ICOs as New Financing Tools: What factors are important for the measurement of its success?

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Abstract

Initial Coin Offerings (ICOs), being unregulated fundraising means with lower transactional costs, attract large pool of small and big investors. This paper is aimed to give theoretical and technical background for this new phenomenon in equity crowdfunding, and by empirical study of 90 ICOs launched during 2017 and 2018, determine the important factors to be considered by potential investors in their decision-making process.

This being said, I further examined Amsden & Schweizer's newly developed model (2018) of measuring ICO success on the theoretical framework of venture uncertainty, venture quality and investor opportunity set with an emphasis to first two factors being venture uncertainty and quality. With regards to those two theoretical measures of success, two observational variables were added to Amsden & Schweizer's model. Variable indicating number of platforms where token is listed was added to ICO characteristics set of variables with an intention to decrease the venture uncertainty component hindering the success of an ICO while variable indicating the presence of a law practitioner among the team was added to the team characteristics set of variables with an intention to both increase the venture quality by enhancing the human capital and decrease the venture uncertainty. Both variables added have proven their positive impact on the measurement of ICO Success.

Keywords: Blockchain, Equity Crowdfunding, Initial Coin Offerings, Crowdsale, Token

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All remaining errors are mine.

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Abbreviations

ICO – Initial Coin Offerings

IPO – Initial Public Offerings

VC – Venture Capital

WP – Whitepaper

SEC – Securities and Exchanges Commission

1. Introduction

After ten years of its existence, blockchain technology has evolved from a by-product of bitcoin development to a forecasted $10 trillion market (Steves, 2018), with economically significant and wider ranges of uses in almost every industry (Pilkington, 2016). Blockchain technology is being used worldwide and has evolved to record ownership of tangible and intangible assets such as intellectual property, property rights, products within supply chains, smart contracts and of course a huge number of cryptocurrencies (Pilkington, 2016).

The key idea is that the decentralized transaction ledger functionality of the blockchain could be used to register, confirm, and transfer all manner of contracts and property. Table 1 lists some of the different classes and examples of property and contracts that might be transferred with the blockchain (Swan, 2015). Satoshi Nakamoto started by specifying escrow transactions, bonded contracts, third-party arbitration, and multiparty signature transactions (Nakamoto, 2008).

Table 1: Blockchain Applications beyond Currency (adapted from the Ledra Capital Mega Master Blockchain List)

Class	Examples
General	Escrow transactions, bonded contracts, third-party arbitration, multiparty signature transactions
Financial Transactions	Stock, private equity, crowdfunding, bonds, mutual funds, derivatives, annuities, pensions
Public Records	Land and property titles, vehicle registrations, business licenses, marriage certificates, death certificates
Identification	Driver's licenses, identity cards, passports, voter registrations
Private Records	IOUs, loans, contracts, bets, signatures, wills, trusts, escrows
Attestation	Proof of insurance, proof of ownership, notarized documents
Physical Asset Keys	Home, hotel rooms, rental cars, automobile access
Intangible Assets	Patents, trademarks, copyrights, reservations, domain names

Source:ledracapital.com

All financial transactions could be reinvented on the blockchain, including stock, private equity, crowdfunding instruments, bonds, mutual funds, annuities, pensions, and all manner of derivatives. In this paper, the implementation of blockchain technology for reinventing crowdfunding is discussed. This phenomenon is called Initial Coin Offerings (ICOs) which are a new and unregulated form of crowdfunding where entrepreneurs raise the funds needed by selling the venture-related tokens or coins in exchange for legal tender, for cryptocurrencies, etc. (Investopedia). Despite being a recent phenomenon which became prevalent in 2017 with the widespread adoption of Ethereum blockchain platforms, ICOs have raised in 2017 about $7.5 billion, versus $3.6 billion for venture capital (Ernst & Young, 2017). However due to their degree of novelty, very little is yet known about the rationale behind ICOs and essential factors of success present for understanding the entrepreneurship required in this equity fundraising method. So, with this paper, I am going to unfold the process behind ICOs by first of all giving a short explanation of the blockchain technology behind this crowdfunding tool (Swan,2015), followed by more technical part of describing the procedures of an ICO project launch and types of tokens issued throughout those crowdsales.

Furthermore, after highlighting the differences with existing methods of equity fundraising, empirically examining the success determinants for an ICO project becomes even more essential for these tools.

This being said, my research objective is to examine the success factors of ICOs which are essential to understanding the entrepreneurship required in this crowdfunding tool.

For the empirical part of my research, I adopted the theoretical framework of how venture uncertainty, venture quality, and investor opportunity set correlate with ICO success being measured as the total amount raised in ICO (Amsden & Schweizer, 2018). My model of ICO success based on Amsden & Schweizer's model along with two observational considerations added and within the context of the dataset I have collected and the time period under consideration for my sample shows the following notable connections:

- explanatory variables of the presence of an ICO on Github, originating from G20 countries which agreed upon blacklist for tax havens(variable tax haven), number of exchange platform where a token is listed and number of White paper pages are there to reduce the venture uncertainty and thus, contribute to the success of an ICO while

- Accepting Fiat in exchange for tokens proved to be negatively correlated to ICO success as in theory, being open for investments issued in fiat will most likely lead to higher level of uncertainty as the venture is exposed to the possibility of interventions by regulators

- Venture quality examined via the variables indicating human and social capital(Baum and Silverman, 2004) of the project showed positive statistical significance for the measurement of an ICO success

- Two observational variables added to the model of Amsden & Schweizer (2018) by me have proven their positive impact on the measurement of ICO success

These considerations are observed on a sample of 90 observations of ICOs launched from 2017 to 2018. This time period was chosen to have in mind the rapid growth of popularity of Initial Coin Offerings starting from 2017, followed by Securities and Exchange Commission's legal definition and regulation of ICO securities tokens (SEC Enforcement, 2017). One of my observational variables (variable the presence of law practitioner in the team) which showed positive significance for the total amount raised in ICO was, in fact, an assumption from data sample construction consideration of SEC regulation. As there is no legal definition of utility tokens, failure to describe the utility token type in White paper with reference to the incompatibility of "Howey" test of SEC for defining security tokens will automatically list those utility tokens as securities (Wilmoth, 2018).

Furthermore, the data collection process was full of deviations of collected data variables and cross-checking was done for more accurate information generation. However, it is worth mentioning that unregulated nature of the market and heterogeneity among ICOs contribute to higher information asymmetries in an ICO context compared to any other equity crowdfunding. Hence, as Ahlers et al. (2015) argue about the importance of empirically studying equity fundraising methods, I believe that this consideration in the direction of research about ICO markets is one of the major components to consider and support.

2. Literature review

The theoretical part of the research utilizes a book Blockchain Blueprint for a New Economy written by Melanie Swan (2015). This technical orientated book promptly explains the perspectives blockchain technology integration are able to open for different kinds of financial services, and far beyond the world of finance. In addition, the research uses the Whitepapers of most successful ICO projects (although not

addressed by the term Initial Coin Offerings) for defining the components which help to attract the crypto-community to invest in tokens and ICO projects implementation. Moreover, the author in one extensive chapter in details and in technical manner explains the Blockchain 2.0 protocol and the terminology that broadly refers to the Blockchain 2.0 space being smart contracts, Dapps(decentralized applications), DAOs(decentralized autonomous organizations) which are important components for understanding the rationale behind integrating blockchain based decentralized models in crowdfunding.

For the empirical study of determinants of ICO success, several models were considered. Baum and Silverman (2004) argue that when faced with great uncertainty about the quality of startups, Venture Capitals(VCs) will rely heavily on the startups' partners, patents, and top management team characteristics to make judgments about the success of the venture measured by the likelihood of a startup's survival opportunity and its financial prospects**;** and that in the race for capital, startups succeeding in establishing alliance partners(human and social capital), creating intellectual property, and possessing capable management will outperform comparable startups that lack such capabilities. Baum and Silverman estimate a model determining the effects of social, intellectual and human capital on venture funding observed in the context of Canadian biotechnology industry from 1991 to 2000.

Ahlers et al. (2015) adopts the model of Baum and Silverman for testing the relationship between project quality characterized by human capital, social capital (alliance) and intellectual capital and funding success on equity crowdfunding and proposes a hypothesis of higher project quality characterized by those three components being positively correlated with funding success on equity crowdfunding platforms. However, the empirical results of the study indicate only the positive statistical significance of human capital on funding success of equity crowdfunding platforms based on their data from ASSOB platform (Australia).

