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Initial Coin Offerings

Considerations for an Investor

by

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&

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Abstract

Cryptocurrency and blockchain has conjointly become trending buzzwords in the business world today. As the blockchain technology has become older and more researched, its areas of usage have broadened far beyond payment solutions like Bitcoin. In venture financing, blockchain has been used to establish a prominent fundraising tool, called initial coin offerings (ICO). An ICO is a crowdfunding method resembling initial public offerings, where ventures issue a blockchain based token, subject to public sale. ICO has become a lucrative financing method for blockchain affiliated ventures.

The hype around cryptocurrency has led to increased ICO attention. Everyone can invest in an ICO, and thus, it has become a popular investment opportunity. This thesis looks at ICOs as investment objects, with the aim to find out what an investor should consider before investing. Additionally, we assess whether ICOs are profitable financial instruments relative to its close substitutes, and evaluate measures to avoid scams.

The study is based on 104 companies that have had ICOs, and analyzes what factors influence both ICO success rate, and post-ICO capital gains. Our results indicate that hype and pricing is influential on the outcome of an ICO, which in turn is important for subsequent price movements. We have also observed that venture capital seed funded companies performed better in the ICO aftermath**.** By further using the results, we have also found that investors may use these parameters when investing in an ICO to outperform both our benchmark cryptocurrency Ethereum, and other ICOs**.**

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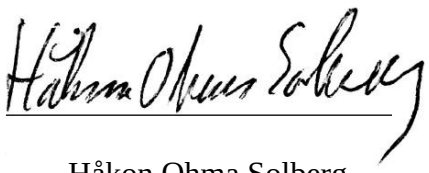

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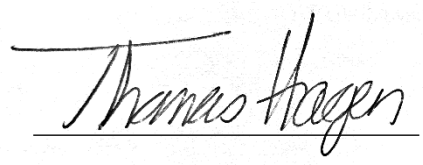

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1. Introduction

1.1 Background

The ongoing IT revolution and rapid technological development has brought forth a new set of opportunities in the business world. The development has lowered the entry barriers in many industries, making anyone theoretically able to partake. Subsequently, entrepreneurship has become gradually more popular, and startup activity has increased dramatically since the trough in 2013 following the aftermath of the financial crisis (Fairlie, Morelix, & Taraque, 2017).

Increased entrepreneurial activity sparks innovation. The current innovative business climate has led to the emerging of many potentially groundbreaking technologies, one of which is the blockchain technology. Blockchain has become one of the most trending buzzwords in business today, regarded as a technological revolution similar to the conception of databases in the 1970's (Gupta, 2017).

Although blockchain technically can be associated with databases, it has mostly become known as the technology behind cryptocurrencies and unregulated payment solutions like Bitcoin. However, its area of usage has broadened dramatically throughout recent years (Marr, 2018). The current influence of the technology can be illustrated by the increasing use in central banking. The Monetary Authority of Singapore has in collaboration with several large financial institutions already begun developing a blockchain system for interbank transactions, aiming to avoid transaction costs in terms of both time and value (Monetary Aithority of Singapore, 2017).

The applicability of blockchain, coupled with the flourishing entrepreneurial activity, has radically increased the use of blockchain in business (Tractica, 2016). According to a report from Tractica, annual revenues from enterprise application of blockchain are expected to rise from $2.5 billion in 2016 to $19.9 billion in 2025. In addition, open source structure allows for start-ups to engage in the use of blockchain. Subsequently, a new wave of blockchain-oriented start-ups began to sprout.

With the sudden increase in entrepreneurial activity, venture capitalists were not able to satisfy the financing needs of all the new blockchain start-ups (International Institute of Finance, 2018). Relative to the supply, the demand for capital rose, and blockchain ventures found a new financing method, called initial coin offerings (ICO). An ICO is a method of public crowdfunding based on blockchain technology, avoiding the limitations of regular venture capital. ICOs are simple in its structure, and the potential of amounts raised have proven to be high.

ICO popularity exploded in 2017, surpassing the capitalization of venture capital funding for blockchain startups (Sunnarborg, 2017). Despite the widespread hype around ICOs, several deficits have arisen due to the short life span of the concept. Incidents regarding frauds and hacks have been reported, which have inflicted both investors and ventures. Consequently, many governments have begun regulating ICOs (Chester, 2018). Additionally, it is hard to evaluate whether the ICO boom can be considered a trend bubble, or if the popularity of the concept is due to market forces, and thus will keep rising.

Relative to many other topics within cryptocurrency and financing, there is little research on the subject of ICOs, due to its short existence. In addition to its financial significance, this makes the topic extremely appealing, and is the reason why we have chosen to write our thesis on it.

1.2 Problem

In this thesis, we consider ICOs as investment opportunities. Thus, we focus on the speculative aspects. By our knowledge, no published study has researched ICOs from an investor's point of view. Because of its availability, anyone can partake in an ICO, including investors with no prior knowledge or experience. In combination with the overall hype around the cryptocurrency market, ICOs may seem an attractive investment opportunity.

We intend to find out what investors should consider before investing in an ICO, aiming to maximize the possibility of both ICO success and profits from capital gains. Firstly, we are going to analyze what factors may lead to ICO success. If the ICO is successful, an investor may choose to maintain affiliation with the venture, or profit from capital gains. We intend to find out whether specific ICO characteristics or corporate aspects such as associated industry and prior venture capital funding have an impact on ICO success rate.

Additionally, we aim to examine what factors might affect post-ICO price change. This way we should be able to evaluate what an investor should consider when investing in an ICO on a speculative basis, aiming to maximize capital gains within certain time frames. We will analyze the impact of corporate characteristics, with regards to cumulative returns respectively one, seven, thirty and sixty days after the token starts trading. We will also briefly discuss how to ensure that an ICO is not a scam, and analyze whether ICO investments may be more profitable than close alternatives.

The analysis of this thesis will be divided in four parts. First, we will look at what factors may impact ICO success rate, using a logistic regression with a pre-defined success measure. Further, we will analyze what may affect post-ICO price changes, to find out what kind of ICO companies have higher capital gains. Lastly, we will briefly discuss risk and compare ICO investments to alternatives, before we consider how to avoid ICO scams. The analysis will be presented after a brief market overview, in addition to a presentation of the data and methodology used in the thesis.

Conclusively, we should be able to find out what assessments investors should do before investing in an ICO. Hence, our overall research question is as follows:

What should investors assess when considering potential ICO investments?

The aim of initiating an ICO should resemble those of start-ups in general, centered around innovation. A venture should target comparative advantages, with an idea or project expected to satisfy an unfulfilled need in the market, or improve an existing product or service. If the investors have reason to believe a product or service will gain comparative advantages, they will more likely invest, and we expect the ICO to have a higher probability of success.

For investors to believe in a project or venture, we hypothesize that venture capital funding may have an impact. If a company has received prior venture capital funding, investors may assume that comprehensive due diligence have been conducted. This can imply business legitimacy and potential, and lead to increased investment popularity. Subsequently, we expect venture capital funded companies to have a higher ICO success rate and post-ICO capital gains.

Additionally, we hypothesize that ventures operating in certain industries are more likely to achieve ICO success. We believe there is potential for innovation in entertainment and fintech.

This digital age has brought forth a wave of innovation opportunities within digital entertainment, with current examples in E-sports and streaming services such as Netflix. The demand for products and services within digital entertainment seem to be continuously growing. Moreover, we expect open banking and PSD2 to have instigated a boom in the fintech start-up environment. We expect these mechanisms to have impact on investor behavior in the ICO market, leading to increased ICO success ratio and post-ICO returns in these industries.

We believe that certain ICO specific characteristics are important for the outcome of an ICO, although we do not expect them to affect post-ICO price change. With hype, we expect a domino effect on investor activity. If potential investors realize that other investors see great potential in an ICO, they expectedly become incentivized to invest themselves. Thus, we hypothesize that hype around the ICO is the most influential factor on ICO success rate. The contradiction in this hypothesis, is that alleged scams also are expected to gain increased attention. However, we do not expect scam to impact our analysis to a considerable degree.

Many blockchain ventures publicly disclose their source code online. We believe investors value transparency and openness. Thus, we hypothesize that public source code is important for achieving ICO success. We believe many ICO investors have technical backgrounds, as indicated by their interest in blockchain ventures. If these investors can inspect a venture's source code, we expect them to be more likely to invest.

Lastly, we believe that certain ICO investments will prove more profitable than its close substitutes. We will use the findings from the analyses on ICO success and post-ICO returns in a comparative context, where we will propose some strategies for investing.

2. Market overview

2.1 Cryptocurrencies

To comprehend the concept of initial coin offerings, it is important to have sufficient knowledge about cryptocurrencies and the cryptocurrency market. A cryptocurrency is a decentralized digital or virtual currency ensured with cryptographic measures to regulate supply and verify transactions (Oxford Dictionaries, nod). Although the concept of an encrypted digital currency was established already in the late 1980s, the first successful cryptocurrency came with Bitcoin's launch in 2009 (Farell, 2015). The idea of Bitcoin was to establish a secure electronic payment solution allowing for peer-to-peer virtual payments unregulated by central authorities (Nakamoto, 2008).

Bitcoin was the first public utilization of the blockchain technology (Marr, 2018). A blockchain is a decentralized, public ledger that records transactions between two parties without the need of a third-party verification. The blockchain of Bitcoin is an unmanipulable database containing encrypted information about ownership, all past Bitcoin transactions, and the creation of new Bitcoins (Berentsen & Shar, 2018).

The process of adding new layers of information upon a blockchain is called mining. In theory, anyone can mine and create new Bitcoins due to the open source structure of the blockchain. This is, however, a difficult and hardware intensive procedure, and has become mainly restricted to large mining farms – coincidentally ensuring a stable supply of coins. The technology behind blockchain storage and cryptocurrency creation is very advanced, and will not be explained further in this thesis, as the technology itself is not relevant.

Bitcoin was first valued in 2010, when 10 000 Bitcoins were traded for two pizzas (Marr, 2017). From there on, the popularity increased dramatically. In 2011, Bitcoin began gaining widespread international attention, peaking at a market capitalization of $189.6 million in June (Bitcoin.com, 2018). Consequently, the creation of altcoins, various new cryptocurrencies based on the same technology, would follow (Farell, 2015).

Altcoins were primarily created as a reaction to Bitcoin's perceived shortcomings. It was not until Ripple began trading in 2013 altcoins began harvesting substantial popularity. In May 2013, before Ripple, nine altcoins were trading, with a total capitalization of approximately

$80.6 million (Coinmarketcap, 2018). By the end of 2014, 505 altcoins were trading, with a total capitalization of approximately $1.2 billion, of which Ripple accounted for almost $740 million. At this point, Bitcoin's capitalization had exceeded $4.3 billion, following a long decline from the extreme $13.3 billion peak in late November 2013.

In 2013, Ethereum (ETH), the second public blockchain, was introduced as an improved and augmented alternative to Bitcoin (Hayes, 2018). The main difference between Ethereum and Bitcoin, is that the Ethereum blockchain can store more than just currency transactions. While Bitcoin solely was created as a disruptive financial instrument, Ethereum was developed as an improved alternative regarding areas of usage

In addition to the functionality similar to that of Bitcoin, Ethereum is a Turing complete programming language, meaning that it theoretically can solve any computational problem given the necessary time and processing power (Bajpai, 2018). Being built on blockchain, Ethereum enables the possibility of creating unmanipulable contracts and applications with the decentralized and cryptographic advantages of blockchain technology. Moreover, transactions are significantly faster with Ethereum than with Bitcoin, being confirmed in seconds as opposed to minutes.

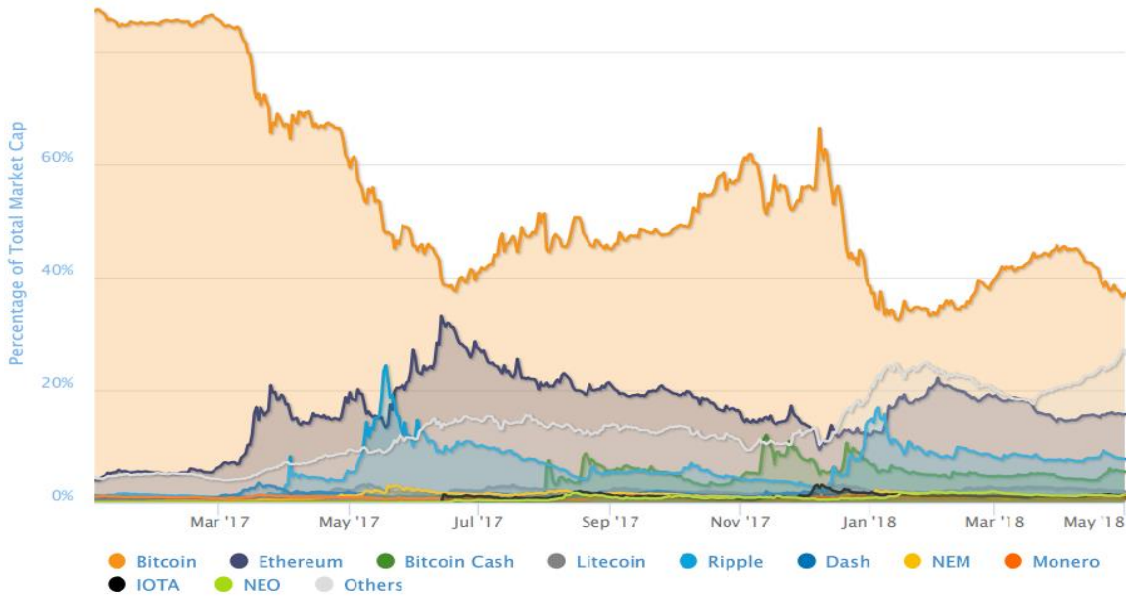
Ethereum's functionality brought forth a new set of opportunities. The Ethereum blockchain can be used to create incorruptible smart contracts representing for instance derivative agreements or employment contracts (Hayes, 2018). The perceived potential of the Ethereum technology can be illustrated by the establishment of the Enterprise Ethereum Alliance (EEA) in 2017 (Popper, 2017). EEA is a non-profit organization comprised of hundreds of various sized companies, including multinational corporations such as Microsoft, JPMorgan and Accenture (Irrera, 2017). The aim of the organization is to research and make use of the opportunities Ethereum technology brings to the business world.

Today, a vast number of companies use Ethereum's blockchain, in either the creation of a new form of cryptocurrency called tokens, or in the development of products and services. For instance, Storj Labs has created a blockchain based decentralized cloud storage platform, on which they guarantee that stored data cannot be monitored, censored or have downtime (Storj, 2018). Tokens are essentially based on the same principal as cryptocurrencies, although typically built directly upon an existing blockchain platform as a smart contract (Castor, 2017). Thus, tokens can be programmed to have other uses than cryptocurrencies, and may for

instance function as vouchers or proof of access for the corresponding venture's service or product.

