5-2018

Illustrating the Contrasts of Initial Coin Offerings and Initial Public Offerings

Adam Jones
University of Arkansas, Fayetteville

Illustrating the Contrasts of Initial Coin Offerings and Initial Public Offerings

by

Adam Grant Jones

Advisor: Dr. Craig Rennie

An Honors Thesis in partial fulfillment of the requirements for the degree Bachelor of Science in Business Administration in Finance and Accounting.

Sam M. Walton College of Business
University of Arkansas
Fayetteville, Arkansas

May 11, 2018

Abstract

This paper explores the intricacies of an Initial Coin Offering and how it differs from an Initial Public Offering, specifically in terms of its process, regulations, utility, performance, and risks. The paper begins with an introduction to cryptocurrencies that includes the development of Bitcoin to more recent developments, in order to give readers the proper background knowledge to understand Initial Coin Offerings. The paper then describes the differences between a coin and a token. Finally the paper lays out the characteristics of an Initial Coin Offerings and then compares those characteristics with that of an Initial Public Offering.

1. Introduction

Financiers and academics alike have been trying to figure out what to make of the new financial innovation that is cryptocurrencies. Is it the money of the future? Is it a bubble? Will it make financial institutions and supply chain systems as we know it obsolete? These are the questions being asked by financial experts. Whatever the conclusion may be, it has become evident that cryptocurrencies are not a fleeting fad. Cryptocurrencies have been traded so much recently that in late December of 2017, the global cryptocurrency market saw a 24 hour trading volume of $50 billion, which is close to the average volume of the New York Stock Exchange (William-Grut, 2017). These cryptocurrencies are being widely adopted by the masses, and have even generated a new form of fundraising for companies. Initial Coin Offerings (ICO), the method of fundraising being adopted by startup and blockchain companies, have seen a growth in their usage over the past couple of years, while investors are still attempting to gain an understanding of what an ICO means. A primary concern of investors and financiers alike is how similar an Initial Coin Offering is to an Initial Public Offering. While both are forms of company funding, and the byproduct of the initial offering can be sold on the secondary market, closer inspection will show that ICOs and IPOs dramatically digress in terms of processing, regulations, utilities, performance, and risks.

2. Literature Review

2.1 The Development of Bitcoin

A cryptocurrency can be defined as any digital form of currency produced by a computer program using cryptography as a way of executing secure transactions and creating new units (Characteristics of CryptoCurrencies, 2017). The data used to identify a unit or coin is encrypted using a string of digits and this is what allows for secure transactions (Lagasse & Columbia University, 2017).

Though it was the first cryptocurrency widely adopted, Bitcoin was not the first attempt at a decentralized digital currency. Other concepts such as B-Money and Bit Gold were conceived in the late 1990s, but were never fully developed (Marr, 2017). Nevertheless, the research that was proposed for these currencies is the backbone for the conception of Bitcoin which was created in 2008. The creation of Bitcoin brought cryptocurrencies into the forefront when an unknown author under the pseudonym “Satoshi Nakamoto” released an article online titled “Bitcoin: A Peer-to-Peer Electronic Cash System.” Within the article, Nakamoto proposes Bitcoin as a solution to eliminate the “double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions” (Nakamoto, 2008). The double-spending problem referenced in the article is part of the reason that cryptocurrencies were never able to catch on before this. Double-spending exists in digital

currencies when a user would use the same coin in two separate transactions with different parties. This is where a financial institution is needed to verify that the buyer still has ownership of the currency being used in the transaction. Digital currencies provide an opportunity to bypass a financial intermediary and decentralizes the process, but this introduces the problem of trust between the two parties. The problem with this is that the whole purpose of digital currencies is to provide a decentralized way of spending that does away with third parties. To solve this problem, Nakamoto proposed a public ledger that includes a time stamp of the transaction and a digital signature of the parties involved (Nakamoto, 2008). This technology that Nakamoto proposed became known as blockchain technology. This peer-to-peer ledger is what allows for online transactions to be completed between two parties without the need of a financial institutions to be involved and protects individuals from fraud since transactions can become non-reversible.

On January 9th 2009, a few months after releasing the Bitcoin whitepaper, Nakamoto sent a message in a cryptography email chain in which he offered Bitcoin publicly for the first time. The message describes that the coins can be sent to another individual by sending it to their IP address or to their Bitcoin address using the public key given to them by the recipient. This allows purchases made with Bitcoin to be secure and anonymous. Nakamoto goes on to explain that the coin mining process was coded to be relatively easy at first, but was to become increasingly difficult as more individuals tried to mine for coins. He also mentions that the total circulation will be 21,000,000 coins with 10,500,000 coins being available to mine for the first years and that number being cut in half every four years afterwards.