Although Ahlers et al.'s research (2015) does not succeed to find sufficient evidence proving the significance of social alliance component for funding success which was significant in Baum and Silverman's research, the research has great literature support for this component having positive influence on funding success in equity crowdfunding emphasizing the importance of study and measurement of social alliance and its influence on venture quality and venture uncertainty elimination.

In order to fit all these models in the context of ICO funding, Amsden & Schweizer (2018) developed their model of ICO success based on both Baum and Silverman's (2004) and Ahlers et al.'s (2015) theoretical framework of measuring equity crowdfunding success. They put three hypotheses that

relate venture quality, venture uncertainty, and investor opportunity set as determinants of ICO success. By categorizing four sets of independent variables being ICO Characteristics(ETH platform, Github, patent, restricted areas, tax haven, Telegram, whitelist, and # WP pages), Financial Details(# accepting cryptocurrencies, accepting FIAT, % distributed in ICO, ICO-bonus, # of tokens, min-contribution, and soft cap), Team Characteristics(# advisors, CEO LinkedIn 500+, CEO LinkedIn followers, and team size) and Cryptocurrrency Dynamics(ETH volatility and ETH value), Amsden & Schweizer define the ICO Success by running three different regressions with success measures of token tradability, being listed on CoinMarketCap.com and total amount raised in ICO. With their empirical results, they succeed to prove the negative correlation between ICO success and venture uncertainty measured by explanatory variables in ICO characteristics and financial details block of independent variables. Furthermore, Amsden & Schweizer analyze the positive relationship between the ICO success and venture quality measured by human capital and social alliance.

Due to their degree of novelty, still, there is very little known about Initial Coin Offerings as an alternative equity crowdfunding tools. However, despite this lack of researches on this topic, I decided to take this challenge and by both, the qualitative and empirical study of the topic, add my own contribution to its literature.

3. Reinventing Financial Services through Blockchain Technology: Crowdfunding Reinvented

As a prime example of how financial services are being reinvented with blockchain-based decentralized models is crowdfunding which will be explored deeply throughout this research paper. The idea is that peer-to-peer fundraising methods such as Kickstarter can replace the need for traditional venture capital funding for startups. Where previously a centralized service like Kickstarter or Indiegogo was needed to enable a crowdfunding campaign, crowdfunding platforms powered by blockchain technology remove the need for an intermediary. Blockchain-based crowdfunding platforms make it possible for startups to raise funds by creating their own digital currencies and selling “cryptographic share” (although not necessarily shares) to early backers (Swan, 2015). Investors in a crowdfunding campaign receive tokens that represent shares of the startup they support. Here emerges the relatively new term describing that process of a new and unregulated form of crowdfunding that raises funds through a blockchain by selling venture-related tokens or coins in exchange for legal tender or

cryptocurrencies or even a work completed by an employee (receiving compensation for the work done) – Initial Coin Offerings (ICOs).

Some of the leading and pioneer cryptocurrency crowdfunding platforms include Swarm (https://www.swarm.co/), an incubator of digital currency-focused startups that raised $1 million in its own crowdfunding, completed in July 2014. Holding the company's own cryptocurrrency, Swarmcoin, gives investors rights to the dividends from the startups in the incubator's portfolio.

In Japan, a Bitcoin crowdfunding site, bitFlyer, has launched as a part of the general crowdfunding site fundFlyer (http://fundflyer.bitflyer.jp/). BitFlyer, as well as other exchange platforms like Binance (https://www.binance.com/), have recently initiated an ICO and started to issue their own tokens which enable to pay for different kind of services in their exchange platforms, thus increasing the circulation of their coins by the integration of their tokens in their business model(Binance WP, n.d.)

Note that tokens issued by BitFlyer or Binance are by their nature different than as of previously mentioned Swarmcoins which are equity tokens. This is another kind of tokens sales, utility tokens sales, which will be explained in details in further sections.

And as importantly Ethereum, a platform and a programming language for building and publishing distributed applications based on blockchain protocol (smart contract applications platform), was funded through pre-sale of Ether tokens for Bitcoin back in July 2014 (Coindesk, 2014). Moreover, in November 2014, bitcoin blockchain platform Counterparty announced that it had ported the open source Ethereum programming language onto its own platform. The implication was that Counterparty re-created Ethereum on the existing blockchain standard, Bitcoin, so that these kinds of smart contracts might be available now, without waiting for the launch (and mining operation) of Ethereum's own blockchain(Swan, 2015). With this background and timeline, it is important to note the sign of the dynamism in the space and the rapid innovation that open source software enables in this sector like it was in the case of Ethereum and Counterparty. So, it can be stated that any individual or any other blockchain industry project can freely examine and work with the code of other projects and bring it into their implementations and this is the whole proposition of open source software on which ICOs are based.

4. Mechanics of ICO Market

- ICO private sale: The sale of tokens to early investors (mainly friends and family)

The sale of tokens in this stage are not open to the public. Discounts are offered and quite big discounts take place as in this stage, the uncertainty level is quite high taking into account there is not even a porotype of the service or product to be delivered after the launch of the venture. Moreover, there is a possibility of purchasing more tokens compared to ICO or pre-ICO stage since private sale usually aimed at institutional level investors(Medium, 2018).

- ICO presale: The sale of tokens conducted before the main ICO

This stage of token sales is open to the public and is announced through their website. In terms of venture uncertainty, relatively lower uncertainty is involved at this stage due to the fact that entrepreneurs make expenses to promote their tokens on different social media and crypto exchange platforms. Moreover, an ICO presale provides a good middle ground for investors wanting a higher discount or bonus compared to ICO crowdsales without the drawbacks or the high risks associated in participating in a private sale (Token Public Presale Conditions, 2018).

- ICO crowdsales: The main sale of tokens

In this stage, the tokens are being promoted more intensively and these promotional activities together with the availability of MVP or already mature product (although rarely) decrease the investment risks. However, the bonuses or discounts are lesser compared to pre-ICO and private sale.

The stages described above relate to those ICO projects that use already existing blockchain platforms. However, it is also possible to conduct an ICO which will eventually crease its own blockchain. Under these circumstances, investors are sold simple agreement for future tokens (SAFTs) as a claim (investment contract) of their ownership of the tokens once the blockchain will be completed. They were created as a way to help new cryptocurrency ventures raise money without breaking financial regulations; specifically, regulations that govern when an investment is considered a security and is subject to regulation (Investopedia, 2018). So, a simple agreement for future tokens (SAFTs) is sold to an investor without having in exchange a coin or token distributed and instead, only documentation

providing an indication that in the event that a cryptocurrrency or other product is created, the investor will be given an access to these much of tokens or coins. The major investor risk associated with them is the possibility of losing the invested money as the investment agreements SAFTs, being non-debt financial instruments, only allow investors to take a financial stake in the venture and have no recourse if the venture fails (Investopedia, 2018).

Although the risk associated with them, Business Insider reports that VCs are experimenting with SAFTs as a way to get involved early on as more and more blockchain startups look to raise funding (2017). In addition, SAFTs are costlier from entrepreneurs' perspectives in terms of the need to create an ongoing incentive mechanism (mining) to attract people to validate its own ledger. And almost nonexistent market dynamics up until late 2015, when Ethereum platform started to serve as a platform which enabled creating ICOs on it through smart contracts is actually explained by the technical and cost challenges exposed in the process of SAFTs (Amsden & Schweizer, 2018).

5. Types of Tokens

5.1. Security Tokens

A security is a fungible, negotiable financial instrument that holds some type of monetary value (Investopedia). Through ICO projects, investors are given opportunities to issue a wide variety of security tokens, ranging from coins redeemable for some precious metals to tokens backed by real estate (Wilmoth, 2018). However recently, the unregulated phenomenon of ICOs became invalid for tokens reviewed to be securities. In the US, in the major market of ICOs, security tokens' sales are subject to Securities and Exchange Commission's (SEC) securities regulation. SEC decided that any token that passes the "Howey" test is likely to be considered a security, and thus being subject to the Securities Act of 1993 and the Securities Exchange Act of 1934 (SEC Enforcement, 2017). The "Howey" test considers the sale of a token to be an investment contract if purchasers 1) invest valuable goods or services, 2) are investing in a common enterprise, 3) have reasonable expectations of earning a profit, and 4) earn profits that are dependent on the efforts of others (SEC Enforcement, 2017).

5.2. Utility Tokens

As ICO projects are mostly viewed as investment opportunities initiated by crowdsales, the majority of tokens are likely to be considered securities (Wilmoth, 2018). However, if they fail to pass the "Howey" test proposed by SEC, those tokens are most probably utility tokens. The idea behind utility tokens (also known as app coins) is that these coins give access to a product or service after being listed in an exchange platform and starting to be traded.