Ever since Ripple and Ethereum's foundation in 2013, the cryptocurrency market has flourished remarkably (Coinmarketcap, 2018). By the beginning of 2017, 617 cryptocurrencies were trading, with a total capitalization exceeding $17 billion. Bitcoin accounted for over $15.5 billion, and the second most valuable coin Ethereum capitalized $722 million. This upturn was succeeded by an even more dramatic boom in 2017. Bitcoin's popularity exploded, and to this day, its capitalization alone exceeds $150 billion, after peaking at $321.4 billion by the end of 2017. The total market capitalization is close to $417 billion at the time this is written (April 2018).

Even though Bitcoin to this day remains the by far most prominent entity in the market, another market effect began transpiring in 2017. Bitcoin accounted for over 90 % of the market by the beginning of 2017, but today, this rate is approximately at 35 %. This development is illustrated in the Graph 1, dating from January 1, 2017 to May 8, 2018. The number of cryptocurrencies has exploded, from 617 in January 2017, to 1591 today. Of these 1591 currencies, 702 are tokens. When tokens, and coins in many instances, are made publicly available for trading, the issuing venture launches an initial token sale. Sharing the same principle as initial public offerings (IPOs), these tokens have become known as initial coin offerings, or ICOs.



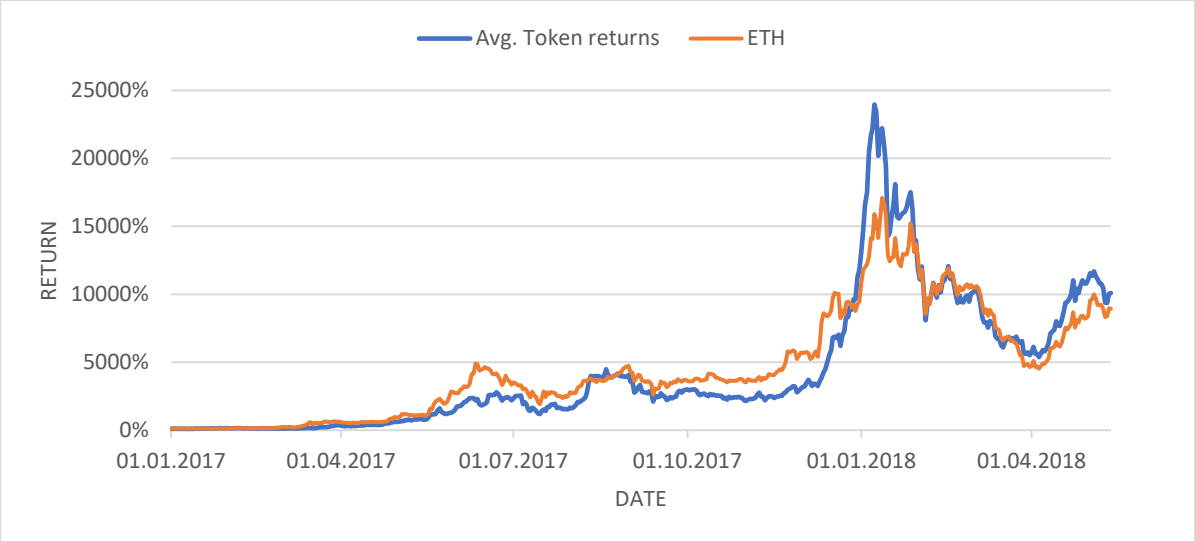
Graph 1: Share of cryptocurrency market cap (Coinmarketcap, 2018)

2.2 Initial Coin Offerings

An initial coin offering (ICO) is a funding method where ventures issue a token subject to public sale (International Institute of Finance, 2018). Sharing traits with both initial public offerings and crowdfunding campaigns, the issuing venture announce a token sale, in which anyone can participate, by creating a predetermined number of tokens or a new cryptocurrency with limited supply. ICOs have become a popular way of funding for blockchain-oriented start-ups, enabling them to raise capital without losing control to venture capitalists and other financial forces.

To establish an ICO, ventures typically disclose a white paper, which is an explanatory document elaborating the idea and purpose of the project or venture (International Institute of Finance, 2018). Subsequently, the ventures create a blockchain token subject to sale. Because of its mendable attributes, Ethereum is often used as a basis for creating these tokens. The Ethereum-based tokens are designed as smart contracts upon the Ethereum blockchain, and has become standardized as ERC-tokens (Castor, 2017).

A large majority of ICOs are based on these smart contract standards, especially ERC-20, which is the most common. To this day, over 83 % of all ICO tokens are based on Ethereum (ICOWatchlist, 2018). This makes the tokens very sensitive to fluctuations in Ethereum. This is depicted by Graph 2, illustrating the cumulative returns of the 83 tokens in our data set in relation to the returns of Ethereum over the same period.



Graph 2: Avg. token returns vs. ETH returns (in USD)

The tokens issued in ICOs may have different functions, as previously stated. Although there is no universal classification, the different token types may be separated in three nonexclusive categories, as defined by FINMA, the Swiss Financial Market Supervisory Authority (Finma, 2018). According to FINMA's principles, tokens can be categorized as payment tokens, utility tokens or asset tokens.

Payment tokens have the same function as cryptocurrencies, and serve only as means of payment. The trading of payment tokens in an ICO is of speculative character, and investors hope to profit from capital gains or future purchasing power. Utility tokens have become the most common ICO token type (EY, 2017). When ventures issue utility tokens in an ICO, the investors receive some form of access or advantage directly connected with the corresponding ventures' product or service, scaled by the acquired token share. For instance, a mobile phone producer may give investors a certain discount on their phones through utility tokens issued in an ICO.

Asset tokens functions as stocks, and may give investors company ownership, revenues or entitlement to interest and dividend payments (Finma, 2018). Because of its properties, these tokens are regarded as securities in some countries, including Switzerland, exposing them to similar financial tax regulations. General regulations on ICOs differ greatly by country (Hryniuk, 2018). China and South Korea have banned ICOs altogether, with other countries currently implementing legislations. Banning ICOs is not expected to become common, but because countries seem to have very different perceptions on dangers regarding ICOs, some countries might become ICO hubs in the future. Today, Singapore and Switzerland have for instance become popular ICO safe havens.

The first ever ICO was initiated by Mastercoin (now called Omni) in 2013, raising approximately $500 000 (International Institute of Finance, 2018). The following year, Ethereum raised over $18 million in an ICO (Acheson, 2018). Six other ICOs were initiated in 2014, but the popularity of the funding method remained modest. A few ICOs were initiated in 2015, raising $9 million in total. By 2016, the Ethereum smart contract became acknowledged for its simplicity regarding the creation of tokens, and ICO activity rose. 43 ventures initiated token sales in 2016, raising $256 million.

The programming functionality of Ethereum has made ICOs susceptible to hacking. In mid-2016, an organization called The DAO (abbreviated from the Decentralized Autonomous

Organization) infamously initiated an ICO, raising over $150 million, by far the highest ICO capitalization up to that point (Acheson, 2018). After the ICO, The DAO was hacked and lost approximately $60 million, ultimately leading to the collapse of the organization. In addition to hacks, several cases of scams have been reported, due to the lack of regulations (De, 2017). Despite this substantial security deficiency, ICOs have continued gaining popularity.

As previously stated, the popularity of cryptocurrency and blockchain exploded in 2017, and ICO popularity increased accordingly. A total of almost $5.4 billion was raised in 342 different ICOs during 2017, ultimately surpassing venture capital as the most grossing funding method for blockchain-oriented start-ups (Sunnarborg, 2017). The increasing number of ICOs has continued into 2018, and numerous ICOs are initiated every month, as shown in Figure 1.

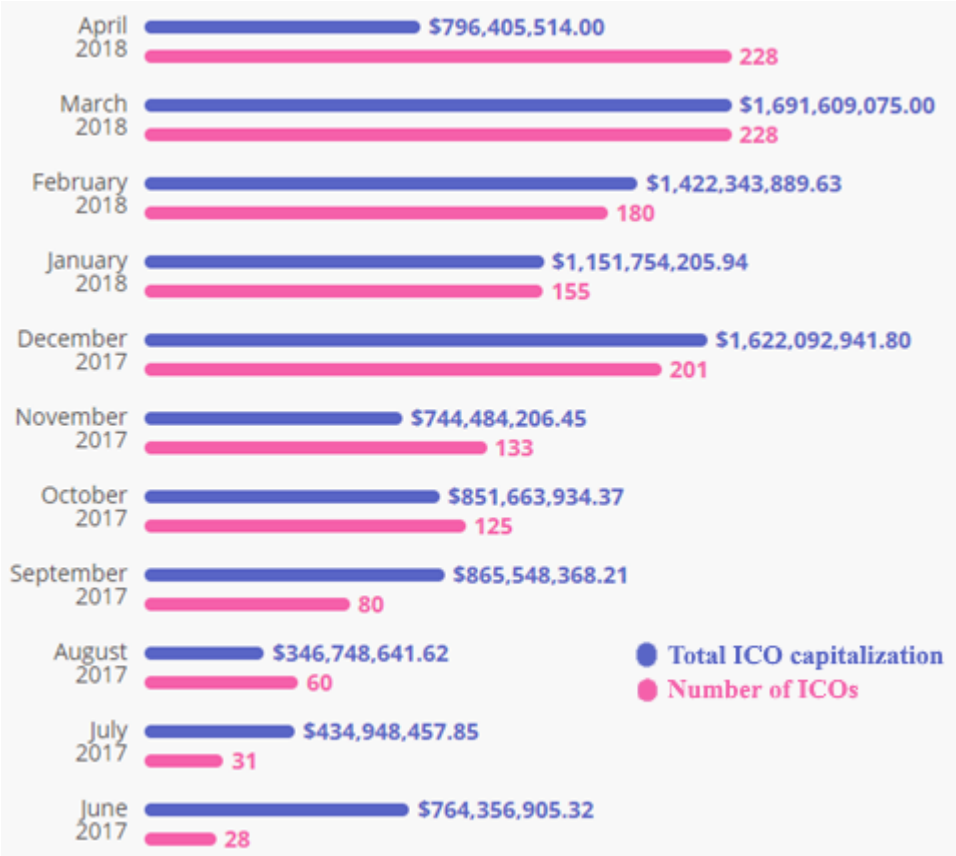


Figure 1: Monthly ICO capitalization and number of ICOs (ICObench, 2018)

The ICO popularity has originated from several key factors in addition to the general cryptocurrency hype (International Institute of Finance, 2018). Ventures may benefit from the simplicity of initiating an ICO, avoiding the need to pursue for instance angel and seed rounds.

In addition, the number of new blockchain-oriented start-ups has escalated at such a rapid rate, that venture capitalists cannot meet the demand for funds. The start-ups not subjected to venture capital funding may subsequently look to ICOs for financing. Lastly, investing early in technological companies has traditionally been restricted to venture capitalists, and the introduction of ICOs have enabled this opportunity for common investors.

3. Data

3.1 Sample

In this thesis, we have randomly selected a set of businesses listed on both Crunchbase and ICOBench. We have omitted companies with undisclosed crucial information such as ICO capitalization, making our sample restricted to companies with sufficient public ICO information. All companies listed on ICOBench.com have had an ICO, and all companies listed on Crunchbase are evidently legitimate businesses. Although the analysis may not give results universally representative for all ICOs and ICO companies, it allows us to do the intended research on all companies with sufficient available information.

We intend to look at what factors affect whether an ICO becomes successful. The data is cross-sectional, and the sample is comprised of ventures that differ in for instance size, industry, origin and prior funding rounds. The only common denominator is that all firms have held an ICO. All ICO companies, however, are in some way affiliated with blockchain technology, making the sample homogenous. In our sample, all ventures have disclosed a white paper preceding their ICO.

In addition to the cross-sectional data, we have collected time series with daily prices on tokens post ICO, from the first day trading, up to May 14, 2018. Because not all tokens in our sample are trading, the time series include data from 83 tokens with different time span, of which 78 have been trading for at least 30 days. In addition, we have added the daily prices on Ethereum, for benchmarking purposes, spanning from the first trading day of the earliest token traded in our sample, which is August 17, 2015.

3.2 Data Source

Due to the short life span of the concept, the data on ICOs available is scarce. There is no universal database containing verified information regarding ICO companies or their ICOs. Thus, we have been restricted to collect data manually, from the sources available. Since the ICO boom in 2017, several ICO tracking sites have emerged, although they are not fully consistent and consequent on what data they present. Therefore, we have cross-referenced and crosschecked the numbers from all companies across every source. We have also excluded ventures where the data seem unreliable, due to lack of information from more than one source or substantial inconsistency between sources.

For general information about ventures, we have mainly used Crunchbase, a business information platform backed by Bain & Company and Citibank, amongst others (Crunchbase, 2018). From Crunchbase, we have collected data on founding year, location, industry, ICO capitalization, and capitalization from prior venture capital funding rounds. All data from Crunchbase have been crosschecked with information from the respective ventures' websites. LinkedIn and the ICO tracking sites mentioned below have also been used to crosscheck industry, founding year and location.

The data on market capitalization has proved to be very inconsistent. Some sources have for instance listed total market capitalization as ICO capitalization, and vice versa. To ensure the reliability of the numbers, we have used several types of sources. In addition to Crunchbase, we have used CoinSchedule, an ICO listing site regularly used as reference by for instance Bloomberg, as well as several ICO tracking sites (Kharif, 2017). Mainly, these include ICObench, ICODrops, ICOData.io, Cryptoslate and ICOMarks. The data on ICO capitalization has been crosschecked with official announcements from the ventures' websites, Twitter and Facebook accounts, and official posts on Medium.com, a blog portal for entrepreneurial companies. ICO tracking sites ICOBuffer, ICORating and ICOTracker have also been used in this regard.

ICOBench has been our primary source of data on ICO presale and bonus schemes, soft and hard caps, and ICO dates. These data have also been crosschecked and cross-referenced with all mentioned ICO tracking sites, as well as official announcements on Facebook, Twitter, Medium.com and the forum on bitcointalk.org. White papers are generally published on venture websites or on official announcements, and does occasionally disclose information on

caps and dates. For information on whether the ventures have publicly disclosed developer codes, we have used GitHub, the world's largest software developer community, used by Facebook and NASA, among others (GitHub, 2018).

Financial data, specifically total token or currency supply, circulating token supply and prices, both historical and current, have been collected from Coinmarketcap. Coinmarketcap operates as a universal listing, including all tokens and coins trading on an exchange. This also applies to Ethereum, our benchmark coin. Caps or capitalization has sporadically been cited in Ethereum currency, and we have used coinmarketcap to convert these numbers into US dollars, using the closing price of Ethereum on the respective ICO end dates as conversion rate. Our hype measure has been taken directly from Google.

