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Success Factors of Initial Coin Offering (ICO) projects

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Abstract

The Initial Coin Offerings (ICOs) concept has been an emerging topic in the literature as well as their success factors. We will build up on the current literature and explore several success factors divided into categories, namely, project, campaign, social network and team's characteristics. The preliminary econometric model developed was built on data from a database composed of 428 ICO projects in the banking/financial sector which allowed us to collect a diverse range of independent variables identified recurring to the existent literature. After proceeding to a literature review, we will analyze the results of the econometric model allowing us to identify the relevant variables and their impact on project's success.

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1. Introduction

Fintechs have been disrupting the financial sector posing challenges to market incumbents and forcing innovation of old practices (Campino, Brochado, & Rosa, 2020). A more innovative concept is the Initial Coin Offerings (ICOs) which appeared for the first time in 2013 with the MasterCoin project proposed by J.R. Willett. This allows the financing of highly innovative ventures via cryptocurrencies (Kranz, Nagel, & Yoo, 2019) which adds a disruptive concept to the venture capital field and promotes a truly democratization of financial investments due to their global reach and small amounts needed to invest (Brochado, 2018). Usually these projects set thresholds for investments which allow a better token valuation and contribute to a better project's perception (Kranz, Nagel, & Yoo, 2019). These limits might be a combination of several thresholds being the most common: (i) soft-cap limits: lowest limit the project is willing to accept in order to be conducted; (ii) hard-cap limits: the highest limit of investment the project is willing to receive. Most of project's characteristics are described in the whitepaper which is an unregulated prospectus of tremendous importance to project's credibility (Fisch, 2019). ICO projects have been compared with other more traditional forms of financing such as Initial Public Offerings (IPOs) (Ofir & Sadeh, 2019), Venture Capital (VC) and crowdfunding (Block, Groh, Hornuf, Vanacker, & Vismara, 2020). Nevertheless, ICOs have unique characteristics which make them different from other types of financing (Biasi & Chakravorti, 2019).

Our current analysis is composed by our preliminary results on the factors determining the ICO projects' success. We are developing a research to determine which are the most relevant factors and their impacts on projects' outcome adding to the literature which has been focusing on these topics and capturing several factors into one research applying them to the same database. We propose to develop a preliminary literature review and present the results of an econometric model.

2. Literature review

2.1. Signaling theory

The ICO market is characterized by information asymmetries between promoters and investors (Momtaz, 2019). The promoters of the projects detain crucial information on their capabilities and the project's characteristics which the investors do not (Yadav, 2017), which, building on the signaling theory, is an information asymmetry problem (Spence, 1973). The signaling theory states that several markets are characterized by an information gap between buyers and sellers, particularly the financial markets where the investors do not have the same level of information as the entrepreneurs. Without a proper information transfer among the participants, the markets will perform poorly as the entrepreneurs may not always be completely transparent on the information they provide (Leland & Pyle, 1977). The signals sent to the receivers must have 2 characteristics in order to be effective reducing the existent information asymmetry: (i) observable sign by the receiver; (ii) be costly to realize and imitate one if no costs are involved the signals will be easy to replicate and thus have no value (Fisch, 2019). Being ICOs characterized by deep information asymmetries, the promoters must reduce this gap in order to obtain a successful project. Signals to reduce information asymmetries might be published in the whitepaper (Fisch, 2019) but might also be available in other sources, such as in dedicated ICO websites with extensive databases (Giudici & Adhami, 2019), or

social networks such as Twitter (Xuan, Zhu, & Zhao, 2020) or GitHub (Jong, Roosenboom, & Kolk, 2018).

