect of expert rating and transparency rating on project start-up success. Thus, both types of ratings exert a significant and positive effect on project start-up success, panels A and B of table 5 respectively. This finding is in line with those of Aslan *et al.* (2023) and Roosenboom *et al.* (2020), who reported a positive and significant effect of both ratings on success.

7. We tested the multicollinearity using the correlation matrix (unreported) and variance inflation factor (VIF) after the estimation. Heteroskedasticity was tested using the Breush Pagan test and the White test. For each regression, we used robust standard errors to make corrections for heteroskedasticity if necessary. We winsorized the variable "Tweets per week" as it contained some outliers. All our models were globally significant with a significant Fisher coefficient.

TABLE 3
Summary statistics

Variable	Obs	Frequency	Mean	Std. Dev.	Min	Median	Max
Dependent variables							
ICO success							
Soft cap hit (binary)	297	0.889					
Funding percentage (%)	369		0.588	0.463	0	0.528	3.396
Funding raised (million dollars)	388		21.900	115	0.0018	11	2250
Token tradability (binary)	410	0.737					
Dependent variables							
Project start-up success							
Website online (binary)	410	0.890					
Tweets per week (#)	410		11.757	31.67	-1.83	6.445	588.75
Twitter activity (binary)	410	0.812					
GitHub activity (binary)	410	0.322					
Independent variables							
Expert rating	410		3.527	0.650	1	3.6	4.7
Transparency rating	410		3.438	0.696	1	3.7	4.8
GitHub pre-ICO (binary)	410	0.500					
Insider token retention (%)	323		0.138	0.075	0	0.12	0.5
Sold tokens (%)	381		0.561	0.204	0.03	0.6	1
Bonus scheme (binary)	410	0.612					
Presale (binary)	410	0.673					
Duration (#)	410		31.837	23.426	0	30	151
Team members (#)	404		11.280	9.307	2	10	132
Gender (binary)	402	0.692					
Soft cap (million dollars)	259		8.748	31.000	0	2.541	346
Hard cap (million dollars)	389		48.500	178.000	0.3	24	3210
Accepted currencies (#)	410		1.995	1.562	1	1	11
Fiat currency (binary)	410	0.195					
Ethereum platform (binary)	410	0.939					
Token price (\$)	407		4.184	39.469	0.0001	0.198	577.2
Total tokens (in billions)	407		46.600	634.000	0.0004	0.25	10 000
Whitepaper (binary)	410	0.746					
WP pages (#)	410		25.934	22.102	0	26	169
Leadership	290		5.155	5.162	0	4	32
Followers on Twitter (#)	410		14558.15	38814.84	0	5304	607 691
KYC (binary)	410	0.288					
Whitelist (binary)	410	0.193					
Telegram (binary)	410	0.802					

TABLE 4
OLS and logit regressions for ICO success: Expert and transparency ratings

Variable	Soft cap hit	Funding%	Ln(Funding raised)	Token tradability
Panel A: ICO success and expert ratings				
Expert rating	0.1758 (0.3396)	0.0457 (0.3515)	0.3265** (0.155)	0.1155 (0.1663)
Obs	297	369	388	410
F value		1.70	4.44**	
Wald Chi 2	0.27			0.48
R squared	0.0014	0.0034	0.0158	0.0010
Panel B: ICO success and transparency ratings				
Transparency rating	0.0888 (0.305)	-0.0150 (0.0379)	0.0878 (0.1316)	-0.0621 (0.1596)
Obs	297	369	388	410
F value		0.16	0.45	
Wald Chi 2	0.08			0.15
R squared	0.0004	0.0004	0.0013	0.0003

Note: For the variable definitions, check Table 1. In the first and fourth columns, we used the logistic regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second and third columns show the coefficients from an OLS regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

TABLE 5
OLS and logit regressions for project start-up success: Expert and transparency ratings