4. Methodology

4.1 Research Design

The analysis of this thesis will mainly be twofold. To find out what considerations investors should make before investing in ICOs, we intend to study the effects of different factors on ICO success, in addition to mechanisms behind changes in post-ICO token prices. We will use these analyses to contemplate strategical investment considerations.

We have collected data on 104 ICO funded ventures, and their corresponding ICOs. The data are measurable, and the analysis will be based on numerical comparisons and statistical inference, using secondary data. Therefore, we take a quantitative approach. The ICOs span from August 2015 to April 2018, and have diverse features of which we intend to measure the effects. We have also collected historical prices from the ICOs in our sample that are listed on public exchanges, from the respective first day of trading until May 2018. We are interested in estimating effects on cumulative returns across ventures, not daily price development. Thus, we treat these time-series as cross-sectional data, from 1-, 7- 30- and 60-day snapshots.

Our first analysis will revolve around measuring effects on ICO success. Because ICO success only has two outcomes, either success or not success, we will conduct a logistic regression with a binary dependent variable. Through this regression, we will analyze the effects of different variables on ICO success probability. We will separate the variables into three categories, comprised of corporate characteristics, specific ICO features and control variables.

Next, we will analyze what impact the variables may have on post-ICO returns. Because we are measuring effects of these variables, effects from time passing is not relevant. Thus, we calculate returns on all tokens after chosen points in time after first trading day, and then conduct an ordinary least squares regression on these cross-sectional data. In addition to the regressions, we will discuss what considerations should be done to avoid scams and assess risk. Conclusively, we should be able to outline what considerations an investor should do before investing in an ICO.

4.2 Performance Metrics

4.2.1 ICO success measure

There are many factors that can determine whether an ICO is successful. When initiating an ICO, ventures generally specify at least one of two standardized goals regarding capitalization, generally called soft and hard cap. The soft cap can be regarded as the minimum amount ventures need to continue developing the respective product or service. The hard cap is the ICO capitalization limit, and the ventures' funding target. If the hard cap is reached, the ICO ceases, disregarding its originally set time span. When the hard cap is reached, ventures supposedly have raised enough to successfully develop and launch the affiliated product or service.

Hard caps are set to avoid diluting shares and investor value, and to create a limited supply, while still reaching their preferred target amount. In accordance with basic microeconomic theory, a limited supply will generally constitute increased value (Worchel, 1975). In comparison, the high value of diamonds comes from the scarcity of the resource. Both hard and soft caps let ventures plan their spending, avoiding situations where ventures raise money without a set purpose, potentially leading to misuse. Caps are set by preference, and may not always be an accurate reflection of the actual funding needs. However, the hard cap generally seems to be set in accordance with corporate rationality, and is often substantiated in the ventures' white papers.

Thus, this analysis will determine ICO success on whether it has reached the hard cap, as this should reflect the ultimate funding goal.

4.2.2 Returns

As stated, we use USD returns as cross-sectional data. After an ICO is finished, the token usually starts trading on one or more exchanges (Bovaird, 2018). From our data sample the average duration from the end of the ICO to the token starts trading is 44.5 days. The exchanges have different criteria for a token to be listed. Bitfinex, GDAX and Bittrex, a few of the major exchanges, state that some of their criteria include shareholder interest, market capitalization, liquidity, innovation to digital currency technology, token design parameters and an assessment of the token's development process.

In our returns variables, we apply the ICO token price as basis to measure returns when investing during an ICO. Several ventures offer a bonus during the beginning of an ICO, but we have used the main ICO token price as basis in our calculation for relativity purposes.

The returns are based on daily closing prices, and are logged to get a linear relationship between observations, so it can be used without bias in the OLS regression. For our returns variables, we look at one day, seven days, 30 days and 60 days returns after the tokens have begun trading.

4.3 Logistic Regression

4.3.1 Regression model

In our first analysis, we aim to determine the effect of each variable on the ICO success rate with a regression model. Because the intention of the regression is to examine whether an ICO is likely to be successful, we use a binary dependent variable (Wooldridge, 2013). Thus, we use a logistic regression model. A logistic regression presents either a logit or a probit model as best estimates for the binary outcome. We choose to use the probit model, as this can account for non-constant error variances.

When we use a binary response model, interest lies primarily in the response probability.

$$P(y = 1|x) = P(y = 1|x_1, x_2, x_3 \ldots\ldots, x_k)$$

x denotes the full set of explanatory variables while y is the dependent variable. To make sure that the estimated response probabilities are strictly between zero and one, the general logistic regression model can be written as described below.

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \ldots + \beta_k x_k) = G(\beta_0 + x\beta),$$

where G is a function taking on values strictly between zero and one, for all real numbers. This makes the regression of our data sample as follows:

$$P(ICO\ Success = 1|x) = G\ (\beta_1 BTS + \beta_2 ETM + \beta_3 Fintech + \beta_4 MP + \beta_5 AR + \beta_6 SR + \beta_7 Series + \beta_8 Presale + \beta_9 Bonus + \beta_{10} Price + \beta_{11} Source + \beta_{12} Hype + \beta_{13} FB2017 + \beta_{14} Country + \beta_{15} ETH)$$

Abbreviation	**Measure**	**Variable**
BTS	Dummy variable, industry	Blockchain Tech Services
ETM	Dummy variable, industry	Entertainment
Fintech	Dummy variable, industry	Fintech
MP	Dummy variable, industry	Marketplace
AR	Dummy variable, previous funding round	Angel Round
SR	Dummy variable, previous funding round	Seed Round
Series	Dummy variable, previous funding round	Series Rounds
Presale	Dummy variable, presale before ICO	Presale
Bonus	Dummy variable, bonus during ICO	Bonus
Price	Logged number, ICO token price	ICO Token Price
Source	Dummy variable, source code available	Source Code Available
Hype	Logged number of Google search results prior to ICO	Hype
FB2017	Dummy variable, company founded before 2017	Founded before 2017
Country	Dummy variable, company residing in ICO liberal country	ICO Liberal Country
ETH	Logged number, 30 day returns prior to ICO	ETH 30 day return

The problem with logistic probit regression is presenting and interpreting the results (Wooldridge, 2013). The coefficient is an estimate of the partial effect each explanatory variable have on the response probability, and does not describe how much a given variable affects the probability of the event to occur. The statistical significance of the variables is determined by whether we can reject null hypothesis that $\beta_j = 0$ at a sufficiently small significance level. Since it can be difficult to interpret the log results, it can be more useful to discuss the variable's marginal effect. This explains how much a change in one explanatory variable changes the probability of the outcome of the dependent variable (Hoetker, 2006).

To use this method, all the other explanatory variables need meaningful values. One of the most common methods is to set the other variables at their mean. The problem with using means is that the average observation in a sample is not the same as the average of response calculated for each observation. As our data set consists of several binary variables that never have the mean value, it can be difficult to measure the effect on the dependent variable. Hence, we only interpret the results to whereas the independent variables have positive or negative effect on the dependent variable.

4.3.2 Dependent variable

ICO Success

ICO Success is constructed as a binary variable indicating whether an ICO reached its hard cap, and thus can be categorized as an evident success. The variable is a product of the definition in section 4.1.3**,** and is the dependent variable of our first analysis

The variable *ICO Success* holds the value 1 if the ICO reached it hard cap, and 0 if it did not.

4.3.3 Independent variables – corporate characteristics

Industry

We want to test if operating in certain industries may impact ventures' ICO success rate, and have therefore created industry variables. We have assembled our observations into four industry groups, namely fintech, blockchain technology services, entertainment, and marketplaces. Each of these industry groups have been assigned a dummy variable. Ventures operating in all other industries constitute the base group of these dummy variables. The grouping is based on what are the most recurring industries in the data sample, and have been chosen because they contain an abundant number of observations.

Fintech

Fintech is an abbreviation of financial technology (Arner, Barberist, & Buckley, 2016). This industry contains all ventures in our sample operating within finance, except financial exchanges. Due to the blockchain implementation, ICO companies are affiliated with technology, and may therefore be categorized as fintech. In our sample, fintech companies include for instance cryptocurrency wallets, investment platforms and wealth management services.

The variable *Fintech* holds the value 1 if the venture operates in the fintech industry, and 0 if it does not.

Blockchain Technology Services

The variable *Blockchain Technology Services* represents all companies which deliver specific services built on or related to blockchain. This includes blockchain software as a service (SaaS), ventures that implement blockchain systems or build blockchain applications for other businesses, blockchain consulting firms and ventures distributing blockchain services such as cloud storage, analytics and application programming interfaces(APIs).

The variable *Blockchain Technology Services* holds the value 1 if the venture delivers blockchain services, and 0 if it does not.

Entertainment

The *Entertainment* variable represents all companies operating in the entertainment segment. This includes E-sports and gaming services, video streaming platforms, and sharing services for video and music.

The variable *Entertainment* holds the value 1 if the venture operates in the entertainment industry, and 0 if it does not.

Marketplace

The variable *Marketplace* represents all companies that have developed or plan developing a marketplace. Marketplaces entails platforms where users may buy or sell products or services, for instance musicians, consumer products and tickets. Services within the sharing industry

also fall under this variable. Although also affiliated with fintech, cryptocurrency exchanges are regarded marketplaces in our analysis.

The variable *Marketplace* holds the value 1 if the ventures develops a form of marketplace, and 0 if it does not.

Venture capital funding

We want to measure if firms with previous venture capital funding have a higher likelihood of ICO success. Being backed by venture capitalists can signal solidity and low firm-specific risk, as venture capital funding typically is preceded by a thorough due diligence. Investors may perceive venture capital funded firms as more likely to be legitimate businesses, which can lead to higher ICO success rate.

We have categorized venture capital funding into three groups, separated by type. These are angel rounds, seed rounds and series rounds, as specified by Crunchbase (Crunchbase, 2018). Ventures may have been subject to one or more of these types. We have logged the venture capital variables due to the skewness of the observations.

Angel round

Angel rounds are the first possible venture capital funding round for a firm (Crunchbase, 2018). Angel investments are commonly low-scale entrepreneurs and startups with high growth potential. Angel investors join at a very early stage and can contribute with expertise, skills and knowledge in addition to money. Angel investors are often friends, family or other entrepreneurs and small companies.

Seed round

Seed rounds typically comes after angel rounds, exceeding angel investments in terms of funding amount (Crunchbase, 2018). With reference to our sample, seed stage is the most common funding type preceding an ICO. Seed rounds may be used to support early stage product development and market research. Thus, these rounds can potentially improve and add substance to an ICO prospectus, for instance enabling the creation of a product prototype.

Series round

Series rounds are typically the largest venture capital funding rounds, ranging from A to H in order of stage, where A is the earliest (Crunchbase, 2018). The ventures undergoing series rounds are typically established, although series A companies are still in early stage financing.

Our sample mostly contains Series A funded ventures, and some which have had unspecified series rounds. ICOs are generally initiated by start-ups and businesses planning to launch a new service or product. Thus, funding beyond series A and B rounds seems to be uncommon with these companies.

4.3.4 Independent variables – ICO characteristics

Presale

Presale bonus is a small-scale token sale held by the company before the official ICO. The token price in a presale is often lower than the price in an ICO. Companies run presales to accrue funds to cover expenses which has incurred before the launch of the ICO. The funds raised in the presale are often used for promo ads, meet-up costs and strategic recruitment to help increase the investor interest.

This variable *Presale* is constructed as a dummy variable, and holds the value 1 if the company held an ICO presale and the value 0 if it did not.

Bonus

An ICO bonus scheme is intended to incentivize investors to participate early in the ICO, by giving discounts the first days or weeks. Envion, as an example venture, launched an ICO with a token price of 1 EVN = $0.7 (ICObench, 2018). During the two first weeks of the ICO, the price of one token gradually increased from $0.7 to $1.

This variable *Bonus* is constructed as a dummy variable, and holds the value 1 if the ICO had a bonus scheme, and the value 0 if it did not.

ICO Token Price

This variable represents the price an investor must pay for one token in an ICO. The price is set unrestrictedly by the company holding the ICO. In our sample, the prices range from $0,0012 to $100 per token.

We created this variable to analyze if the price of a token impacts the probability of ICO success. One could assume that the price of the token would not intuitively matter, because the number of tokens you get for a set amount of money would not differ in value. We use this variable to find out if there is a psychological effect of dilution, where investors prefer having

a larger number of tokens, disregard the value. For instance, an investor may prefer buying 100 tokens in an ICO for $10 to buying 10 tokens in another for $10, ceteris paribus.

Because we observe that the distribution is highly skewed, we log the variable.

Source code available

Companies affiliated with ICOs generally base their products or services on blockchain. Companies may choose to have an open source code to show transparency and openness to potential investors. This enables people with sufficient technical ability to assess the quality of the code before investing. The source code is often the fundament of an ICO, and many companies thus choose to publish it. Published source codes may give the company more credibility.

The variable *Source code available* is constructed as a dummy variable that holds the value 1 if the source code is publicly available and the value 0 if it is not.

Hype

This variable is used to analyze whether hype around an ICO may affect the success probability. Community engagement and internet hype are important for promoting ICOs to potential investors. Investors may be more likely to invest in a renowned ICO than an inconspicuous one, both due to marketing and possible lower perceived risk from information shortage. To include the different social medias, forums and newspapers in the variable, we used the total number of results from a refined google search, customized to only show entries relevant to the company and its ICO. As we are only interested in the hype prior to the ICO, we have filtered out the search results from the ICO start date and onwards.

This variable shows the number of refined google search entries prior to the ICO. As the search results are highly skewed, we have logged the variable.

4.3.5 Control variables

Company founded before 2017

To control for effects from the attention from the still ongoing ICO boom, we include a variable representing whether the company was founded before 2017. As mentioned, the total number of ICOs drastically increased in 2017. Many entrepreneurs saw the potential profitability of ICOs, and thus, a large wave of new blockchain start-ups emerged accordingly.

This variable is intended to remove the variations in ICO success rate caused by the ICO popularity rise and accompanying start-up boom in 2017. We intend to control for potential supply and demand effects by distinguishing what companies were established during this time. The increase in number of start-ups may have led to fewer of the affiliated ICOs resulting in success, because of abundant supply of ICO investment opportunities. On the other hand, companies founded before 2017 may be perceived as less risky investments, as they already are established ventures.

The variable *Company founded before 2017* is constructed as a binary variable, holding the value 1 if the venture was established before 2017, and 0 if it was not.

ICO Liberal Country

This variable is intended to control for effects from differences in governmental ICO regulations. As stated, countries differ greatly in regulations of the ICO market. Because of the short lifespan of the ICO concept, many countries have not yet decided their regulatory position, and many regulations have arisen over the time span of our sample. Over time, we expect regulations on ICOs to increase on a global basis. Thus, we aim to control for regulatory effects by creating a dummy variable representing countries known for their historically liberal ICO policy, as defined by applicature.com (Hryniuk, 2018). The countries we label as ICO liberal are Singapore, Switzerland, Cayman Islands, Gibraltar, Malta, Latvia, Estonia, Lithuania and Russia.

