Haaga-Helia
University of Applied Sciences

Initial Coin Offering: What a Company Needs to Consider Before and After Conducting Its ICO

Andreas Lutz

Bachelor's Thesis
Degree Programme in
International Business
2019

Haaga-Helia
University of Applied Sciences

Abstract

Date 18.02.2019

Author
Andreas Lutz

Degree programme
International Business

Thesis title	**Number of pages and appendix pages**
How a Company Can Introduce Its Own Cryptocurrency as a Payment option	**59 + 1**

Ever since the invention of Bitcoin in 2008, cryptocurrencies have grown in popularity, which has led to the creation of thousands of new cryptocurrencies. This thesis is commissioned by Blocktek University, a blockchain and cryptocurrency learning platform, and investigates some of the most important factors a company needs to consider before and after it conducts an Initial Coin Offering (ICO). Legal factors are not taken into consideration and the technological aspect is kept to a minimum.

The study consists of a theory section and a research section. The theory section discusses traditional economic theories in order to formulate expectations towards the cryptocurrency market. Additionally, this section covers the basics of ICOs and stablecoins.
The research part investigates how the value of a token can be estimated for the ICO, the correlation between cryptocurrency utilisation and its value, and whether a company's own token should be pegged to fiat money.
The study involved both qualitative methods in the form of a survey and various discussions, as well as quantitative methods in the form of analysing over 29'000 data entries.

Firstly, the research revealed that the best way to price a token for the ICO is to establish a fiat money funding target, price each token at an appealing fiat money value and convert that amount into the accepted cryptocurrencies. Secondly, there is in fact a correlation between cryptocurrency price and its utilisation. This result allows a company to forecast its revenue better. Thirdly, a company's own token should not be pegged to fiat money as there is not only substantial risk in doing so, but also maintaining the peg is difficult. Additionally, it is not industry standard.

The outcome of this thesis provided the commissioning company with new insight and allowed it to offer better advising services. Furthermore, this thesis may serve as a guideline for companies looking to establish their own cryptocurrency.

Keywords
Cryptocurrency, Initial Coin Offering (ICO), Blockchain, Stablecoins

Table of contents

1 Introduction

This chapter provides the reader with background information and introduces the case company as well as the research objectives. Demarcation, anticipated benefits to stakeholders, key concepts, and key sources are also presented in this chapter. The chapter concludes with a short risk analysis.

1.1 Background

When cryptocurrencies emerged in the early 2000s, they were only known to few. It was not until an anonymous individual, calling himself Satoshi Nakamoto, invented Bitcoin in 2008 that cryptocurrencies started to gain attention. Bitcoin was different than the other existing cryptocurrencies. Satoshi Nakamoto was the first person to implement a revolutionary concept: The blockchain. Thanks to this technology, it was possible to construct a cryptocurrency that allows easy, fast, and secure peer to peer transactions. (Nakamoto 2008, 4.)
Bitcoin became a success and is today the most well-known cryptocurrency.

Motivated by Bitcoin's success, several individuals developed their own cryptocurrencies as well as their own blockchains. Over the years, cryptocurrencies gained so much attention that even established companies started issuing their own cryptocurrency, mostly using it to raise money quickly by holding an initial coin offering (ICO). An ICO is similar to an initial public offering (IPO), but instead of selling shares, the issuer sells its coins or tokens. The advantage of an ICO is that the company does not sell its ownership and most tokens do not entitle the buyer to any rights whatsoever.

The concept of cryptocurrencies however is still foreign to most individuals and companies, and only few companies accept cryptocurrencies as a payment option, especially due to the volatility of cryptocurrencies. As the technology moves forward, an increasing number of companies could be interested in creating their own cryptocurrency.

If a company wants to issue its own cryptocurrency, the company might consider pegging it to fiat money in order to avoid problems with volatility. This means that the company's token is always worth the same amount of fiat money, typically 1 Dollar. As that would seemingly make a token obsolete in the first place (the company could just accept credit cards), it should be noted that cryptocurrencies have several advantages over fiat money.

One such advantage is the transaction fee. Credit card payments, PayPal payments and other forms of payment typically cause a two to five percent transaction fee. The transaction fees caused by a cryptocurrency transaction can vary. In October 2018, a Bitcoin transaction cost between 0.40$-0.60, and an Ethereum transaction 0.10-0.30. The following chart shows the transaction fees of the two cryptocurrencies between March 2018 and October 2018 (inclusive). The transaction fees of other cryptocurrencies, like Ripple (XRP), the third biggest cryptocurrency by market capitalization, can be less than 0.01$. (BitInfoCharts 2018)

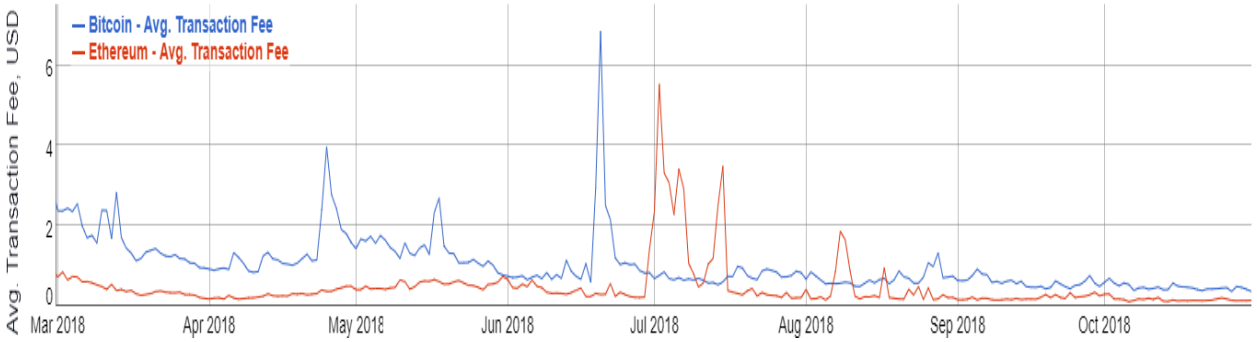

Figure 1. Average transaction fee, USD (BitInfoCharts 2018)

As the chart shows, the transaction fees are just as volatile as the rest of the cryptocurrency market. The transaction fee can increase or decrease heavily. However, credit card and banking fees could exceed cryptocurrency transaction fees, depending on the size of the transaction.

Despite the transaction fee advantage, another motivation for companies to offer a cryptocurrency payment method is that the payments are received much faster. Unlike fiat payments, which are processed (up to) once a day, the company has the funds available much faster. The speed of the transaction however depends heavily on how busy the underlying blockchain is at the time of transaction and which cryptocurrency was used. It can range between a few seconds to a few hours.
Furthermore, offering a cryptocurrency payment method eliminates the risk of a chargeback. Once the transaction has been entered into a block, it cannot be reversed.

Taking all these benefits into consideration, companies might be tempted to create their own cryptocurrency. Issuing an own cryptocurrency also allows the company to raise funds in an uncomplicated way by conducting an Initial Coin Offering (ICO), which is like an Initial Public Offering (IPO).

In 2018, several major companies offered a cryptocurrency payment option. Expedia, Microsoft, Subway, PayPal and other mainstream companies are providing this payment option (Sloan 2018).

The following figure shows where Bitcoin is accepted on the 09 October 2018. Coinmap is a platform on which companies can register themselves or be registered by others as a venue that accepts Bitcoin.

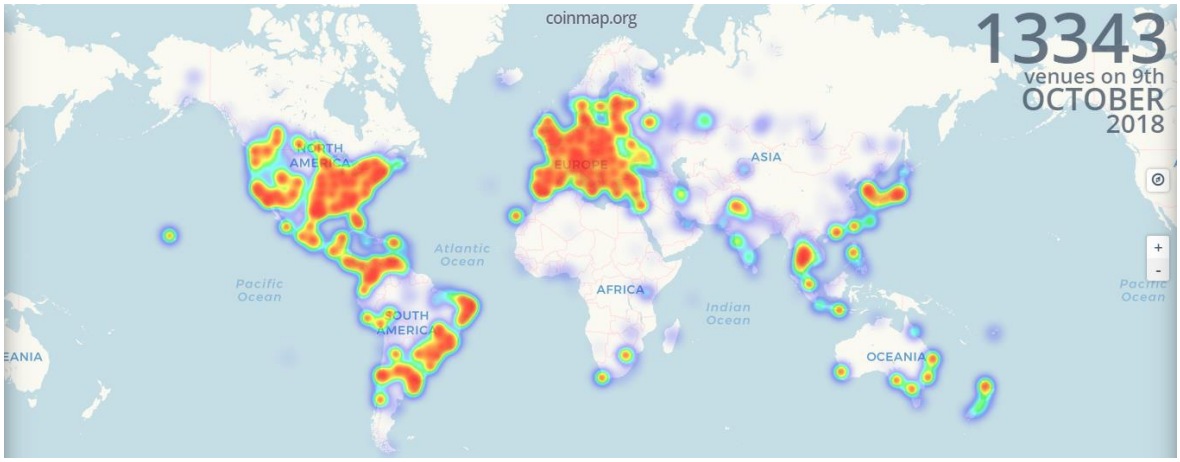

Figure 2. Current Bitcoin acceptance (Coinmap 2018)

According to the platform, a total of 13’343 venues are accepting Bitcoin in the second week of October 2018 (Coinmap 2018). The actual number may be a lot higher as only a small percentage of venues register themselves on the platform, but it nonetheless provides a great overview over how Bitcoin acceptance is spread throughout the world.

1.1 Case company

This thesis is commissioned by Blocktek University. Despite its name, the company is not officially registered as a university. The start-up was established in 2017 and first operated under the name Network Token, but soon rebranded to its current name. Blocktek University provides a platform which aims to educate the masses about the blockchain technology and cryptocurrencies by offering a range of online courses. The basic courses cover topics such as an introduction to blockchain and cryptocurrencies, and the advanced courses provide detailed instruction about how to code a new cryptocurrency. (Blocktek University 2018.)

The company’s goal is to support the mainstream adoption of the blockchain technology and cryptocurrencies. Thus, despite offering advanced courses, the platform mainly focuses on covering the basics to help people who have never been in touch with either

cryptocurrencies nor the blockchain. To further support mainstream adoption, the basic courses are offered for free. The company goes one step further: Users learning on the company's website can not only do so for free, but are also rewarded with the company's own token, the BKU. This token can be used to purchase access to the advanced courses. In the future, the token can also be used to purchase the company's own trading tools and other advanced content. Like any other token, this token is tradeable on exchanges. (Blocktek University 2018.)

1.2 Case Introduction

Blocktek University plans to offer an in-depth course for companies that are new to crypto and plan to conduct their own ICO. Conducting an ICO is a complex process and a lot of information is required. As cryptocurrencies are still new, not all the information needed has yet been researched and a lot of questions remain unanswered.
Thus, the research question of this thesis is: What are the most important things a company needs to consider before and after conducting its ICO?
To understand the first investigate question, the reader needs to know that the cryptocurrency market is not very well regulated (yet). The fact that an ICO does not have any format requirements allows companies to set any price for their token during the ICO. There is no official guideline on how to proceed. Naturally, the price of the token is quickly put to a fair level when the tokens become available on exchanges, but before that, each company can decide the price of the token itself. Blocktek University would like to know how companies estimate the price of their token during the ICO and which process of doing so is the best. The information currently available depends on the source used: One source is certain that scenario A is most used, another source is certain that scenario B is most used. They have one thing in common: All available sources are only based on experience and the author's own preference. The fact that no research has been conducted yet makes this question the first investigative question of this thesis: How can a token's ICO price be determined?

Shortly after the ICO ends, the token becomes available on exchanges. By entering an exchange, it also enters the volatile environment of cryptocurrencies. In traditional economics, people spend less money in a recession and more money in an expansion. But does that also apply to cryptocurrencies?
If a company wants to receive 5$ worth of its tokens for a certain product and its tokens are worth 1$ each, 5 tokens are needed to pay for the product. If the token is worth 0.1$, 50 tokens are needed. The price only increases in terms of the token, but not in terms of fiat money. This suggests that the token will not be used any less if its value depreciates, given that the product still costs 5$ and the customer's income is not affected. On the

other hand, this may cause interest to fade. Currently, it is unknown how the price of a cryptocurrency affects the utilisation of a token or vice versa. Blocktek University believes that this is vital information for companies as it supports companies in their sales forecasting process. Due to that, the second investigative of this thesis is: How does the price of a token correlate with its utilisation?

Volatility means unstableness and companies may not want their token to be unstable. Pegging its token to fiat money is a potential solution for a company. Unfortunately, this process is not as simple as it may seem, and, amongst several other challenges, a pegged cryptocurrency does not stay pegged 100% of the time. The third investigative question of this thesis is based on the scenario described above: A company creates its own cryptocurrency and will accept it as a payment method. The investigative question is: Should a new token be pegged to fiat money?

The following list provides a quick overview of the main research question and the investigative questions.

1. RQ: What are the most important things a company needs to consider before and after conducting its ICO?
2. IQ 1: How can a token's ICO-price be determined?
3. IQ 2: How does the price of a token correlate with its utilisation?
4. IQ 3: Should the company's token be pegged to fiat money?

Blocktek University did not conduct an ICO as worldwide legislation was (and still is) considered insufficient. Instead, the tokens were made available on third party exchanges. As a result, the commissioning company is unable to provide guidance regarding IQ1. Table 1 below presents the theoretical framework, research methods and results chapters for each investigative question.

Table 1. Overlay matrix

Investigative question	Theoretical Framework	Research Methods	Results (chapter)
IQ 1. How can a token's ICO-price be determined?	Conceptual framework of ICOs.	Qualitative research.	4.1
IQ 2. How does the price of a token correlate with its utilisation?	Theoretical framework of traditional market cycles.	Mixed research.	4.2
IQ 3. Should a new token be pegged to fiat money?	Concepts and theories regarding stablecoins, and their comparison to fiat money.	Mixed research.	4.3

1.3 Demarcation

To not go beyond the scope of a 15-credit thesis, a strict demarcation is required.

- Department: Finance.
- No legal aspects of ICOs and cryptocurrencies.
- Only very basic technical information is covered.
- Only information published up to the 01 November 2018 are taken into consideration.

As the research focuses on how a company can implement its own cryptocurrency as a payment option, the impacts on the marketing are ignored. This needs to be stated as often, one of the reasons for companies to create its own cryptocurrency is for marketing purposes as a new token can raise a lot of awareness. Furthermore, as ICO's are controversial and new regulations applying to ICOs are published on a weekly basis throughout the world, no legal aspects are taken into consideration. The underlying technology of cryptocurrencies is very complex and not all cryptocurrencies are based on the blockchain. Thus, the theory only covers as much of the technology as is required to understand this thesis. The history of the blockchain and cryptocurrencies are not taken into consideration, unless the information is required in order to gain an understanding of the discussed topic. Finally, as there is a vast amount of new information published daily, only information published up to the 01 November 2018 is taken into consideration.

1.4 International aspect

As the author is a Swiss citizen studying at a Finnish University of Applied Sciences, the international aspect required by the institution is given. Additionally, the outcome of this thesis is intended to act as a guideline for, and thus will be beneficial to, any company which wishes to establish and implement its own cryptocurrency as a payment option, regardless of its location.

1.5 Anticipated benefits

The first stakeholder of this thesis is the commissioning company, Blocktek University. The outcome should benefit the company and support them in helping companies enter the cryptocurrency industry. Blocktek University might gain a substantial lead over its competitors as it is able to provide its clients with new, relevant research.

The second stakeholder is me as the author of this thesis. This topic is very important to me. Ever since I got into cryptocurrencies in 2013, I have been fascinated. Not only am I interested in the blockchain technology, but I am also curious about how cryptocurrencies will affect the common socioeconomic model in the long term. Writing a thesis on such a

fascinating topic, combined with a real-life case, provides me with the motivation and dedication that is required to conduct pertinent field and desk research. In the future, I plan to deepen my knowledge about this topic.
During this thesis, I will be able to establish a connection with the case company, and a future collaboration between the case company and I is more likely once I am able to demonstrate my researching skills as well as the determination needed to write a good thesis. Furthermore, I will be able to extend my knowledge about cryptocurrencies greatly which will support me in my anticipated career path. I intend to provide cryptocurrency-related consulting services in the future, and this thesis is my first publication. This kept me motivated throughout the research and writing process.
By this thesis I hope to establish a solid base for my professional career.