Variable	Website online	Tweets per week	Twitter activity	GitHub activity
Panel A				
Expert rating	0.9814**** (0.2099)	5.4705** (2.395)	0.9093*** (0.1973)	0.57601*** (0.1693)
Obs	410	410	410	410
F value		5.22**		
Wald Chi 2	21.85***		21.24***	11.57***
R squared	0.0726	0.0126	0.0619	0.0209
Panel B				
Transparency rating	0.9387*** (0.1904)	5.5751* (2.8785)	0.8931*** (0.1747)	0.5461*** (0.1588)
Obs	410	410	410	410
F value		3.75*		
Wald Chi 2	24.3***		26.13***	11.83***
R squared	0.0704	0.0150	0.0654	0.0222

Note: For variable definitions, check Table 1. In the first, third, and fourth columns, we used logistic regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second column shows the coefficients from an OLS regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

Multivariate analysis: Determinants of success

We examined the determinants of ICO and project start-up success. In this study, the regressions did not suffer from any multicollinearity issues as the VIF coefficients are lower than 3. Table 6 provides the results of our regressions using the four measures for ICO success as dependent variables: soft cap hit, funding percentage, funding raised, and token tradability.

Our empirical results showed that overall, ICO success is explained by the following factors: voluntary disclosure quality, team characteristics, deal characteristics (offer and demand characteristics), and country of issuance or geographic location of ICO.

Concerning voluntary disclosure quality, we found that the presence of repositories on GitHub has a positive effect on the amount of funds raised and token tradability. This result is in line with those of Cohn *et al.* (2018). It indicates that posting the code on GitHub before the beginning of the ICO signals a high level of confidence in the project. Moreover, the number of whitepaper pages positively and significantly impacts the soft cap hit and the amount of funds raised. However, it is important to discuss that GitHub disclosure might be a source of risk, leading the companies to adopt some specific operational approaches as risk mitigation strategies. For example, they might use private repositories for sensitive data and code, limited access permissions, and secure encryption methods. Furthermore, companies may choose to only disclose certain parts of their codebase that are less sensitive but still indicative of their technical prowess, thus maintaining a level of information asymmetry that protects their competitive edge. The presence of a whitepaper negatively impacts the funding raised. A possible explanation for this result is that we think that some ICOs deleted their whitepapers once the ICO ended. Hence, we did not have information about whether the ICOs published whitepapers and then deleted them or never posted one. Therefore, given that the ICOs in our sample are completed ICOs, we had to consider that the nonexistence of an online whitepaper indicated that one was never published.

For team characteristics, we found that a larger team positively influences the amount of funds raised. Such finding is similar to those of Ahmad *et al.* (2023), Amsden and Schweizer (2018), and Roosenboom *et al.* (2020). Interestingly, we observed that having a female team member negatively and significantly impacts the ICO success measured by different proxies: the probability of reaching the soft cap amount, the amount of funds raised, and the percentage of funds raised in hard cap. Our result contrasts with those of Johnson *et al.* (2018) who found the opposite relationship. According to behavioral finance, our result is explained by the excess of confidence among male investors. The more the domain is considered “masculine,” the more men feel touched by divine grace. As 90% of crypto investors are males (Charness & Gneezy, 2012), those who invest in ICOs tend to prefer ICOs with more male team members. Therefore, this negative association between female members and ICO success reflects a negative perception by investors of the gender factor, which can be attributed to the fact that investors do not seem to appreciate the low-risk profile of women when launching and managing a start-up. Finally, we found that leadership has a significant and positive impact on the funding raised. This shows the importance of a positive perception by investors of the leadership of the project team.