For example, Filecoin (https://filecoin.io/), the largest ICO ever by the total amount raised, is going to provide a decentralized cloud storage service in terms of the tokens distributed which will be used to purchase storage space from Filecoin once it will be launched and will be listed in different exchange platforms(Lielacher, 2017).

In addition, entrepreneurs of ICO projects distributing utility tokens should describe their tokens as a utility token in their white paper, as failing to do so, regulators can consider those tokens as securities. It is important to note that SEC has not given an official guidance on app coins compared to security tokens and "utility token" is an organizational distinction, not a legal one (Wilmoth, 2018).

5.3. Equity Tokens

This categorization is not as widely used as it is in cases of security and utility tokens, however, few startups have already attempted to conduct equity token sales and issue tokens representing stock or equity of a company having in mind the opportunities the blockchain backed crowdfunding will open for some investors which face barriers to enter financial markets (Wilmoth, 2018). So, several successful examples of these kinds of ICO projects, give hints on the potential expansion of equity tokens' sales.

Having discussed utility tokens which have similar funding designs to donation- and reward-based crowdfunding, and security tokens along with equity tokens, which have similar funding designs to equity crowdfunding, lending crowdfunding, and venture capital funding, the proceeding section will consider alternative equity fundraising tools and costs associated with them in short with relation to ICOs.

6. Initial Coin Offerings: Where do they stand as equity fundraising tools?

The issue of not being attractive private equity market faces is mainly connected to the risk that initial investment never sees any profit, as the only viable ways to get return are through an Initial Public Offerings (IPO), merger or acquisition, or sale of the company (Lamarque, 2016). The illiquidity problem is still prevalent in the market. Moreover, the risk for an investor continues to increase by the time as the overall transactional costs for going public and acquiring capital through fundraising are rising, as companies prefer to stay private longer than before (TrueBridge Capital, 2015).

The IPO cost for the company is usually 7% of its post-IPO valuation (Berk, DeMarzo, Harford, 2012). However, there are other cost components being the involvement of intermediaries (investment banks, management consultants, lawyers, and so on). Moreover, when going public, audited financial statements should be prepared, updated and presented in line with a specific document called prospectus describing the investment offering in details and in accordance to Securities and Exchange Commission (Berk, DeMarzo, Harford, 2012). It is important to note that we cannot really compare the prospectus issued for IPOs with White papers of ICOs, despite both providing details about the investment offering and disclosing the business ideas, as there is no consistent format for Whitepapers due to diverse nature of ICO projects (Buterin, 2017). All those procedures add to the transaction costs of going public and by making them higher, unattractive for a big market of small companies.

With relation to the issues described above when going public, ICOs by their nature are capable of ensuring liquidity, thus being attractive for investors. Unlike in other fundraising tools being Venture Capital, Crowdfunding and IPOs as well, the ownership transfer is verifiable and is processed without the need for a central intermediary. Moreover, not introducing high costs and barriers for participation, Initial Coin Offerings are open for every kind of investors. With ICO liquidity, a savvy investor who believes in the product could participate in the ICO, not for the product itself, but to resell the acquired token for a profit at a later point in time (Amsden & Schweizer,2018). An investment gain can simply be acquired even through reselling the acquired token right at the moment of token launch in the market when having those tokens purchased during the private or public pre-sale with discount or bonus.

However, on the other side, most ventures launched through ICOs are yet ideas, not a product. Ernst & Young (2017) found that only 5% of ventures had running projects, 11% had prototypes and the vast majority (84%) is merely ideas. So, it is obvious that most of those projects which are in their “idea”

stages will undergo major changes of their concept from the time of being in ICO to their final product launch. This uncertainty in line with having high information asymmetries due to voluntary adherence to regulations and no consistent format when disclosing information about the venture and the use of funds through White papers given the heterogeneity among ICOs (which can be updated by entrepreneurs whenever needed) makes it clear that empirically examining the success determinants for an ICO project becomes really essential. Thus, the further sections of my paper will concentrate on this important aspect of Initial Coin Offerings and will examine the success factors which are important to understanding the entrepreneurship needed in this equity fundraising method.

7. Data Collection

The data was compiled manually. My sample includes 90 observations of ICOs launched from 2017 to 2018. This time period was chosen to have in mind the rapid growth of popularity of Initial Coin Offerings starting from 2017, followed by Securities and Exchange Commission's legal definition and regulation of ICO securities tokens. As ICO phenomenon is new, it was expected to have some data inconsistencies with various sources. As major and more reliable sources for data collection the websites *coinmarketcap.com, icobench.com, cryptoslate.com, coinschedule.com, and icomarketcap.com* were used. In some cases, other sources were also considered due to a complete absence of some parts of information required to run the model. The process of data collection took quite a lot of time as for compiling the necessary information skimming on average 32 pages of White papers of each ICO was compulsory for complete data formulation. The data was collected with assistance and guidelines of Dr. Denis Schweizer, whose model (Amsden & Schweizer, 2018) is adapted for determining the ICO success formula. Throughout email communication, he assisted me with some issues faced during the collection of data. In their paper, they addressed the inconsistencies of data needed in different sources and have identified 15% deviation of collected data variables. However, among my observation, I came across cases where the deviations between data variables from major sources identified were twice. While together considering those cases, I was advised to consider White papers as the information disclosed there are being updated more frequently.

8. Data Limitations

So, as indicated in Data Collection section, data inconsistencies is one of the limitations I want to highlight my research topic. Furthermore, some ICOs which have already launched their products or services, removed their White papers from their websites making it impossible to cross-check information acquired from websites with their original source. This example resulted from unregulated nature of the market once again indicates higher information asymmetries in ICO context compared to other equity crowdfunding means being venture capital, crowdfunding (Ahlers et al.,2015).

9. Methodology

My model is adopted from Amsden & Schweizer's (2018) research which was built on the framework of Baum and Silverman's (2004) and Ahlers et al.'s(2015) venture and (equity) crowdfunding selection criteria. Amsden & Schweizer's model is first to delineate and describe the characteristics of a successful ICO during the whole time of its existence (having 1009 observations) by developing a theoretical framework of how *venture uncertainty*, *venture quality*, and *investor opportunity set components measured by explanatory variable blocks ICO characteristics, financial details, team characteristics and cryptocurrency dynamics* correlate with ICO success measured by the total amount raised and token tradability.

To illustrate the success of an ICO based on my dataset, the following regression was conducted:

$$ICO\ Success = \alpha + \Sigma\gamma i * \text{ICO Characteristics} + \Sigma\phi j * Financial\ Details + \Sigma\xi k * \text{Team Characteristics} + \varepsilon$$

ICO success is measured by total amount raised, which indicates the logarithm of the sum of funds raised in the ICO being analyzed using OLS. Detailed descriptions of all three sets of independent variables are disclosed in Table 1 (see Appendices). The main explanatory variables in the *ICO characteristics* block are *ETH platform*, *Github*, *restricted areas*, the *tax haven*, *Telegram*, *whitelist*, number of *Whitepaper pages and number of exchange platforms where the token is listed*(my

observational variable added to the ICO characteristics set of Amsden & Schweizer's model). The *financial details* block includes *the number of accepting cryptocurrencies*, *accepting FIAT*, *% distributed in ICO*, *ICO-bonus*, *and total token supply*. The *team characteristics* include the *number of advisors*, the component of law practitioner among team and/or advisors (my observational variable added to the team characteristics set of Amsden & Schweizer's model), *CEO LinkedIn 500+* and *team size*.

Some explanatory variables considered by Amsden & Schweizer were excluded from my model due to unavailability of data access (patent information disclosed in Whitepapers, soft capitalization, minimum contribution, etc.).

10. Emphirical Results and Discussion

Table 2 below gives descriptive statistics for one dependent and 18 independent variables. We see that on average the ICOs on my dataset raised $55 million. It is important to note that Schweizer's model(2018) has a mean of $14 million and this huge differences in the average amounts raised besides being due to the big difference between sample sizes and different time periods for consideration, is also explained by the fact that my sample used recent ICOs launched in 2017(mainly in the second half) and in 2018 with a widespread adoption of Ethereum blockchain: market capitalization of blockchain-based coins and tokens rose from $2.4 billion to $373 billion, excluding bitcoins (Coinmarketcap.com).