Another stakeholder is my institution, Haaga-Helia University of Applied Sciences. By supporting such a controversial thesis topic, the institution proves that it is willing to support innovation and drive change, which is a desirable trait in institutions of higher education.

Despite those three stakeholders, this thesis also anticipates being beneficial to the reader as it aims to provide useful information to help companies with some of their key decisions.

1.6 Key concepts

Cryptocurrencies are digital currencies. Those currencies are considered very secure and are almost impossible to counterfeit. Cryptocurrencies often, but not always, rely on the blockchain as underlying technology. Cryptocurrencies are usually not issued by one central authority but are instead decentralised. (Investopedia 2018.) An example of a cryptocurrency would be Bitcoin.

A token is generally used to describe a digital asset, like a Bitcoin token (one Bitcoin token is commonly referred to as one Bitcoin). However, in the cryptocurrency industry, the word token is commonly used to describe a cryptocurrency built on another cryptocurrency's blockchain, typically on the Ethereum blockchain. An example would be the token DAI which will be mentioned later in this thesis. DAI utilises the Ethereum blockchain, meaning that all transactions are done and visible on the Ethereum blockchain. (DAI 2018.) While a token can also be built on other blockchains, in this thesis the word token describes a cryptocurrency built on the Ethereum blockchain, if not otherwise specified.

An altcoin describes the cryptocurrencies launched after the success of Bitcoin. (Investopedia 2018.)

A blockchain consist, as the name suggests, of blocks. Every time a transaction is made, it is collected in a virtual block, which, as soon as enough transactions have been collected, is added to the blockchain. The transactions are verified by a network of computers, so-called miners. Those miners are rewarded with the block reward, a few tokens of the corresponding cryptocurrency that are distributed to a miner by chance. This reward varies heavily between different blockchains. It motivates users to mine the cryptocurrency, which improves the decentralization and security of the asset as each transaction is verified by tens of thousands of miners. This number varies from cryptocurrency to cryptocurrency. The blockchain serves as public ledger of all transactions of the corresponding cryptocurrency which makes cryptocurrencies very transparent as all wallets and transactions are publicly accessible. Cryptocurrencies can have their own blockchain, but that is not always the case. (Iansiti & Lakhani 2018, 1.)

An Initial Public Offering (IPO) occurs when a company offers its stocks for the first time to the public. It is a great way, especially for start-ups, to raise money quickly. An underwriting firm assists the issuer in questions regarding the best offering price, the best time for going public, and the amount of shares the company should issue. Those shares are then sold to the public, providing the issuing company with funding. (Investopedia 2018.)

An Initial Coin Offering (ICO) is very similar to an IPO. However, unlike in an IPO, no shares are sold in an ICO, meaning that the buyers do not have any ownership stake of the issuing company. Anyone can establish their own token and therefore, anyone can conduct an ICO. Potential investors are presented a white paper, which includes all important information about the project. Based on that, the interested person can decide whether the project is worth investing in. If an individual decides to invest, he can purchase the tokens at a price given by the issuer. Usually, the issuer accepts Bitcoin and Ethereum, sometimes also other cryptocurrencies or even fiat money. The buyer will hope for the company to succeed and for the coin or token to increase in value. (Siegel, Gramatke, Paulsen, Giessen & Brosig 2017, 3.)
Conducting an ICO is still not regulated very well (November 2018), but heavy regulations will be implemented in the future (Diemers, Arslanian, McNamara, Dobrauz, Wohlgemuth 2018, 1).

Fiat money describes a currency without intrinsic value. Fiat money is established by a government. The currency itself is not backed by a physical commodity, but its value is maintained by the issuing government. The value does not depend on the value of the

material it is made of. Most common currencies are fiat money, such as the US Dollar and the Euro. (Goldberg 2005, 3.)
As per definition, cryptocurrencies are not fiat money. In this thesis, the term “fiat money” is used to refer to traditional currencies, usually the US Dollar if nothing else is specified.

1.7 Key sources

As cryptocurrencies are completely new technologies, there are very few experts and theoretical frameworks. While there are countless theoretical frameworks for almost any field imaginable, this does not apply to crypto. The innovation proceeds quickly. New laws are passed monthly, and new technologies are introduced weekly. Books about specific topics, if there are any, can be outdated after a couple of days. This is an issue that is not experienced in other theses.

Due to the fast-moving environment, online sources provide far more relevant data than books. Extracting information primarily from books would be a fatal mistake that would cause the results of this thesis to be skewed or outdated.

As the most common and most trusted sources of knowledge in the cryptocurrency field are gained from sources not known to the average reader, they are presented in this chapter.

The most important provider of cryptocurrency price data is Coinmarketcap. The platform provides data on price, trading volume, market capitalization, exchange platforms and much more (Coinmarketcap 2018). The platform is highly trusted by cryptocurrency professionals and used as source for cryptocurrency-related articles on news platforms such as Forbes.

Coindesk is a news platform which focuses on cryptocurrency and blockchain related content. Coindesk has established itself as one of the most trusted news portals in the industry. Their authors are cryptocurrency and blockchain professionals. The website is visited by 5 million unique visitors each month, totalling to over 50 million monthly clicks. (Coindesk 2018.)

ETHGasStation provides information taken directly off the Ethereum blockchain. As the name suggests, that information relates primarily to the current transaction price (gas) of transaction on the Ethereum blockchain. The website is used as a reference for current and past data on gas fees. (ETHGasStation 2018.)

Additional sources were used in this thesis. Each source's trustworthiness has been assessed and confirmed before extracting information.

1.8 Risk analysis

A risk would be that the outcome of this thesis will become irrelevant. This is not a big risk as it is unlikely that the interest in cryptocurrencies will disappear.
Another risk would be that the case company withdrew from the commissioning agreement. However, even if that is the case, the content of this thesis would still be valuable for other companies and finding another commissioning company possible.
The biggest risk is that there is not enough data to base the research on, due to the lack of information and empiric data as cryptocurrencies are a very recent innovation. If that turns out to be the case, the gap is filled by interviewing cryptocurrency professionals. Said professionals are found in the author's personal network.
All challenges and risks are intended to be overcome by motivation and determination.

2 Theoretical framework

This chapter provides a short overview of all the theoretical framework used in this thesis. As one of the investigative questions focuses on ICOs, the theoretical framework of ICOs needs to be defined. A short comparison between an ICO and an IPO, which is more commonly known, is appropriate to deepen the reader's understanding of the process.

The second investigative question researches the correlation between a token's price and its utilisation. Hence, theoretical framework about consumer spending behaviour in a recession and an expansion may be an interesting addition in order to formulate expectations towards the research, as well as comparing cryptocurrency macroeconomics to fiat money macroeconomics.

The third investigative question researches whether the token should be pegged to fiat money. The theoretical aspect covered here will analyse the characteristics of a stablecoin.

Throughout the thesis, the theoretical framework established by Satoshi Nakamoto and Vitalik Buterin will be used. Satoshi Nakamoto is the person who invented Bitcoin as well as the blockchain technology in 2008 (Nakamoto 2008, 2). Nakamoto is only an alias; Up to this date, it is unknown who Satoshi Nakamoto really is. Vitalik Buterin on the other hand is more transparent. He invented Ethereum in 2015, which is the platform most ICOs run on (Buterin 2015, 3).

2.1 Cryptocurrencies compared to fiat money

There is a wide range of differences between cryptocurrencies and traditional currencies (fiat money) like the US Dollar or the Swiss Franc. To understand the outcome of this thesis, a broad understanding of the differences is required.

An obvious difference is the physical form; Whereas fiat money is available in its physical form, cryptocurrencies are not. A physical cryptocurrency would contradict the very idea of cryptocurrencies: An ecosystem without the need for third parties.

Cryptocurrencies are decentralised. Thus, decisions like the amount of mining rewards (and the resulting transaction fees) are made by anyone who mines the currency, and not by one institution. The maximum supply is often limited (Bitcoin), but cryptocurrencies with an unlimited supply exist (Ripple). The supply of fiat money is not limited, and more

money can be printed at any given time. Additionally, cryptocurrencies are generated by individuals and not governments. (Harris 2017.)

As there is no “Bitcoin government”, the legal status of cryptocurrencies is still surrounded by a lot of uncertainty. Depending on the country, cryptocurrencies are not acknowledged as currencies, or then they are fully accepted as currencies and citizens may even pay their taxes with Bitcoin, like in Zug, Switzerland (Gesley 2018, 2). In some countries, cryptocurrencies are taxed as foreign currency (Switzerland), and in others as income tax (Denmark) (Library of Congress 2018, 3). Compared to fiat money, this may be confusing as other currencies are usually taxed in similar ways across the world and accepted as such.

2.2 Stablecoins

A stablecoin is a cryptocurrency which is pegged to a certain fiat money value, most commonly one US Dollar (Lee 2018). While the term “stable coin” is a descriptive term, it is written as “stablecoin”. The most well-known cryptocurrency pegged to fiat money is Tether (USDT), based on its market capitalization and trading volume (Coinmarketcap 2018).

2.2.1 The most important stablecoins

The most well-known stablecoin is Tether (USDT), a stablecoin on the Bitcoin blockchain. The project claims that “at any given time the balance of fiat currency held in our reserves will be equal to (or greater than) the number of tethers in circulation”. For each Dollar the Tether project receives, it creates one USDT. (Tether 2017, 1.)

Despite USDT being criticized for not being audited (Jenkins 2018), the currency has established itself in the top 10 cryptocurrencies by market capitalization and trading volume. The cryptocurrency’s largest trading volume in 24 hours was $5.72 Billion on the 18th January 2018. At that time, its market capitalization was $1.65 Billion, and in October 2018, the market capitalization is approaching $3 Billion. (Coinmarketcap 2018.)

The fact that Tether has a trading volume corresponding to twice its market capitalization can be explained by examining what Tether is mostly used for. The cryptocurrency is used as a trading pair on various exchanges to enable trading cryptocurrencies against the next best thing close to fiat money. As Bitcoin, Ethereum and several other cryptocurrencies are tradeable against USDT, its daily trading volume can easily exceed its market capitalization. In case of the 18th January, each USDT was traded 3.46 times on average.

TrueUSD (TUSD) is the second largest pegged cryptocurrency by market capitalization (Coinmarketcap 2018). TrueUSD has been established as a direct response to USDT and its criticism. The developers of TrueUSD state that they “wanted a simple stablecoin, without the need to trust (a) company’s hidden bank account or special algorithm”. The trust issue is approached in a special way: Instead of having one bank account, which is not visible to the public and thus not transparent, the fiat money is held in the bank accounts of multiple companies. The amount of USD held in the bank accounts are published every day. Unlike USDT, TUSD is audited monthly. (TUSD 2018.)

The companies holding the fiat money have signed escrow agreements. This means that the funds are only released once both parties have fulfilled their obligations, in this case if the corresponding amount of TUSD to the amount of received USD has been printed, which avoids printing too much TUSD. As soon as an amount of USD has been sent to and verified by one of the trusted companies, their application programming interface (API) will activate the TUSD smart contract, which will proceed to issue the same amount of TUSD as USD have been received and send the newly created tokens to the customer’s Ethereum address. (TUSD 2018.)

The cryptocurrency pegged to fiat money with the third largest market capitalization and daily trading volume is Dai (DAI). In October 2018, Dai has a market capitalization at $60 Million. It has reached its highest trading volume within 24 hours on the 22th April 2018 with $98 Million. However, this was an absolute exception; A daily trading volume of $4 Million better reflects the reality. Its trading volume does not usually exceed its market capitalization, if the spike of volume mentioned above is not taken into consideration. (Coinmarketcap 2018.)

Unlike Tether and TUSD, Dai is not controlled by one institution. It is completely decentralized and uses the Ethereum blockchain (Maker Team 2017, 3). DAI is designed to be a credit system. Each DAI coin is issued when users lock up their assets in this credit system. The stability of DAI is maintained by a system of dynamic autonomous interest rates that automatically react to emerging market conditions and change the fees and incentives associated with the credit system. The value of each DAI coin equals to 1 USD. Dai has a complex system behind the scenes which makes sure that the price of a DAI coin will remain constant with the price of the USD. If a user wants to purchase $100 worth of DAI coins, the user must put $150 worth of Ether (ETH) into the Maker Dao Smart Contract. This only works with ETH as DAI is built on and into the Ethereum ecosystem. This process is called entering the “Collateralized Debt Position” and is known as CDP. During

this process, the user receives 100$ worth of DAI, so 100 DAI tokens. The remaining 50$ are held as a collateral. As DAI is built on the Ethereum blockchain and thus is pegged directly to the value of ETH, ETH price developments affect DAI directly. If the value of the ETH that is held as collateral depreciates, it causes the value of the ETH held as collateral to become lower than the corresponding amount of DAI. In this case, the DAI's smart contract will quickly buy the collateral and will sell it off for a profit to the keepers. These keepers will sell the liquidated assets for profits which are then used for stabilizing the value of DAI. (DAI 2018.)

As TrueUSD and DAI are built on the Ethereum blockchain, they profit from smaller transaction fees as USDT on the Bitcoin blockchain. Depending on the current Bitcoin and Ethereum values and technical changes, this may change.

The successful concept of stablecoins has been copied countless times. This led to the existence of several, unimportant other stablecoins, as well as new, upcoming stablecoins. Covering each existing stablecoin is impossible as a new stablecoin is established on a weekly basis, but the three stablecoins covered in this chapter are the most relevant ones in late 2018. The following table compares the most important features of USDT, TUSD and DAI.

Table 2. The three largest stablecoins by market capitalization

Pegged token	USDT	TUSD	DAI
Trust	Low	High	Medium-High
Transparency	Low	High	High
Centralization	Centralized	Decentralized	Decentralized
Daily trading volume	High	Medium	Low
Transaction fee	High	Low	Low

Volatility (typically)	<5%	<1%	<1%

Trust: As stated, USDT is not trusted by the general crypto user. However, as USDT is listed on the largest exchanges as trading pairs for almost every cryptocurrency, it is continued to be used. TUSD and DAI are trusted much more as TUSD is audited and DAI is unable to fail (due to its functionality), if enough people are involved.

Transparency: While USDT is not transparent, TUSD and DAI are.

Centralization: USDT is centralized, one institution has complete control over USDT. TUSD and DAI are not centralized, with DAI having the edge as no companies are involved.

Trading volume: With well above $1 Billion, USDT has by far the biggest daily trading volume. TUSD follows with around $60 Million, and DAI ranks third with only about $4 Million.

Transaction fee: Currently, transaction fees for tokens on the Bitcoin blockchain (UDST) are higher than for tokens on the Ethereum blockchain (TUSD & DAI).

Volatility: While the price occasionally moves beyond 1% volatility, either currency has an average daily volatility of under 1% (Coinmarketcap 2018). However, USDT sometimes reaches a higher volatility, especially when new criticism arises. It is fair to grade USDT lower than TUSD and DAI.

TUSD offers the best mix between trust and trading volume. Anyone is strongly encouraged to favour TUSD over USDT.

2.2.2 The current use of stablecoins

USDT is used to trade mainly Bitcoin and Ethereum on large cryptocurrency exchanges, such as Binance and Bitfinex. There are over 400 USDT trading pairs currently listed. (Coinmarketcap 2018.)

TUSD is used for the same purpose. It is used on Binance, Bittrex and several other exchanges. Additionally, there are USDT/TUSD trading pairs on said exchanges so that users can quickly shift between the two stablecoins. In total, TUSD is tradeable with 34 other cryptocurrencies. (Coinmarketcap 2018.)

It is not DAI's purpose to be a stablecoin to trade other cryptocurrencies with. Instead, DAI is supposed to be a solution for companies to offer a stablecoin payment option. Thus, it has only 33 trading pairs. The first two largest (by trading volume) trading pairs account for 69% of the total trading volume. (Coinmarketcap 2018.)

Despite serving as trading pairs, it could be assumed that the stablecoins are used to purchase products and services. As stated in chapter 1.1, several major companies offer a cryptocurrency payment option. Expedia, Microsoft, Subway, PayPal and other mainstream companies are providing this payment option. However, none of those companies accept any kind of stablecoin (Sloan 2018). It seems as stablecoins are used for trading only and businesses are not interested in adding a stablecoin payment option. Usually, businesses add cryptocurrency payment options because they want to look innovative and because cryptocurrencies are used by more and more people.
Bitcoin leads the growth of the cryptocurrency market and is the most well-known cryptocurrency and it is in a company's interest to accept the widest spread cryptocurrency. This does not mean that other cryptocurrencies will not be accepted soon (some like Litecoin and Ethereum are already accepted), but stablecoins do not seem to be attractive enough.