TABLE 6
OLS and logit regressions for ICO success: Determinants of ICO success

Variable		Soft cap hit	Funding percentage	Ln(Funding raised)	Token tradability	
Voluntary disclosure quality		GitHub pre-ICO	0.854 (0.789)	0.0495 (0.0612)	0.320* (0.168)	0.580* (0.333)
		Whitepaper	-0.419 (1.040)	-0.128 (0.108)	-0.502* (0.280)	0.317 (0.515)
		WP pages	0.0558* (0.0317)	0.0005 (0.0013)	0.0073** (0.0036)	0.0091 (0.0103)
		Telegram	-0.212 (0.953)	0.0075 (0.084)	0.366 (0.257)	-0.552 (0.662)
Team characteristics		Insider token retention	-4.363 (4.304)	0.0756 (0.489)	-2.164 (1.947)	1.054 (2.298)
		Team members	0.147 (0.11)	0.00256 (0.00175)	0.0142** (0.0056)	0.0153 (0.016)
		Gender	-1.727* (0.941)	-0.195*** (0.067)	-0.368* (0.211)	-0.510 (0.467)
		Leadership		0.0107 (0.0085)	0.0446*** (0.0147)	
Deal characteristics	Offer characteristics	Bonus scheme	-2.751** (1.187)	-0.0532 (0.0691)	0.0517 (0.166)	-0.0748 (0.377)
		Presale	-0.466 (0.728)	0.00822 (0.067)	-0.094 (0.179)	-0.986** (0.492)
		Duration	-0.0204 (0.0142)	-0.00502*** (0.0014)	-0.0125** (0.006)	-0.032*** (0.0069)
		Ln(soft cap)	-0.800** (0.375)			
		Ln(hard cap)		-0.137*** (0.052)		
		Accepted currencies	0.543** (0.237)	0.0033 (0.0177)	0.103* (0.0587)	0.235* (0.127)
		Fiat currency	-1.304* (0.707)	-0.0470 (0.0693)	-0.119 (0.200)	-0.589 (0.384)
		Ethereum platform	2.050** (1.00)	-0.0185 (0.101)	-0.178 (0.288)	-0.852 (0.805)
		Ln(1+token price)	-0.214 (0.329)	-0.0328 (0.0834)	0.146 (0.320)	-0.303 (0.273)
		KYC	-0.953 (0.825)	-0.0854 (0.064)	-0.254 (0.180)	-0.555 (0.373)
		Whitelist	-0.676 (0.839)	0.0137 (0.082)	0.0496 (0.212)	-0.218 (0.430)
	Demand characteristics	Tokens sold	-2.974 (1.828)	-0.296 (0.190)	-0.512 (0.467)	-0.218 (0.962)
		Followers on Twitter	0.000211*** (0.000071)	0.000005 (0.000007)	0.000005 (0.000002)	0.00008*** (0.000029)
		Ln(total tokens)	-0.337 (0.219)	0.0319 (0.0225)	0.125 (0.0775)	0.028 (0.0978)

TABLE 6
OLS and logit regressions for ICO success: Determinants of ICO success

Variable		Soft cap hit	Funding percentage	Ln(Funding raised)	Token tradability
Country	USA	0.566 (0.991)	-0.081 (0.0747)	0.0433 (0.228)	0.333 (0.510)
	Russia	-3.026*** (1.163)	-0.208** (0.0925)	-0.730* (0.382)	0.113 (0.606)
	UK	-1.480 (1.756)	0.153 (0.139)	0.223 (0.325)	0.581 (0.676)
	Singapore	0.376 (0.994)	0.151 (0.113)	0.146 (0.199)	0.248 (0.525)
	Switzerland	-0.179 (0.997)	0.239 (0.161)	0.355 (0.434)	0.439 (0.658)
	Estonia	-0.325 (1.213)	0.0488 (0.171)	-0.304 (0.464)	-0.559 (0.787)
Observations		199	221	228	309
F-value			3.96***	2.81***	
Chi 2		45.23**			66.48***
R ²		0.4146	0.2882	0.2322	0.2564

In the first and fourth columns, we used the logistic regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second and third columns show the coefficients from an OLS regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

Our results concerning deal characteristics showed that setting a large soft cap amount reduces the likelihood of hitting it and setting a large hard cap amount decreases the percentage of funds from this amount. In line with our expectations, a shorter ICO duration significantly influences ICO success. In fact, a shorter duration signals the capability of attaining the amount of funds needed quickly. Our findings are aligned with those of Fisch (2019) and Roosenboom *et al.* (2020). We also found that accepting several cryptocurrencies for payment positively and significantly affects the probability of reaching the soft cap amount, the amount of funds raised, and the tokens raised (Amsden & Schweizer, 2018). Meanwhile, accepting a fiat currency negatively influences the probability of reaching the soft cap amount. This result supports the idea that crypto investors are unable to complete ICOs on their own. It is in line with that of Amsden and Schweizer (2018), who found that not accepting fiat currency for payment and having a complete whitepaper positively influence success. Moreover, not setting up a bonus scheme significantly impacts the likelihood of reaching the soft cap amount. Such a situation signals the lack of confidence of entrepreneurs in their projects and their willingness to attract investors through the bonus structure. Moreover, issuing tokens on the Ethereum platform, having a long whitepaper, and being followed by a large number of users on Twitter exert significant and positive impacts on ICO success. Finally, it seems that setting a KYC process does not significantly impact the success of the ICO.