First 4 years: 10,500,000 coins
Next 4 years: 5,250,000 coins
Next 4 years: 2,625,000 coins
Next 4 years: 1,312,500 coins

In 2010, the mysterious Nakamoto gave control of Bitcoin to Gavin Andresen who has acted as Bitcoin's chief developer ever since (Madey, 2017).

2.2 Coins v. Tokens

Cryptocurrencies have quickly evolved over the last few years, and have started to be created to serve different functions. These cryptocurrenciess have been broken down into two broad categories: Coins and Tokens. These two types of cryptocurrencies may appear similar on the surface, but are different both in their structure and utility, and as such are treated differently in the marketplace.

2.2.1 Coins

Alternative cryptocurrency coins (Alt-Coins) or just simply coins, are what most people think of when they talk about cryptocurrencies. These are cryptocurrencies that use its own blockchain platform and are independent, meaning that you don't have to use a different program to use or trade the coin (Aziz, n.d.). Most coins are created as a fork of Bitcoin, meaning the creators of the coin used the Bitcoin blockchain and changed its underlying code to create a separate fork in the blockchain for their own coin. Other coins have created their own blockchain from scratch with their own protocol for their currency. It is important to note that even though most coins use a blockchain that is derived from Bitcoin's blockchain, it is still considered an independent blockchain. Coins have a very simple function. They are created to act as a digital form of paper money, which means that it is simply used to denominate value to facilitate an exchange for goods or services. They can also, of course, be traded on the market and held in

hopes of the value appreciating over time, much like a more traditional form of currency. Bitcoin is currently the largest coin in terms of market capitalization at a $140.5 billion as of April 15, 2018, with Ethereum being the second largest at just $51.6 billion(Figure 1). Ripple, Bitcoin Cash, and Litecoin are the other three coins that comprise the top five coins by market capitalization.

2.2.2 Tokens

Tokens are a little more unique than their coin counterpart. These are cryptocurrencies that run on an already established blockchain and are therefore much easier to create due to the fact that a new blockchain doesn't need to be coded (Chronobank, 2017). This also means that these currencies are not considered independent because they are tethered to another blockchain. Most run on the Eretheum blockchain. Tokens can be broken down even further based on their usage. The first being a Utility Token. These tokens are not meant for investment and are instead used for transactions or exchanges. This may sound similar in utility to that of a coin, but these tokens have a key difference in that they can be used in a specific market or even a single business. The purpose acts like a token at an arcade or reward points for consistently shopping with a company. This creates an insulated, self-containing economy for a specific business or niche market. This can prove to be mutually beneficial for the company and customers since the company can reward loyal customers with tokens that are exclusive to the company, therefore ensuring that customers will use that currency only at that company. These coins aren't often traded on the market due to their narrow scope of usage, which makes them fairly illiquid. Security tokens, on the other hand, can be traded like on the open market. These differ from coins still because they are dependent, and would be more comparable to a derivative. As of April 15, 2018, EOS is currently the largest token by market capitalization at $6.6 billion with Tron in second at 2.8 billion. Tether, VeChain, and Binance Coin are the other tokens that comprise the top five by market capitalization. VeChain is the only one of the five that use Omni as its underlying platform rather than Ethereum (Figure 2). It is interesting to note that the market cap for the top token is only $6.6 billion compared to the top coin, Bitcoin, which has a market cap of over $140.5 billion.

2.3 Recent Developments

In the Fall of 2012, the Bitcoin Foundation was formed with Gavin Andresen acting as one of the initial board members. The purpose of the organization according to Executive Director Peter Vessenes was for "promoting Bitcoin, protecting them, and increasing their legitimacy through standardization" (Matonis, 2012). Then in 2013, a cryptocurrency known as Mastercoin launched the first Initial Coin Offering. The offering proved to be rather successful as they brought in $5 million in 2013. Ethereum followed suit the following year and raised over $18 million in 2014 (Marshall, 2017). In the Spring of 2017, cryptocurrencies saw a drastic increase in trading volume and price. The market cap hovered from around $1 billion USD to $20 billion USD from mid 2013 to the first part of 2017, then began to grow significantly until peaking at about $813 billion USD on January 7th 2018. The market cap currently sits at about $305 billion USD. The trading volume also saw a significant growth where it went from significantly less than $1 billion for several years before growing in 2017 to a peak of $24 billion being traded in a 24-hour window on January 7th 2018 as well (Figure 3). This $305 billion in market cap is made up of over 1500 cryptocurrencies that are being traded across almost 10,000 different markets across the globe. Although there are over 1500 cryptocurrencies that are

currently in circulation, the top 5 currencies make up almost 75% of that amount, with Bitcoin having 44.6% of market share alone.