The variable *ICO liberal country* is constructed as a dummy variable, and holds the value 1 if the company resides in a historically ICO liberal country, and the value 0 if it does not.

Ethereum 30-day prior cumulative return

This variable is used to control for potential momentum effects on ICO success probability caused by fluctuations in Ethereum. Because most tokens are built on the Ethereum blockchain, we expect the prices are highly correlated with the Ethereum price. Ventures may profit on having an ICO when Ethereum is in an upturn, because of the increased demand at the time. In other words, an ICO may reach its hard cap to some extent because of an upturn in Ethereum, due to increased demand. We intend to control for this potential effect.

The variable represents the cumulative log-return of Ethereum 30 days prior to the ICO start.

4.4 Ordinary Least Squares Regression

4.4.1 Regression model

In our second analysis, we want to determine the effect of each variable on the first 30-day cumulative return of a token. As the dependent variable is ratio scaled, we use ordinary least squares regression (OLS) (Moutinho & Hutcheson, 2011). This is a generalized linear modelling technique used to model a single response variable recorded on at least an interval scale. The OLS model can be applied to both single and multiple explanatory variables.

There are certain assumptions that must be satisfied in order to use the OLS method to estimate and make interference about the coefficients in linear regression analysis (Wooldridge, 2013). The assumptions are that the model is linear in the parameters (β), we have a random sample of n observations, none of the independent variables are constant or have an exact linear relationship and the error has an expected value of zero.

The OLS regression represents the relationship between a continuous response variable (Y) and explanatory variables (X) using a line of best fit, where Y is predicted, at least to some extent, by X (Moutinho & Hutcheson, 2011). This can be mathematically presented by the equation $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_2 X_2 + \ldots + \beta_k X_k$ if the relationship is linear. The intercept, α, indicates the value of Y when all the explanatory variables are equal to zero. The regression coefficients, β, indicates the slope of the regression line and describe the change in Y that is associated with a unit change in X.

In addition to interpreting the coefficients, it can be important to check how well the model fits the data (Moutinho & Hutcheson, 2011). This can be determined by comparing the expected values of Y from the regression with the observed values of Y. This is the deviation, or residual, and provides an indication of how well the regression model predicts each data point. The sum of all squared residuals (RSS) provides a measure of model fit for an OLS regression model. A low deviance indicates a good-fitting model, and a high deviance indicates a poorly fitted model. The deviance is also used to determine the significance of the explanatory variables by explaining each variables effect on the prediction of the response variable.

Another commonly used measure of model-fit is the R^2 (Moutinho & Hutcheson, 2011). This indicates the percentage of variation in the response variable that is explained by the model.

R^2 is defined as $R^2 = \frac{RSS\ after\ regression}{total\ RSS}$. An issue with the R^2 is that it will always increase when additional explanatory variables are added. A solution to this is to calculate the adjusted R^2, which considers the number of explanatory variables added to the regression model. By doing this, the R^2 does not necessarily increase as more explanatory variables are added. The adjusted R^2 is defined as: $R_a^2 = R^2 - \frac{k(1-R^2)}{n-k-1}$, where k is the number of explanatory variables and n in the total number of observations.

The OLS regression of our data sample can be written as:

$$Y(30TR) = \alpha + \beta_1 Success + \beta_2 BTS + +\beta_3 ETM + \beta_4 Fintech + \beta_5 MP + \beta_6 AR + \beta_7 SR + \beta_8 Series + \beta_9 FB2017 + \beta_{10} ETH$$

Abbreviation	**Measure**	**Variable**
30TR	Logged number of token returns first 30 days	30-day Token return
Success	Dummy variable, ICO reached hard cap	ICO Success
BTS	Dummy variable, industry	Blockchain Tech Services
ETM	Dummy variable, industry	Entertainment
Fintech	Dummy variable, industry	Fintech
MP	Dummy variable, industry	Marketplace
AR	Dummy variable, previous funding round	Angel Round
SR	Dummy variable, previous funding round	Seed Round
Series	Dummy variable, previous funding round	Series Rounds
FB2017	Dummy variable, company founded before 2017	Founded before 2017
ETH	Logged number of ETH returns from mid ICO to 30-days after trading starts	ETH Returns

4.4.2 Dependent variable

Returns

Returns are the dependent variable of this analysis. It indicates the 30-day log-returns in USD after the tokens starts trading. Additionally, we use one-day, seven-day and 60-day returns as dependent variable, constructed similarly.

4.4.3 Independent variables

ICO Success

ICO Success is the dependent variable in our first analysis, and indicates whether an ICO reached its hard cap. In this analysis, we will use it to examine the effect ICO success may have on token returns after they have begun trading.

Industry

We include the industry variables constructed as dummies representing ventures operating within fintech, blockchain technology services, entertainment and marketplace industries. We want to find out if investments in certain industries are more profitable regarding capital gains, and thus more attractive investment opportunities. The variables are binary, and identical to the variables used in the logistic regression.

Venture capital funding

We also intend to measure if having prior venture capital funding may impact the token price post-ICO. Thus, we include the variables also used in the logistic regression, representing prior venture capital funding rounds. These are angel rounds, seed rounds and series rounds. Having been funded by venture capitalists may indicate both corporate solidity and expected profits, which can affect the price movements of a token. The venture capital funding variables are logged.

4.4.4 Control variable

Company founded before 2017

Resembling seasonal effects, we intend to control for price movements originating from the ICO start-up boom. Therefore, we include this control variable representing companies founded before 2017. This way we mean to draw out possible effects on price movements

from supply and demand shocks following the increased start-up activity in the ICO market. The variable is identical to the equivalent in the logistic regression, and is binary.

ETH returns

As stated, the price movement of tokens are highly correlated with Ethereum. To correct for token price movements caused by changes in the Ethereum price, we include a control variable with Ethereum returns from the middle of the ICO until either one, seven, 30 or 60 days after the token starts trading. We calculate Ethereum from the mid-point of the ICO to compensate for the timespan. Participants may invest at any point during an ICO, and thus, we assume the mid-point to be the most accurate.

As the Ethereum returns are highly skewed, we log them to get a linear relationship.

4.5 Limitations

4.5.1 Success measure

There are some weaknesses in using hard cap reach as measure of ICO success. As stated, the hard cap is the absolute funding limit of an ICO. This implies that a venture may already have surpassed its original financing goal, and still continue accepting funds. Subsequently, they may raise funds beyond what they essentially need to launch the projected product or service. A venture can set a hard cap far beyond what they initially deem realistic, and this may be underpinned by recurring disproportionality between ventures' soft and hard caps. As stated, however, soft caps generally represent the amount ventures need to continue development of a product or service, and may therefore not directly coincide with unconditional ICO success.

The lack of universal hard cap regulation is another issue regarding use as success measure. Hypothetically, a venture can set its ICO hard cap to an initially unrealistic $1 billion, while only needing $1 million to launch its product. If the ICO greatly outperforms its perceived potential, and for instance raises $900 million, the ICO is a huge success relative to an ICO from a venture needing $950 million to launch its product, all else equal. In most ICO announcements, however, ventures substantiate the set hard cap. In this thesis, we therefore assume that hard caps are set in accordance with rationality.

An ICO raising 95 % of its hard cap may not unconditionally be categorized as unsuccessful. One may argue that ICOs raising amounts close to the respective hard caps may be as

successful as ICOs reaching it. From looking at official post-ICO announcements, we have generally seen that ventures reaching hard caps tend to announce this, while ventures almost reaching it does not. This indicates that the ventures themselves does not consider their ICOs unconditionally successful unless the hard cap is reached. Subsequently, in the current ICO climate, ventures generally seem to set hard caps to the exact amount they need for a successful launch.

There are other ways to determine whether an ICO is successful or not. Christian Fish from University of Trier uses the total amount raised in an ICO as success measure in his paper on ICOs (Fish, 2018). The problem with this is that firms differ in size and funding goals. The missing relativity between businesses will make total ICO capitalization unable to illustrate whether an ICO is successful or not. A venture may set its funding goal to $5 million and raise $10 million, while another aim for $200 million and raise $20 million. If ICOs did not have a funding limit, or a hard cap, the amount raised could be a fitting dependent variable.

Some may compare ICOs and tokens to IPOs and stocks. This is generally not a suitable comparison because of the attributes of tokens. There are, however, some similarities. Both tokens and stocks are often traded publicly post-offering. Therefore, it is possible to use post-ICO price movements as measurement for ICO success. If an ICO is successful, one may argue that this should be reflected in the price. This measure disregards ICO capitalization, but the relativity remains due to market forces.

There are several problems with this measure. Firstly, not all ICO tokens are made publicly available for trading. All non-trading tokens will therefore be omitted, and the results from an analysis will not be as representative. ICOs with non-trading tokens may be as successful as trading tokens, especially if the tokens are utility or asset tokens as categorized in 2.2. In addition, the cryptocurrency market is extremely volatile relative to the stock market. Thus, the prices of a token may vary dramatically from day to day from external causes, disregarding the ventures' actual situation. There is also an important distinction between the success of the company post-ICO and the success of the ICO itself. This is not taken into account when using price change as ICO success measure. Additionally, a venture's product or service funded by an ICO may take time to fully develop and launch, which is not necessarily reflected in the token price between the ICO and the product launch.

5. Analysis

5.1 ICO Success

5.1.1 Descriptive statistics

	ICO Failure						ICO Success					
Variables	**ICOs**	**Qty**	**Mean**	**Sd**	**Min**	**Max**	**ICOs**	**Qty**	**Mean**	**Sd**	**Min**	**Max**
Corporate Characteristics												
Blockchain Tech Services	58	4	0.07	0.26	0	1	46	9	0.20	0.40	0	1
Entertainment	58	6	0.10	0.31	0	1	46	3	0.07	0.25	0	1
Fintech	58	23	0.40	0.49	0	1	46	16	0.35	0.48	0	1
Marketplace	58	8	0.14	0.35	0	1	46	7	0.15	0.36	0	1
Angel Round (in millions)	58		0.07	0.28	0	1.5	46		0.12	0.45	0	2.3
Seed Round (in millions)	58		0.18	0.48	0	2.5	46		0.84	3.74	0	25.0
Series Rounds (in millions)	58		1.56	5.05	0	32.6	46		5.98	23.01	0	140.3
ICO Characteristics												
Presale	58	24	0.41	0.50	0	1	46	12	0.26	0.44	0	1
Bonus	58	14	0.24	0.43	0	1	46	8	0.17	0.38	0	1
ICO Token Price	58		2.69	13.26	0.01	100.0	46		1.02	4.40	0.001	29.9
Source Code Available	58	28	0.48	0.50	0	1	46	32	0.70	0.47	0	1
Hype (in thousands)	58		23.43	15.5	0.14	71.8	46		32.6	18.2	5.82	102.0
Control variables												
Founded before 2017	58	33	0.57	0.5	0	1	46	32	0.7	0.47	0	1
ICO Liberal Country	58	20	0.34	0.48	0	1	46	21	0.46	0.5	0	1
ETH 30-day return (%)	58		20 %	52 %	-49 %	202 %	46		31 %	55 %	-57 %	168 %

Table 1: Descriptive statistics of ICO Failure/Success

	ICO Failure		ICO Success		Total	
	Qty	Mean	Qty	Mean	Qty	Mean
Angel Round (in millions)	6	0.68	5	1.07	11	0.86
Seed Round (in millions)	15	0.71	11	3.53	26	1.90
Series Rounds (in millions)	9	10.05	13	21.14	22	16.62

Table 2: Descriptive statistics of funding rounds

Table 1 provides descriptive statistics of our main data sample. The statistics are divided into two subsamples; ICOs that are classified as successes and ICOs that are classified as failures. The descriptive statistics gives a numeric overview and comparison of the variables in our regression model. In our data sample, we have 104 ICOs, whereas 46 have been classified as successful and 58 as failed.

Most of our variables are dummy variables, and holds the value 0 or 1. Funding rounds, hype and token price are logged in our regression analysis due to skewness, but we choose to show the original values in the descriptive statistic to give a better overview of the observations. In corporate characteristics, we include industry and previous funding. Blockchain technology services seems to be more frequent in successful ICOs, as the mean is 0.20 compared to 0.07 in failed ICOs. This can indicate that ventures in this industry tends to have a higher success rate in an ICO. As for the rest of the industries, it is hard to observe a difference as the means are quite similar. For funding rounds, we can observe that the means for Seed Rounds and Series Rounds are higher in successful ICOs, and can indicate that ventures with these previous funding rounds have a higher success rate.

In ICO characteristics, we can observe that the means for source available and hype are higher in successful ICOs, while the mean for ICO token price is lower. Bonus and Presale Bonus have lower means and seem to decrease the probability for success, but the difference is low and might not be significantly different.

Table 2 shows descriptive statistics on the observations of previous funding. We observe that the mean for each funding type is much higher in successful ICOs, and can indicate that previous funding increases the chance of ICO success.

The descriptive statistics seems consistent with our hypotheses that some corporate and some ICO characteristics can contribute to higher probability of ICO Success.

5.1.2 Correlation matrix

The correlation matrix shows possible covariance between the variables in our analysis. To test for this, we measure the correlation between two variables as shown in Table 3. Coefficients close to 1 and -1 indicates strong correlation. From Table 3, we can see that the coefficients range between -0.32 to 0.36. This indicates that there should be no problems regarding correlation between variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dependent variable																
(1) ICO Success	1															
Corporate Characteristics																
(2) Blockchain Tech Services	0.19	1														
(3) Entertainment	-0.07	-0.12	1													
(4) Fintech	-0.05	-0.29	-0.24	1												
(5) Marketplace	0.02	-0.16	-0.13	-0.32	1											
(6) Angel Round (log.)	0.02	-0.04	0.01	0.07	-0.05	1										
(7) Seed Round (log.)	0.00	0.20	-0.03	0.00	-0.12	0.07	1									
(8) Series Rounds (log.)	0.15	-0.01	0.09	0.15	-0.21	0.00	0.10	1								
ICO Characteristics																
(9) Presale	-0.16	-0.15	-0.01	0.10	0.05	-0.06	-0.07	-0.09	1							
(10) Bonus	-0.08	-0.05	0.01	-0.01	0.06	-0.10	0.08	0.02	0.27	1						
(11) ICO Token Price (log.)	-0.18	-0.03	-0.17	0.10	-0.13	-0.01	-0.06	0.15	-0.06	-0.02	1					
(12) Source Code Available	0.21	0.27	0.06	-0.14	0.02	-0.13	0.01	0.09	-0.20	0.02	-0.05	1				
(13) Hype (log.)	0.28	0.19	-0.14	-0.02	0.15	-0.03	-0.08	0.01	0.08	0.11	-0.19	0.26	1			
Control variables																
(14) Founded before 2017	0.13	0.05	-0.04	-0.02	-0.13	0.14	0.36	0.27	-0.19	-0.04	0.23	-0.10	-0.24	1		
(15) ICO Liberal Country	0.11	0.17	-0.04	0.07	-0.11	-0.02	-0.06	0.01	0.03	0.11	0.04	0.01	0.25	-0.31	1	
(16) ETH prior 30-day return (log.)	0.10	0.11	-0.12	-0.16	-0.03	-0.08	0.17	0.00	-0.07	-0.01	-0.04	-0.05	-0.02	0.17	0.00	1

Table 3: Correlation matrix

5.1.3 Regression results

Table 4 provides the main results of our study. The models are numbered from 1 to 4, and provide different variables in the regression for ICO Success.