2.2. Success factors

The factors determining the success of an ICO project are mostly signals to reduce information asymmetry being some more successful and unique than others, for instance, a strong whitepaper (Fisch, 2019). On the other hand, they might be also factors not determined or controlled by the project promoters, for instance, prices of cryptocurrencies (Myalo & Glukhov, 2019). We have grouped the success factors of ICO projects into four main groups: (i) project success factors: intrinsically related with the project's characteristics; (ii) campaign success factors: linked to the way the campaign is managed; (iii) social networks success factors: describing the use of social networks to promote the project; (iv) team success factors: related with the project's human capital. Concerning the project success factors, the first we have identified concerns the industry in which the project is developed (Davies & Giovannetti, 2018) being the experience in that industry not necessary to achieve a successful outcome (Mamonov & Malaga, 2018). The location of a project is also important for its success (Ackermann, Bock, & Bürger, 2020) as projects developed in the US tend to be more successful than anywhere else (Fisch, 2019). ICO projects do not benefit to mention or following a specific regulation (Giudici & Adhami, 2019) as opaque projects will be anyway penalized by the investors (Bourveau, George, Ellahie, & Macciocchi, 2018) being the key to success the disclosure of the most information possible and provide quality signals (Fisch, 2019). The whitepaper is the golden source of information about the project but the mere existence of this document is not enough to assure project's success (Adhami, Giudici, & Martinazzi, 2018) as investors tend to focus more on its contents (Bourveau, George, Ellahie, & Macciocchi, 2018) and (Feng, Li, Wong, & Zhang, 2019). The token's tradability is a factor of tremendous importance and also considered to be itself a measure of success (Ackermann, Bock, & Bürger, 2020). The campaign success factors concern the project's aspects during the campaign and are more volatile than the previous success factors. The common idea is that longer campaigns lead to less successful outcomes (Roosenboom, Kolk, & Jong, 2020). A common practice is to offer bonuses to early investors during the pre-sales of tokens (Liu & Wang, 2019). Although there is proof of positive impact of pre-sales activities (Giudici & Adhami, 2019) there is also proof on the opposite direction once these activities are perceived by the investors as an immediate need for money and thus jeopardizes project's credibility (Momtaz, 2020a). The existence of financing thresholds (e.g. soft- and hard-cap) positively influences project's outcome (Amsden & Schweizer, 2019) but the limits must be kept realistic (Lyandres, Palazzo, & Rabetti, 2019). There is also proof that volatility in cryptocurrencies, particularly Ethereum, have an impact in project's financing (Myalo & Glukhov, 2019). Lastly, experts' ratings, attributed by external parties, influence investor's perception and thus the project's final result (Xuan, Zhu, & Zhao, 2020). The use of social networks is of crucial importance to successful project promotion (Ante, Sandner, & Fiedler, 2018). The social network Twitter is particularly important in ICO projects (Albrecht, Lutz, & Neumann, 2019) and its correct use can lead to very postivie results (Benedetti & Kostovetsky, 2018). The same happens with the correct use of Github as a public repository of code (Albrecht, Lutz, & Neumann, 2019). The team's characteristics are indeed an important contribution to the project's success (An, Duan, Hou,

& Xu, 2019). Larger teams are considered to have a positive relation with project's success (Ante, Sandner, & Fiedler, 2018) as well as larger advisory teams (Charlotte, Sung, & Cheng, 2019). Several team characteristics such as past professional experience, entrepreneurial background or education appear to be not relevant contributions to a successful outcome (Giudici & Adhami, 2019).

2.3. Measures of success

There is still no consensus regarding a single success measure for ICO projects since different studies follow different measures each of them with a purpose and good reasoning to capture the success of a venture. Some studies even aggregate several measures with similar results (Jong, Roosenboom, & Kolk, 2018). As the secondary market is seen as extremely important for the project to be successful, it is even considered to be able to measure its success because it is considered that the project's success is directly linked to tokens' tradability (Amsden & Schweizer, 2019). Other measures were also developed and are equally relevant. Another measure is a binary variable in which a positive result is achieved when the project reaches its own soft-cap threshold and intrinsically related is the measure in which a percentage is made on the capital reached above the mentioned threshold, being the most successful the ones with higher percentages (Jong, Roosenboom, & Kolk, 2018). However, these measures require disregarding several projects, namely, the ones with no soft-cap limits. Therefore, as in crowdfunding, the most common measure of success is the capital raised allowing the inclusion of all the projects in a database and allowing their differentiation given the amount of capital they have achieved (Fisch, 2019) and (Šapkauskienė & Višinskaitė, 2020).

3. Methodology

3.1. Database

The database was collected though an API accessible with a premium subscription of ICO Bench website. This database is comprised of 556 projects in the banking/financial sector which was selected due to the impacts it faces with the appearance of Fintech companies and due to their role as third parties which is being challenged by new models such as ICOs (Campino, Brochado, & Rosa, 2020). The database contains several key information on ICO projects, namely, information on the project itself (e.g. project's year), information on the campaign (e.g. threshold amounts) and information on the team (e.g. team composition). From the 556 projects available we were able to work with 428. The projects discarded had incomplete information which did not allow their correct analysis and could lead to a biased model. Complementing the mentioned database, we have collected information using the Twitter and LinkedIn social network platforms. Therefore, we were able to collect information on Twitter activity, such as the number of followers and activity during the ICO campaign, and on LinkedIn networks, such as the team member's number of connections from team members.