Regarding geographic location effect, our results showed that issuing tokens in Russia has a negative and significant association with the funding raised. Russia does not have friendly ICO regulations, and it has begun to set laws surrounding ICOs (Ahmad *et al.*, 2023; Huang *et al.*, 2020).

Table 7 provides the results from our multivariate regressions using the four measures for success after the completion of the ICO (project start-up period) as dependent variables (website online, tweets per week, Twitter activity, and GitHub activity).

Variable		Website online	Tweets per week	Twitter activity	GitHub activity	
Voluntary disclosure quality	GitHub pre-ICO	1.367** [0.682]	1.179 (1.249)	0.185 (0.385)	1.605*** (0.312)	
	Whitepaper	3.632 (1.049)	-5.010** (2.182)	1.316 (0.671)	-0.173 (0.506)	
	WP pages	-0.0176 (0.022)	0.0412 (0.0377)	-0.0076 (0.014)	0.0095 (0.0094)	
	Telegram	-0.848 (1.112)	0.877 (1.719)	-0.781 (0.580)	-0.210 (0.450)	
Team characteristics	Insider token retention	7.387** (3.291)	-5.636 (7.517)	-0.263 (2.331)	1.405 (1.938)	
	Team members	0.075 (0.055)	0.011 (0.0325)	0.029 (0.029)	0.0088 (0.014)	
	Gender	0.912 (0.792)	0.388 (1.441)	-0.162 (0.482)	-0.776** (0.324)	
	Leadership		0.137 (0.126)			
Deal characteristics	Offer characteristics	Bonus scheme	-0.356 (0.457)	0.353 (1.373)	-0.451 (0.399)	-0.200 (0.307)
		Presale	0.0874 (0.760)	-2.739* (1.554)	0.0878 (0.465)	0.326 (0.374)
		Duration	-0.0027 (0.011)	-0.0133 (0.0311)	-0.0059 (0.009)	-0.021*** (0.0075)
		Accepted currencies	0.735** (0.311)	0.09 (0.507)	0.256* (0.141)	-0.007 (0.095)
		Fiat currency	-1.602*** (0.603)	1.491 (1.746)	-0.557 (0.500)	-0.664* (0.374)
		Ethereum platform	-0.075 (1.318)	-4.013 (3.247)	-0.682 (1.204)	-0.779 (0.510)
		Ln[1+token price]	-0.236 (0.385)	-1.689 (1.595)	-0.494* (0.262)	0.046 (0.227)
		KYC	1.444** (0.652)	0.325 (1.487)	0.598 (0.469)	-0.0513 (0.321)
		Whitelist	-0.710 (0.646)	-0.716 (1.749)	-0.499 (0.543)	0.216 (0.346)
	Demand characteristics	Tokens sold	1.663 (1.488)	-4.415 (3.528)	-1.186 (1.264)	-0.627 (0.888)
		Followers on Twitter	0.00017*** (0.00061)	0.000033*** (0.000011)	0.000197*** (0.00006)	0.000005 (0.000005)
		Ln(total tokens)	0.270* (0.161)	-0.272 (0.307)	0.0584 (0.134)	0.102 (0.083)

TABLE 7
OLS and logit regressions for project start-up success post-ICO

Variable		Website online	Tweets per week	Twitter activity	GitHub activity
Country	USA	-1.175** [0.592]	0.0231 [1.563]	-0.730 [0.523]	0.491 [0.365]
	Russia	-0.769 [1.076]	-2.435 [2.284]	-0.599 [0.662]	-0.948* [0.574]
	UK	0.278 [1.267]	-0.918 [2.204]	-0.356 [0.656]	0.498 [0.501]
	Singapore	0.621 [1.256]	-0.711 [2.193]	0.517 [0.615]	0.398 [0.501]
	Switzerland	0.243 [0.838]	-0.194 [2.511]	1.130* [0.664]	1.131** [0.517]
	Estonia	0.137 [1.073]	-1.665 [3.330]	-0.661 [0.954]	0.00246 [0.658]
Observations		309	229	309	309
F-value			1.56**		
Chi 2		62.29***		47.40***	52.34***
R ²		0.3822	0.1346	0.2588	0.1772