In Model 1, we test the corporate characteristics' effects on ICO Success. We can see that the only significant variables are whether the venture is in the blockchain technology services industry and whether it has had previous series rounds. This is, however, only on a 10 % significance level, and affects ICO success positively.

In Model 2, we test whether ICO characteristics affect ICO Success. We observe that the hype is significant on a 1 % significance level and affect the ICO success positively. Presale affect the ICO success negatively, but only on a 10% significance level. Bonus and Source Code Available do not have a significant effect on the outcome of the ICO.

In Model 3, we test for both corporate and ICO characteristics. ICO token price is now significant on a 5% significance level and affect the ICO success negatively, meaning that a lower price increases the probability of ICO Success. We observe that the blockchain technology services and presale are no longer significant. This indicates that the perceived effects from these variables could be explained by variations in other variables.

In our unrestricted model, model 4, we include all control variables. We observe that Founded before 2017 has a significant effect on the ICO success. This means that ventures founded before 2017 have a higher chance of ICO success. Series rounds are no longer significant, while ICO token price and hype are still significant on a 5% significance level. The control variables ICO liberal countries and Ethereum prior 30-days return does not have a significant impact on ICO Success. Adding the control variables does not result in large changes in the coefficients of the other independent variables, as we observe when comparing Model 3 and Model 4.

ICO Success	1	2	3	4
Corporate Characteristics				
Blockchain Tech Services	0.834*		0.271	0.182
	(0.448)		(0.493)	(0.504)
Entertainment	-0.269		-0.510	-0.413
	(0.505)		(0.557)	(0.592)
Fintech	-0.016		-0.190	-0.109
	(0.320)		(0.351)	(0.370)
Marketplace	0.287		-0.100	0.032
	(0.410)		(0.446)	(0.458)
Angel Rounds (log.)	0.010		0.011	0.001
	(0.031)		(0.035)	(0.036)
Seed Rounds (log.)	-0.012		-0.017	-0.038
	(0.022)		(0.025)	(0.027)
Series Rounds (log.)	0.037*		0.043*	0.032
	(0.020)		(0.022)	(0.024)
ICO Characteristics				
Presale		-0.506*	-0.447	-0.265
		(0.303)	(0.317)	(0.326)
Bonus		-0.213	-0.205	-0.302
		(0.330)	(0.344)	(0.362)
ICO Token Price (log.)		-0.119	-0.175**	-0.245**
		(0.081)	(0.087)	(0.098)
Source Available		0.308	0.244	0.368
		(0.277)	(0.295)	(0.306)
Hype (log.)		0.611***	0.595**	0.648**
		(0.223)	(0.237)	(0.254)
Control variable				
Founded before 2017				0.936**
				(0.373)
ICO Liberal Country				0.427
				(0.326)
ETH prior 30-day returns				0.120
				(0.359)
Constant	-0.360	-6.444***	-6.372***	-7.824***
	(0.260)	(2.208)	(2.313)	(2.520)
Observations	104	104	104	104
Log Likelihood	-67.502	-61.903	-59.349	-55.687
Akaike Inf. Crit.	151.005	135.806	144.698	143.373

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: ICO Success regression results

5.1.4 Discussion

As presented above we can see that we may discard our hypotheses regarding effects from prior venture capital funding and operating industry on the probability of ICO success. In our unrestricted model, none of the corporate characteristics has significant effect on whether the ICO becomes successful. This can indicate that investors are not industry specific, and rather assess ICOs by product. In addition, investors do not seem to prefer venture capital funded companies in ICO investments. This may be a result of information shortage, if ventures do not announce venture capital backing, or that investors believe venture capitalist control negatively compensate for the benefits of funding.

The ICO characteristics have two significant variables, ICO token price and hype, both on 5 % significance level. The fact that the ICO token price affects the probability of ICO success negatively, can indicate a psychological effect where investors will choose an ICO where they get more tokens for the same amount of money, all else equal. Getting 1000 tokens can be more attractive to investors compared to 0.1 token, disregard the value, as the perceived value might be higher.

The hype around the ICO affects the probability of ICO success positively. Ventures use social media, blogs and other online forums to promote their ICO. The fact that the hype plays a significant role in getting enough investors to achieve a successful ICO unites with our hypothesis. We also see that it may not be possible to use a momentum strategy based on Ethereum to increase the chance of ICO success. This indicates that movements in the Ethereum price does not affect interest for investing in ICOs. As ICOs probably requires thorough planning, Ethereum momentum may not be relevant for the time of the ICO.

In contradiction to our hypothesis, available source codes do not seem to have a significant effect on ICO success. Ventures choose to have an open source code to show transparency and to give people with technical qualifications the opportunity to assess it. The fact that this variable is not significant can indicate that the quality of the source codes differ, making the difference in source codes more interesting than the availability. On the other hand, it can indicate that investors normally do not have the technical qualifications to assess them, and therefore choose not to make an investment based on this.

Presale and bonus are not significant, and evidently does not affect whether an ICO becomes successful. Both presale and bonus offer a discount on the token for a limited time. This might

spike the investment in the beginning, but the ICO still needs to reach its hard cap to become successful. It is important to note that investing in a presale or in an ICO with a bonus scheme could be ideal if the investor has already considered an ICO to be a potentially good investment.

Companies founded before 2017 are evidently more likely to achieve ICO success. More established companies may have a sound record, for instance with a history of producing successful products. Thus, investors may perceive their ICOs more likely to be successful. This effect, however, may be more accurately explained by the ICO boom. As stated in section 2.2, the number of ICOs increased dramatically. In an increasing pool of ICO investment opportunities, some are likely to be more popular than other. In accordance with the effect of hype, investors may gather around the popular ICOs, neglecting those not as hyped, which may be the reason why ICOs founded during the boom are less likely to succeed.

Countries have recently begun regulating ICOs due to scam incidents. Our ICO liberal country variable is not significant, and the reason might be that it may take time to decide on and implement new national regulations. The ICOs in our analysis might also be located in countries that have altered their regulations during the time span of our sample. Some countries have announced that they have legislated regulations, which might not be effective yet. In addition, the regulations of today may not affect ICOs as severely as hypothesized. Few governments for instance regulate utility tokens, which is the most common. Although the effect is not apparent in our sample, we expect increased regulations to affect ICOs if these regulations begin differing greatly between countries.

5.2 Returns

5.2.1 Descriptive statistics

	ICOs	Qty	Mean	St. Dev.	Min	Max
Dependent variable						
30-day token USD return	78		180.9 %	580.6 %	-93.2 %	3805.7 %
Independent variables						
ICO Success	78	41	0.53	0.50	0	1
Blockchain Tech Services	78	10	0.13	0.34	0	1
Entertainment	78	6	0.08	0.27	0	1
Fintech	78	28	0.36	0.48	0	1
Marketplace	78	14	0.18	0.39	0	1
Angel Round (in millions)	78	6	0.09	0.39	0	2.30
Seed Round (in millions)	78	19	0.56	2.89	0	25.0
Series Rounds (in millions)	78	18	4.04	17.88	0	140.3
Control variables						
Founded before 2017	78	49	0.63	0.49	0	1
ETH Returns	78		71.7 %	172.3 %	-69.2 %	874.7 %
First day token USD return	83		151.5 %	467.5 %	-96.6 %	2902.7 %
Seven day token USD return	83		154.4 %	420.8 %	-96.8 %	2110.7 %
30-day day token USD return	78		180.9 %	580.6 %	-93.2 %	3805.7 %
60-day token USD return	69		58.9 %	186.9 %	-89.0 %	1112.7 %

Table 5: Descriptive statistics on 30-day token USD returns regression, and one, seven, 30 and 60 days token USD returns

In our secondary analysis, the sample consists of 78 observations, because not all tokens are trading on public exchanges and have been trading for at least 30 days. The 30-day token return is the dependent variable, and represents cumulative price change after 30 days of trading, with ICO token price as basis.

Most of the independent variables are binary, except the Ethereum control variable and the prior venture capital variables angel round, seed round and series rounds. As in the first analysis, we have log-transformed these variables because of skewness. In our descriptive statistics, however, we have chosen to present them in absolute numbers for more sensible interpretation. We have also chosen to add descriptive statistics on token return variables after 1, 7 and 60 days of trading, for comparative reasons.

Complete descriptive statistics on the models related to 1-, 7- and 60-day returns are presented in the appendix, in addition to a correlation matrix. The latter is not discussed, as all the independent variables except for ETH returns are identical to the equivalents from the first analysis, and the dependent variables are not substantially correlated with any of the others. ETH returns has a correlation coefficient of 0.48 with the dependent variable. This is in accordance with our assumption, as token returns are affected by price movements in Ethereum.

From the mean value, we see that the average token bought in an ICO have 180.9 % increase in price after 30 days of trading, indicating underpricing. The returns vary greatly, as shown by the standard deviation of 580.6 % and the maximum and minimum values of respectively 3805.7 % and -93.2 %. The high variation also applies to returns after 1, 7 and 60 days, although the standard deviation is highest at 30 days. We see that mean returns are highest after 30 days, and lowest after 60 days, at 58.9 %. 60-day returns also has a substantially lower standard deviation, with 186.9 %, as opposed to the second lowest in our set, at 420.8 %, after seven days.

83 tokens from our sample have been traded for at least seven days on a public exchange post-ICO, and 69 have been trading for 60 days or more. As stated, 78 of them have been trading for at least 30 days, of which 41 originates from successful ICOs. 28, 14, 10 and 6 of the tokens are affiliated with ventures respectively operating in fintech, marketplace, blockchain technology services and entertainment. Thus, 20 ventures with tokens that have traded for at least 30 days operate in other industries.

Of the 78 trading tokens, six of the affiliated companies have been subject to angel funding, 19 to seed funding and 18 to series funding. The average angel funding amount is $90 000, whereas seed is $560 000 and series $4 040 000. These numbers do not represent the average funding amounts for companies subject to venture capital funding, but the average for all ventures that have tokens traded for 30 days, including companies without previous funding. The largest amount of prior venture capital funding is the same as in the first analysis, $2.3 million, $25 million and $140.3 million from angel, seed and series respectively. 49 of the relevant companies were founded before 2017.

5.2.2 Regression results

Table 6 presents the results from our second analysis, measuring effects on cumulative token returns after 30 days of trading. The models are numbered from 1 to 5, and provide the results from regressions with different sets of variables.

In model 1, we test the impact of an ICO being successful on the 30-day token returns, with only the Ethereum returns variable included to control for Ethereum fluctuations. The intention of this regression is to check the assumption made initially, that ICO success lead to higher estimated returns. We see that ICO success is significant on a 5 %-level. The coefficient is positive with a value of 0.555, which indicates that estimated returns increase by 55.5 percentage points if an ICO is successful. The adjusted R^2 is at 0.259, presumably at such a high value because the Ethereum price is so significant, at 1 %-level.

Model 2 tests if ventures operating in certain industries are more prone to 30-day capital gains. In the model, we regress 30-day log-returns on the binary variables blockchain technology services, entertainment, fintech and marketplace, in addition to the Ethereum control variable. We see that blockchain technology services is significant on a 5 %-level, with a positive coefficient. The significance of blockchain technology services may indicate that companies operating in this industry achieve an estimated 95 percentage points higher capital gains than ventures in other industries, ceteris paribus. The adjusted R^2 in model 2 is 0.238, just below model 1.

Model 3 tests if having different prior venture capital funding rounds impact 30 days post-ICO capital gains on a token, without any other variables besides the Ethereum control variable. Thus, we have included the logged variables seed, angel and series rounds. As we can see, seed round and Ethereum returns are the only significant variables. Seed round is significant on a 1 %-level, with a positive coefficient of 0.055. This indicates that one percentage point increase in seed round funding increase estimated 30-day returns with 0.055 percentage points. The adjusted R^2 has risen to 0.301, indicating that prior funding rounds may explain more of the variation in log-returns than industry.

Model 4 is a combination of models 1-3, and estimates effects on 30-day log-returns from ICO success, industries and prior funding rounds, controlled for Ethereum price changes. Seed round and blockchain technology services are still significant, though to a lesser extent, respectively on 5 %- and 10 %-level. The coefficients are still positive, at 0.053 and 0.702,

indicating that blockchain technology service-companies and ventures subject to prior seed funding are more prone to capital gains after 30 days of trading.

ICO success is significant on a 5 %-level, similar to model 1. The coefficient is 0.486, indicating that estimated returns increase by 48.6 percentage points if an ICO is successful. The R^2 in model 4 has risen to 0.343, and thus indicate that some variations in 30-day log-returns are explained by the included variables, and that the goodness of fit is at an acceptable level.

Model 5 is our unrestricted model estimating effects on 30-day post-ICO log-returns. The model includes all the variables from model 4, in addition to the control variable representing companies founded before 2017. In model 5, ICO success is significant on a 1 %-level, strongly indicating that ICO success influence returns 30 days post-ICO. The coefficient is 0.665, and thus implies that estimated returns after 30 days increase with 66.5 percentage points if the ICO is successful.

Blockchain technology services variable is not significant in this model. Thus, the variable does not substantiate an indication of effect. Seed round is, however, significant on a 1 %-level, with a coefficient of 0.069. Therefore, we may state that one percentage point increase in prior seed funding increase the estimated 30-day post-ICO returns with 0.069 percentage points.

The control variables are significant on a 1 %-level, and strongly indicate that founding year impact 30-day post-ICO returns. The coefficient is negative at -0.746, implying that companies founded before 2017 have 74.6 percentage points lower estimated 30-day returns than companies founded in 2017 and 2018. In addition, the clear influence of Ethereum on the token returns are substantiated. The adjusted R^2 of model 5 is 0.406, which can be perceived as a good fit.