3.2. Variables Description

We were able to collect 26 independent variables using the methods previously described. These variables can be divided into 4 main groups: (i) project variables: related with the project's characteristics; (ii) campaign variables: related with ICO campaign characteristics; (iii) social network variables: related with the activity on social networks, and; (iv) team

variables: related with human capital characteristics. Concerning the dependent variable, we have used the logarithmic transformation of the total capital raised by each project denominated in US Dollars.

Concerning the project variables, we captured variables related with the project itself and obtained the following: (i) project rating: the rating attributed by an algorithm and by experts to the overall project; (ii) whitepaper: we have captured three main whitepaper's characteristics, namely, its length, the disclosure of the project's team and technical aspects; (iii) secondary market: captures the tradability of the token and therefore their success; (iv) restricted countries: number of countries in which the project has restrictions, and; (v) region: the project's region divided into North America, Asia-Pacific and Europe.

The variables capturing the campaign characteristics are focused on aspects relevant during the ICO campaign as follows: (i) pre-sales: captures the existence of tokens pre-sales; (ii) bonus scheme: captures the existence of bonus to investors; (iii) fundraising goal: captures the existence of financing thresholds, such as, soft-cap or har-cap limits; (iv) token price: captures the price the token was sold; (v) ICO duration: captures the number of days the campaign was active; (vi) cryptocurrencies average price: captures the yearly average price of Bitcoin and Ethereum, and; (vi) currencies accepted: captures the number of currencies the project accepts as investment.

Social networks have become an essential part of new ventures' promotion and we captured their characteristics as follows: (i) Twitter activity: activity during the campaign, the number of followers the project has and the number of tweets made; (ii) Github activity: captures the existence of a Github account and the existence of publicly available code before the ICO campaign, and; (iv) website active: captures the existence of an available website on May, 2020.

Concerning the team variables, we were able to capture the following aspects: (i) team members: number of members in the team; (ii) advisors: number of advisors in the project, and; (iii) LinkedIn connections: the sum of team members' LinkedIn connections.

There were several further variables which we were able to capture but have decided not to include in the model due to multicollinearity issues (Wooldridge, 2013). We were able to obtain several ratings attributed to the project, namely, the project rating, team rating, vision rating and product rating. These variables had a strong relation among them and although for prediction purposes this would not be an issue, collinearity could influence regression coefficients. Therefore, we have decided to keep only project rating because it is the more general rating capturing more project features. The same happened with Twitter followers and profiles followed by the project. A collinearity issue was present in this case and we have decided to keep only Twitter followers because, according to the literature, is an important characteristic and also because it was the variable considered statistically significant and with a higher coefficient.

3.3. Model and Propositions

We have used the software STATA 14 to develop the econometric model and perform several tests. We have firstly regressed the econometric model using the standard OLS method and performed a test to detect skewness and kurtosis which we verified was present. Therefore, we have performed a Shapiro-Wilk test which confirmed that the residuals were not normally

distributed (STATA, 2020a). There was also an issue with heteroskedasticity once the residuals exhibit non-constant variation confirmed by the Breusch-Pagan test and reinforced by the White's general test for heteroskedasticity which overcomes some limitation of the first test (Williams, 2020). We have confirmed that there was no issue with multicollinearity, after adjusting the variables, with a Variance Inflation Factor (VIF). Although the standard OLS method could be used it could also be biased and we have decided to run a robust regression using the command "*rreg*" in STATA (STATA, 2020b). Although the OLS estimator has dominated the literature, and the application of regression techniques the robust regression techniques appeared as a strong substitute to it once they offer protection against distortion of anomalous data (Li, 1985). This regression type was already used in the ICO literature (Jong, Roosenboom, & Kolk, 2018) and (Fisch, 2019). After regressing the models with the different methods, we have confirmed that they reach very similar results which we present. Furthermore, we will progressively add the variables in order to verify the coefficient and p-values behavior as a model's robustness check. With the econometric model we aim to confirm which are the relevant variables contributing to the ICO projects success within the categories described before (project, campaign, social network and team variables). We have tried to cover the literature on ICOs and the relevant variables highlighted and apply them to our database. Therefore, we aim to confirm if they can be considered relevant and their impact on banking/financial projects.