2.3 The Ethereum platform

In order to get a clear understanding of an ICO and the term "token", it's important to look at the Ethereum blockchain as most of the ICOs are conducted on Ethereum (EY 2018, 19). Ethereum is a project which has been established by Vitalik Buterin in 2015. Ethereum has its own blockchain. It allows anyone to create their own cryptocurrency in the form of a token within minutes. Those tokens utilize the Ethereum blockchain and thus depend on its blockchain to perform well. This quick and easy process of creating a cryptocurrency is the reason why most companies choose to use the Ethereum blockchain. (Buterin 2015, 3.)

The Ethereum blockchain has its own token, Ether. This token is used to pay the transaction fees and is usually accepted as a paying method for ICOs (Buterin 2015, 4). Despite this, the token is usually referred to as Ethereum.

2.4 Initial coin offering (ICO)

An ICO is an important part of the modern cryptocurrency industry. In 2017, ICOs have raised a total of $5.5 billion. In the first quarter of 2018, ICOs had already surpassed this

number and have raised $6.3 billion. (Floyd 2018, 1.) Thus, knowing what an ICO is, is crucial in order gain an understanding of the bigger picture.

2.4.1 Definition

An initial coin offering is a simple way to fund start-up companies in the cryptocurrency industry. An ICO is similar to an initial public offering (IPO), but simpler. Investors may invest into a project at a very early stage as the only requirement to conduct an ICO is to have an own cryptocurrency. (Siegel & al. 2017, 9.)

Companies have the option to create their own token on the Ethereum blockchain. While there are other platforms available, ICO Watchlist, a trusted source of information for professionals, shows that 82,60% of all ICOs have chosen the Ethereum blockchain (November 2018) (ICO Watchlist 2018).
The company's tokens are sold during the ICO for either US Dollar or, most commonly, Bitcoin and Ethereum.

2.4.2 The process

The first step in an ICO process is to establish the conditions of the ICO (such as the price of the token), prepare a sales pitch and a whitepaper, and advertise the ICO. Typically, each ICO is announced on Bitcointalk. This platform has established itself among professionals as the first place to advertise new cryptocurrencies. Other places where new tokens are advertised are Reddit and Twitter. The main communication channels between ICO conductor and investors are Telegram and Twitter. (Siegel & al. 2017, 10.)

After announcing the new cryptocurrency as well as its upcoming ICO, the company presents the whitepaper and its sales pitch as the ICO commences. This whitepaper includes all necessary information about the project, the company, and the developers. It also elaborates the purpose of the new cryptocurrency. Furthermore, this whitepaper states which rights the investors receive as well as the price of one token. The company is expected to be transparent and show how the raised funds will be allocated. It is also expected that the company provides an overview of the maximum supply, how many tokens are being sold in the ICO, how many of them are kept by the team, and how many will be sold after the ICO and for what purpose. (Siegel & al. 2017, 10.)

In a third step, the actual ICO is conducted. Marketing is crucial in this stage as many of the companies are not well known. The ICO usually stays active for a predefined period of time or until a certain amount of funding is reached. (Siegel & al. 2017, 11.)

After the ICO closes, the tokens are distributed. Soon after, the tokens will become tradeable on cryptocurrency exchange platforms. Having the token trading on a prestigious exchange is a very good indicator of the token's short-term success. (Siegel & al. 2017, 11.)

The four main steps are summarized in the figure below (Siegel & al. 2017, 9).

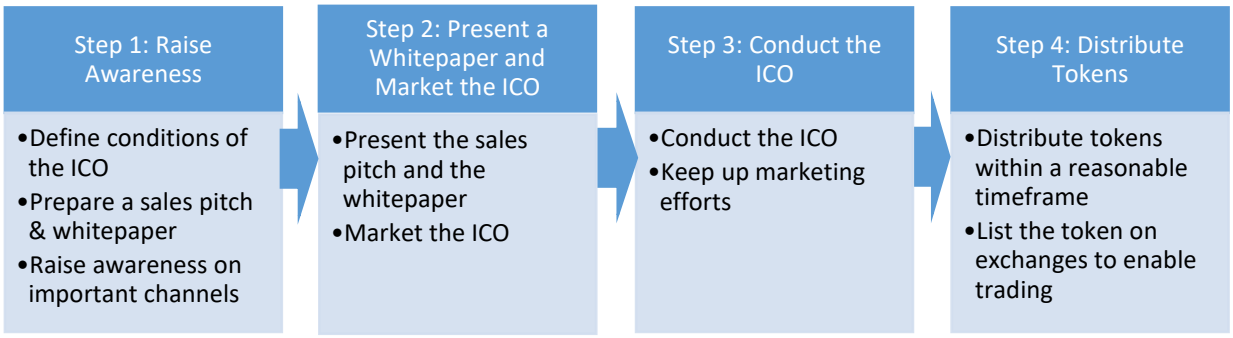

Figure 3. The ICO process.

Some projects have decided to conduct a pre-ICO, which, as its name implies, is conducted before the main ICO. A bonus is usually offered in this pre-ICO to attract early investors.

2.4.3 Differences to an Initial Public Offering (IPO)

An ICO is similar to an IPO. However, there are some major differences to consider. Unlike during an IPO, no shares are sold during an ICO, meaning that the buyers do not have any ownership stake of the issuing company. The only thing the buyer receives is the company's token. Often, this token is a utility token, a form of payment to access the company's platform or purchase its products or services. As the laws regarding ICOs are still unclear, the risk involved with investing in an ICO is much higher. (Siegel & al. 2017, 11.)

Another key difference is found in the target audience. The ICO company does not necessarily target large investors, but instead targets individuals. Thus, the transaction size is much smaller and sometimes starts from as little as 1$. IPOs on the other hand aim to attract institutional investors. (Siegel & al. 2017, 11.).

Additionally, a company's shares are priced according to the company's valuation (Geddes 2005) whereas the price of a token in an ICO does not depend on the company's valuation.

The differences are summarized in the table below. This does not include all differences, but it does include the most important ones.

Table 3. The most important differences between an ICO and an IPO (Siegel & al. 2017)

Differences ICO IPO	ICO	IPO
Typically conducted by	A start up	An established company
Target audience	Private investors	Institutional investors
Pricing of share/ token	Based on funding target	Based on company valuation
Regulations	Unregulated	Regulated
Risk	High risk	Medium risk
Ownership	No ownership of issuing company	Ownership of issuing company

This table clearly shows that investing in an ICO is much riskier. Further regulation is needed for more investors to be able to invest in ICOs.

2.5 Traditional market cycles

Consumer spending behaviour is a term used to describe the process of an individual or a household buying goods and services for personal consumption (Sheth 2014, 1). As there is no data existing regarding the spending behaviour of cryptocurrencies during expansion and recession, investigating the traditional market cycles expansion and recession may indicate how the price of a token affects its utilisation.

2.5.1 Expansion

In an expansion, economic activity grows which is measured in the rise of the real GDP. Production in general rises which cause salaries to rise as well, increasing the average income. (O'Sullivan & Sheffrin 2003, 310.)

Between 2001 and 2007, the world has seen a global expansion phase as the average GDP grew by 2.8 percent. The personal savings rate rose from 3.8 percent in 2001 to 6.3 percent in 2004, and then, as soon as individuals got comfortable with the economic growth, dropped to 2.8 percent in the following year and stayed around this level until the expansion phase ended. (Statista 2018.)

This information may be applied to the cryptocurrency market and may prove itself important in researching how the price of a token affects its utilisation.

2.5.2 Recession

With the slowing down of the economy, the public pauses to ruminate about their spending habits. Most people decide to save up for retirement and resorts to quality rather than quantity. This is when minimalism and simplicity play a healthy role in society.

The Great Recession took place in the US between December 2007 and June 2009. This recession was related to the financial crisis between 2008 and 2009 and the US mortgage crisis between 2007 and 2009. It is known as the most devastating global economic crisis since the Great Depression which began in 1929. (Grusky, Western & Wimer 2011, 4.)

To gain an authentic understanding of the recession, news articles and sources from 2009 have been investigated. In December 2009, the spending on residential construction dropped 22 percent compared to one year before. In December 2008, the spending on durable goods dropped by 0.8 percent and spending on nondurable goods by 1.8 percent compared to November 2008. (Healy 2009, 3.)
The average personal saving rate in the US in 2008 was 6.4 percent, which is a big increase from the 3.0 percent in 2007 (Statista 2018). At that time, consumer spending behaviour accounted for 70 percent of growth in total. Thus, as the consumer saved more money and spent less, the recession got deeper as well.

During a recession, people spend a lot less. While this is not surprising, those findings are important when researching how the price of a token affects its utilisation, especially as there is no comparable data regarding cryptocurrencies.

2.5.3 Expectations to the cryptocurrency market

In a traditional market, the public spends more money when the market is doing well and spend less when the market is crashing. As a result of that, the expectation towards the cryptocurrency market are that most coins are used when the market is doing well, and less coins are used when the market is crashing. As the cryptocurrency market is much more volatile, investigating a shorter time period will suffice.

3 Research

The main problem which had to be faced was that there is very little theoretical framework currently existing regarding cryptocurrencies and ICOs. Thus, research is vital. The other problem is the lack of experts in the field of blockchain and cryptocurrencies. While there are plenty of self-proclaimed experts, it is not an easy task to find an expert who qualifies as one, especially considering that cryptocurrencies have only been around for about ten years.

3.1 Target of research

The target of this research is to find out all information necessary to answer the investigative questions, which ultimately lead to answering the research question.

The process of estimating a token's value during its ICO is answered in this chapter. The impact of the token's value on its use, as well as the question whether it should be pegged to a traditional currency, are other key outcomes of this chapter.

The outcome of this research will enable the commissioning company to provide better consulting services to companies that intend to set up their own cryptocurrency.

3.2 Research methods

The chosen research methods are based on each investigative question individually. The target of the research is to answer the investigative questions and the research question mentioned below.

RQ: What are the most important things a company needs to consider before and after conducting its ICO?
IQ 1: How can a token's ICO-price be determined?
IQ 2: How does the price of a token correlate with its utilisation?
IQ 3: Should a new token be pegged to fiat money?

Both quantitative and qualitative methods are used to analyse the collected data. The quantitative approach served best when analysing the correlation between a cryptocurrency's price and its trading volume (in numbers traded, not USD).
The qualitative method on the other hand is used when analysing the cryptocurrency holder's behaviour, which is researched by conducting a survey. The survey aims to in-

vestigate what drives an investor's decision to invest in a cryptocurrency. It also investigates how often Bitcoin is used to pay for a product or a service and how often other cryptocurrencies are used for their intended purpose. This survey was only made available to cryptocurrency holders. It is kept short as a long survey may bore the respondents which could lead to a falsified result.

Both methods complement each other in the research of the other remaining questions. Researching the best way for a company to estimate the price of its token before the ICO requires both methods because not only hard numbers matter, but the situation of each company needs to be taken into consideration as well, especially when giving recommendations to companies on how to price their token. The same applies for IQ 3; When researching whether the token should be pegged to fiat money, it is important to take both quantitative and qualitative aspects into consideration as a pegged coin might be a great idea considering only quantitative factors, but on the other hand might be a bad idea if only considering qualitative aspects.

The following figure provides a quick overview over how each investigative question was researched.

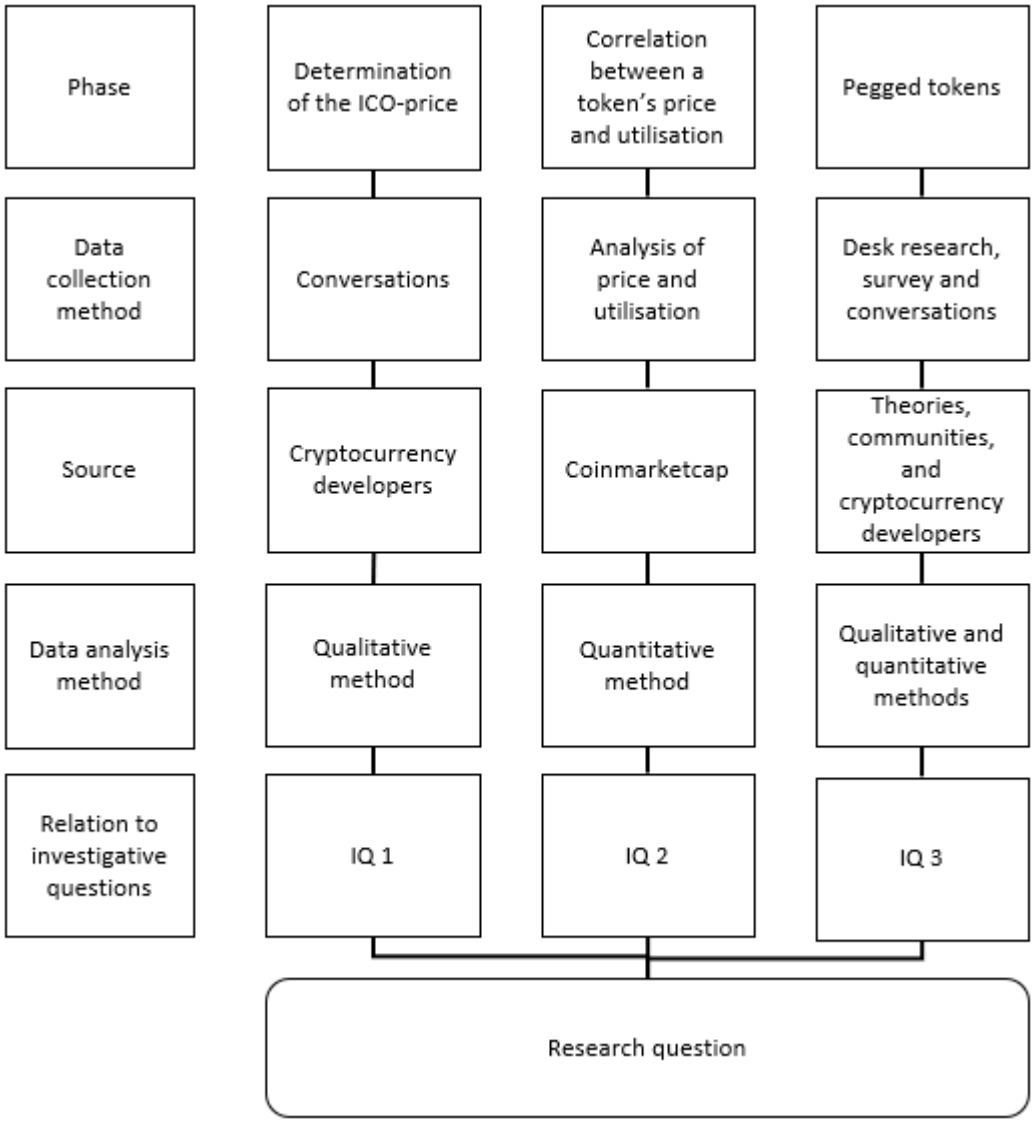

Figure 4. Research methods

A relevant and trusted outcome of this thesis was anticipated throughout the writing process. To ensure that, only trusted sources were used when writing the theory aspect, as well as when conducting the research.

3.3 The correlation between price and utilisation

The consumer spending behaviour with fiat money has been investigated in chapter 2.4. The research showed that consumers spend less money in times of recession than they do in times of expansion. But this behaviour could be entirely different with cryptocurrencies.

It was not possible to collect data regarding the utilisation of cryptocurrencies: While the amount of transactions is available for most of the researched cryptocurrencies, determining which of the transactions were made as a payment is impossible. The amount of

transactions would also include transactions of individuals between their own wallets, sending to and receiving from exchange platforms, over the counter deals, and other unrelated transactions. This approach would have falsified the outcome of this research. Instead, researching the utilisation of the cryptocurrency was conducted comparing the daily price (in USD) to the daily trading volume (in amount of the corresponding cryptocurrency). The used price is the average daily price calculated of the daily open, close, high, and low price.