USD returns after 30 days of trading	1	2	3	4	5
ICO Success	0.555**			0.486**	0.665***
	(0.240)			(0.234)	(0.231)
Blockchain Tech Services		0.950**		0.702*	0.597
		(0.403)		(0.384)	(0.367)
Entertainment		0.630		0.697	0.644
		(0.484)		(0.460)	(0.438)
FinTech		0.344		0.272	0.121
		(0.304)		(0.290)	(0.281)
Marketplace		0.267		0.455	0.321
		(0.365)		(0.352)	(0.338)
Angel Round (log.)			0.041	0.032	0.049
			(0.032)	(0.032)	(0.031)
Seed Round (log.)			0.055***	0.053**	0.069***
			(0.020)	(0.020)	(0.020)
Series Rounds (log.)			0.014	0.014	0.027
			(0.017)	(0.017)	(0.017)
Control variable					
Founded before 2017					-0.746***
					(0.260)
ETH Returns (log.)	0.917***	0.817***	0.804***	0.912***	1.027***
	(0.173)	(0.171)	(0.164)	(0.166)	(0.163)
Constant	-0.310*	-0.334	-0.264*	-0.852***	-0.528*
	(0.185)	(0.239)	(0.148)	(0.273)	(0.283)
Observations	78	78	78	78	78
R2	0.278	0.288	0.337	0.420	0.483
Adjusted R2	0.259	0.238	0.301	0.343	0.406
Residual Std. Error	1.025	1.040	0.996	0.966	0.918
F Statistic	14.462***	5.812***	9.270***	5.465***	6.261***
Note:	*p<0.1; **p<0.05; ***p<0.01				

Table 6: Regression results of USD returns after 30 days of trading

Additionally, we have used the unrestricted model to estimate effects on one-day, seven-day and 60-day post-ICO log-returns. These three models, along with the 30-day model, are presented in Table 7 for comparison.

As we see from the model comparison in Table 7, ICO success is significant on 1-5 %-level in all time spans, with coefficients varying from 0.542 to 0.747. Success is significant on 1 %-level on 1-day, 7-day and 30-day returns, and 5 % on 60-day. 1- and 30-day returns have the highest coefficients, of 0.747 and 0.665 respectively.

As stated, seed round is significant on a 1 %-level in the 30-day model. This also applies to 60-day returns, with a coefficient of similar magnitude, at 0.063. The variable representing companies founded before 2017 is only significant on 1 %-level in the 30-day model. In the 7-day and 60-day models, it is significant on a 5 %-level, and in the one-day model on 10 %-level. The adjusted R^2 in the different models is 0.317, 0.356 and 0.328 on respectively 1-day, 7-day and 60-day returns, all lower than in the 30-day model, although all can be considered good fits. Thus, our use of 30-day returns as main model is substantiated by its goodness of fit.

USD returns comparison	First day	Seven days	30 days	60 days
ICO Success	0.747***	0.658***	0.665***	0.542**
	(0.219)	(0.226)	(0.231)	(0.243)
Blockchain Tech Services	0.482	0.468	0.597	0.422
	(0.369)	(0.368)	(0.367)	(0.382)
Entertainment	0.341	0.144	0.644	0.606
	(0.444)	(0.458)	(0.438)	(0.483)
FinTech	0.125	0.188	0.121	-0.061
	(0.286)	(0.291)	(0.281)	(0.302)
Marketplace	-0.019	0.103	0.321	-0.026
	(0.332)	(0.343)	(0.338)	(0.374)
Angel Round (log.)	0.007	-0.007	0.049	0.031
	(0.029)	(0.029)	(0.031)	(0.031)
Seed Round (log.)	0.026	0.031	0.069***	0.063***
	(0.019)	(0.020)	(0.020)	(0.021)
Series Rounds (log.)	0.008	0.032*	0.027	0.019
	(0.017)	(0.018)	(0.017)	(0.018)
Control variable				
Founded before 2017	-0.421*	-0.527**	-0.746***	-0.744**
	(0.248)	(0.255)	(0.260)	(0.280)
ETH Returns (log.)	1.174***	1.315***	1.027***	0.858***
	(0.224)	(0.211)	(0.163)	(0.157)
Constant	-0.326	-0.428	-0.528*	-0.190
	(0.279)	(0.289)	(0.283)	(0.306)
Observations	83	83	78	69
R2	0.400	0.435	0.483	0.427
Adjusted R2	0.317	0.356	0.406	0.328
Residual Std. Error	0.935	0.965	0.918	0.910
F Statistic	4.807***	5.540***	6.261***	4.314***
Note:	*p<0.1; **p<0.05; ***p<0.01			

Table 7: Comparison of unrestricted models for USD returns after one, seven, 30 and 60 days of trading

5.2.3 Discussion

Our analysis strongly suggests that ICO success affects post-ICO returns positively. The intuition behind this finding is that successful ICOs are more likely to become successful ventures, which evidently seem to be reflected in subsequent price movements. After a successful ICO, ventures should be able to realize their idea, which consequently may result in the deliverance of a planned product or service. If the post-ICO development of a venture is promising, the prices should increase accordingly, similar to mechanisms in the stock market. This is, however, dependent on whether businesses make their progress public, which they are incentivized to do if the news are positive.

The analysis also shows that ICO success evidently impacts returns 1, 7 and 30 days after the ICO, all with over 50 percentage points. Conclusively, one may argue that ICO success is critical for post-ICO capital gains. The impact of ICO-success is, however, lesser in both magnitude and in significance after 60 days of trading. This may come as a consequence of other market effects taking its place. ICO success may lead to extraordinary hype first day of trading, which can be reflected in price increase. By the following week, the price effect of success may have declined in strength. Similarly, after 60 days, the outcome of the ICO may not be as relevant for investors, and thus the price may to a greater extent reflect other factors.

Ventures operating in certain industries evidently does not cause higher potential returns, despite what was hypothesized. The intuition is that the firm-specific product or service may be of more interest for investors than certain industries, similar to what was discussed regarding ICO success. All ICO ventures fall under the blockchain industry classification, and industry-specific variations may thus affect all ICO ventures accordingly.

Seed rounds evidently seem to impact post-ICO returns after 30 and 60 days of trading. Series and angel rounds does not seem to affect systematically. Angel investments are typically small investments made on a very early stage. Although they may be helpful, the financial upsides are potentially not large enough to secure a sufficient establishment of a pre-ICO company, leading to corporate success.

Through series funding, company founders may lose too much control to venture capitalists. As the founders may be the driving force of an ICO company relative to the venture capital outsiders, the latter may not manage the venture ideally. Thus, series funding, despite the financial upsides, may not be influential on post-ICO success.

Seed round funding, however, falls in between. The core management retain control, and the funding is more substantial than with angel funding. Therefore, one may argue that pre-ICO seed round funding can induce a compromise between ideal technical leadership and efficient business management, in addition to the financial upsides of funding. This may in turn, potentially from 30 days after first trading day and onwards, lead to capital gains, as the business is favorably managed.

The effects from supply and demand shocks following the ICO boom evidently seem to have impacted post-ICO returns, especially after seven, 30 and 60 days of trading. The negative impact may come from that companies established before 2017 do not experience the extreme price corrections during the first trading days. Established companies may have the knowledge to set a more correct ICO token price and supply during the ICO to reflects the real value of the company.

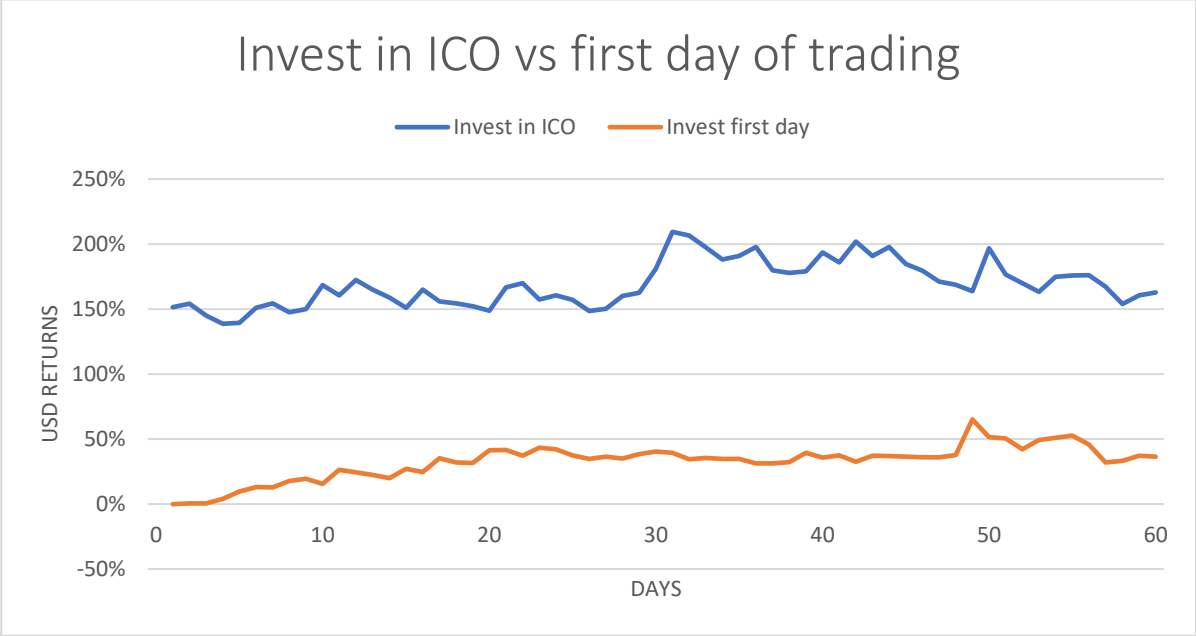
As we can see from the regression, Ethereum price change strongly impacts post-ICO price movements of tokens. This may be explained by the fact that most ICO tokens are built on Ethereum, and subsequently they are closely tied together. In addition, we use Ethereum as a benchmark for the cryptocurrency market. As stated, Ethereum and other cryptocurrencies are extremely volatile due to lack of regulations. Thus, investors should be aware of the risks associated with general cryptocurrency investments before participating in ICOs.

5.3 Risk and Investment Strategy

To decide whether ICOs are a preferable investment, we need to understand the alternatives. In the frame of this thesis, we aim to consider if ICO investments are preferable to post-ICO token investments, in other words buying tokens after they become listed for public trading. In addition, we should consider if ICO investments may yield higher returns than other cryptocurrency investments. Because most ICOs are built on Ethereum, which has become a popular financial trading instrument, it is sensible to use this cryptocurrency as a benchmark for comparison. The idea is to consider whether investing in ICOs are likely to be more profitable than investing in Ethereum.

From our analyses, we observe that investors have the possibility of obtaining extreme returns, but at significant risk. In Graph 3 and Table 8, we look at the differences of investing in the

ICO compared to invest first day of trading. We observe that the expected returns are much higher if you invest in the ICO, but also with significantly larger standard deviation.



Graph 3: USD returns time series of investing in ICO compared to first trading day

	USD token returns	N	Mean	St. Dev.	Min	Max	Sharpe ratio
Invest in ICO	First day returns	83	151.5 %	467.5 %	-96.6 %	2902.7 %	0.32
	Seven day returns	83	154.4 %	420.8 %	-96.8 %	2110.7 %	0.37
	30-day returns	78	180.9 %	580.6 %	-93.2 %	3805.7 %	0.31
	60-day returns	69	162.6 %	424.5 %	-85.6 %	2327.3 %	0.38
Invest first day of trading	First day returns	83	-0.1 %	24.1 %	-51.3 %	93.0 %	0.00
	Seven day returns	83	12.7 %	75.1 %	-70.6 %	299.6 %	0.17
	30-day returns	78	40.4 %	168.6 %	-77.1 %	1095.2 %	0.24
	60-day returns	69	36.4 %	189.0 %	-87.6 %	1285.2 %	0.19

Table 8: USD returns of investing in ICO compared to first trading day

A risk neutral investor is only concerned about expected returns of the investment, and does not assess an investment opportunity based on risk (Dow, 1992). These investors will therefore invest in the ICO as this can yield much higher returns. A risk averse investor, on the other hand, pays attention to both expected returns and risk, in our case measured as standard deviation. If they think the higher expected returns are justified given the increased risk, they can choose to invest in the ICO, and not the first day of trading. These investors will pick

investments based on the risk-adjusted return, the Sharpe ratio (Sharpe, 1994). The Sharpe ratio is defined as returns divided by standard deviation. We observe that the Sharpe ratios for all time spans are higher if you invest in the ICO, and ICOs are therefore the most attractive investment for risk averse investors as well.

The differences in returns of investing in an ICO compared to investing in a token the first day of trading may be explained by ICO underpricing. If the market thinks the valuation of the company is either too low or too high, the token will undergo a price correction during the first trading days. As we see from Table 8, the average underpricing of a token the first day is 151.5 %, the standard deviation 467.5 %, the minimum return -96.6 % and the maximum return 2902.7 %. This shows that some tokens have extreme price changes the first day, and that it can be difficult for a company to set an ICO token price.

In table 9, we compare mean returns and Sharpe ratios of tokens and Ethereum to check whether it is better to invest in Ethereum than in ICOs. When comparing Ethereum returns with ICO returns, we calculate the Ethereum returns from the middle of the ICO to account for the returns between the initial investment during the ICO and 1, 7, 30 and 60 days after the token starts trading, as mentioned in section 4.4.4. The average timespan between the end of an ICO until it gets listed is 44.5 days. When comparing Ethereum with investing in tokens first day of trading, we calculate Ethereum returns from the first day of trading post-ICO.

			Invest in ICO			**Invest in ETH**		
USD returns		**N**	**Mean**	**St. Dev.**	**Sharpe ratio**	**Mean**	**St.dev**	**Sharpe ratio**
Invest during ICO	First day returns	83	151.5 %	467.5 %	0.32	28.9 %	79.1 %	0.37
	Seven day returns	83	154.4 %	420.8 %	0.37	37.3 %	94.1 %	0.40
	30-day returns	78	180.9 %	580.6 %	0.31	71.7 %	172.3 %	0.42
	60-day returns	69	162.6 %	424.5 %	0.38	86.0 %	176.7 %	0.49
Invest first day of trading	First day returns	83	-0.1 %	24.1 %	0.00	0.8 %	6.1 %	0.13
	Seven day returns	83	12.7 %	75.1 %	0.17	7.1 %	23.4 %	0.30
	30-day returns	77	40.4 %	168.6 %	0.24	30.0 %	75.7 %	0.40
	60-day returns	69	36.4 %	189.0 %	0.19	39.7 %	117.4 %	0.34

Table 9: Comparison of investing in ICO and ETH

From table 9 we observe that Ethereum investments have higher Sharpe ratios than both investing in ICOs and investing in tokens at first day of trading, for all time spans. A risk averse investor will therefore invest in Ethereum instead of an ICO, as the Sharpe ratio is

higher. A risk neutral investor will still invest in the ICO as this may yield higher expected returns.

From our second analysis, in section 4.4, we observe that ICO Success and previous seed round funding have a significant positive impact on post-ICO returns. From our first analysis, in section 4.3, we have seen that hype and ICO token price significantly impact ICO Success. Since these three variables can be researched in potential venture investments before an ICO, we can create a hypothetical portfolio with ventures containing certain values of these variables.

The first portfolio we construct includes ventures with hype above or equal to the overall median (25450), and token price below or equal to the overall median (0.18 USD). This portfolio consists of 26 ventures traded for at least 7 days, 23 ventures for 30 days and 17 ventures for 60 days.