3.4. Database descriptive statistics

We present a descriptive statistics table and a frequencies table of the variables included in our model. We conclude that most of the projects are located in Europe, followed by Asia-Pacific region and North America. There are variables which besides its importance present great discrepancies, for instance, the existence of a secondary market or a technical whitepaper with few projects presenting positive results. Other variables behave as expected, for instance, most of the projects had an active Twitter campaign and have fundraising goals previously defined. We would like to highlight the project's rating mean which has a positive value of 3.

Figure 1 - Descriptive statistics and frequencies tables

	Descriptive Statistics				
	Observations	S.D.	Min.	Max.	Mean
Project Rating	428	0.76	1.10	4.9	3.15
Whitepaper Word Count	428	6738.09	0	88211	6464.51
Restricted Countries	428	6.47	0	124	1.56
Token Price Log	428	0.42	0	3.48	0.21
ICO Duration Days Log	428	0.43	0	2.76	1.67
Bitcoin Price Log	428	0.12	2.75	3.88	3.82
Ethereum Price Log	428	0.20	1.03	2.68	2.54
CCYs Accepted	428	2.02	1	30	2.23
Twitter: Followers Log	428	1.52	0	5.45	2.46
Twitter: Number of Tweets Log	428	1.14	0	3.85	1.72
Team Members	428	8.22	1	47	12.89
Advisors Log	428	0.35	0	1.23	0.34
Linkedin Connections Log	428	1.47	0	4.24	2.71

		Frequencies Table		
		Frequency	Percentage	Cumulative Percentage
Whitepaper: Team Disclosed	No	224	52%	52%
	Yes	204	48%	100%
	Total	428	100%	-
Whitepaper: Technical	No	344	80%	80%
	Yes	84	20%	100%
	Total	428	100%	-
Secondary Market	No	352	82%	82%
	Yes	76	18%	100%
	Total	428	100%	-
Region: North America	No	384	90%	90%
	Yes	44	10%	100%
	Total	428	100%	-
Region: Asia-Pacific	No	322	75%	75%
	Yes	106	25%	100%
	Total	428	100%	-
Region: Europe	No	209	49%	49%
	Yes	219	51%	100%
	Total	428	100%	-
Pre-sales	No	196	46%	46%
	Yes	232	54%	100%
	Total	428	100%	-
Bonus Scheme	No	236	55%	55%
	Yes	192	45%	100%
	Total	428	100%	-
Fundraising Goal	No	65	15%	15%
	Yes	363	85%	100%
	Total	428	100%	-
Twitter Active Campaign	No	177	41%	41%
	Yes	251	59%	100%
	Total	428	100%	-
Github Account	No	208	49%	49%
	Yes	220	51%	100%
	Total	428	100%	-
Github Code Prior ICO	No	272	64%	64%
	Yes	156	36%	100%
	Total	428	100%	-
Website Active on May, 2020	No	190	44%	44%
	Yes	238	56%	100%
	Total	428	100%	-

3.5. Results

We have regressed a model using the standard OLS method[1] and, due to data limitations, regressed a second model using the robust regression in STATA (table 4). As expected, we have obtained very similar results independently of the method used. Although the measure R-squared and adjusted R-squared are not the most appropriate measures to apply to a robust regression, we have decided to present them and use them since they are consistent with the values obtained when the standard OLS method was used. We have obtained a final R-squared of 0.36 for the OLS model and the robust regression, as well as a final adjusted R-squared of 0.32 for both methods. These measures increase with the inclusion of further independent variables progressively contributing for the variance of the dependent variable. Along with the inclusion of new variables in both models, the already existent ones keep their significance and new ones are added which can also be considered statistically significant. This is a proof of model's robustness being the only exception the binary variable location for North America in the robust model which can be considered significant in the second and third regressions but not in the final model. In both models the final variables which can be considered statistically significant are the same with very similar levels of significance and coefficients. We have proved statistical significance for the following project variables: (i) project rating; (ii)

[1] Detailed results available upon request to the authors.

whitepaper: team disclosed; (iii) whitepaper: technical and; (iv) secondary market. The campaign variables considered significant are: (i) bonus scheme; (ii) token price; (iii) ICO duration; (iv) Bitcoin price, and; (v) Ethereum price. Concerning the social network variables, the ones considered significant are: (i) Twitter active during ICO campaign, and; (ii) Twitter number of followers. The team variable considered significant is: (i) number of team members. Although not statistically significant we would like to highlight the importance of the existence of a fundraising goal as a good way of investors assessing the value of a token as highlighted in the literature. We would like also to highlight the importance of Twitter activity measured by the number of Tweets since, as in the literature, we have found that extremely active Twitter accounts, which put pressure on the investors may contribute negatively to project success.