This approach works under the assumption that a certain percentage of the purchased coins are used for their intended purpose. The receiving company must then sell the same amount in order to cover its expenses. The exact percentage is unknown and impossible to determine, however, as the companies sell the tokens they receive, it is to be assumed that the buying and selling of coins (connected to their intended purpose) account for a very similar percentage of the total trading volume, especially over an extended period. Thus, this research investigates a time span of one year (12th October 2017 until 11th October 2018).

The number of traded cryptocurrencies was calculated by dividing the daily volume (in USD) by the average daily price (in USD). To conduct this research, 29 200 data entries have been analysed. This includes all daily prices (open, high, low, close, and the resulting average) and volume (in USD and number of corresponding cryptocurrency trades). To gain an overview, the top 11 cryptocurrencies (by market capitalization) were researched – excluding the stablecoin USDT, leading to a total of 10 investigated cryptocurrencies.

The data used for the following charts has been taken from Coinmarketcap (Coinmarketcap 2018.) This applies to all charts in this chapter.

3.3.1 Bitcoin

Bitcoin (BTC) is the largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).
After calculating the average price as mentioned above, the data was plotted on a chart.

Figure 5. Bitcoin price development

Afterwards, the trading volume was calculated. As the trading volume in USD is not interesting due to the price fluctuations, the daily volume was divided by the daily average price to get an accurate estimation of the number of Bitcoins traded on that day. This data was plotted on a chart, resulting in the following chart.

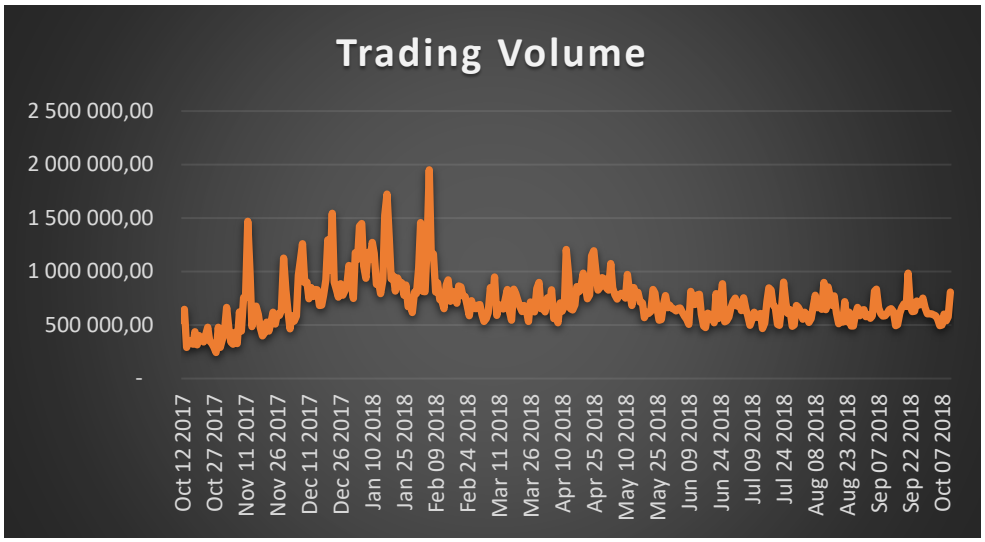

Figure 6. Bitcoin trading volume

In a third step, the charts were merged. This simplifies comparing the two data sets. Using charts provides much better results than using a scatter plot as the trading volume often lags behind the price chart.

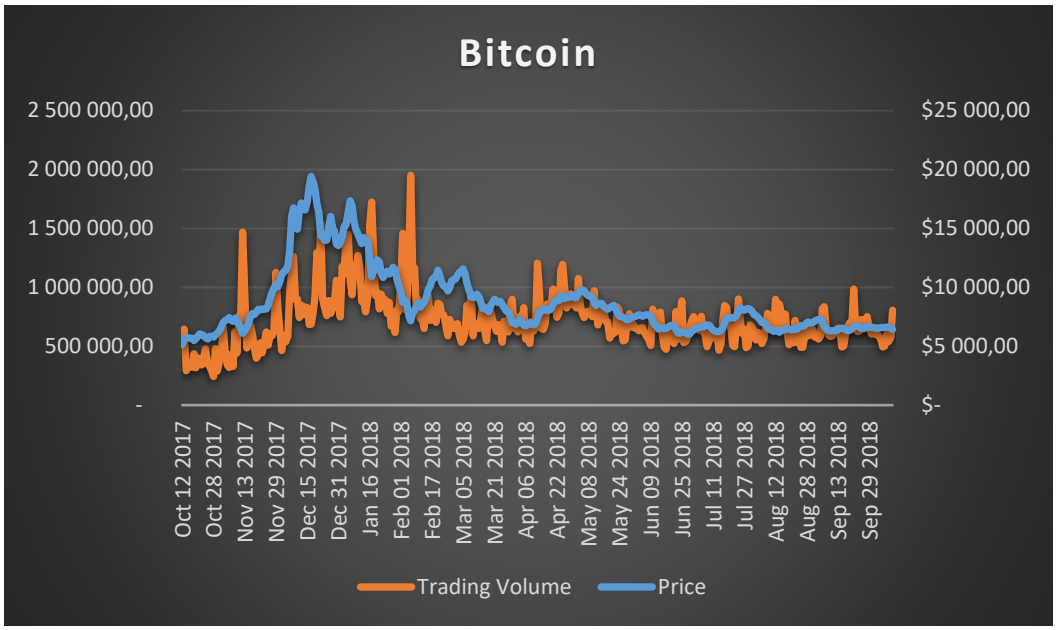

Figure 7. Bitcoin price compared to trading volume

This chart shows that there is a correlation between price and number of Bitcoins traded. Between October 2017 and December 2017, the trading volume surged as did the price. Afterwards, both the price and the trading volume declined until February 2018, when the trading volume spiked. The price followed the trend but did not spike as much. However, after a decline in both data between march and April, both increased until May 2018, and afterwards both declined until June 2018. Except for a little spike in both trading volume and price, both have been moving sideward until October 2018. The correlation between the two data sets is 0.50. As the chart shows, and the correlation factor confirms, there is a moderate correlation between the price of the asset and the number of Bitcoins traded.

3.3.2 Ethereum

The second largest cryptocurrency by market capitalization on the 11th of October 2018 is Ethereum (ETH) (Coinmarketcap 2018). The same concept has been applied to Ethereum and resulted in the following chart.

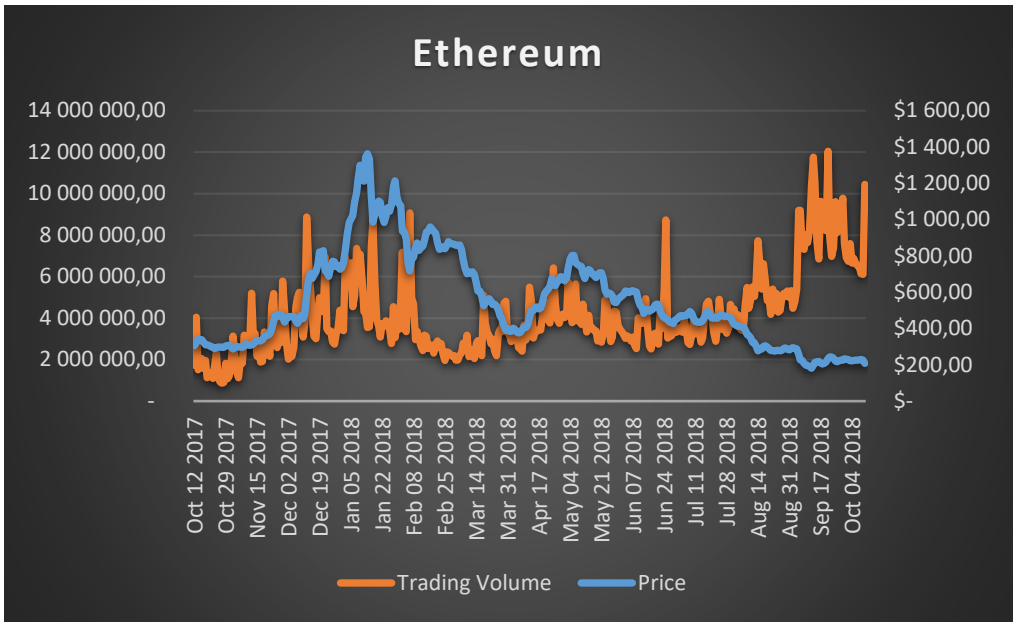

Figure 8. Ethereum price compared to trading volume

The chart shows that there is a weak correlation between the price and the number of Ethereum traded. Between October 2017 and January 2018, both the price and the trading volume surged and then plummeted until March 2018, where both bounced and reached a new lower high in May 2018. The charts correlate until the end of July 2018. From August on, the price further depreciates, but the number of Ethereum traded surges. This trend continues until October 2018. The total correlation between the two data sets is -0.19, a weak negative correlation. The correlation coefficient between October 2017 and the end of July 2018 is 0.35 (0.40 when excluding a sudden spike in volume on the 25th of June 2018), and -0.75 between August 2018 and October 2018. While the correlation before August seems weak, it suddenly becomes a strong negative correlation.

As stated in chapter 1.1, ICOs have raised vast amounts of money since late 2017. This money was mostly raised in the form of Ethereum, which led to its price spike in January 2018. ICOs often raised millions of Dollars' worth of Ethereum. The companies behind the ICO have business operations to fund and are forced to liquidate their assets, which being Ethereum. As the Bitcoin price declined in February, so did the whole cryptocurrency market capitalization which probably caused investors to lose interest in the field and the ICOs to be generally less successful. This caused the Ethereum trading volume to drop and as the prices were still good, companies did not have to sell as a lot of Ethereum to keep up their operations. However, after August, pressure seems to have become too much and more Ethereum was sold by the ICOs in order to cover their expenses, causing the price to further decline and the trading volume to increase drastically. This theory is further backed by a research done by Trustnodes, which revealed that ICOs did in fact sell up to

83’000 Ethereum a day (Trustnodes 2018). However, this theory does not account for most of the daily trading volume which, between August 30st and October 11th, was at an average of around 8 Million Ethereum traded. Thus, ICOs selling Ethereum are not the only reason for the price decline, but it is undoubtably one of the reasons. Despite the bear market cryptocurrencies are experiencing, headlines stating that ICOs are selling Ethereum and have much more to sell, surely lead to individual holders selling their Ethereum in order to avoid a loss, which led to another wave of selling as sell orders trigger. This spiral accelerated, causing the trading volume to rise and the price to fall.

The chart displays a clear correlation between the price and the trading volume with a correlation coefficient of up to 0.40, ignoring the spike in volume on 25th of June when interest in Ethereum spiked. The correlation became negative at the begin on August due to the aforementioned reasons. This concludes that there is a clear correlation between the price and the trading volume of Ethereum under normal circumstances.

3.3.3 Ripple

Ripple (XRP) is the third largest cryptocurrency by market capitalization on the 14th of October 2018 (Coinmarketcap 2018).
Applying the same concept as above resulted in the following chart.

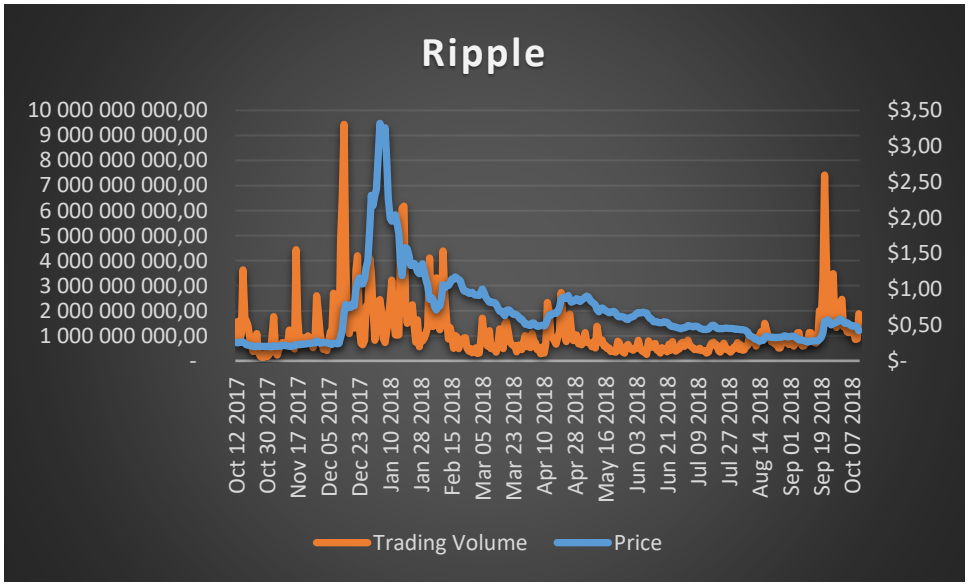

Figure 9. Ripple price compared to trading volume.

Ripple too shows a clear correlation between its price and the trading volume. Between October 2017 and December 2017, there was no correlation, but that quickly changed as both surged until January 2018 and then dropped until September 2018 (except for a short-lived rise in February 2018 and April 2018). In September, the price surged, and the

trading volume surged even more. This was most likely due to Ripple's launch of the xRapid, a tool that allows payment providers to minimalize liquidity costs (Ripple 2018).

The correlation coefficient between the two data sets is 0.24. Between the 15th December 2017 and the 15th September 2018, the correlation coefficient is 0.43. The latter excludes special events and, as it was the same with Ethereum, the correlation coefficient excluding special events is much higher.

3.3.4 Bitcoin Cash

Bitcoin Cash (BCH) is the fourth biggest cryptocurrency by market capitalization on the 14th of October 2018 (Coinmarketcap 2018). The cryptocurrency shows the following correlation between its price and the number of BCH traded.

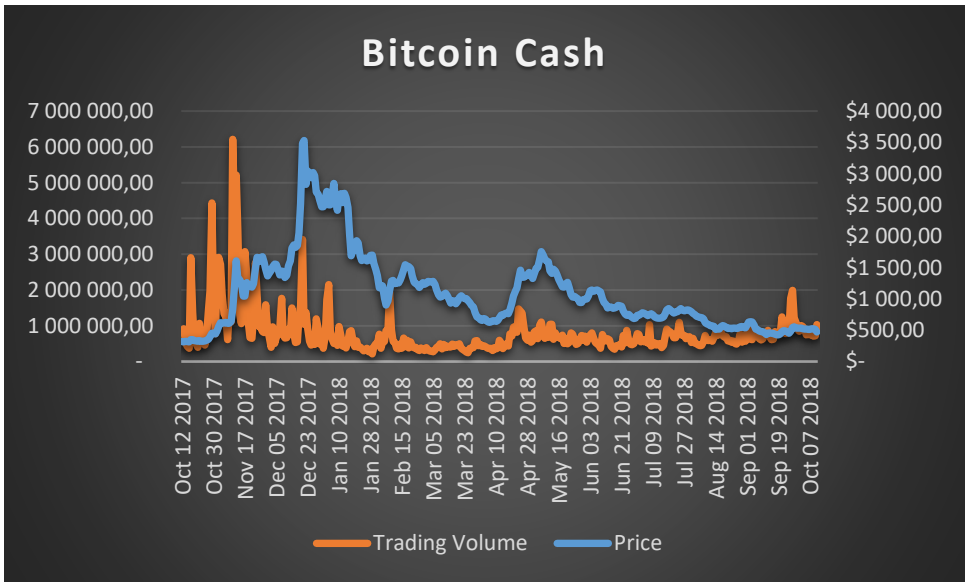

Figure 10. Bitcoin cash price compared to trading volume

Bitcoin Cash is showing a similar correlation between price and utilisation as the previous coins do. The correlation coefficient however is 0.03, indicating that there is no correlation between the two data sets. However, Bitcoin Cash was created on the 01 August 2017 (Bitcoin Cash 2018). This means that the interest (and thus the trading volume) in the new cryptocurrency has been very volatile. This large interest also shows in the fact that the coin is the fourth largest cryptocurrency by market cap within such a short period. Between the 1st of December and the 11th of October, the correlation coefficient is 0.18.

3.3.5 EOS

EOS (EOS) is the fifth largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).