In the first and fourth columns, we used the logistic regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second and third columns show the coefficients from an OLS regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

Our empirical results showed that overall, project start-up success is explained by the following factors: voluntary disclosure quality, team characteristics, deal characteristics (offer and demand characteristics), and country of issuance or geographic location of ICO.

Our results showed that having repositories on GitHub pre-ICO positively and significantly impacted the GitHub activity in the recent period and the setting up of an online website post-ICO (Cohney *et al.*, 2018). The results also showed that issuing a whitepaper is negatively associated with tweets per week.

Regarding the team characteristics, the results indicated that a higher percentage of tokens retained by insiders increases the probability of having an online website post-ICO. This relation highlights the high confidence of the insiders in the project. This result is similar to that of Roosenboom *et al.* (2020) and confirms the incentive and compensation theories. Moreover, the presence of a female team member has a significant negative impact only when the post-ICO success is measured by the probability of being active on GitHub. The gender variable is positive but not significant when we consider the other proxies of success after the completion of the ICO as dependent variables, that is, website online, tweets per week, and witter activity. This result shows that being a female negatively impacts the success of the ICO but does not have an impact on the post-ICO performance. This result can be explained by the excess of confidence and risk taking among male investors, which is a necessary condition for the success of ICOs. However, there is no gender effect on the managerial performance during the project start-up post-ICO.

The most significant result concerning deal characteristics showed a positive association between the number of followers on Twitter and ex-post ICO success. We also showed that accepting a high number of cryptocurrencies for payment, not allowing payments with fiat currency, and issuing a high number of tokens (supporting the risk sharing phenomenon) positively and significantly impact the project start-up success. We also confirmed that setting a KYC process does not impact the success during the pre- and post-ICO periods, except for a positive performance (evaluated by the presence of website) observed for the start-up period. Moreover, token price has a significant and negative association with Twitter activity. Finally, and as predicted, a shorter ICO duration impacts the GitHub activity in the recent period. Furthermore, presale seems to have a significantly negative association with tweets per week, but the overall effect on project start-up success is minimal.

Finally, after controlling for the country of issuance effect, we found that issuing tokens negatively impacts the GitHub activity in Russia and the USA and positively impacts that in Switzerland. Specifically, ICO issuance in Switzerland exhibits a positive and significant relationship with Twitter activity; this result was expected as Switzerland has friendly ICO regulations.

Robustness checks

To check the robustness of our results, we used generalized linear model (GLM) regressions for the quantitative dependent variables and probit regressions for the dummy dependent variables. In terms of the univariate analysis, the results of the probit and GLM regressions are presented in Tables 8 and 9 for ICO and project start-up success, respectively.

TABLE 8 Robustness check: GLM and probit regressions for ICO success: Expert and transparency ratings				
Variable	Soft cap hit	Funding%	Ln(Funding raised)	Token tradability
Panel A				
Expert rating	0.0913 (0.178)	0.0458 (0.35)	0.327** (0.1548)	0.0697 (0.100)
Obs	297	369	388	410
F value				
Wald Chi 2	0.26			0.48
R squared	0.0013	-----	----	0.0010
Panel B				
Transparen- cy rating	0.046 (0.158)	-0.015 (0.0378)	0.0878 (0.1315)	-0.0371 (0.095)
Obs	297	369	388	410
F value				
Wald Chi 2	0.08			0.15
R squared	0.0004	----	----	0.0003

Note: For the variable definitions, check Table 1. In the first and fourth columns, we used the probit regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second and third columns show the coefficients from a GLM regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

As for the ICO and project start-up success based on expert and transparency ratings, the results are in line with those reported in Tables 4 and 5. They show a significant and positive association between expert rating and the funding raised as a proxy for ICO success. Meanwhile, the relation between transparency rating and ICO success does not show any significant difference. The expert and transparency ratings appear to be significantly and positively associated with project start-up success after the completion of the ICO. These results are in line with those reported in Tables 4 and 5.