			Invest in portfolio 1			**Invest in ETH**		
USD returns		**N**	**Mean**	**St. Dev.**	**Sharpe ratio**	**Mean**	**St.dev**	**Sharpe ratio**
Invest during ICO	First day returns	26	178.3 %	468.6 %	0.38	18.8 %	93.7 %	0.20
	Seven day returns	26	180.8 %	487.7 %	0.37	17.5 %	78.4 %	0.22
	30-day returns	23	229.6 %	662.5 %	0.35	15.6 %	81.5 %	0.19
	60-day returns	17	169.8 %	391.7 %	0.43	7.3 %	69.8 %	0.10
Invest first day of trading	First day returns	26	4.7 %	26.4 %	0.18	0.0 %	7.5 %	0.00
	Seven day returns	26	7.2 %	63.9 %	0.11	3.6 %	19.1 %	0.19
	30-day returns	23	63.3 %	249.4 %	0.25	12.7 %	50.4 %	0.25
	60-day returns	17	28.8 %	150.9 %	0.19	-14.2 %	46.0 %	-0.31

Table 10: Invest in portfolio 1 compared to ETH. Includes certain values of hype and ICO token price

As observed in table 10, the Sharpe ratios and expected returns of investing in portfolio 1 during the ICOs are higher compared to investing in Ethereum, making the portfolio the preferred investment for risk neutral and risk averse investors. The Sharpe ratios and returns in portfolio 1 are also higher than the portfolio containing all ICOs, meaning you may be able to use our findings to create portfolios with higher Sharpe ratios and expected post-ICO returns compared to randomly investing in an ICO.

Portfolio 2 includes the seed round variable, in addition to hype and token price from portfolio 1. This portfolio only consists of 7 ventures traded for at least 7 days, 6 ventures for 30 days and 5 ventures for 60 days.

			Invest in portfolio 2			Invest in ETH		
USD returns		N	Mean	St. Dev.	Sharpe ratio	Mean	St.dev	Sharpe ratio
Invest during ICO	First day returns	7	115.8 %	199.8 %	0.58	2.2 %	75.1 %	0.03
	Seven day returns	7	81.3 %	182.3 %	0.45	5.9 %	60.3 %	0.10
	30-day returns	6	623.0 %	1249.2 %	0.50	5.1 %	37.8 %	0.13
	60-day returns	5	369.3 %	713.0 %	0.52	-12.1 %	42.0 %	-0.29
Invest first day of trading	First day returns	7	-2.0 %	26.0 %	-0.08	0.9 %	9.6 %	0.09
	Seven day returns	7	1.2 %	60.2 %	0.02	11.0 %	25.9 %	0.42
	30-day returns	6	196.0 %	456.8 %	0.43	27.6 %	64.2 %	0.43
	60-day returns	5	45.3 %	176.7 %	0.26	-4.8 %	65.3 %	-0.07

Table 11: Invest in portfolio 2 compared to ETH. Includes certain values of Hype, ICO Token price and previous seed rounds

This portfolio yields the highest Sharpe ratios in all time spans, and highest returns after 30 and 60 days compared to portfolio 1, given that you invest in the ICO. Sharpe ratios and expected returns are also higher than investing in Ethereum. The standard deviation after 30 days is 1249.2%, which indicates extreme price movements on some of the tokens. As this portfolio consists of very few ventures, extreme price movements of single tokens will affect the results greatly.

As we observe from table 10 and 11, we are able to create ICO portfolios that yields higher expected returns and Sharpe ratios compared to investing in Ethereum or first day of trading, hence make these portfolios the preferred investment for both risk neutral and risk averse investors.

5.4 Scam Considerations

Although several scam occurrences have been reported, we have found that these are getting less frequent as the surrounding community have grown, and measures to avoid them have developed. ICO prospects are regularly discussed in forums and social media, where scam suspicions are communicated, and alleged scams potentially vindicated. There is still a certain risk involved, and we will therefore present our insights on how to ensure ICOs in consideration are not scams.

There are some traditional measures that can be done to investigate scam possibility. If a company have had prior venture capital funding, we would assume sufficient due diligence to ensure legitimacy have been done by the venture capitalists. If not, we would recommend investigating how far the company has come in terms of development of their product or service. For instance, if the venture already has produced a viable prototype, this could strongly indicate legitimacy. Potential media coverage is also helpful in this regard.

In addition, we would recommend researching the team affiliated with an ICO. If the founders of a company initiating an ICO have prior acknowledged business experience, this would be a good indicator of legitimacy. Many blockchain ventures are established by accredited people, such as the Brave browser, which was founded by Brendan Eich, the creator of the JavaScript programming language (Shankland, 2015). Ensuring that the team behind an ICO are legitimate people with real relevant experience will help certify ICO legitimacy.

As implied, online research is important when assessing ICOs. The blockchain community has grown proportionately with the cryptocurrency hype. Consequently, the digital environment has become very informative. We have already seen that hype seem to impact ICO success rate, and it may be plausible to assume that hype also increase the chance of scams being revealed. In forums like Bitcointalk.org, ICOs are often discussed thoroughly. Whenever someone suspects scam, it is common to report these suspicions online. When considering a potential ICO investment, we would recommend thoroughly investigating forums. If scam has been reported, you should reconsider the investment, regardless of substantiation. Even though the ICO is legitimate, the accusation may affect the behavior of other investors, possibly worsening the outcome of the ICO.

Lastly, we would recommend investigating source codes and white papers. As stated, source codes are the technical foundation of an ICO. Ventures often disclose their source code, so anyone can examine them. Robust and reliable source codes may indicate ICO legitimacy. If the investor does not have a technical background, the source codes may be incomprehensible. However, the source codes are often discussed in forums and social media, and investors may get impressions from there.

White papers are the primary source of information on an ICO and corresponding venture, with purpose to substantiate the idea behind an ICO. By examining white papers, investors can get insights in the venture plans, strategies and approaches. Ventures without white papers should be avoided. Thorough and detailed white papers without inconsistency and ambiguity can be perceived as good indicators against scam. There has, however, been incidents where illegitimate ventures have created thorough and substantiated white papers. To ensure an ICO is not a scam, we recommend examining all mentioned aspects, and make sure all precautions are taken.

6. Conclusion

In the conclusion, we summarize our research and our findings from both analyses. Lastly, we will provide suggestions for further research on ICOs.

6.1 Summary

In our study, we have looked at the still booming phenomenon of initial coin offerings by analyzing factors possibly impacting ICO success rate and post-ICO capital gains. The purpose of our study was to answer the following research question:

What should investors assess when considering potential ICO investments?

In order to answer this question, we collected data from several sources containing detailed information on ICOs and their affiliated companies, as well as the historical token price movements post-ICO. We gathered information on corporate characteristics, ICO characteristics and external factors to be used in a logistic probit regression to see how the different variables may contribute to ICO success, which is defined as hard cap being reached.

Our second analysis addresses post-ICO returns, and looks at the possibility for investors to benefit from capital gains on ICO investments. We have focused on returns after 30 days of trading, but we have also briefly looked at returns after one day, seven days and 60 days. We wanted to test whether ICO success and certain corporate characteristics may affect capital gains after a token starts trading. We analyzed this data using an OLS regression to see how these independent variables affected the returns post-ICO.

Our findings in the first analysis indicates that corporate characteristics do not affect whether an ICO becomes successful. This is contradictory to our assumptions, as we though investors would see previous venture capital funding as a sign of reassurance, because comprehensive due diligence have been conducted by professionals. In addition, what industry a venture operates in does not seem to matter in terms of ICO success. This can be explained by the fact that investors may not be industry specific, and rather invest in certain products than in certain industries.

Some ICO characteristics evidently have a significant effect on ICO outcome. The hype regarding the ICO is important, as this contributes to attract investors into investing,

consequently raising more money, which is in line with our assumption. The analysis also indicates that the token price is important for ICO success. A lower token price gives the investor more tokens for the same amount of money. It can be hard to understand the rationality behind this, but the intuition is that the investors yields higher psychological utility with more tokens. This positive signal, however, may be conditional on potential underpricing.

Residing in countries with low ICO regulations does not seem to matter. As of today, many countries are in the process of regulating ICOs, and many have legislated regulations in recent time. By the time of the ICOs in our sample, regulatory differences may not have been substantial enough to impact the ICO market. This may, however, change in the future, as governments reacts differently to the concept.

Our second analysis indicates that both ICO success and certain corporate characteristics affect post-ICO returns. An ICO that have reached its hard cap evidently performs substantially better, which intuitively can be explained by subsequent successful development of a product or service. Thus, if targeting capital gains, investors should initially target ICO success, via the proposed considerations from the first analysis.

What industry yields the higher capital gains is not clear, and we have no reason to suggest any industry-specific variations. Our hypotheses regarding entertainment and fintech has not been substantiated, and we may generally conclude that investors should look at what specific ventures may offer, rather than what industries may be profitable.

Venture capital funding rounds at angel or series stages does not seem to categorically affect post-ICO prices. Seed funding, however, seem to influence positively. This may come as a result of combining venture capital professionalism with technical and ideal leadership. A previously seed funded venture may be the most structurally sound company, which may be reflected in higher returns from 30 days of trading and onwards.

We observed that investing in a random ICO yields higher expected returns than investing in the benchmark Ethereum. The Sharpe ratio on Ethereum returns is higher, making Ethereum the preferred investment for risk averse investors. By using the results from our analyses, we have created portfolios of ICOs with certain values of hype, token price and previous seed rounds. These portfolios turned out to be the preferred investment for both risk averse and risk neutral investors as these yield the higher expected returns and Sharpe ratios. Thus, these parameters may be used by investors when considering ICO investments.

When considering ICOs, investors must do the necessary research to ensure they are not partaking in scams. This entails investigating the team behind the ICO, thoroughly read the white paper, and find out if the company have had prior venture capital funding, or other documented business merits. The most important arena, however, seem to be the online community. Investors should research and discuss on forums and social media, and avoid all companies that are alleged scams. With an increasing number of governments regulating ICOs, it is plausible that scams will become less frequent over time, making the market safer.

Risk and volatility is investors' most important considerations. As we have seen with Bitcoin and Ethereum, the volatility of the general cryptocurrency market is extreme, and the market reacts greatly to subtle disturbances. The future profitability will depend greatly on how the world will react to the phenomenon over time, and how the legislation will turn out. ICO investments should thus be done only by investors familiar with cryptocurrency and accustomed to risk. However, as with many markets, high risk may yield high reward. Today, investing in ICOs often have proven to be extremely profitable, and it will probably still remain profitable – at least in the near future.

6.2 Suggestions for Further Research

Initial coin offering is a phenomenon that has recently boomed, and attracted a lot of public interest. As it is relatively new, it lacks official sites where reliable and complete information on ICOs are publicly disclosed. It would be interesting to be able to conduct analyses with bigger data samples and with longer periods of post-ICO returns. Analyzing post-ICO returns over a longer period could results in other variables having greater long-term impact than what we found in our analysis.

Country regulations will likely play a bigger role in the future, and it would be interesting to see how this may affect both probability of ICO success and post-ICO returns. In addition, some types of tokens may perform better than others, which could be interesting to research if the needed data become available.

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8. Appendix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) 30-day Token returns	1										
(2) ICO Success	0.10	1									
(3) Blockchain Tech Services	0.20	0.13	1								
(4) Entertainment	0.07	-0.11	-0.11	1							
(5) Fintech	0.02	0.02	-0.29	-0.22	1						
(6) Marketplace	-0.09	-0.02	-0.18	-0.14	-0.35	1					
(7) Angel Round (log.)	0.18	0.08	-0.11	0.10	0.19	-0.02	1				
(8) Seed Round (log.)	0.29	0.02	0.24	-0.05	-0.02	-0.19	0.15	1			
(9) Series Rounds (log.)	0.15	0.10	-0.06	0.06	0.17	-0.26	0.10	0.05	1		
(10) Founded before 2017	0.05	0.23	0.06	0.02	-0.03	-0.19	0.22	0.32	0.31	1	
(11) ETH Returns (log.)	0.48	-0.25	0.01	-0.01	0.05	-0.12	0.01	0.00	0.09	0.18	1

Table 12: Correlation matrix 30-day token USD returns

	ICOs	**Qty**	**Mean**	**St. Dev.**	**Min**	**Max**
Dependent variable						
One day token USD return	83		151.5 %	467.5 %	-96.6 %	2902.7 %
Independent variables						
ICO Success	83	43	0.52	0.50	0	1
Blockchain Tech Services	83	12	0.15	0.35	0	1
Entertainment	83	6	0.07	0.26	0	1
Fintech	83	30	0.36	0.48	0	1
Marketplace	83	15	0.18	0.39	0	1
Angel Round (in millions)	83		0.09	0.38	0	2.30
Seed Round (in millions)	83		0.53	2.80	0	25.0
Series Rounds (in millions)	83		3.80	17.35	0	140.3
Control variables						
Founded before 2017	83	51	0.61	0.49	0	1
ETH return	83		28.9 %	79.1 %	-60.5 %	397.6 %

Table 13: Descriptive statistics on one day token USD returns

USD returns after first day of trading	1	2	3	4	5
ICO Success	0.723***			0.675***	0.747***
	(0.207)			(0.218)	(0.219)
Blockchain Tech Services		0.787**		0.574	0.482
		(0.374)		(0.369)	(0.369)
Entertainment		0.268		0.380	0.341
		(0.460)		(0.449)	(0.444)
FinTech		0.276		0.229	0.125
		(0.289)		(0.283)	(0.286)
Marketplace		0.017		0.053	-0.019
		(0.337)		(0.334)	(0.332)
Angel Round (log.)			0.016	0.002	0.007
			(0.029)	(0.029)	(0.029)
Seed Round (log.)			0.018	0.015	0.026
			(0.019)	(0.019)	(0.019)
Series Rounds (log.)			0.005	-0.0005	0.008
			(0.017)	(0.017)	(0.017)
Control variable					
Founded before 2017					-0.421*
					(0.248)
ETH Returns (log.)	1.209***	0.960***	1.110***	1.105***	1.174***
	(0.208)	(0.227)	(0.221)	(0.223)	(0.224)
Constant	-0.320**	-0.152	-0.027	-0.535**	-0.326
	(0.152)	(0.221)	(0.142)	(0.253)	(0.279)
Observations	83	83	83	83	83
R2	0.340	0.287	0.253	0.376	0.400
Adjusted R2	0.323	0.241	0.215	0.299	0.317
Residual Std. Error	0.931	0.986	1.003	0.947	0.935
F Statistic	20.595***	6.207***	6.607***	4.894***	4.807***
Note:	*p<0.1; **p<0.05; ***p<0.01				