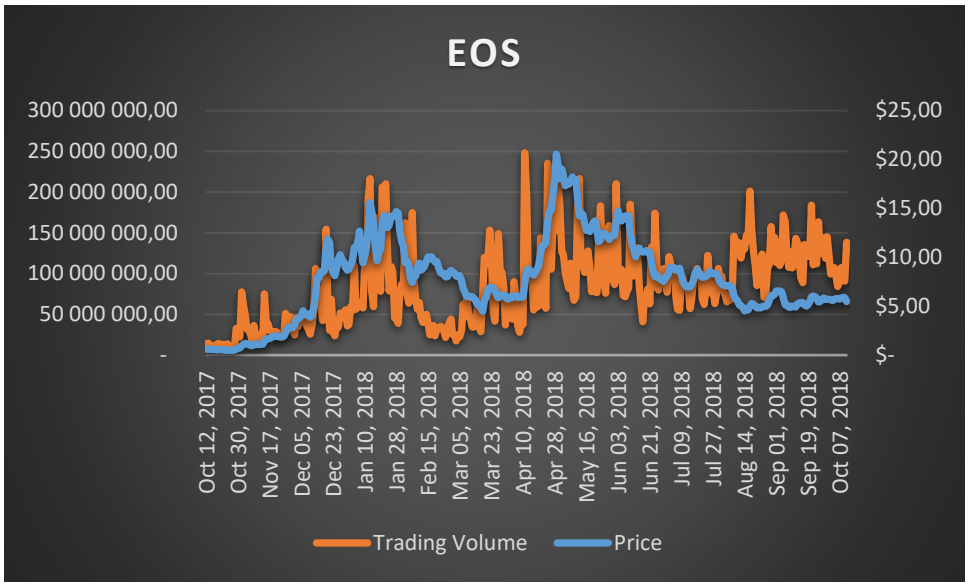

Figure 11. EOS price compared to trading volume

The correlation coefficient between the two data sets is 0.43. Up until the end of July, the correlation was 0.61. This change in correlation happened at the same time as it did for Ethereum. EOS offers similar functions as Ethereum and claims to provide the most powerful infrastructure for decentralised applications, one of Ethereum's main functions.

3.3.6 Stellar

Stellar (XLM) is the sixth largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).

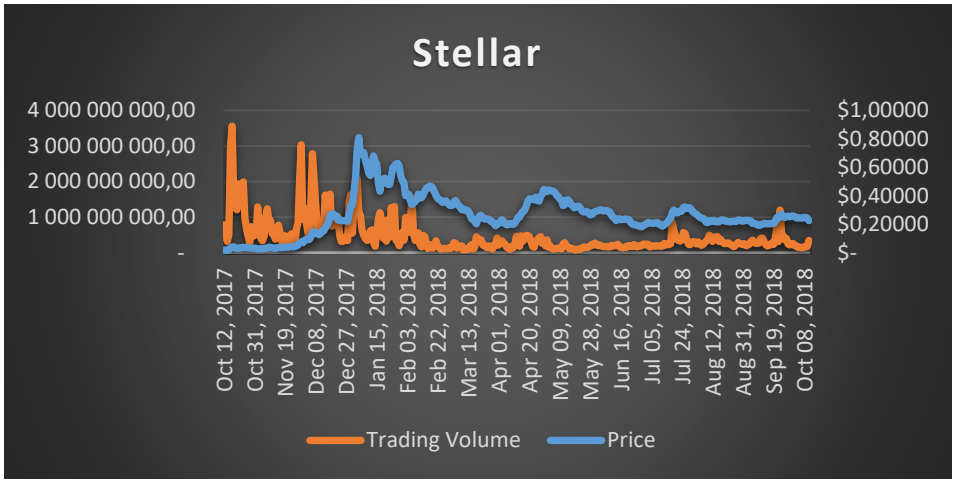

Figure 12. Stellar price compared to trading volume

The correlation coefficient between the two data sets is -0.16, and the correlation between 1st of January 2018 and 14th of October 2018 is 0.45. It seems as the correlation increased heavily after a period of non-correlation between October 2017 and December 2017. This

is the same development as Bitcoin Cash and very similar to Ripple, as all three crypto-currencies have a higher correlation between January and October 2018 than between October 2017 and December 2017.

3.3.7 Litecoin

Litecoin (LTC) is the seventh largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).

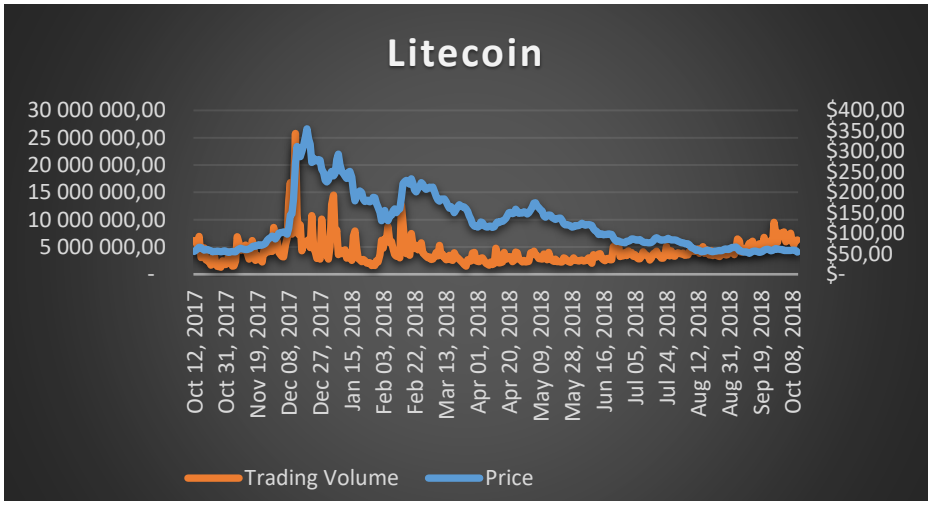

Figure 13. Litecoin price compared to trading volume

The chart shows the same pattern as previous comparisons: There is a correlation between the price of the asset and the trading volume. The correlation coefficient is 0.17. Litecoin too seems to reach a higher correlation between price and trading volume if the data after the 31st of July is not considered. Without this data, the correlation coefficient is at 0.30.

3.3.8 Cardano

Cardano (ADA)) is the ninth largest cryptocurrency by market capitalization on the 14th of October 2018 (Coinmarketcap 2018).

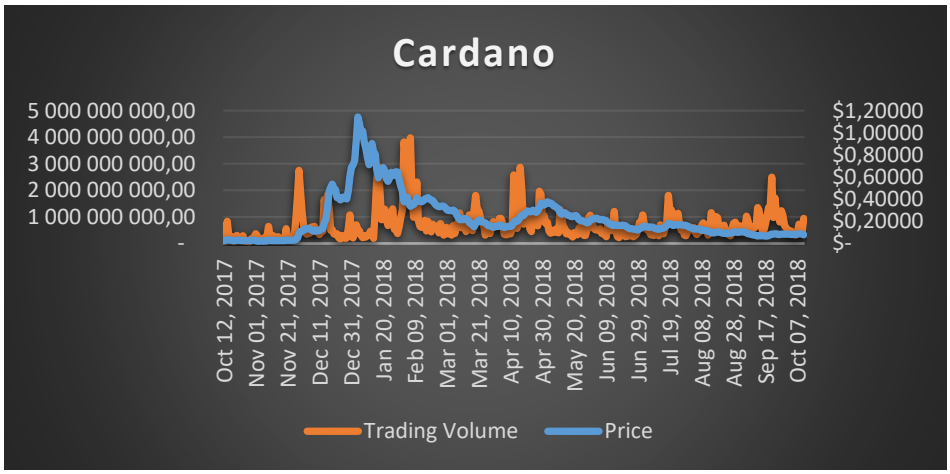

Figure 14. Cardano price compared to trading volume

The two data sets used have a correlation of 0.15. This is mainly caused by a few spikes in volume, as well as an appreciation in price which did come with a rise in trading volume. Cardano seems to have an exceptionally low correlation.

3.3.9 Monero

Monero (XMR) is the tenth largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).

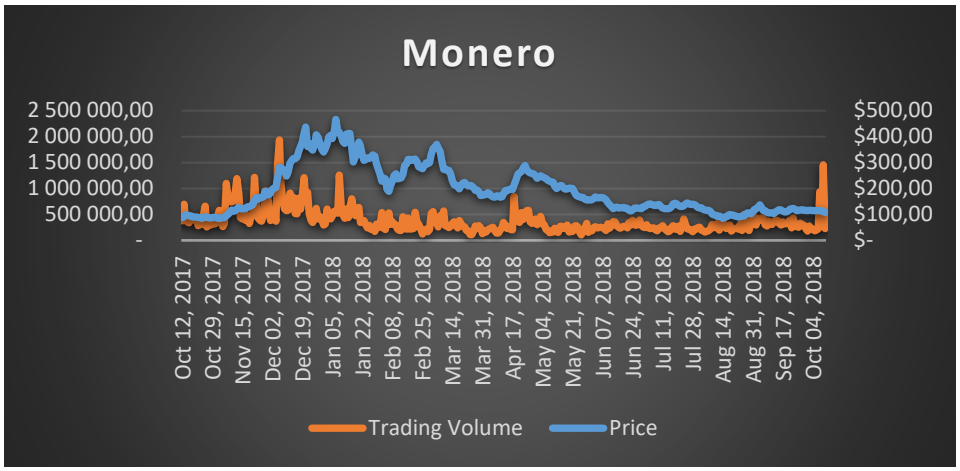

Figure 15. Monero price compared to trading volume

The correlation coefficient is 0.27. However, excluding two spikes in trading volume (on the 8th and 10th of October), the correlation coefficient rises to 0.29.

3.3.10 Tron

Tron (TRX) is the eleventh largest cryptocurrency by market capitalization on the 11th of October 2018 (Coinmarketcap 2018).

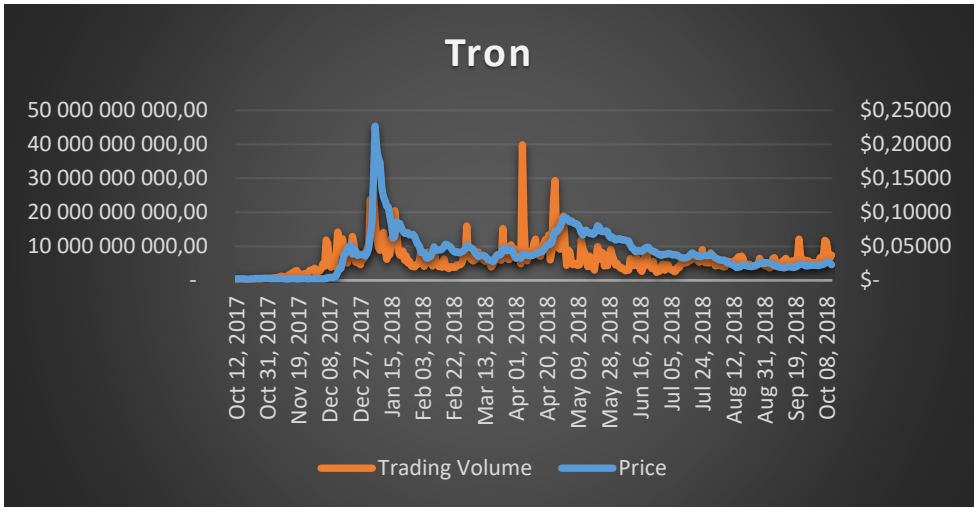

Figure 16. Tron price compared to trading volume

The correlation coefficient between the two data sets is 0.48, the second strongest correlation measured. Excluding the spikes in volume on the 5th, 24th and 25th of April, the correlation coefficient is at 0,54, exceeding the correlation coefficient of Bitcoin's price and utilisation (0.50).

3.3.11 Summary

Comparing the price and the trading volume of the ten largest cryptocurrencies (excluding USDT) using 29 200 data entries revealed that there is in fact a correlation between the two. As the price of the asset declines, so does the trading volume in number of coins traded. The same applies when the asset depreciates in value. This does certainly not mean that the volume affects the price directly, it only means that there is a correlation between the two, but external factors also have a large impact on both. The average correlation between price and trading volume of all the data analysed is 0.19. However, not considering special situations like the Ethereum situation after July 31st and sudden spikes in volume, the correlation coefficient is 0.39. Thus, it is concluded that the utilisation and the price of a cryptocurrency correlate moderately if special events are not taken into consideration.

Interestingly, the trading volume seems to change before the price does, meaning that an increased trading volume could lead to an increase in price. This may not apply vice versa.

3.4 The three ways to price a token

Prior to the ICO, the issuing company needs to establish a price per token. This can occur either in the form of fiat money or in cryptocurrency. As most new tokens are on the Ethereum blockchain, Ethereum is typically accepted. Bitcoin is always accepted, but fiat money is not as fiat payments are very slow and cause a lot of administrative expenses. The following four ways to price a token are based on the author's own experience after investigating more than one hundred ICOs.

First, the company needs to decide how much fiat money (as future expenses like salaries must be covered in fiat money and not crypto) it wants to raise during the ICO and how much of the total supply of its token it is ready to sell. After that, the company has three possibilities.

The first possibility is to simply declare the fiat price of one of their tokens. When doing that, the company should try to give itself a realistic evaluation; A start-up without any equipment, infrastructure nor experience, should not sell their tokens for 1$ each if the token has a supply of 100 million, as that would value the token at 100 Million dollars. However, as the company can decide the price of their token, such exaggerations are seen often.

If the company would like to take a different approach to this issue, they can go for another way of pricing by simply setting a price in Bitcoin or Ethereum. This could be for example a price of 0.0001 BTC per token, or 0.001 ETH per token. This would require the company to adjust either their target funding or the number of tokens it is ready to sell during the ICO.

Companies also have a third option. This is a combination of the two previously mentioned methods. The company can convert its fiat money funding target into a price per token and convert this to one of the accepted cryptocurrencies. As Birdchain revealed in a conversation with the author, that is exactly what its developers did: They set a certain target (in fiat money), calculated how much fiat money they need per sold token, and converted that to Ethereum. They expected Ethereum to be worth around 800-1000$, securing themselves against volatility in Ethereum's value of up to 20%. (Birdchain 2018.)

3.5 Survey: Investor behaviour

This survey examines if the cryptocurrency market consists mainly of believers or speculators. Based on the author's personal experience, it must be assumed that long surveys result in the respondents being less interested in the survey. This would cause the answers to be much less reliable, which must be avoided. If this survey is short, individuals are more likely to answer it honestly.

3.5.1 Introduction

This survey analysed the most important reason for an individual to invest in cryptocurrencies. It also shows whether the cryptocurrency consumer spending behaviour is similar to the traditional consumer spending behaviour. The number of spent tokens is not published by the issuing projects, so a survey is the only way to get a grip on the cryptocurrency consumer spending behaviour. The outcome of this survey will shed light upon whether individuals spend tokens more or less during times of expansion or recession.

For this survey, a non-random sampling was used as specifically individuals who are currently holding cryptocurrencies were asked to participate. Within this group, there was no further demarcation. The survey was published in several crypto-related Facebook groups, on relevant websites such as Bitcointalk, and in crypto-related Telegram channels.

3.5.2 The survey

The first question needs to determine why the user purchased the token.

Question 1: What is your motivation when investing in a project by buying their tokens?
A: Speculation (I hope for a good return on investment)
B: I believe in the project and plan to use the token later for its intended purpose.

Users will not find the answer “both”, as that would probably be the one chosen most often. This is to be expected as investors would not invest in a project they do not believe in, thus, individuals are forced to declare what mainly drove their decision.

The second question is based on an imaginary scenario: After purchasing the token, its price increases by 50% over one week. While this number may seem outrageous to the average reader, this is a very realistic scenario in the crypto space. This question will test if individuals are likely to sell the token in times of expansion.

Question 2: Scenario 1: The token you purchased gains 50% value within one week. Do you sell your tokens?
A: No, because I am hoping for even bigger gains.
B: No, because I believe in the project and plan to use the token for its intended purpose only.
C: Yes.

The answers to this question will help to gain further insight into the mind of an investor.

The third question focuses on the opposite situation; The token’s value has decreased by 50% within one week. This question will test the consumer spending behaviour in times of recession as it asks the individual whether they still intend to spend the token on its intended purpose or if they rather get rid of the token. This question also examines the likeliness of individuals selling during a bear market.

Question 3: Scenario 2: The token you purchased loses 50% value within one week. Do you sell your tokens?
A: No. By doing so, I would realise a 50% loss.
B: No. I still intend to use the token for its intended purpose and do not care about the short-term valuation of the token.
C: Yes. I rather sell my tokens now and do not risk lose even more money on this project.