TABLE 9
Robustness check: GLM and probit regressions for post-ICO
success: Expert and transparency ratings

Variable	Website online	Tweets per week	Twitter activity	GitHub activity
Panel A				
Expert rating	0.549*** (0.1187)	5.471** (2.392)	0.529*** (0.112)	0.354*** (0.102)
Obs	410	410	410	410
F value				
Wald Chi 2	21.39***		22.26***	12.13***
R squared	0.0749	—	0.0625	0.0214
Panel B				
Transparency rating	0.531*** (0.1065)	5.575* (2.875)	0.531*** (0.101)	0.333*** (0.095)
Obs	410	410	410	410
F value				
Wald Chi 2	24.84***		27.92***	12.37***
R squared	0.0740		0.0677	0.0225

Note: For the variable definitions, check Table 1. In the first, third, and fourth columns, we used the probit regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second column shows the coefficients from a GLM regression with t-statistics, and the robust standard errors are set in parentheses. *, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

In terms of the multivariate analysis, the results of the probit and GLM regressions are presented in Tables 10 and 11 for ICO and project start-up success, respectively. The results do not deviate significantly from those reported in Tables 6 and 7, although some variables become more significant. Furthermore, the results globally confirm those reported in Tables 5 and 6 for ICO and project start-up success, respectively.

TABLE 10
Robustness check: GLM and probit regressions for ICO success

Variable		Soft cap hit	Funding percentage	Ln(Funding raised)	Token tradability	
Voluntary disclosure quality	GitHub pre-ICO	0.491 (0.343)	0.0495 (.0573)	0.320** (0.158)	0.361* (0.185)	
	Whitepaper	-0.155 (0.538)	-0.128 (0.101)	-0.502* (0.264)	0.165 (0.294)	
	WP pages	0.0274* (0.0146)	0.0005 (0.0012)	0.0073** (0.0034)	0.0054 (0.00571)	
	Telegram	-0.200 (0.502)	0.0075 (0.079)	0.366 (0.242)	-0.275 (0.346)	
Team characteristics		Insider token retention	-2.220 (2.193)	0.0756 (0.458)	-2.164 (1.832)	0.774 (1.267)
		Team members	0.0822* (0.0468)	0.0026 (0.0016)	0.0142*** (0.0056)	0.0103 (0.009)
		Gender	-1.033** (0.442)	-0.195*** (0.0628)	-0.368* (0.198)	-0.237 (0.239)
		Leadership		0.0108 (0.0079)	0.0446*** (0.0139)	
Deal characteristics	Offer characteristics	Bonus scheme	-1.538*** (0.539)	-0.0532 (0.0647)	0.0517 (0.156)	0.0039 (0.209)
		Presale	-0.233 (0.369)	0.008 (0.063)	-0.094 (0.168)	-0.567** (0.253)
		Duration	-0.0112 (0.00709)	-0.00502*** (0.0013)	-0.013** (0.0056)	-0.0183*** (0.00382)
		Ln(soft cap)	-0.435*** (0.168)			
		Ln(hard cap)		-0.137*** (0.0485)		
		Accepted currencies	0.315*** (0.116)	0.0033 (0.0166)	0.103* (0.0552)	0.137** (0.068)
		Fiat currency	-0.736** (0.337)	-0.047 (0.065)	-0.119 (0.189)	-0.328 (0.222)
		Ethereum platform	1.237** (0.503)	-0.0185 (0.0951)	-0.178 (0.271)	-0.467 (0.425)
		Ln(1+token price)	-0.112 (0.176)	-0.0328 (0.0781)	-0.146 (0.301)	-0.168 (0.165)
		KYC	-0.561 (0.394)	-0.0854 (0.0598)	-0.254 (0.169)	-0.313 (0.208)
		Whitelist	-0.375 (0.427)	0.0137 (0.0767)	0.0496 (0.200)	-0.129 (0.239)
	Demand characteristics	Tokens sold	-1.733* (0.953)	-0.296* (0.178)	-0.512 (0.440)	-0.144 (0.531)
		Followers on Twitter	0.000119*** (0.00005)	0.000005 (0.000006)	0.000005 (0.000002)	0.00044*** (0.000134)
		Ln(total tokens)	-0.170 (0.106)	0.0319 (0.0211)	0.125* (0.0729)	0.0173 (0.055)