Tabell 14: Regression results, USD returns after first day of trading

	ICOs	Qty	Mean	St. Dev.	Min	Max
Dependent variable						
Seven day token USD return	83		154.4 %	420.8 %	-96.8 %	2110.7 %
Independent variables						
ICO Success	83	43	0.52	0.50	0	1
Blockchain Tech Services	83	12	0.15	0.35	0	1
Entertainment	83	6	0.07	0.26	0	1
Fintech	83	30	0.36	0.48	0	1
Marketplace	83	15	0.18	0.39	0	1
Angel Round (in millions)	83	6	0.09	0.38	0	2.30
Seed Round (in millions)	83	19	0.53	2.80	0	25.0
Series Rounds (in millions)	83	18	3.80	17.35	0	140.3
Control variables						
Founded before 2017	83	51	0.61	0.49	0	1
ETH return	83		37.3 %	94.1 %	-65.1 %	557.9 %

Table 15: Descriptive statistics on seven days token USD returns

USD returns after seven days of trading	1	2	3	4	5
ICO Success	0.637***			0.570**	0.658***
	(0.217)			(0.227)	(0.226)
Blockchain Tech Services		0.673*		0.562	0.468
		(0.377)		(0.373)	(0.368)
Entertainment		0.061		0.184	0.144
		(0.474)		(0.468)	(0.458)
FinTech		0.316		0.306	0.188
		(0.295)		(0.291)	(0.291)
Marketplace		0.024		0.182	0.103
		(0.348)		(0.348)	(0.343)
Angel Round (log.)			0.00001	-0.014	-0.007
			(0.030)	(0.030)	(0.029)
Seed Round (log.)			0.020	0.017	0.031
			(0.019)	(0.019)	(0.020)
Series Rounds (log.)			0.024	0.021	0.032*
			(0.017)	(0.018)	(0.018)
Control variable					
Founded before 2017					-0.527**
					(0.255)
ETH Returns (log.)	1.315***	1.130***	1.211***	1.247***	1.315***
	(0.205)	(0.216)	(0.211)	(0.213)	(0.211)
Constant	-0.376**	-0.237	-0.175	-0.681**	-0.428
	(0.163)	(0.229)	(0.145)	(0.268)	(0.289)
Observations	83	83	83	83	83
R2	0.359	0.326	0.318	0.401	0.435
Adjusted R2	0.343	0.282	0.283	0.327	0.356
Residual Std. Error	0.975	1.019	1.019	0.986	0.965
F Statistic	22.404***	7.452***	9.075***	5.436***	5.540***
Note:	*p<0.1; **p<0.05; ***p<0.01				

Tabell 16: Regression results, USD returns after seven day of trading

	ICOs	Qty	Mean	St. Dev.	Min	Max
Dependent variable						
60-day token USD return	69		58.9 %	186.9 %	-89.0 %	1112.7 %
Independent variables						
ICO Success	69	38	0.55	0.50	0	1
Blockchain Tech Services	69	10	0.15	0.36	0	1
Entertainment	69	5	0.07	0.26	0	1
Fintech	69	27	0.39	0.49	0	1
Marketplace	69	11	0.16	0.37	0	1
Angel Round (in millions)	69		0.10	0.41	0	2.30
Seed Round (in millions)	69		0.61	3.07	0	25.0
Series Rounds (in millions)	69		4.35	18.97	0	140.3
Control variables						
Founded before 2017	69	44	0.64	0.48	0	1
ETH return	69		86.0 %	176.7 %	-63.5 %	822.3 %

Table 17: Descriptive statistics on 60 days token USD returns

USD returns after 60 days of trading	1	2	3	4	5
ICO Success	0.372			0.342	0.542**
	(0.244)			(0.243)	(0.243)
Blockchain Tech Services		0.768*		0.523	0.422
		(0.401)		(0.399)	(0.382)
Entertainment		0.586		0.572	0.606
		(0.511)		(0.507)	(0.483)
FinTech		0.159		0.094	-0.061
		(0.314)		(0.311)	(0.302)
Marketplace		0.091		0.138	-0.026
		(0.391)		(0.387)	(0.374)
Angel Round (log.)			0.017	0.015	0.031
			(0.031)	(0.032)	(0.031)
Seed Round (log.)			0.053**	0.047**	0.063***
			(0.020)	(0.021)	(0.021)
Series Rounds (log.)			0.010	0.007	0.019
			(0.018)	(0.019)	(0.018)
Control variable					
Founded before 2017					-0.744**
					(0.280)
ETH Returns (log.)	0.715***	0.696***	0.654***	0.734***	0.858***
	(0.160)	(0.159)	(0.152)	(0.158)	(0.157)
Constant	-0.142	-0.162	-0.147	-0.507*	-0.190
	(0.193)	(0.260)	(0.152)	(0.296)	(0.306)
Observations	69	69	69	69	69
R2	0.236	0.265	0.301	0.356	0.427
Adjusted R2	0.213	0.207	0.258	0.258	0.328
Residual Std. Error	0.985	0.989	0.957	0.956	0.910
F Statistic	10.198***	4.544***	6.906***	3.631***	4.314***
Note:	*p<0.1; **p<0.05; ***p<0.01				

Table18: Regression results, USD returns after 60 days of trading

Organization name	Token	Founded	Location	Industry	Raised	ICO Success	Fund	30 day ret
1world online	1WO	2011	US	Other	10 800 000	No	Series	-81.0 %
Aidcoin	AID	2013	Switzerland	Other	18 600 000	Yes		-50.2 %
Ambrosus	AMB	2017	Switzerland	Other	32 229 228	No		-30.9 %
Astronaut	ASTRO	2017	Singapore	Fintech	2 513 535	No		242.0 %
Augur	REP	2015	US	Other	5 200 000	Yes		169.1 %
Authoreon	AUTH	2017	Singapore	Other	1 500 000	No	Angel	
Aventus Systems	AVT	2016	UK	Marketplace	20 000 000	Yes		-28.7 %
B2BX	B2B	2014	Russia	Fintech	8 094 402	No		-19.4 %
BABB	BAX	2017	UK	Fintech	20 000 000	Yes		-67.2 %
Bankera	BNK	2017	Lithuania	Fintech	192 000 000	No		
Bankex	BKX	2016	US	Fintech	70 600 000	Yes		884.3 %
BetBox.ai	BETX	2015	Italy	Fintech	4 247 643	No	Seed	
Bitcomo	BM	2017	Poland	Other	2 300 000	No		
Blackmoon	BMC	2015	Russia	Fintech	30 000 000	Yes	Series	-25.4 %
BlockEx	DAXT	2014	UK	Fintech	28 401 229	No	Series	
Blocklancer	LNC	2016	Austria	Other	300 000	No	Seed	-83.6 %
Blockport	BPT	2017	Netherlands	Fintech	15 000 000	Yes		26.4 %
Blockstack	Blockstack token	2013	US	Blockchain Tech	52 000 000	Yes	Seed, Series	
Blox	CDT	2016	US	Fintech	9 370 869	No	Seed	-61.8 %
Bluzelle	BLZ	2014	Singapore	Blockchain Tech	19 500 000	Yes	Seed, Series	218.4 %
BnkToTheFuture	BFT	2010	Hong Kong	Fintech	33 000 000	Yes	Series	101.5 %
Bread	BRD	2015	Switzerland	Fintech	32 000 000	Yes	Series	72.7 %
Cappasity	CAPP	2013	US	Entertainment	5 100 000	No	Angel, Seed	3134.4 %
Cashaa	CAS	2016	UK	Fintech	18 530 000	No	Seed	-62.5 %
ChronoBank	TIME	2016	Australia	Other	5 400 000	No		-4.0 %
Cindicator	CND	2015	Russia	Fintech	15 000 000	Yes	Seed	70.6 %
Civic	CVC	2016	US	Other	33 000 000	Yes	Seed	496.7 %
CoinMetro	XCM	2017	Estonia	Fintech	15 000 000	No		
Colu	CLN	2014	Israel	Fintech	23 000 000	No	Seed, Series	
Crowdholding	YUPIE	2016	UK	Other	2 000 000	No	Angel, Seed	
CrowdWiz	WIZ	2016	Hong Kong	Fintech	7 234 387	No		
DataWallet	DXT	2015	US	Fintech	40 000 000	Yes	Angel	-60.0 %
District0x	DNT	2017	US	Marketplace	9 000 000	No		450.6 %
Dmarket	DMT	2017	Ukraine	Entertainment	19 069 000	No		2.6 %
DomRaider	DRT	2013	France	Marketplace	65 000 000	Yes		-69.6 %
Education Ecosystem	LEDU	2015	US	Other	10 000 000	Yes		-84.0 %
Eidoo	EDO	2017	Switzerland	Fintech	27 900 000	No		-3.0 %
Electrify	ELEC	2017	Singapore	Marketplace	30 000 000	Yes		-38.5 %
Encrypgen	DNA	1985	US	Other	1 000 000	No	Seed	522.2 %
Enigma	ENG	2015	US	Blockchain Tech	45 000 000	Yes		-26.9 %
Envion	EVN	2015	Switzerland	Blockchain Tech	100 012 279	No	Seed	-41.7 %

Equibit Group	EQB	2015	Canada	Fintech	570 000	No	Angel	
Eristica	ERT	2015	Russia	Entertainment	3 138 109	No	Seed	
Faceter	FACE	2014	US	Other	28 610 352	No		
FintruX	FTX	2017	Singapore	Fintech	25 000 000	Yes		
Firstblood	1ST	2016	US	Entertainment	6 100 000	Yes	Series	2.5 %
Fortitude Ranch	FR	2013	US	Other	250 000	No		
FundRequest	FND	2016	Belgium	Fintech	12 500 000	No		
FUSION Foundation	FSN	2002	Singapore	Blockchain Tech	108 394 802	Yes		-27.8 %
Genaro	GNX	2017	Singapore	Blockchain Tech	11 362 000	No		189.2 %
Get Protocol	GET	2016	Netherlands	Marketplace	7 500 000	No		92.7 %
Global Jobcoin	GJC	2014	Switzerland	Other	7 000 000	No		-62.1 %
Gnosis	GNO	2015	US	Other	12 500 000	Yes	Series	756.7 %
Havven	HAV	2017	Australia	Fintech	30 000 000	Yes	Seed	-9.5 %
Helbiz inc	HBZ	2015	US	Marketplace	36 288 000	No	Seed	
Humaniq	HMQ	2016	UK	Fintech	5 163 000	Yes		269.7 %
Iconomi	ICN	2016	Slovenia	Fintech	10 000 000	No	Series	3.5 %
Indorse	IND	2017	Singapore	Other	9 247 392	No		-75.6 %
Jincor	JCR	2016	Cyprus	Fintech	450 000	No	Seed	
Lamden	TAU	2017	Switzerland	Blockchain Tech	10 000 000	Yes	Series	336.6 %
LAToken	LA	2017	UK	Fintech	19 600 000	No		-34.7 %
LeadCoin	LDC	2017	Gibraltar	Other	50 000 000	Yes		-75.7 %
MedicalChain	MTN	2017	UK	Other	24 000 000	Yes		-8.2 %
Micromoney	AMM	2015	Singapore	Fintech	10 500 000	No	Seed, Series	-5.6 %
Mobius	MOBI	2017	Cayman Islands	Blockchain Tech	35 000 000	No	Seed	34.6 %
Morpheus Labs	MITx	2017	Singapore	Blockchain Tech	10 100 000	Yes	Angel	
MyBit	MYB	2017	Switzerland	Fintech	2 700 000	No		-21.3 %
Naga trader	NGC	2015	Germany	Fintech	50 020 960	No	Angel, Series	85.0 %
Neufund(neumark)	NEU	2016	Germany	Fintech	15 100 000	No	Seed, Series	734.2 %
Odem.io	ODEM	2017	Switzerland	Marketplace	6 900 000	No		156.1 %
OpenANX	OAX	2017	Hong Kong	Marketplace	18 756 937	No		86.8 %
Patientory	PTOY	2015	US	Other	7 200 000	No		109.1 %
PHI Token	PHI	2017	Malta	Fintech	4 700 000	No		
Play2Live	LUC	2017	Russia	Entertainment	30 000 000	Yes	Series	
PlayKey	PKT	2012	Russia	Entertainment	10 512 361	No	Series	23.3 %
PM7 ou	PM7	2015	Estonia	Other	2 000 000	Yes		
PolySwarm	NCT	2017	Puerto Rico	Marketplace	25 900 000	No		-57.2 %
Propy	PRO	2015	Russia	Other	15 077 000	No		-70.8 %
Qchain	XQX	2017	US	Other	700 000	No		
Qtum	QTUM	2016	Singapore	Blockchain Tech	15 600 000	Yes	Seed	3805.7 %
Quoine	QASH	2014	Singapore	Fintech	105 000 000	Yes	Angel, Series	206.5 %
Rentberry	BERRY	2015	US	Other	30 000 000	Yes	Seed, Series	-60.6 %
Republic Protocol	REN	2017	Singapore	Fintech	34 400 000	Yes		-11.8 %

Seratio	SER	2015	UK	Other	8 148 000	No	Angel	
SingularDTV	SNGLS	2015	US	Entertainment	7 500 000	Yes		-25.9 %
SingularityNET	AGI	2017	Switzerland	Marketplace	36 000 000	Yes		453.0 %
Sirin Labs	SRN	2013	Switzerland	Other	157 885 825	Yes	Seed, Series	364.6 %
Spectiv	SIG	2012	US	Marketplace	7 600 000	No		-93.2 %
Storiqa	STQ	2016	Hong Kong	Marketplace	25 000 000	Yes		-66.7 %
Storj Labs	STORJ	2015	US	Blockchain Tech	30 000 000	Yes	Seed	522.2 %
Stox	STX	1997	Canada	Fintech	33 300 000	Yes	Series	-3.6 %
Substratum Network	SUB	2017	US	Other	13 800 000	No	Series	110.2 %
SureRemit	RMT	2017	US	Fintech	7 000 000	No		-18.7 %
SwissBorg	CHSB	2017	Switzerland	Fintech	51 000 000	Yes		-54.6 %
SyncFab	MFG	2013	US	Blockchain Tech	9 100 000	No		
TenX	PAY	2015	Singapore	Fintech	100 000 000	Yes	Angel, Seed	151.7 %
Tierion	TNT	2015	US	Blockchain Tech	25 000 000	Yes		13.1 %
Utrust	UTK	2017	Switzerland	Fintech	17 875 000	No		557.1 %
Viberate	VIB	2015	Slovenia	Marketplace	12 000 000	Yes	Angel, Seed	78.0 %
Vice Industry Token	VIT	2017	Canada	Entertainment	15 003 186	No		-41.2 %
Viewly	VIEW	2017	Slovenia	Entertainment	8 900 000	No		
WePower Network	WPR	2017	Lithuania	Marketplace	40 000 000	Yes		-9.3 %
Wetrust	TRST	2016	US	Other	4 978 366	Yes		198.1 %
Zap	ZAP	2017	US	Marketplace	5 000 000	No		54.3 %

Table 19: Overview of ICOs in data sample