The fourth question will examine how often cryptocurrencies are spent on their intended purpose. As Bitcoin is probably spent the most often, it has been excluded from this question and instead will be investigated in question 5.

Question 4: How many times per month do you spend your tokens on their intended purpose (excluding Bitcoin)? Example: The BKU token is supposed to be used to buy access to the Blocktek University platform.
A: 0
B: 3 or less
C: 7 or less
D: 10 or less
E: More than 10 times

The fifth question is entirely dedicated to Bitcoin. The parameters are the same as in question 4, which makes it easier to compare the results.

Question 5: How many times per month do you purchase something with Bitcoin?
A: 0
B: 3 or less
C: 7 or less
D: 10 or less
E: More than 10 times

3.5.3 Expectations

The first question asks why the individual purchased the token. It is to be assumed that the vast majority purchased the token in hopes of a big return on their investment.

The second question asks whether the individual would sell a token which has seen an increase of value in a short amount of time. In order to assess this, one needs to know that there are mostly two types of cryptocurrency holders: Traders and so-called hodlers, a

term widely used to describe a person who is holding their tokens and would not sell under any circumstances. They live by this principle as they strictly believe in the cause of cryptocurrencies and only spend the coins on their intended purpose. Note that the way of writing “hodler" is intentional. In fact, this grammatical mistake is what has led to the popularity of the term. Thanks to a large community of hodlers, it should be expected that the answers to this question should be much more equally distributed than in question one, giving a slight edge to the second option.

Question three assesses the opposite scenario; The token has lost half its value within a short time. The answer to this question should show a similar distribution than the answers to question two. Answer C may be chosen most often.

The answer options for the fourth question tell much about the expected numbers. The question “how often do you spend your tokens on their intended purpose” is very relevant, and, judging by the current stage of cryptocurrencies, the answer choices are between zero and more than ten times per month. There is no need for a specific number above ten times, as it is to be assumed that individuals spending tokens on their intended purpose over ten times a month are a minority.

The same applies to the fifth question, which assesses how often individuals pay with Bitcoin. Both questions reflect the early stage of cryptocurrencies in general as well as their currently very limited real-life application. Answer choice A and B may very well be the most used answers for both questions.

3.5.4 Results

In total, 215 individuals responded to the survey.

The first question was: What is your motivation when investing in a project by buying their tokens?

The question was answered as follows.

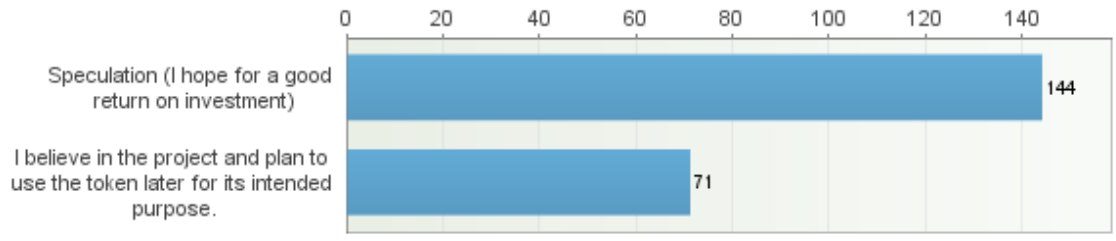

Figure 17. The main reason for investing in cryptocurrencies

While 144 individuals speculate, the belief in the projects only drove the decision of 71 individuals.

The second question was: Scenario 1: The price of the tokens you purchased goes up 50% within one week. Do you sell your tokens?

The question was answered as follows.

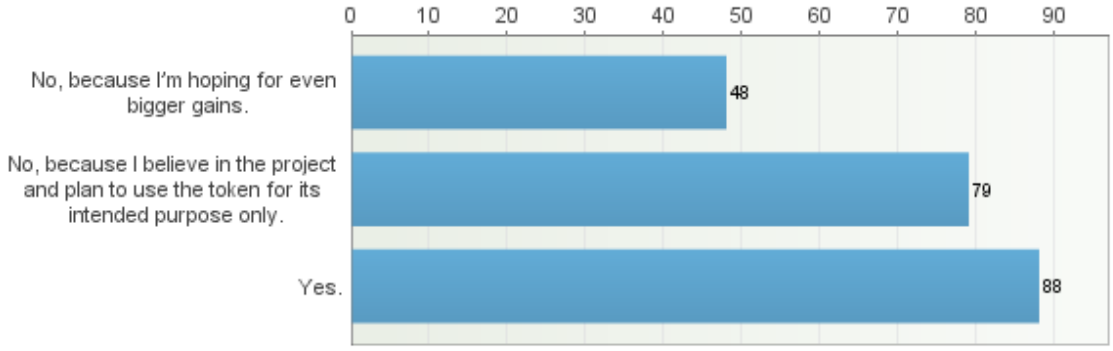

Figure 18. Scenario 1

127 individuals would not sell the tokens if they appreciated 50% in value. However, only 79 base their decision on belief in the project and still plan to use the token for its intended use. 48 individuals would not sell their tokens as they hope for bigger gains. 88 individuals chose to take profits and would sell their tokens.

The third question was: Scenario 2: The price of the tokens you purchased goes down 50% within one week. Do you sell your tokens?

The question was answered as follows.

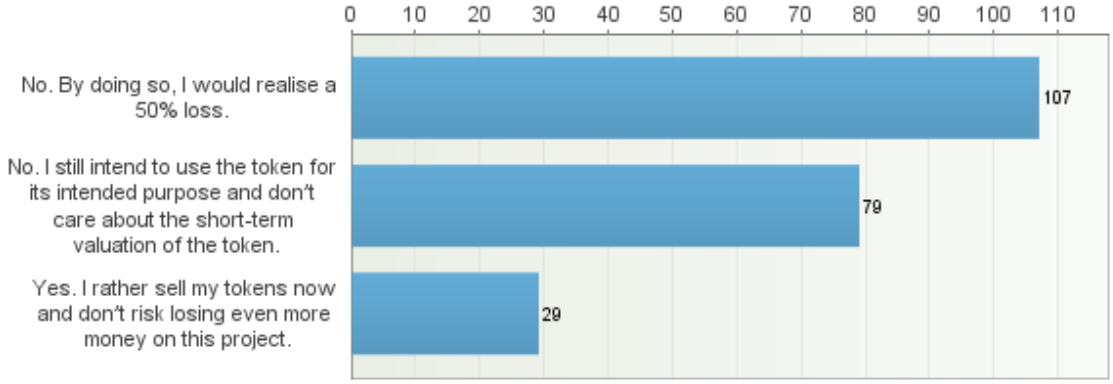

Figure 19. Scenario 2

107 individuals chose to not sell their tokens as they would not want to realise a 50% loss. They are willing to take a risk of the token losing more of its value as the hope for an appreciation in value outweighs their fear of further depreciation. Another 79 individuals chose to neither sell their tokens, but because they believe in the project and are not worried about its short-term valuation. They intend to use the token for its intended purpose. 29 individuals would sell their tokens and realise a 50% loss.

The fourth question was: How many times per month do you spend your tokens on their intended purpose (excluding Bitcoin)? Example: BKU is supposed to be used to buy access to the Blocktek University platform.

The question was answered as follows.

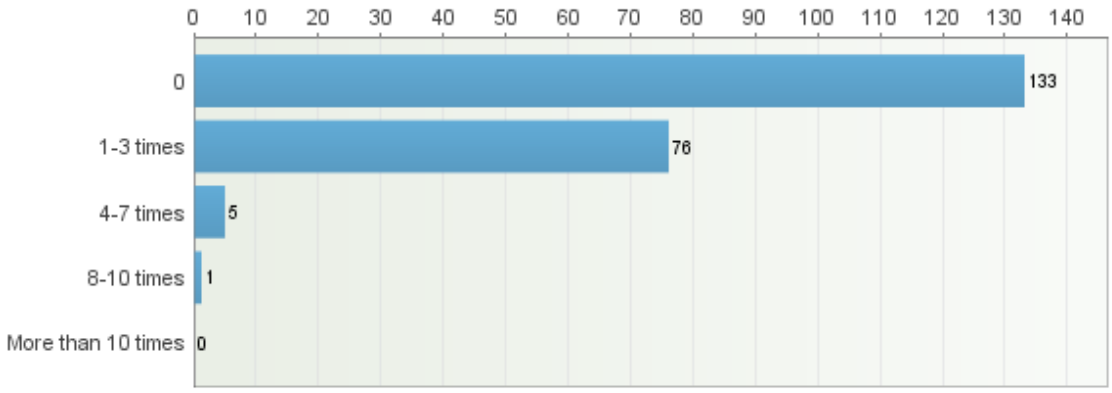

Figure 20. How tokens are used for their intended purpose

An overwhelming 133 out of 215 individuals do not use a token for its intended purpose, 76 individuals do so 3 times or less per month, 5 individuals do so seven times or less, one individual does so ten times or less, and no one uses a token for its intended purpose more than 10 times per month.

The fifth question was: How many times per month do you purchase something with Bitcoin?

The question was answered as follows.

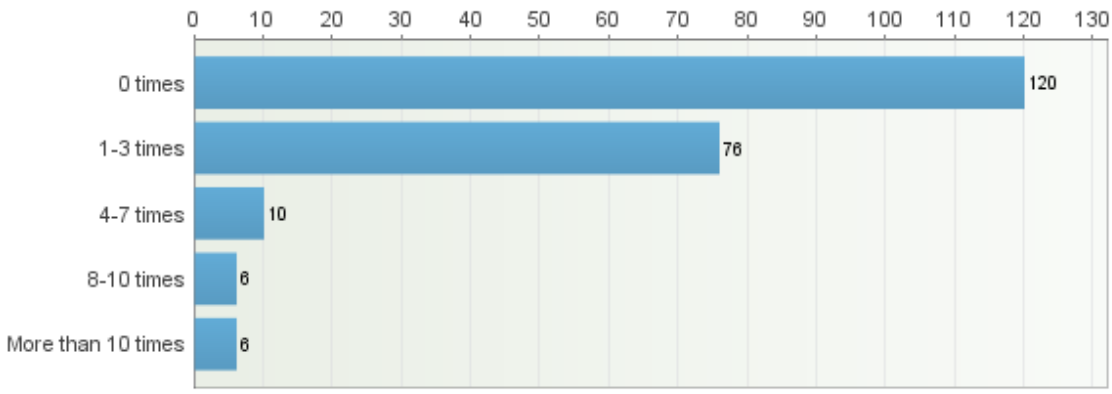

Figure 21. How often Bitcoin is used as a payment method

With 120 individuals choosing the first option, an overwhelming majority of respondents does not use Bitcoin as payment method. 76 individuals purchase something with Bitcoin at least 1 to 3 times per month. 10 individuals do so 7 or less times per month. 6 individuals use Bitcoin as a payment method 10 or less times, or more than 10 times, each.

3.5.5 Discussion

The answers to the first question reveal that 67.0% (a bit over two third) of people who invested in cryptocurrencies did so out of pure speculation. This does not mean that the remaining 33.0% do not speculate, but their decision was mainly motivated by their belief in the project. The second question shows a similar pattern: In case of a 50% depreciation of a token's value, only 36.7% would keep the token because of their belief in the project. The remaining 63.3% base their decision on financial motives. The exact same numbers were achieved in question number three, which assumes that the token appreciates in value by 50%. This is surprising and implies that the same individuals who already showed their belief in projects in the previous question continue to do so even if the token appreciates in value. It seems as roughly one third of cryptocurrency investors are not affected by the value of the tokens they own and are true believers in the success of their chosen cryptocurrency. The other two thirds of investors seem to be speculators. This confirms what has already been shown in question one.

Questions four and five show how rarely cryptocurrencies are used for their intended purpose. 61.9% replied that they never use tokens for their intended purpose, and another 35.3% do so between one and three times a month. This concludes that an overwhelming 97.2% do not use tokens for their intended purpose more than three times a month. 2.8% do so between four and ten times per month, and 0% more than ten times. The number of individuals who use Bitcoin as a payment method is a bit higher as 4.65% use it between four and seven times and 2.79% use it between eight and ten times a month. Another

2.79% use it over ten times a month, while 35.35% use it one to three times a month and 55.81% do not use Bitcoin as a payment option.

3.5.6 Conclusion

Overall, this survey confirms the immaturity of cryptocurrencies.

For most of the respondents, a potential financial gain was the main motivation to invest in a cryptocurrency. Only a small fraction buys cryptocurrency with the main motivation of using them on their intended purpose. This does not mean that the individuals mainly interested in a financial profit do not believe in cryptocurrencies, but it does mean that the financial gain is more important.

Furthermore, the results indicate that Bitcoin and other cryptocurrencies are scarcely used as a payment method.

3.6 Conversations with developers

Developers may contribute substantially to this research as they are the individuals who create new cryptocurrencies.

3.6.1 Introduction

A short conversation was held with ten cryptocurrency developers who have been part of the development, distribution and implementation of a cryptocurrency. Those conversations investigated how many of these developers seriously considered pegging their token to fiat money and if so, why. It also investigates whether the token was ultimately pegged to fiat money and if not, what changed the developers' mind. The most important outcome are the reasons behind the decisions, which should reveal advantages and disadvantages of stablecoins.

Ten developers have been discussed with. Upon their wish, they were promised to stay anonymous and the participating projects may not be mentioned in this thesis. However, it may be revealed that the market capitalization of any of the cryptocurrencies developed by the interviewees does not exceed $10 Million in November 2018. The conversations were kept very short in order to keep the conversations relevant.

3.6.2 Planning the conversations

The first part of the conversation had to determine if the developer ever seriously considered pegging his token to fiat money and whether an ICO was conducted. The question

shall include the word “seriously” as the conversations does not seek answers to a simple thought of consideration, but instead wants to find the reason behind a serious consideration of a pegged token. The conversation must then investigate why pegging the token was or was not seriously considered in order to reveal advantages and disadvantages of stablecoins in a real-life situation. Additionally, it is interesting to know if the token was ultimately pegged to fiat money and, if not, what changed the mind of the developers who answered that they did seriously consider pegging the token. The developers have also been asked how they priced their token for the ICO in case they did not peg it to fiat money. They were presented the following five options:

A: We established a funding target in fiat money, divided this by the number of tokens allocated to the ICO and converted this fiat value per token to BTC, ETH, and/or another cryptocurrency.
B: We established a funding target in fiat money, priced the token at an appealing fiat money price (for example 0.10$ or 1$), and converted this to BTC, ETH and/or another cryptocurrency.
C: We established a funding target in fiat money, priced the token at an appealing cryptocurrency price (for example 0.001 BTC or 0.01 ETH), and adjusted the number of tokens allocated to the ICO.
D: We did not conduct an ICO.
E: None of the above? Please briefly explain how you did it.

3.6.3 Expectations

Hopefully, those conversations point out the advantages and disadvantages of ICOs and stablecoins from a developer’s point of view. It must be assumed that the developers were not interested in developing a stablecoin and it would be surprising if any of the ten interviewed developers would reveal that they developed and implemented a stablecoin. It is also expected that the reason to conduct an ICO is that the company wanted to collect funds, and if they chose not to conduct an ICO it may be due to the unclear legal situation.

3.6.4 Results

In order to keep the content of this chapter relevant, each conversation is summarized.

Conversation 1. This conversation was held on the 01 November 2018 on the platform Telegram.
The project represented by this developer did not conduct an ICO as the legal situation is very unclear and the company does not want to face legal consequences in the future.

The developer never considered pegging the token to fiat money. The developer believes that cryptocurrencies should never be pegged to fiat money. While he admits that pegged tokens may have the advantage of not being volatile, he states that pegging a token to fiat money is not worth the effort. As the company still wanted its own token, it now uses an unpegged token.

Conversation 2. This conversation was held on the 06 November 2018 on the platform Telegram.
No ICO was conducted because the company did not have the funds to advertise a potential ICO well enough, and as the cryptocurrency market is in a bear market, the company did not expect a lot of investors. This developer did not consider pegging the token to fiat money as that would not be interesting for potential investors. The company expects that most investors purchase a token because they expect a return on their investment in fiat value and not because they intend to use the token to gain access to the company's platform. Thus, the token is not pegged to fiat money. The developer did not see any advantage of a stablecoin except for the obvious. Instead, the developer also pointed out that unpegged tokens are the norm.