Table 2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
totalamoun~d	87	5.50e+07	2.35e+08	1012863	2.20e+09
platform	90	.9111111	.2861776	0	1
github	90	.6888889	.4655417	0	1
preico	90	.2666667	.4446941	0	1
restricted~s	90	.2666667	.4446941	0	1
taxhaven	90	.6444444	.481363	0	1
telegram	90	.7888889	.4103833	0	1
whitelist	90	.0888889	.2861776	0	1
ofplatform~d	90	11.5	16.56533	0	134
pagesinwhi~r	88	31.76136	15.65504	8	85
acceptingc~s	90	1.711111	1.359481	1	8
acceptingf~t	90	.1555556	.3644639	0	1
distribute~o	90	54.30389	21.5427	2	100
icobonus	90	.5111111	.502677	0	1
oftokens	90	2.43e+10	2.07e+11	1000000	1.96e+12
ofadvisors	90	6.577778	2.710685	1	13
oflawyers	90	.6777778	.4699457	0	1
ceolinke~500	90	.8222222	.3844675	0	1
teamsize	90	13.92222	7.812735	4	49

Furthermore, from the table 2, we can see that the vast majority of the launched ICOs are Ethereum platform based. EY Research published (2017) also supports the fact that the majority of ICOs are on Ethereum platform. Approximately 70% of my observations collected have a presence on Github and approximately 90% are active on Telegram. Roughly half of the ICOs incorporated bonuses in their model for incentivizing investments. On average, 2 different cryptocurrencies are accepted while roughly 15% of ICOs observed accept fiat in exchange of their tokens. This low result is quite expected to have into consideration the nature of ICOs and the institutional background of ICOs being blockchain technology.

On average 24.3 billion tokens were issued for ICOs, having them listed on average 12 exchange platforms. The average number of pages of White papers is 32 which is a good indicator. Although the quality of paper measures the quality of WP in part, the average number of 32 is able to indicate the inclusion of commercial, technological and financial details of the project which are important for an investment decision to be made.

Teams of ICOs under consideration usually consist of 14 members, with 7 advisors and 67% of them having a law practitioner among the teams and/or the advisors.

The results of 5 OLS regressions are summarized in Table 3 (see below). I have first run the regression to see the relationship between my dependent variable being the logarithm of the total amount

raised for each ICO and each set of independent variables being ICO characteristics, financial detail and team characteristics separately.

For each set of regressions, variance inflation factors were calculated and the results indicated no evidence of multicollinearity being present (see Table 2, Appendices). Then all 19 variables were considered simultaneously after which the major insignificances were excluded to have a stronger model of determining ICO success among my dataset. It is worth mentioning that the cumulative number of significant variables influencing the success of an ICO regressed separately with each set of independent variables is the same as the number of factors identified when using all sets simultaneously and when constructing better and final model.

For my final model of OLS, White test was conducted (see Table 3, Appendices) indicating homoscedasticity in the data. Furthermore, normality was also tested by conducting the Skewness-Kurtosis (Jarque Bera) test which indicated that the residuals are not normally distributed at 10% significance level (see Table 4, Appendices). Having into mind the asymmetries, discreteness, and boundedness of the observable cross-sectional data, I will proceed with the model and data analysis.

Table 3: OLS Model for Determining ICO Success (* p<0.1, ** p<0.05, *** p<0.01)

	(1) Y	(2) Y	(3) Y	(4) Y	(5) Y
platform	-0.306			-0.648	-0.618
	(0.417)			(0.440)	(0.418)
GitHub	0.401			0.406	0.416*
	(0.243)			(0.248)	(0.237)
preico	-0.334			-0.146	
	(0.242)			(0.302)	
restrictedareas	0.139			0.118	
	(0.271)			(0.269)	
taxhaven	0.329			0.560**	0.544**
	(0.221)			(0.241)	(0.225)
telegram	0.562*			0.428	0.387
	(0.293)			(0.300)	(0.276)
whitelist	-0.659			-0.624	-0.567
	(0.426)			(0.429)	(0.352)
ofplatformsthetokenislisted	0.0358***			0.0326***	0.0332***
	(0.00633)			(0.00783)	(0.00682)
pagesinwhitepaper	0.0167**			0.0208***	0.0199***
	(0.00687)			(0.00728)	(0.00700)
acceptingcryptos		-0.0170		0.108	0.0973
		(0.0988)		(0.0881)	(0.0841)
acceptingfiat		0.242		-0.675*	-0.640**
		(0.368)		(0.340)	(0.318)
distributedinico		0.0133**		0.00220	
		(0.00580)		(0.00551)	
icobonus		-0.491**		-0.363	-0.412*
		(0.247)		(0.287)	(0.227)
tokensupply		0.0911		0.000876	
		(0.0644)		(0.0624)	
ofadvisors			0.131***	0.0987**	0.103**
			(0.0438)	(0.0415)	(0.0390)
lawyers			0.590**	0.452*	0.460**
			(0.255)	(0.231)	(0.223)
ceolinkedin500			-0.0678	0.268	0.309
			(0.299)	(0.283)	(0.268)
teamsize			0.00637	-0.0290*	-0.0303**
			(0.0151)	(0.0149)	(0.0144)
_cons	15.37***	14.52***	15.52***	14.70***	14.83***
	(0.529)	(1.416)	(0.390)	(1.498)	(0.582)
N	85	87	87	85	85
R^2	0.420	0.116	0.193	0.525	0.521

Being represented on Telegram, on average, increases the total amount of the ICO project by 56%, compared to the projects which are not represented on Telegram, everything else held constant**.** This relationship is present when considering the block of ICO characteristics variables independently from the rest of independent variables; however, the positive statistical significance is lost when we include all sets of explanatory variables.

On the other side, the opposite situation is observed for another variable of same nature. Being represented on Github in the final model brings to app. 42% increase in the total amount raised in ICO. The similar situation is observed in empirical results of Amsden & Schweizer. Being present on Telegram and Github imply relatively less venture uncertainty and thus, contributing to the ICO success model (Amsden & Schweizer, 2018).

The variable indicating the number of platforms the token is listed I added to Amsden & Schweizer's model of ICO success with an intention to further demonstrate the negative relationship between ICO success and venture uncertainty. And as it was expected, there is a positive correlation between the variable and total amount raised. If the number of exchange platforms where the token of ICO is listed increases by 1 on average, the total amount raised increases by app. 3%, everything else held constant. Investors are more convinced about their future success having greater number of exchanges where their tokens are tradable and thus, decreasing the uncertainty around the venture.

Furthermore, the bonus in the ICO (variable ICO bonus) and accepting Fiat currencies (variable accepting Fiat) are statistically significantly negatively related, to the amount raised in the ICO. Having negative correlation for the variable ICO bonus is surprising to have into consideration that bonuses are helpful for attracting and obtaining funding from early contributors, which has been shown to positively correlate with funding success in crowdfunding (Hornuf and Schwienbacher, 2017). With regards to negative statistical significance of variable accepting Fiat, Amsden & Schweizer (2018) argue that this negative relationship signals the insecureness of raising required funding from "cryptocurrrency investors" and thus, being open for "Fiat investors" as well, which consequently can expose the venture to the possibility of interventions by regulators to take control, e.g. by freezing bank accounts(Amsden & Schweizer,2018). Theoretically, similar scenarios implied by the acceptance of Fiat currencies are somewhat contradicting the rationale behind blockchain technology and ICOs.

In addition to venture uncertainty being a hurdle for an ICO success, the positive correlation with White paper pages (variable number of pages in Whitepaper) and with being among G20 countries which

agreed upon blacklist for tax havens (variables tax haven) is obvious. The total amount raised in ICO increases by app. 2% for one page increase in the number of pages of White paper everything else held constant. As already said, although being partly measure of the quality, longer White papers are in fact capable of decreasing venture uncertainty. Moreover, originating from G20 countries, on average, increases the amount raised by app.54%. Although Amsden & Schweizer's findings do not indicate statistical significance for tax haven variable in determining ICO success, token offerings launched in G20 countries which agreed upon blacklist for tax havens should reduce venture uncertainty for potential investors and minimize the risk of future regulatory costs to ventures by their nature (Amsden & Schweizer, 2018).

It is interesting to note that Amsden & Schweizer's empirical results demonstrate negative correlation with the presence of Ethereum platform for an ICO success (variable platform) due to the existence of largest ICO "outliers" which are based on their own blockchain platforms to eliminate the limitations in the functionality of Ethereum platform. In this aspect, my data results are not in line with Amsden & Schweizer's model and the variable platform is insignificant for determining ICO success based on my dataset. This can be explained by the time period factor according to which my dataset was collected. As mentioned in the introductory section of my research paper, during the launch of Ethereum ICO, other blockchain initiations were created to follow the dynamics of blockchain technology development and address the limitations being in place.