TABLE 10
Robustness check: GLM and probit regressions for ICO success

Variable		Soft cap hit	Funding percentage	Ln(Funding raised)	Token tradability
Country	USA	0.410 [0.545]	-0.0805 [0.07]	0.0433 [0.214]	0.215 [0.282]
	Russia	-1.634*** [0.566]	-0.208** [0.087]	-0.730** [0.360]	0.0571 [0.337]
	UK	-0.677 [0.670]	0.153 [0.131]	0.223 [0.306]	0.356 [0.361]
	Singapore	0.279 [0.546]	0.151 [0.106]	0.146 [0.187]	0.162 [0.304]
	Switzerland	-0.0505 [0.565]	0.239 [0.151]	0.355 [0.409]	0.307 [0.364]
	Estonia	-0.0143 [0.634]	0.0488 [0.160]	-0.304 [0.436]	-0.445 [0.433]
	Observations	199	221	228	309
	F-value		3.96****	2.81***	
	Chi 2	46.56***			77.63***
	R ²	0.4180	0.29	0.23	0.2581

In the first and fourth columns, we used probit regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second and third columns show the coefficients from a GLM regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

TABLE 11
Robustness check: GLM and probit regressions for project start-up success post-ICO

Variable		Website online	Tweets per week	Twitter activity	GitHub activity
Voluntary disclosure quality	GitHub pre-ICO	0.647** [0.297]	1.179 [1.175]	0.113 [0.213]	0.944*** [0.176]
	Whitepaper	2.003 [0.479]	-5.010** [2.054]	0.765 [0.354]	-0.148 [0.291]
	WP pages	-0.0109 [0.009]	0.0412 [0.0355]	-0.00451 [0.00719]	0.0061 [0.0054]
	Telegram	-0.560 [0.535]	0.877 [1.618]	-0.482 [0.328]	-0.130 [0.251]
Team characteristics	Insider token retention	3.719** [1.714]	-5.636 [7.075]	-0.302 [1.298]	0.679 [1.110]
	Team members	0.0474* [0.0282]	0.0110 [0.0306]	0.0186 [0.0156]	0.0057 [0.009]
	Gender	0.429 [0.359]	0.388 [1.356]	-0.0421 [0.257]	-0.458** [0.189]
	Leadership		0.137 [0.119]		

TABLE 11
Robustness check: GLM and probit regressions for project start-up success post-ICO

Variable			Website online	Tweets per week	Twitter activity	GitHub activity
Deal characteristics	Offer characteristics	Bonus scheme	-0.217 (0.240)	0.353 (1.292)	-0.273 (0.217)	-0.113 (0.179)
		Presale	0.0321 (0.343)	-2.739* (1.463)	0.0035 (0.248)	0.171 (0.209)
		Duration	-0.00053 (0.006)	-0.0133 (0.0293)	-0.0034 (0.00481)	-0.0117*** (0.0042)
		Accepted currencies	0.386*** (0.140)	0.0901 (0.477)	0.138* (0.0738)	0.0038 (0.056)
		Fiat currency	-0.824*** (0.289)	-1.491 (1.644)	-0.290 (0.268)	-0.396* (0.217)
		Ethereum platform	0.0707 (0.611)	-4.013 (3.056)	-0.370 (0.529)	-0.446 (0.312)
		Ln(1+token price)	-0.146 (0.183)	-1.689 (1.501)	-0.290** (0.158)	-0.0169 (0.141)
		KYC	0.831*** (0.304)	-0.325 (1.399)	0.397 (0.248)	-0.057 (0.190)
		Whitelist	-0.369 (0.2315)	-0.716 (1.646)	-0.292 (0.285)	-0.128 (0.208)
	Demand characteristics	Tokens sold	0.778 (0.735)	-4.415 (3.321)	-0.659 (0.629)	-0.423 (0.504)
		Followers on Twitter	0.000091*** (0.000028)	0.000033*** (0.000011)	0.000102*** (0.00003)	0.000003 (0.000002)
		Ln[total tokens]	0.147* (0.0789)	-0.272 (0.289)	0.0369 (0.0714)	0.0543 (0.0486)
Country	USA		-0.650** (0.321)	0.0231 (1.471)	-0.377 (0.297)	0.285 (0.218)
	Russia		-0.357 (0.453)	-2.435 (2.150)	-0.328 (0.364)	-0.608* (0.343)
	UK		0.128 (0.558)	-0.918 (2.074)	-0.152 (0.364)	0.292 (0.301)
	Singapore		0.212 (0.532)	-0.711 (2.064)	0.349 (0.345)	0.253 (0.281)
	Switzerland		0.127 (0.455)	-0.194 (2.363)	0.628* (0.369)	0.655** (0.308)
	Estonia		0.133 (0.611)	-1.665 (3.134)	-0.428 (0.462)	-0.0398 (0.382)
	Observations		309	229	309	309
	F-value			1.56**		
	Chi 2		66.86***		54.76***	56.54***
	R ²		0.3845	0.14	0.2608	0.1761