Conversation 3. This conversation was held on the 06 November 2018 on the platform Telegram.
This company conducted an ICO. While it did not reach its target, enough funds were raised to fund business operations. The company held an ICO because it saw it as the easiest way to raise funds. The uncertain legal situation did not affect the decision as the ICO was supervised by a lawyer. The developer did not peg the token to fiat money as that would have led to problems in the ICO: The only way to convince an investor to purchase the token would have been by offering a bonus. As the token would, in that case, never increase in value, it is expected that the tokens are sold right after the ICO. The token was priced as described in answer choice C: The funding target was defined in fiat money. Each token was priced at 0.001 ETH and the corresponding number of tokens was then allocated to the ICO. A 15% bonus was offered during the pre-ICO.

Conversation 4. This conversation was held on the 08 November 2018 on the platform Telegram.
Just like in the previous case, this developer told that the company conducted an ICO due to the same reasons. Furthermore, this developer neither considered pegging the token to fiat money as that did not even come to his mind. The token was priced as described in

answer choice B: The company established a funding target in fiat money, priced the token at an appealing fiat money price (in this case 0.10$), and converted this to BTC and ETH.

Conversation 5. This conversation was held on the 08 November 2018 on the platform Telegram.
This company did conduct an ICO. However, that was a close decision: The unstable legal situation almost outweighed the advantage of being able to raise funds quickly. Surprisingly, this developer did consider pegging the token to fiat money to eliminate volatility. The company considered offering a 10% bonus in the ICO, but after conducting a survey among cryptocurrency investors, the company realised that a 10% ROI would not be enough for an investor and decided not to peg the token. Ultimately, the token was priced as described in answer choice A.

Conversation 6. This conversation was held on the 13 November 2018 on the platform Telegram.
No ICO was conducted due to the heavy competition. The company decided that it does not have enough money to fund an advertising campaign. The developer did not consider pegging to token to fiat money. The reason for that is that stablecoins are, in the developer's perception, not interesting to investors and maintaining the peg is too difficult. The company briefly thought about selling and buying a potential stablecoin itself as to keep it pegged to a certain fiat value, but that idea was discarded as that would have been too complicated.

Conversation 7. This conversation was held on the 18 November 2018 on the platform Telegram.
A successful ICO was conducted. The easy way of funding a company was the reason why the ICO was conducted and the company is not afraid of any legal consequences as it complied to the law according to its best knowledge. The developer did not consider pegging the token to fiat money because no other projects do so. The token was priced as described in answer choice B: After establishing a funding target in fiat money, each token was priced at an appealing fiat money value, in this case 0.01$. Then, this was converted to BTC, ETH and LTC and recalculated daily. The company chose this method to protect itself against a potential drop in the coins' value.

Conversation 8. This conversation was held on the 23 November 2018 on the platform Telegram.

An ICO was conducted. The company is not worried about legal consequences and believes that there are not going to be any, despite not having a lawyer audit the ICO. The company's motivation was to collect funds easily. The token was not pegged to fiat money as that is, according to the developer, not industry standard and confusing to the investors. Pegging the token was not even considered. The token was priced as described in answer choice B.

Conversation 9. This conversation was held on the 23 November 2018 on the platform Telegram.
This developer chose to conduct an ICO as well. The ICO was conducted in February 2018, when individuals still invested more money in ICOs and the legal situation was still more unclear, but at the same time less threatening, than today. The ICO was conducted to raise funds. The developer did consider pegging the token, but ultimately chose not to do so. A stablecoin would have one big disadvantage: The company itself would have to sell and buy the token, else it would lose its peg or then it would require a complicated and expensive mechanism to keep the peg, like DAI. Thus, the token remained unpegged and was priced according to the option presented in choice B. Additionally, the company offered a 10% bonus on each token purchased during the pre-ICO.

Conversation 10. This conversation was held on the 28 November 2018 on the platform Telegram.
An ICO was conducted and ended in the first week of November 2018. Due to the ongoing bear market it has not been successful, and the company is considering conducting another ICO in 2019. The developers never considered pegging the token to fiat money as that would have complicated the ICO as the company would have had to offer a good bonus to attract investors. The company did not choose this because they expected people to sell as soon as they receive the tokens. The did consider distributing the tokens over a period of two years to avoid too many people selling but have ultimately decided not to peg the token as it seemed like the easier way. The token was priced as described in answer option B.

3.6.5 Discussion

Those ten discussions revealed that developers are not interested in pegging their token to fiat money. This is perfectly supported by the fact that, during the research, most of the investigated new cryptocurrencies are not pegged to fiat money. Despite the advantages of a pegged token, a volatile cryptocurrency is preferred by most developers as it is seen as a better investment opportunity than a stablecoin, and because it is the industry standard. This result is not surprising.

The conversations also showed that tokens are priced in different ways. The most mentioned way to price a token was answer choice B: Establishing a funding target in fiat money and allocating a number of tokens to the ICO that is based on the goal of reaching an even fiat money price per token. This fiat price is then converted into BTC, ETH and other cryptocurrencies the company intends to accept in the ICO. This makes sense from a company's perspective. The company has a clear funding target in fiat money, which helps them to cover all expenses such as salaries and marketing costs.

3.7 Pegged cryptocurrencies

The theory of stablecoins in chapter 2.2 introduced the most important stablecoins: USDT, TUSD, and DAI. This chapter researches the advantages and disadvantages of stablecoins, and under which circumstances a stablecoin makes sense. Ultimately, this chapter answers the question whether the company should peg their token to fiat money or not, also taking the survey in chapter 3.5 and the conversations in chapter 3.6 into consideration.

3.7.1 Advantages and disadvantages of offering a stablecoin payment option

Assuming a company is selling a product for 20$ and the customer would like to pay using a cryptocurrency like Bitcoin. At the time of receiving the payment, the Dollar value of the used cryptocurrency could have depreciated, directly affecting the Dollar value of the payment. While the company can set the price of the product in fiat money, it has no control over the amount of fiat money it receives after selling the Bitcoins. On the day after the purchase, the 20$ payment could be worth 16$, or it could be 24$. Large market movements of 10% or more often happen within minutes. As a company must cover its expenses (such as purchasing, insurance, salaries) in fiat money, it may not be in its interest to accept a volatile cryptocurrency as a payment method. However, a company might still be interested in providing a cryptocurrency payment option as the advantages of cryptocurrencies defined in chapter 1.1 may outweigh the disadvantages. Implementing a stablecoin as payment method unites the advantages of both cryptocurrencies and fiat money as they are not as volatile as Bitcoin and other cryptocurrencies, but at the same time offer fast and secure transactions with a low transaction fee. Clearly, this is a major advantage of a stablecoin payment option.

As stated in chapter 2.2.2, despite its advantages, companies typically do not offer a stablecoin payment option. Stablecoins also have another big disadvantage. Converting a stablecoin into fiat money is a slow procedure. TUSD and USDT need to be cashed out

via their institutions and DAI can only be sold for another cryptocurrency. Bitcoin, Ethereum, Litecoin and a couple of other large cryptocurrencies can be converted into fiat money quicker. A common way to cash out Bitcoin is by selling it on Coinbase, a large cryptocurrency exchange. After selling on Coinbase, the fiat money can be withdrawn to a bank account for a small fee. This process is much simpler than cashing out a stablecoin and is probably one of the reasons why companies prefer a Bitcoin payment option.

The ten conversations conducted in chapter 3.6 also provide interesting insight in the mind of a cryptocurrency developer. None of the interviewed developers ended up implementing a stablecoin due to the following disadvantages:

- It is not industry standard.
- It is difficult to maintain the peg if the token is trading on an exchange.
- A stablecoin is uninteresting to investors as shown in chapter 3.5.
- It is risky to maintain the peg by buying and selling the tokens only on the company's platform due to:
    - Laws and regulations
    - Liquidity
    - Risk of mass-withdrawing of funds.

Those disadvantages shed serious doubt upon the assumption that a stablecoin is a good option for companies to implement as a payment option.

3.7.2 Introducing a stablecoin with and without ICO

While using a pegged token eliminates the negative sides of volatility, it does have disadvantages. The table below compares a pegged token to a non-pegged token as well as both tokens in an ICO.

Table 4. Pegged tokens vs. non-pegged tokens

Pegged token vs. non-pegged token	Own pegged token & ICO	Own non-pegged token & ICO	Own pegged token & no ICO	Own non-pegged token & no ICO
Return on Investment for Investors	Tends to be low but possible in form of a bonus in the ICO	Tends to be high	Non-existent	Tends to be high
Difficulty to Implement and maintain	High	Low	High	Low
Potential to harm further operations	High	Low	High	Low

Chance to raise capital	Yes	Yes	No	No

This table shows that a non-pegged token in combination with an ICO is the best option if the company looks to raise funds. An own pegged token does always bear the risk of affecting future operations if it is sold and bought by the company, as customers could mass-convert their tokens back to fiat money, which would most likely lead to a problematic financial situation.

Additionally, a stablecoin is difficult to implement and tends to be uninteresting for investors. Funds can only be collected by conducting an ICO, but an ICO with a pegged token will not be successful. An unpegged token on the other hand is interesting for investors, not difficult to implement and does not harm future operations. It is also possible to collect funds via an ICO.

4 Discussion

4.1 How can a token's ICO price be determined?

The conversations with various developers in chapter 3.6 revealed the preferred way of pricing a token. The following figure describes the process and provides an example.

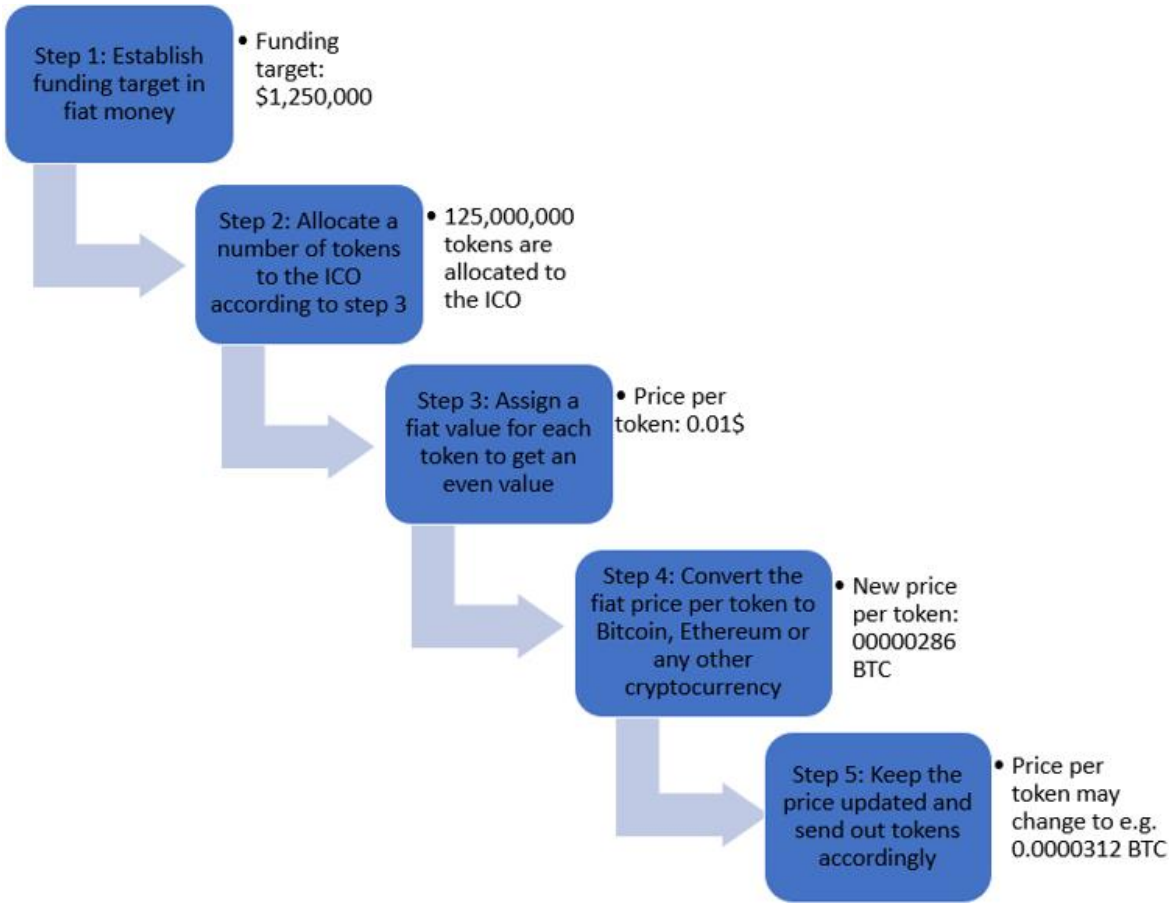

Figure 22. How to price a token for an ICO

Establishing a fiat money funding target should be the first step of any ICO as expenses need to be covered in fiat money as well. As most of the investors hope to see a profit in fiat money, as shown in the survey in chapter 3.5, displaying a fiat price for each token is the best choice as it appeals to an investor's goal of yielding profit (in fiat money). The only downside to this way of pricing are the exchange rate fluctuations. However, the company can simply freeze a certain price either at the begin of the ICO (not recommended unless the funding target is expected to be reached within a few hours) or at the time the payment arrives. Alternatively, the prices can be updated hourly or in other intervals the company deems appropriate. This extra step should pay off by the positive effects of displaying the token prices in fiat money.
Hence, this is the most efficient and most promising way of pricing a token.

4.2 How does the price of a token correlate with its utilisation?

The second investigative question analysed the correlation between the price of a cryptocurrency and its utilisation. This question is important because the outcome will support companies in their sales forecasting. A lot of other factors are vital to forecasting as well, but the outcome of this research will affect the forecasting directly.

For the cryptocurrency to be used for its intended purpose, it must be purchased first. As the company or institution receives payments in the form of said currency, it needs to liquidate the received cryptocurrency to cover expenses. Thus, the amount of the cryptocurrency purchased and sold connected to its intended use must be about equal over a longer time frame. Most of the trading volume is not related to the cryptocurrency being used for its intended purpose, but rather to speculation, as shown in the survey in chapter 3.5. However, this does not matter: If 5%, 10%, or 20% of the trading volume is related to a currency's intended use, it will still lead to the same correlation between its price and the trading volume.

As the research in chapter 3.4 has shown, there is a clear correlation between the price of a cryptocurrency and its trading volume. As a result, there must be a correlation between a cryptocurrency's price and its utilisation. There are some cases in which other factors have led to a price in volume while the price did not spike.

The research question can be answered: If the USD value of a cryptocurrency decreases, so does its utilisation. If the USD value of a cryptocurrency increases, so does its utilisation. This can be influenced by external factors in special cases.
A company should closely monitor the interest in its token as a dwindling interest may lead to a depreciation in the currency's price.

4.3 Should a new token be pegged to fiat money?

While both unpegged tokens and stablecoins have their advantages and disadvantages as shown in the theoretical aspect and in the research, this question needs to be approached from a company's point of view.

Scenario 1: The company wants its token to be a stablecoin. The only advantage of offering a pegged token in an ICO is the chance to raise capital, but the potential to harm further operations is very high as investors will be looking to sell their tokens for a profit as soon as they receive them. The token would not be trading on an exchange platform as

maintaining a constant fiat money value is difficult (example: DAI in chapter 2.2.1) and requires a high trading volume. Thus, the company itself would have to be the institution that sells and buys the tokens. Assuming the company does that, it has no control over when people would like to sell their tokens. The company could suddenly be forced to pay out more fiat money than it owns, and that could threaten the company's survival. If the company would not buy the tokens back, people would not be interested in purchasing them either, unless they have a clear intention to purchase the company's products or services. This is a big problem and there are only two ways to avoid this: The company either ca not offer a bonus in the ICO as people would sell their bonus, but no investor would invest in a stablecoin without a bonus. Or, it cannot offer the option to buy the tokens back, but then again, interest in the token would not be very high. Those are both bad options and a stablecoin does not seem like the right decision.

Scenario 2: The company wants its token to be a stablecoin. It does not plan to raise capital, and thus no ICO will be conducted. The token cannot be listed on a third-party exchange as that would unpeg the token as mentioned above. This option ultimately leads to the same issue: The company should not offer the option to buy back the tokens, meaning the buyer cannot sell them for fiat money. Again, this is not a good solution.