What is more, when considered independently under the variable set of financial details, the variable which indicates the percentage of tokens distributed in ICO is positively correlated with ICO success and a percentage change of the variable increases the total amount raised of an ICO by 1.3%. However, this significance is lost when all other variables are considered simultaneously. In different circumstances, Amsden & Schweizer's model shows a negative relationship between the same variables. They support the results by explaining the negative impact of a higher percentage of tokens in the ICO on venture uncertainty and its increase.

Adopting Amsden & Schweizer' model (2018) with an emphasis of its theoretical base of Baum and Silverman's model (2004) for venture quality measurement via human and social alliance factors, my observation in terms of the variable number of lawyers was added to the variable set of team characteristics and the result was positive. In my dataset, the presence of a lawyer among the ICO team and/or among the advisors is positively correlated to the success of a venture, and the total amount raised,

on average, increases by 46% with the presence of a law practitioner. For this positive statistical significance, the involvement of SEC and its proposed procedure in 2017 for defining security tokens should be considered (Howey Test, SEC Enforcement, 2017). So, having in mind that the emergence of this involvement and regulation of security tokens and consequently, possible regulation of utility tokens as well, as it was discussed in the earlier section of the paper, my observational variable was set to be examined and has proved its significance in the ICO success model by enhancing the human capital and by decreasing legal uncertainty around the venture launch.

Furthermore, an important component of venture quality being number of advisors for an ICO success was also proven by the empirical results I got. One unit increase in the number of advisors for an ICO project brings 10% increase in the amount raised. ICO advisors are in fact at the intersection of human capital and social alliance capital ensuring the venture quality (Amsden & Schweizer, 2018). Amsden & Schweizer identified that venture quality measured by the number of advisors and CEO LinkedIn 500+ followers' presence along with team size variable is positively correlated with the total amount raised in ICO. In my model, however, the presence of CEO LinkedIn followers numbering 500+ is insignificant variable for determining the success of an ICO. The absence of significance in part can be explained by the fact that a proportion of ICOs from my observations originate from Asian countries like China, Singapore, South Korea stimulated by the popularity of ICOs starting from 2017 (although followed by government bans in China and in South Korea shortly, during the 4th quarter of the same year) or despite the country of origin being a European country, several teams considered in my observations were of Asian origin by their vast majority of members. While examining the top social networks and platform used in those countries, the presence of LinkedIn as a social engagement tool among its population is not obvious. This social platform is not seen in the top 12 social networks for the 3rd quarter of 2017(statista.com) in South Korea and not in the list of social media sites used by Korean companies (KPR Social Communication Research Lab and Macromill Embrain survey, 2015). In China, Chinese government's internet censorship project leads to universal usage of their domestic social platform WeChat among its population while at least in Singapore 24% of its population by 3rd quarter of 2017 use LinkedIn despite the dominance of Facebook and Twitter for a professional environment (statista.com). Although this can in part explains the absence of statistical significance of the variable, for more accurate data collection and analysis, social engagement tools specific to region and country are important to be considered.

Additionally, the variable team size shows an interesting pattern of correlation. When observed separately, within the set of variables of team characteristics, team size shows no significance. However, in the final model, a member increase in the team brings 3% decline of the total amount raised which contradicts to the findings of Amsden & Schweizer (2018). Again, as in the case of the variable number of White paper pages, the quantitative part can be considered as a measure of quality to a limited extent.

And lastly, there is an interesting connection between the total token supply and the total amount raised in ICO. In my model, the insignificance of the variable token supply is really high while Amsden & Schweizer observed a positive significance among those variables. While considering the reason behind the insignificance in my model, an important notion should be considered- *coin burn*. This procedure is a way of quickly increasing the growth of the coin (token) in its single value. *Proof of Burn protocol* is behind it which has found popularity in recent months (BitcoinWiki).

While constructing my dataset and reading White papers of my observations, this practice of burning coins was mentioned in Whitepapers of several ICOs being aXpire, Binance, etc. For example, the tokens of aXpire (APX) were indicated to be used in their business model as a mean to budget and pay for services (as any other utility). And as the process of utility tokens issuance follows, with each transaction taking place with an exchange of the utility tokens, a "burn" function is being generated on the blockchain behind the ICO and those "burned" tokens are being removed from the total supply, increasing the utility value of each token. Coming back to aXpire, the venture's White paper has stated that over time the total supply of tokens will decrease by their burn function. Hence, at first stage the total supply of tokens can be high and decrease over time implying that at some point time, the relationship between the total amount raised and higher amount of tokens supply will not be possible to statistically define as the unit value of the token will increase while the number of coins in circulation will decrease.

To understand this negative relationship between the unit price of a coin and the total supply of coins under this procedure, I have plotted several graphs indicating both linear and exponential growth pattern of those two factors. Several assumptions were made for number figures such as coefficient of growth, the initial price of a token, initial supply of the tokens, etc. However, those have no importance as the intention is to show the concept of coin burn. Figures 1-3 show the slow linear growth pattern between the unit price of a coin/token and the total supply of coins. The relationships are shown on the basis of 6, 12 and 24 months' period. The number of hedge funds signed for a single period (a month) increases by a coefficient of 1(an assumption) which is likely to be indicated in the initial business model of the project.

And to understand how in this model the number of coins to be burned for a period is calculated (Proof of Burn protocol), monthly revenue is calculated upon the number of hedge funds signed for a period. And to put it simply, the coins burned for a particular period will be the total revenue earned divided by the price of a coin as those coins from the perspective of its market are being "burned" (eliminated). With this principle, each period (month) the total supply of tokens decreases while the monthly revenue stays the same (as a coefficient of signed hedge funds is 1). So, behind the increase of one coin price plotted in the relation of decrease of total supply in the market, the proof of burn protocol can be observed as it was stated above and demonstrated in these graphical examples, all of those supporting the initial statement of insignificance between the total supply of the coins and the total amount raised in an ICO.

Figure 1: Slow Linear Growth (6 months)

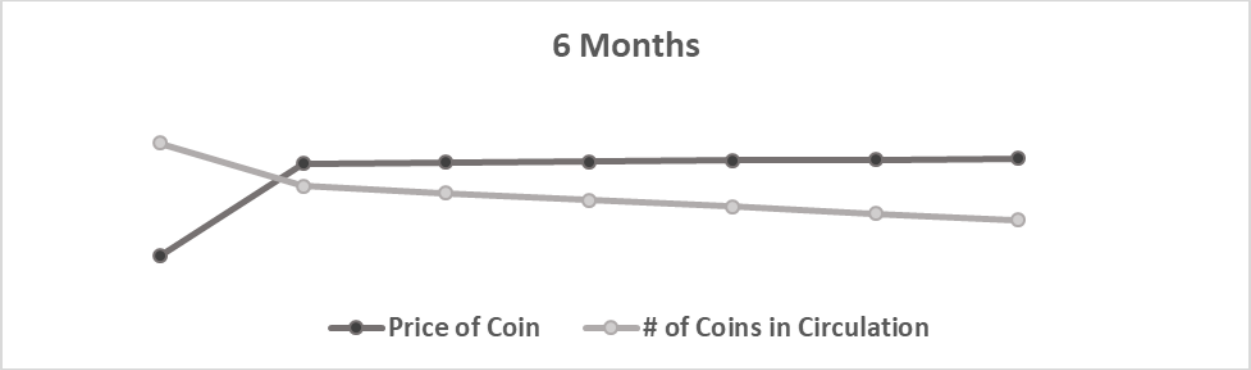


Figure 2: Slow Linear Growth (12 months)