Figure 2 – Robust regression model

	Model 1		Model 2		Model 3		Model 4	
	Project Variables		+ Campaign Variables		+ Social Networks Variables		+ Team Variables	
R2	0.24		0.33		0.35		0.36	
Adjusted R2	0.23		0.30		0.31		0.31	
Observations	428		428		428		428	
	Coeficient	Strd. Error	Coeficient	Strd. Error	Coeficient	Strd. Error	Coeficient	Strd. Error
Project Varibales								
Project Rating	0.86	0.22***	1.02	0.23***	0.89	0.27***	0.75	0.30**
Whitepaper: Team Disclosed	1.13	0.37***	1.07	0.35***	1.06	0.35***	0.99	0.36***
Whitepaper: Technical	2.18	0.43***	1.96	0.42***	1.96	0.42***	1.89	0.42***
Whitepaper: Word Count Log	0.05	0.13	0,00	0.12	-0.03	0.12	-0.01	0.12
Secondary Market	2.32	0.43***	1.44	0.44***	1.37	0.44***	1.40	0.44***
Restricted Countries	-0.01	0.02	0,00	0.02	-0.01	0.02	-0.01	0.02
Region: North America	-0.50	0.66	-1.11	0.62*	-1.15	0.62*	-1.03	0.63
Region: Asia-Pacific	0.24	0.54	0.12	0.51	-0.01	0.51	-0.02	0.51
Region: Europe	0.40	0.49	0.12	0.46	0.02	0.46	0.06	0.46
Campaign Varibales								
Pre-sales			-0.18	0.32	-0.11	0.31	-0.14	0.32
Bonus Scheme			0.62	0.33*	0.73	0.33**	0.76	0.33**
Fundraising Goal			0.55	0.44	0.58	0.44	0.54	0.45
Token Price Log			0.72	0.37*	0.75	0.37**	0.70	0.37*
ICO Duration Days Log			-0.66	0.38*	-0.89	0.39**	-0.83	0.39**
BTC Price Log			-10.16	1.82***	-9.61	1.82***	-9.32	1.83***
ETH Price Log			4.49	1.01***	4.47	1.01***	4.12	1.03***
CCY Accepted			0.05	0.08	0.07	0.08	0.06	0.08
Social Netowrk Varibales								
Twitter Active Campaign					1.07	0.43**	1.07	0.44**
Twitter Followers Log					0.30	0.20	0.33	0.20*
Twitter Number of Tweets Log					-0.40	0.28	-0.43	0.29
Github Account					0.01	0.46	-0.05	0.46
Github Code Prior ICO					-0.19	0.46	-0.11	0.46
Website Active on May, 2020					0.09	0.34	0.05	0.34
Team Varibales							0,00	0,00
Team Members							0.05	0.02**
Advisors Log							-0.02	0.49
LinkedIn Connections Log							-0.07	0.13

Significance levels: p < 0.01 (***); p < 0.05 (**); p < 0.1 (*)

4. Conclusions

Our preliminary research explores some literature on the ICOs' success factors topic and explores the already identified factors which influence the outcomes of the projects. We were able to collect a database and regress an econometric model using a robust regression method. From our analysis we have identified several characteristics which have an impact in the success of the project and have divided them into categories: (i) project's variables; (ii) campaign variables; (iii) social network variables; (iv) team variables. We have concluded that ratings attributed by third parties influence and are predictors of a project's outcome as well as the disclosure of key information in the whitepaper. The secondary market is also crucial to guarantee ICO's success. Our data reveals that investors prefer more expensive tokens compensated with bonus schemes and usually shorter campaigns mean positive outcomes. Cryptocurrencies' prices are linked to the success of a project as well as a well-managed Twitter campaign. Larger teams also mean better outcomes. This research contributes to the emerging literature on ICOs being able to capture several success factors and apply them in one single database which allowed the results confirmation of previous studies adding also further insights. Contributions to ICO investors and promoters concern a deeper knowledge of ICO project's functioning and the factors considered the most important to their success. Regulators should also look at the existing literature in order to tackle future regulatory challenges. We add useful insights on this field particularly in the whitepaper's analysis building up on the literature which states the importance of this document and its' contents.

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