In the first, third, and fourth columns, we used the probit regression. We also report the average marginal effect with z-statistics and set the robust standard errors in parentheses. The second column shows the coefficients from a GLM regression with t-statistics, and the robust standard errors are set in parentheses.

*, **, *** = statistically significant at the 10%, 5%, and 1% levels, respectively.

Conclusion

Our study is among the first to examine the determinants of ICO and project start-up success. The ICO is a novel financing channel that enables start-ups to raise funds for their venture projects by selling newly created tokens. We investigate the factors that contribute to the success of ICOs and project start-ups post-ICO.

Using a sample of 410 ICOs over the 2016–2018 period, we empirically showed that the following factors exhibit a positive and significant effect on ICO success: i) disclosure quality (GitHub, whitepaper pages); ii) project team characteristics (team size, leadership, gender, diversity); and iii) certain deal characteristics, such as subscription duration and the number of accepted cryptocurrencies. Additionally, the success of project start-ups post-ICO is affected by insider ownership, expert and transparency ratings, and country of token issuance. Our empirical results are robust to the use of alternative regression methods and offer several practical implications.

Our study contributes to the emerging literature on ICOs in at least three ways. First, it proposes a comprehensive typology of potential determinants of ICO success. Second, it provides new empirical results about the success of project start-ups. From the perspective of reducing asymmetric information and investor adverse selection, our study shows the significant effect of expert and transparency ratings on ICO success and project start-up success. All the other voluntary disclosure quality variables point in the same direction. Third, this study shows the importance of the project team, in particular, the negative perception of the gender factor. Investors do not seem to appreciate women's low-risk profile when launching and running a start-up.

In addition, this study offers several noteworthy managerial implications. For example, it allows a better understanding of the links between the characteristics of ICOs and their success during and after deal transactions. This could encourage start-ups to use this new channel of fundraising to finance their projects in the early stages. Thus, entrepreneurs can identify key success factors during and post-ICO to attract investors. In addition, investors will be able to make arbitrage portfolios, targeting ICOs that have the highest probability of success and are potentially value-creating.

Our research findings can be further contextualized within the broader scope of entrepreneurial finance literature, particularly the studies focusing on fundraising channels. Notably, our results indicate that factors such as diversity within the project team and the country of issuance play a significant role in both the immediate success and project start-up post-ICO. This opens up intriguing possibilities for examining various country-specific characteristics, such as the governance structures and decision-making processes of ICO-funded projects and their contribution to investor confidence. How do voting mechanisms and governance token dynamics influence project direction and success? Based on our empirical findings, future research could conduct comparative studies across different ICOs and blockchain ecosystems to identify common patterns and success factors, and explore regional variations in ICO success and regulatory approaches. Finally, another promising direction for future research would be examining the growing importance of environmental and sustainability factors in ICOs, including the adoption of eco-friendly consensus mechanisms and the carbon footprint of blockchain projects.

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