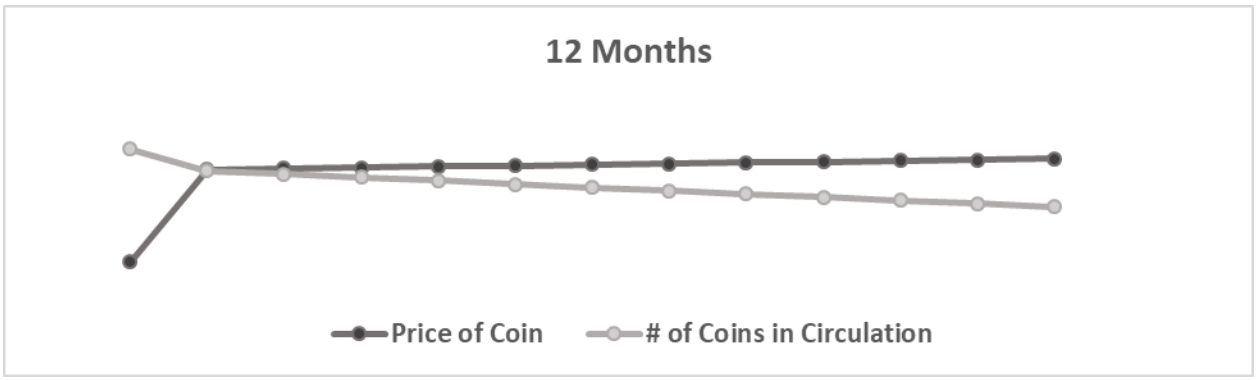
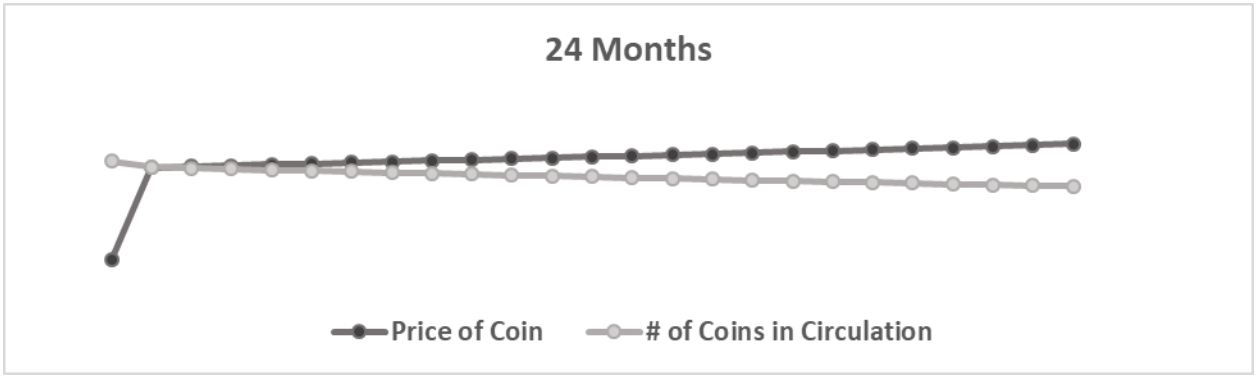


Figure 3: Slow Linear Growth (24 months)



Important note: An assumption was made that the number of hedge funds signed increases by a coefficient of 1 over a period of one month for the slow linear growth model.

Figure 4: Fast Linear Growth (6 months)

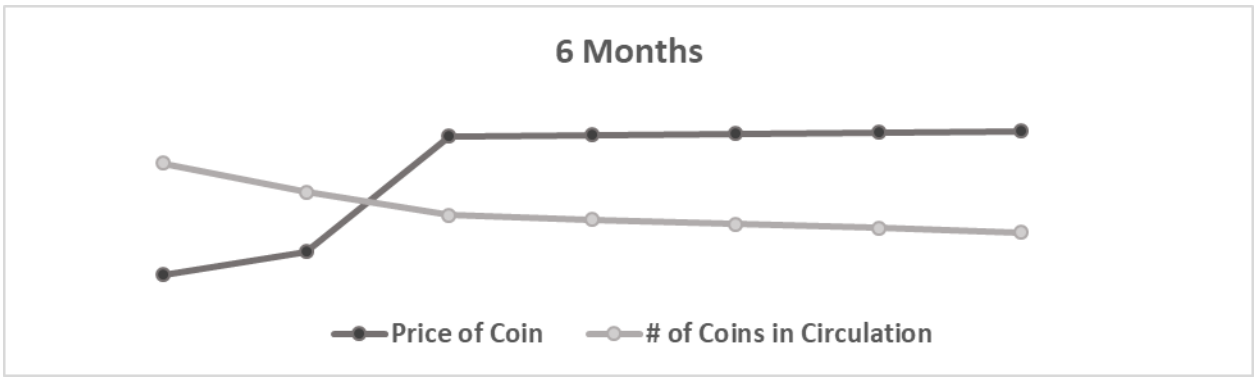


Figure 5: Fast Linear Growth (12 months)

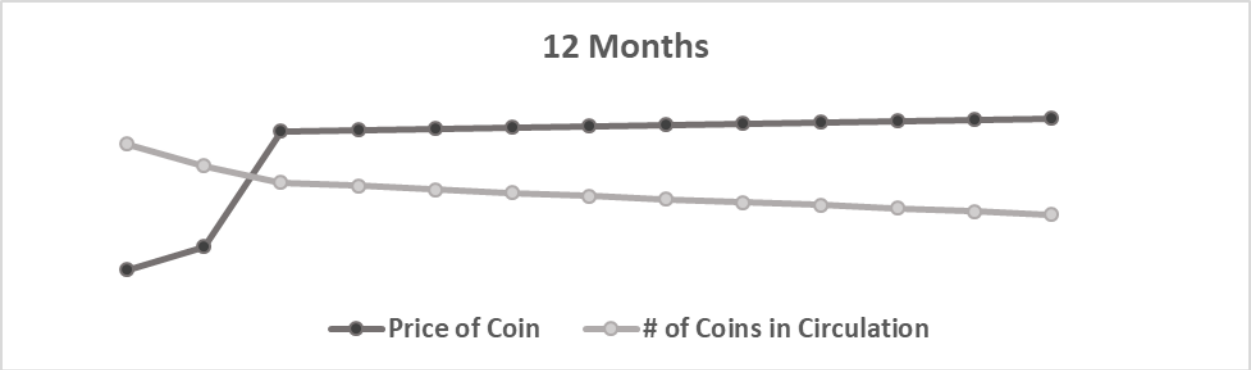
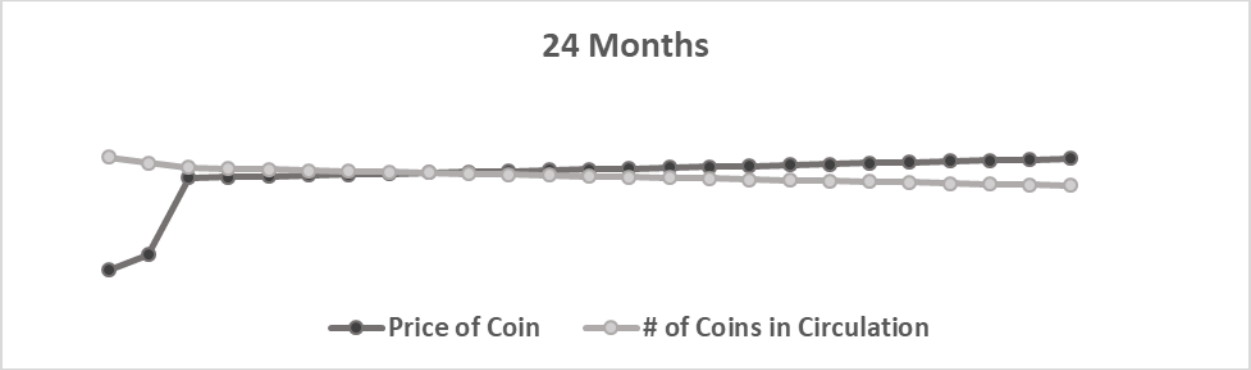


Figure 6: Fast Linear Growth (24 months)



Important note: An assumption was made that the number of hedge funds signed increases by 5 (+5) over a period of one month for the fast linear growth model.

With the same principle, the fast linear growth pattern is plotted in figures 4-6 respectively over 6, 12, and 24 month periods. In case of fast linear growth, the growth pattern of the price of a coin with relation to decrease in the number of coins in circulation is more obvious as the coefficient determining the growth of the number of hedge funds signed is five in this model.

In principle, the same rationale applies to exponential growth (Figures 6-9 for slow exponential growth, Figures 9-12 for fast exponential growth). Only differences are the pattern at which the number of hedge funds is assumed to increase (exponential growth) which results in different levels of monthly revenue (in case of linear the monthly revenue was constant). So, in these cases, the relationship between the increase of one unit price of a coin and decrease of the total supply of coins via burning coins is stronger than under consideration of linear growth.