The survey in chapter 3.5 shows that 67% of investors speculate, meaning those investors would not be interested in purchasing a pegged token. Additionally, the survey also shows that 97.2% of cryptocurrency holders use a token for its intended purpose less than four times a month. This means that a company's own stablecoin may not only be a threat to the company's future operations as outlined above but would also not raise any awareness as at least 67% of the potential investors would not be interested in investing in a stablecoin. Additionally, the conversations referred to in chapter 3.6 clearly show that developers are not interested in creating a pegged token either.

Creating an unpegged cryptocurrency allows a company to raise funds. After the ICO, the company has its funds and the price development of the token is more of an investor's concern. If the price appreciates in value, the company can still sell the tokens it decided to keep for itself, and if the price depreciates, it does not affect the company's operations as the prices of their product or service can be adjusted. Because volatile tokens are traded on third party exchanges, the company never needs to buy its tokens back. If the company would like to implement a stablecoin payment option, it should accept one of the existing stablecoins. In this case DAI should be preferred. Implementing a DAI payment option would add trading volume and thus support DAI at being constantly at a value of 1$. The biggest advantage is that the company is then able to sell their products for the

fiat value they want, while being able to accept a cryptocurrency payment option with all its advantages.

However, Bitcoin is the most commonly known cryptocurrency and according to Blockchain.com, a platform which provides reliable blockchain information, there are over 28.6 million Bitcoin wallets existing in October 2018. While this number does not represent the total number of individual Bitcoin wallets, around 600,000 wallets are active each day. (Blockchain 2018.)
Thus, if the company does not need its own cryptocurrency, it is best to accept Bitcoin.

If the company wants to implement its own cryptocurrency as a payment option, the token should not be pegged to fiat money.

4.4 Conclusion

The first research question focused on how a company can price its token for the ICO. This is still a new process and traditional methods of pricing have not established themselves. The tokens are not priced based to the issuing company's valuation, they are priced based on the company's funding target. The ICOs are often enough successful and start-ups were able to raise millions within hours in mid to late 2017 (EY 2018, 8), so companies were never forced to price their tokens at reasonable prices. As cryptocurrencies mature, institutional investors might be interested in investing in ICOs, which will probably change the way tokens are priced. However, until then, pricing a new token according to the method stated in chapter 4.1 is the best choice.

After the ICO, the tokens are sent out and trading begins. The company is now relying on its own token being used to purchase its products and services. As the entire cryptocurrency industry is extremely volatile, so is the company's revenue if it accepts its own token. However, the costs of running the company are not. The second investigative question prepares companies for the volatility in their income. As the interest in a cryptocurrency fades (measured by its trading volume), the company's revenue decreases. The trading volume thus serves as an indicator of the company's revenue. This knowledge is especially important if the whole market tanks, but the company's revenue does not. Latest then, the company must expect an according decrease in revenue.

Some companies want to avoid volatility by creating a pegged token. The result of the third investigative question revealed that this is not a good idea. Not only because a pegged token makes an ICO unprofitable, but also because the interested in a new stablecoin would be extremely low. Additionally, maintaining the peg is very complex and

simply not worth the effort. If a company wants to avoid the volatility, it should accept another stablecoin instead.

This thesis has shown that cryptocurrencies are far from mass adoption. As long as cryptocurrency holders do not even plan to use the tokens they buy for their intended purpose, the industry cannot evolve. Instead of hundreds of new tokens every year, developing a few tokens with a greater benefit than only serving as a payment option for the issuing company's products and services, may be better for the evolution of cryptocurrencies.

4.5 Ethical viewpoints

The research was conducted in an ethical way. Every respondent of the survey and every discussion partner was aware that their replies are published in this thesis. The anonymity of contributors who wished to remain anonymous has been preserved. No wrongful actions have been committed throughout the writing process.

Cryptocurrencies, in combination with the blockchain technology, can be used to fight corruption as all transactions and account balances are accessible to the public. They can also be used to provide the 1.7 billion people, who currently do not own a bank account, with a way to pay their bills or send money to their peers (The World Bank 2018). The author believes that the social advantages of cryptocurrencies outweigh the disadvantages (abusing the semi-anonymous nature of cryptocurrencies) by far.

4.6 Trustworthiness of the results

The research was conducted using only reliable sources. A large part of the information used in this thesis was gained directly from experts in the form of conversations, or from cryptocurrency holders by conducting a survey. A small portion of information was taken from books. Most of the remaining information used was collected from dedicated and widely trusted websites as books simply could not keep up with the rapid developments in the cryptocurrency field. Relying on books would have been a calamitous mistake and would have endangered the trustworthiness of the entire research. Hence, the only information taken from books were about the basics of ICOs, cryptocurrencies and the blockchain.

4.7 Development ideas and further research

Cryptocurrencies are an extremely controversial field. While some say cryptocurrencies are worthless and unnecessary, others expect a mass adoption of cryptocurrencies that would make banks obsolete. Between those two extremes is the probably most realistic

group of people who know that cryptocurrencies might not make banks obsolete in the close future but see the advantages cryptocurrencies offer businesses and individuals worldwide. However, the public usually agrees on one thing: Regardless of the future of cryptocurrencies, the blockchain technology is here to stay. The technology itself can make the lives of millions of people easier by applying it in logistics and elections.

I personally believe that cryptocurrencies have not reached their peak. Today there are several thousand cryptocurrencies. I estimate that there are about 2500 cryptocurrencies in November 2018. Some of those cryptocurrencies hold an advantage over others (like faster transactions), but a lot of those currencies have absolutely no advantage. All those currencies are only accepted by the issuing company and can typically be used to buy its services or products. This leads to an oversaturated market which is why I expect a lot of cryptocurrencies to go extinct within the next few years, leaving only a couple of surviving coins and tokens with a real-life application. Until then, ICOs will remain profitable – at least for the conducting company.

Already now the market can be described as oversaturated, especially regarding stablecoins. As mentioned, if a company wants to issue their own cryptocurrency, it should not be a stablecoin. After the cryptocurrency extinction I mentioned before, I believe we will be left with only one stablecoin for each fiat currency. And that may very well be one issued by the national banks, and not a stablecoin we know today. This would not be a real cryptocurrency as it is not decentralized, but neither are a lot of today's cryptocurrencies. Governments might be especially interested in issuing a cryptocurrency as that would allow them to track every transaction. Further research is needed to see how likely this scenario is and how such a currency could be developed and implemented in terms of security, feasibility and ethics.

4.8 Evaluation of the thesis process

Writing this thesis has been a true learning experience for me. It was always clear to me that I would write my thesis about cryptocurrencies as I have been part of the cryptocurrency community since 2015. The fact that there is not a lot of theory about cryptocurrencies and their impact on modern businesses was an extra motivation for me and encouraged me to contribute by adding my own findings. I enjoyed researching a topic which has not yet been previously researched. This thesis does not revolve around challenges and problems the majority of businesses are typically facing today, it revolves around issues businesses might have to face in the future.

During the process of writing this thesis, I was challenged many times and often found myself in a situation where I could not rely on any existing model or theory framework. I was forced to do extensive research in order to know how to proceed with my thesis. As a result, I did not only learn a lot about the topics I covered in this thesis, but also about related topics.

In the future I intend to work with cryptocurrencies. I would like to help a company set up and operate its own cryptocurrency. By writing this thesis, I hope to demonstrate that I have a good understanding of cryptocurrencies as well as the required experience, personal interest and motivation for a cryptocurrency-related job.

References

Birdchain. 04 November 2018. Conversation.

Bitcoin Cash 2018. About. URL: https://www.bitcoincash.org/. Accessed: 19 November 2018.

Blockchain 2018. Blockchain Wallet Users. URL: https://www.blockchain.com/en/charts/my-wallet-n-users. Accessed: 22 September 2018.

Buterin, V. 2015. A Next-Generation Smart Contract and Decentralized Application Platform. 1st Edition. Unknown location.

Coindesk 2018. About CoinDesk, Inc. URL: https://www.coindesk.com/about/. Accessed: 22 September 2018.

Coinmarketcap 2018. Top 100 Cryptocurrencies by Market Capitalization. URL: https://coinmarketcap.com/. Accessed: 14 October 2018.

Coinmarketcap 2018. Dai. URL: https://coinmarketcap.com/currencies/dai/. Accessed: 04 October 2018.

Coinmarketcap 2018. Tether (USDT). URL: https://coinmarketcap.com/currencies/tether/. Accessed: 04 October 2018.

Coinmarketcap 2018. TrueUSD (TUSD)L: https://coinmarketcap.com/currencies/trueusd/. Accessed: 04 October 2018.

Cong, L. & He, Z. 2017. Blockchain Disruption and Smart Contracts. URL: https://mendoza.nd.edu/assets/253880/2017_fall_seminar_series_will_cong_paper_updated.pdf. Accessed: 14 June 2018.

DAI 2018. Whitepaper. URL: https://makerdao.com/whitepaper/. Accessed: 04 October 2018.

Diemers, D., Arslanian, H., McNamara, G., Dobrauz, G., Wohlgemuth, L. 2018. Initial Coin Offerings. Pricewaterhouse Coopers. Strategy & report. June 2018 edition. Zurich.

EY 2018. EY research: initial coin offerings (ICOs). December 2017 Issue.

ETH Gas Station 2018. Std Cost for Transfer. URL: https://ethgasstation.info/. Accessed: 21 September 2018.

Figure 1. Current Bitcoin Acceptance. Coinmap 2018. URL: https://coin-map.org/#/world/1.75753681/14.06250000/2. Accessed: 11 October 2018.

Figure 2. Average Transaction Fee, USD. BitInfoCharts 2018. URL: https://bitinfo-charts.com/comparison/transactionfees-btc-eth.html#1y. Accessed: 01 November 2018.

Floyd, D. 2018. $6.3 Billion: 2018 ICO Funding Has Passed 2017's Total. URL: https://www.coindesk.com/6-3-billion-2018-ico-funding-already-outpaced-2017/ Accessed: 09 September 2018.

Forbes 2017. Why cryptocurrencies could push the dollar from world reserve currency status. https://www.forbes.com/sites/laurashin/2017/11/07/why-cryptocurrencies-could-push-the-dollar-from-world-reserve-currency-status/#1a851ef36a9e. Accessed: 18 July 2018.

Geddes, H. 2005. IPOs and Equity Offerings. Elsevier Science & Technology. Amsterdam.

Gesley, J. 2018. Regulation of Cryptocurrency: Switzerland. Regulation of Cryptocurrency. Library of Congress. Washington.

Goldberg, D. 2005. Famous Myths of "Fiat Money". 5th ed. Ohio State University Press. Ohio.

Grusky, D., Western, B. & Wimer, C. 2011. The Great Recession. 2nd ed. Russell Sage Foundation. New York.

Harris, L. 2017. Are Cryptocurrencies Just More Fiat Money? URL: https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014?guccounter=1. Accessed: 16 September 2018.

Healy, J. 2009. Consumers Are Saving More and Spending Less. The New York Times, 03.02.2009 issue, pp. B3.

Iansiti, M. & Lakhani, K. 2018. The Truth About Blockchain. Harvard Business Review, January-February Issue.

ICO Watchlist 2018. ICO Statistics – By Blockchain Platform. URL: https://icowatchlist.com/statistics/blockchain. Accessed: 15 September 2018.

Investopedia 2018. Cryptocurrency. URL: https://www.investopedia.com/terms/c/cryptocurrency.asp. Accessed: 13 July 2018.

Investopedia 2018. Initial Public Offering - IPO. URL: https://www.investopedia.com/terms/i/ipo.asp. Accessed: 13 June 2018.

Investopedia 2018. What is an ICO? URL: https://www.investopedia.com/news/what-ico/. Accessed: 13 June 2018.

Investopedia 2018. Altcoin. URL: https://www.investopedia.com/terms/a/altcoin.asp. Accessed: 21 September 2018.

Jenkins 2018. Cancelled Audit and Issuance of 300 Mln New Tokens: What's Going on With Tether? URL: https://cointelechart.com/news/canceled-audit-and-issuance-of-300-mln-new-tokens-whats-going-on-with-tether. Accessed: 21 September 2018.

Lee, S. 2018. Explaining Stable Coins, The Holy Grail of Cryptocurrency. URL: https://www.forbes.com/sites/shermanlee/2018/03/12/explaining-stable-coins-the-holy-grail-of-crytpocurrency/#6ea2b89a4fc6. Accessed: 22 September 2018.

Library of Congress 2018. Regulation of Cryptocurrency Around the World. Library of Congress. Washington.

Maker Team 2017. The Dai Stablecoin System Whitepaper. URL: https://makerdao.com/Dai-Whitepaper-Dec17-en.pdf. Accessed: 18 August 2018.

Nakamoto 2009. Bitcoin: A Peer-to-Peer Electronic Cash System. 1st Edition. Location Unknown.

O'Sullivan, A., Sheffrin, S. 2003. Economics: Principles in action. Pearson Prentice Hall. Upper Saddle River.

PWC 2018. Accounting for cryptocurrencies. http://pwc.blogs.com/ifrs/2017/11/accounting-for-cryptocurrency.html. Accessed: 18 August 2018.

Ripple 2018. Source Liquidity. xRapid. URL: https://ripple.com/ripplenet/source-liquidity/. Accessed: 14 October 2018.

Sheth, J. 2014. Consumer Behaviour. Emory University. Atlanta.

Siegel, D., Gramatke, M., Paulsen J., Gieesen W. & Brosig, M. 2017. ICOs – The New IPOs? URL: https://www2.deloitte.com/content/dam/Deloitte/de/Documents/Innovation/ICOs-the-new-IPOs.pdf. Accessed: 09 September 2018.

Sloan 2018. 7 Major Companies That Accept Cryptocurrency. URL https://due.com/blog/7-companies-accept-cryptocurrency/. Accessed: 12 October 2018.

Statista 2018. Global advertising spending from 2014 to 2010. URL: https://www.statista.com/statistics/273288/advertising-spending-worldwide/. Accessed: 12 June 2018.

Statista 2018. Personal saving rate in the United States from 1960 to 2017. URL: https://www.statista.com/statistics/246234/personal-savings-rate-in-the-united-states/. Accessed: 09 September 2018.

Tether 2017. Whitepaper. 1st Edition. Hong Kong.

TrueUDS 2018. Website Landing Page. URL: https://www.trusttoken.com/trueusd/. Accessed: 21 November 2018.

Trustnodes 2018. ICOs Capitulate, 300,000 ETH Sold. URL: https://www.trustnodes.com/2018/09/13/icos-capitulate-300000-eth-sold. Accessed: 18 September 2018.

The World Bank 2018. Gains in Financial Inclusion, Gains for a Sustainable World. URL: http://www.worldbank.org/en/news/immersive-story/2018/05/18/gains-in-financial-inclusion-gains-for-a-sustainable-world?cid=ECR_TT_worldbank_EN_EXT. Accessed: 23 November 2018.

Appendices

Appendix 1. Survey.

Cryptocurrencies

Welcome to this survey. By conducting this survey, I'm trying to find out how often tokens and coins are actually used for their intended purpose. This survey is kept simple. Please just choose the answer that you find most fitting. Note: The outcome of this survey will be published in my Bachelor's thesis.

1. What's your motivation when investing in a project by buying their tokens? *

- Speculation (I hope for a good return on my investment)
- I believe in the project and plan to use the token later for its intended purpose.

2. Scenario 1: The price of the tokens you purchased goes up 50% within one week. Do you sell your tokens? *

- No, because I'm hoping for even bigger gains.
- No, because I believe in the project and plan to use the token for its intended purpose only.
- Yes.

3. Scenario 2: The price of the tokens you purchased goes down 50% within one week. Do you sell your tokens? *

- No. By doing so, I would realise a 50% loss.
- No. I still intend to use the token for its intended purpose and don't care about the short-term valuation of the token.
- Yes. I rather sell my tokens now and don't risk losing even more money on this project.

4. How many times per month do you spend your tokens on their intended purpose (excluding Bitcoin)? Example: BKU is supposed to be used to buy access to the Blocktek.University platform. *

- 0
- 1-3 times
- 4-7 times
- 8-10 times
- More than 10 times

5. How many times per month do you purchase something with Bitcoin? *

- 0 times
- 1-3 times
- 4-7 times
- 8-10 times
- More than 10 times

Thank you for participating!