Figure 7: Slow Exponential Growth (6 months)

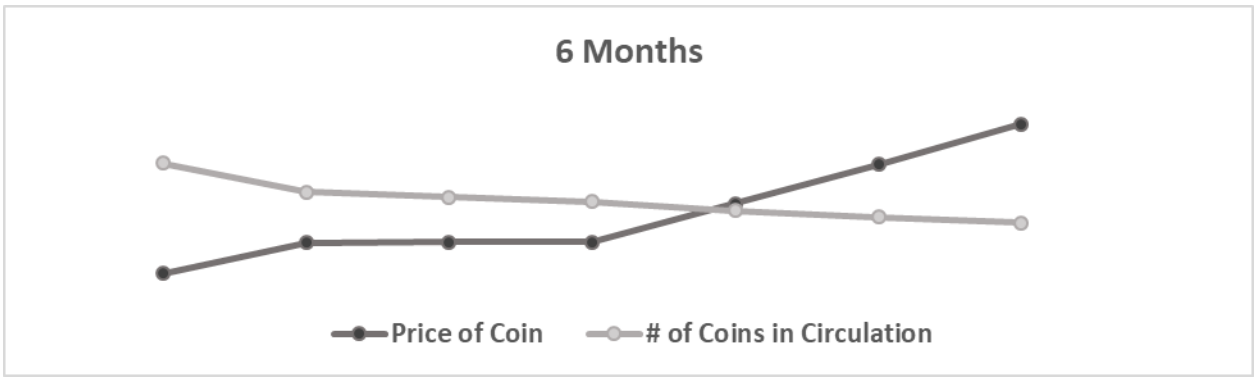


Figure 8: Slow Exponential Growth (12 months)

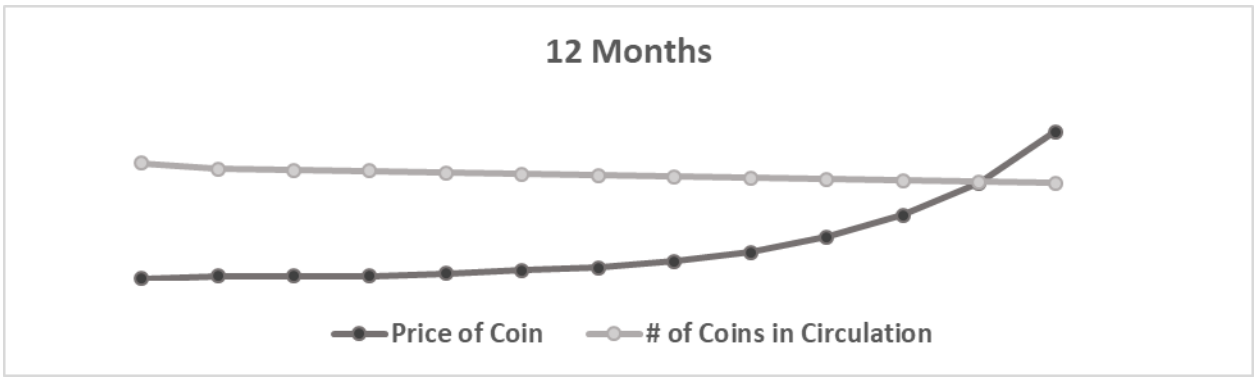
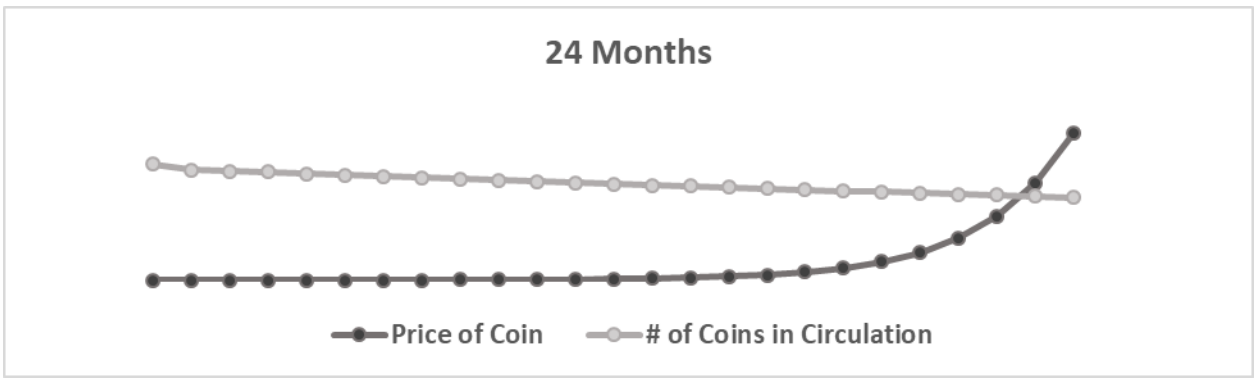


Figure 9: Slow Exponential Growth (24 months)



Important note: An assumption was made that the number of hedge funds signed increases by a 1.5 times (x 1.5) over one month period for the slow exponential growth model.

Figure 10: Fast Exponential Growth (6 months)

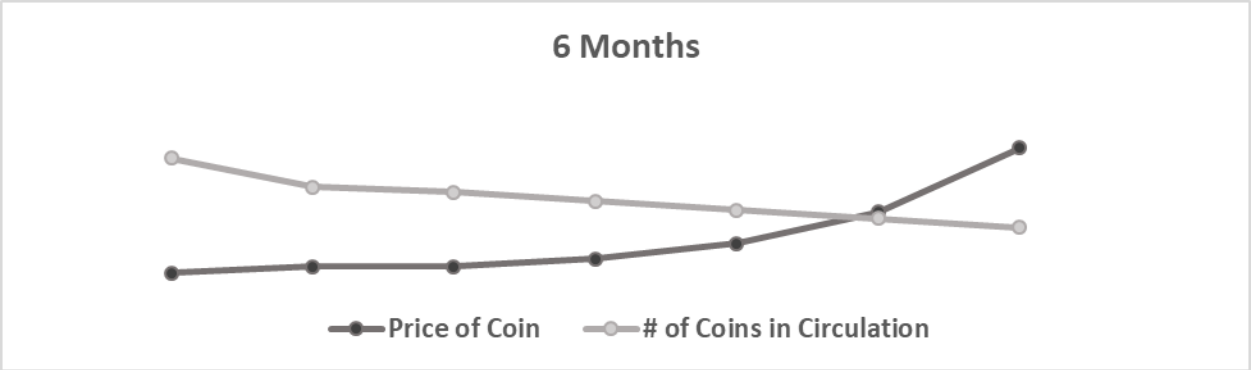


Figure 11: Fast Exponential Growth (12 months)

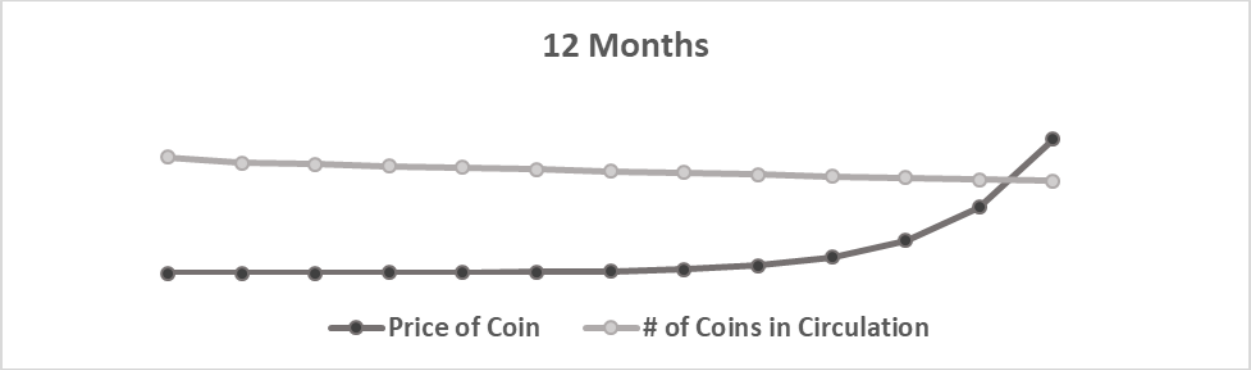
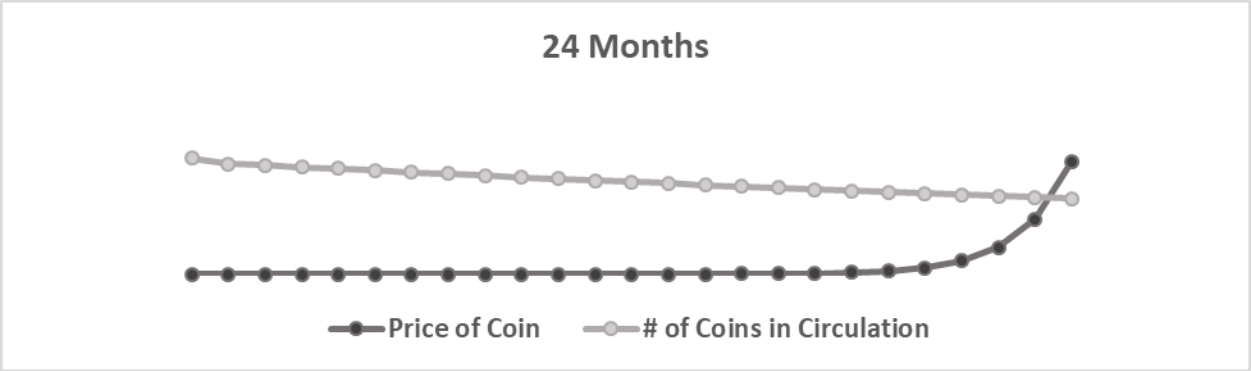


Figure 12: Fast Exponential Growth (24 months)



Important note: An assumption was made that the number of hedge funds signed increases by a 2 times (x 2) over one month period for the fast exponential growth model.

So, here is my final model for ICO success:

ICO success (log (total amount raised)) = 14.83 + 0.416 * (Github) + 0.544 * (tax haven) + 0.0332 * (# of platforms) + 0.0199 * (#of pages in WP) - 0.64 * (accepting FIAT) – 0.412 * (ICO bonus) + 0.103 * (# of advisors) + 0.46 * (lawyer) - 0.0303 * (team size) + Error

11. Conclusion

Over the last year, the popularity of Initial Coin Offerings has raised dramatically. As EY Research states, ICOs have raised in 2017 about $7.5 billion versus $3.6 billion for venture capital (Ernst & Young, 2017). This boom in their popularity is mainly explained by the widespread adoption of Ethereum blockchain platforms, not to mention the huge increase of awareness and interest in cryptocurrencies and blockchain technology. ICOs, being unregulated fundraising means with lower transaction costs, attract large pool of various investors. The basic idea behind this process is that after considering an ICO project successful based on several factors, a potential investor will likely exchange his/her assets (cryptocurrrency, fiat, immovable asset, etc.) with a certain amount of tokens issued by the ICO. In this paper, besides providing theoretical and technical background for this new phenomenon in equity crowdfunding, 18 factors are considered to understand the important determinants of ICO success considered by the potential investors in their decision-making process. The model used in my research is a newly developed model by Amsden & Schweizer (2018) aimed to delineate and describe the characteristics of a successful ICO. Amsden & Schweizer measure the success of an ICO in terms of token tradability and the total amount raised with 4 set of independent variables being ICO characteristics, financial details, team characteristics and cryptocurrrency dynamics. In my model, I used only first three groups of the explanatory variable with two observational variables added to those sets. Variable number of exchange platforms where the token is listed was added to the ICO characteristics set of variables with intention to decrease the venture uncertainty and thus, increase the total amount raised for a project and another variable, the presence of lawyer among the team and/or among advisors was added to the team characteristics set of variables with intention to both increase venture quality by

enhancing the human capital component of the team and secondly, decrease the venture uncertainty in terms of ensuring that several regulatory aspects are fulfilled. For example, correctly describing the (utility) token to be issued both in its functional and legal terms and considerations, releases the tokens issued from being considered securities as it is automatically done otherwise.

Furthermore, it became clear that there is a high amount of information asymmetries in ICO market based on its nature which further demonstrates the importance of empirical analysis of important factors which are there to determine the success of an ICO.

To conclude, the ICO market is still in its growth stage. However, taking into consideration the immense potential behind this phenomenon in terms of revolutionizing the entire fundraising process and challenging the traditional models of different industries with a financed venture, another and greater boom of popularity is highly expected in the nearest future.

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APPENDICIES

Table 1: Description of Variables

	Column name	Description
Dependent:	Total amount raised	The logarithm of amount raised for each ICO project
Independent variables:		
G1: ICO characteristics		
	platform	dummy variable indicating 1 if the project is based on Ethereum platform,0 otherwise
	Github	dummy variable indicating 1 if the project is represented on Github, 0 otherwise
	pre-ICO	dummy variable indicating 1 if the project had pre-ICO stage, 0 otherwise
	restricted areas	dummy variable indicating 1 if the project is restricted in any country, 0 otherwise
	tax haven	dummy variable indicating 1 if the origin country is among G20 countries which agreed upon blacklist for tax havens, 0 otherwise
	telegram	dummy variable indicating 1 if the project is represented on telegram, 0 otherwise
	whitelist	dummy variable indicating 1 if the project has a whitelist, 0 otherwise
	# pages in Whitepaper	number of pages of the ICO's whitepaper
	# of platforms the token is listed	number of exchange platforms where the token of the ICO is listed
G2: Financial details		
	# accepting cryptos	number of cryptocurrencies accepted by each project
	accepting fiat	dummy variable indicating 1 if the ICO accepts any fiat, 0 otherwise
	% distributed in ICO	percentage of tokens distributed in the ICO for crowdsale
	ICO bonus	dummy variable indicating 1 if the ICO offers bonuses either in private pre sale, during pre sale or pre-ICO, 0 otherwise
	# of Tokens	the logarithm of the total number of tokens in circulation
G3: Team Characteristics		
	# of advisors	number of advisors for each ICO
	# of lawyers	dummy variable indicating 1 if there is a law practitioner both among the team and among the advisors, 0 otherwise
	CEO Linkedin 500+	dummy variable indicating 1 if CEO has 500+ followers on Linkedin, 0 otherwise
	team size	number of team members

Table 2: Correlation of Independent Variables

	platform	github	preico	restrictedareas	taxhaven	telegram	whitelist	ofplatformsthetokenislisted	pagesinwhitepaper	acceptingcryptos	acceptingfiat	distributedinico	icobonus	tokensupply	ofadvisors	lawyers	ceolinkedin500	teamsize
platform	1																	
github	0.0468	1																
preico	0.0161	-0.201	1															
restrictedareas	0	-0.0711	0.0589	1														
taxhaven	0.0896	-0.144	0.145	0.0546	1													
telegram	0.246	0.0489	0.17	-0.1116	-0.19	1												
whitelist	-0.175	0.125	0.00726	0.456	-0.08 96	0.155	1											
ofplatformsthetokenislisted	-0.169	0.11	-0.223	-0.102	-0.0963	-0.0414	-0.123	1										
pagesinwhitepaper	0.0459	-0.281	0.15	-0.0384	-0.106	0.0628	0.0353	-0.0705	1									
acceptingcryptos	0.0817	-0.205	0.16	-0.077	0.143	0.134	-0.14	-0.0565	-0.0218	1								
acceptingfiat	-0.0786	-0.0475	-0.127	-0.0359	0.2	-0.0233	-0.0295	0.143	0.13	0.383	1							
distributedinico	0.0147	0.126	-0.089	-0.186	-0.01 16	0.08	-0.162	0.219	-0.107	-0.15	0.0386	1						
icobonus	-0.0647	-0.241	0.585	0.0788	-0.0129	0.166	0.0647	-0.370	0.183	0.109	-0.082	0.0571	1					
tokensupply	-0.174	-0.0358	0.219	0.0201	0.095	0.0435	-0.0408	0.231	0.0219	0.0683	-0.174	-0.310	-0.0479	1				
ofadvisors	0.0306	0.0656	-0.154	-0.0292	-0.119	0.105	-0.104	0.263	-0.0264	-0.0919	0.116	0.156	0.00613	-0.212	1			
lawyers	0.218	0.0917	-0.0905	-0.0142	-0.0419	0.0489	0.039	0.104	0.132	-0.115	0.0199	0.068	0.00561	-0.12	0.184	1		
ceolinkedin500	0.261	-0.186	-0.0421	0	0.0111	0.217*	-0.0559	-0.0432	0.0439	0.057	0.0439	0.155	0.198	-0.182	0.155	0.134	1	
teamsize	0.144	-0.0141	-0.0241	-0.162	0.199	0.0146	-0.159	0.264	0.113	0.132	-0.0549	-0.0339	-0.133	0.143	0.236	0.163	0.0714	1

Table 3: Checking Heteroscedasticity via White Test

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity

chi2(84) = **85.00**
Prob > chi2 = **0.4490**

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	**85.00**	**84**	**0.4490**
Skewness	**16.21**	**14**	**0.3005**
Kurtosis	**2.82**	**1**	**0.0932**
Total	**104.03**	**99**	**0.3450**

Table 4: Normality Test Skewness Kurtosis (Jarque-Bera)

Skewness/Kurtosis tests for Normality

Variable	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
resid	**0.013**	**0.128**	**7.64**	**0.0219**

I agree that American University of Armenia will post my work on the library database for an open access to the AUA community.