3. Initial Coin Offerings

Initial Coin Offerings have become a new financial vehicle for startups and blockchain based companies to raise funding for projects. It allows for investors to directly be involved in the capital raising process and in return the company will issue coins or tokens to the investor. The benefits of investing in an ICO can range from giving investors access to the platform services, governance powers, and rights to the profits (Adhami, Giudici, & Martinazzi, 2017). Investors also have the opportunity to sell their coins or tokens in the secondary market as an investment. The popularity of ICOs has grown significantly in the last few years. There were only 43 ICOs in 2016 and that number grew to 210 in 2017 (Figure 4 and 5). There have already been 158 ICOs through March in 2018, which is on pace for over 600 ICOs for the entire year (Figure 6).

The companies that perform ICOs are becoming more and more diverse. In 2016, most companies that performed ICOs were in the infrastructure industry, which consist of companies that create blockchains. The $95 million raised was only spread across 14 different industries during the year. In 2017, the infrastructure industry still led the pack, but dropped to only 26% of the market share. 2017 was also significantly more diverse than the previous year as the $3.8 billion raised was spread across 30 different industries. So far in 2018, Communications is leading in terms of funds raised in ICOs, and the $4.8 billion total is spread across 24 different industries (Figure 7). It is clear that not only have ICOs become more popular for investors, but a much wider variety of companies are testing the waters in order to raise capital.

3.1 Process and Access

Initial Coin Offerings have a more simplified process than IPOs. Firms that want to execute an ICO do not require a third party to perform underwriting for the process. They also don't need to go through all the requirements with the SEC that a company pursuing an IPO needs to go through. In order to perform an ICO, the entrepreneur must decide how many coins will be created, and how much the owners of the firm will retain versus selling to the public. They must also decide what the initial price per token will be (Catalini & Gans, 2018). The firm then will release the tokens to the public to be purchased. These steps in the process are very similar to what is required in an IPO, but the key difference is the simplicity afforded to an ICO in the planning period. There is very little prep work when compared to what is required to auction stocks in an IPO. Another unique aspect of the ICO process that is very important to note is the fact that if the total token purchases don't exceed a certain threshold predetermined by the firm, all contributions will be funded to the original investors. This simplified process makes an ICO very appealing for the firm trying to raise capital and the investors as well. Due to the lack of bureaucracy within the ICO process, individual investors are able to participate in the primary market, unlike IPOs. This is one of the main draws of ICOs in that it gives individual investors a seat at the table for participating in primary markets.

3.2 Regulations

ICOs are currently fairly unregulated as with any emerging technologies, it can take a very long time for legislation to catch up. Companies are not legally required to issue a prospectus like what is necessary in their IPO counterparts. However, it is a market precedent for

a firm to present a "white paper" that outlines key information about the project. While this white paper is similar in principle to that of a prospectus, it is much more brief and is consistent in structure from ICO to ICO than what would be seen in a prospectus. The white paper would also outline the specifics of the ICO that were discussed in the previous section, like total tokens being offered, set price, etc. While ICOs see significantly less regulatory oversight, this does not mean that they are completely lawless. Some ICOs must register with the SEC much like an IPO, but only if they are deemed to be a security. Whether or not cryptocurrencies are considered securities has been a largely controversial discussion as of late, and there has been no conclusive decision so far. It is still determined on an individual basis by applying the Howey Test to the token in question. In the decision of SEC v. W.J. Howey Co. in 1946, the SEC defined a security as "a scheme (that) involves an investment of money in a common enterprise with profits to come solely from the efforts of others." To put it more simply, if the burden of creating value of a token lies in the hands of the investor, then it can be considered a security. The DOA example was found to be a security.

Jay Clayton, chairman of the US Securities and Exchange Commission, has alluded to the fact that the SEC may impose more restrictions moving forward. During a senate hearing on February 6th, 2018, he spoke about how he believed that every ICO token that the SEC has seen so far is a security. He even said "You can call it a coin, but if it functions like a security. It's a security" (Young, 2018). If Clayton and the SEC decide to crackdown on ICO regulations moving forward, it could lead to a significant decrease in ICOs performed in the US moving forward.

3.3 Utility of a coin or token

If an investor participates in an ICO, they receive a coin or token. While a coin or token can be compared to a stock, the utility of a coin or token differs and is much less consistent than a stock of a public company. Different ICOs will give investors different claims than others, and it is important to note that some coins or tokens may provide all of the following, and same may provide only some of the following. Buying tokens in an ICO doesn't usually give ownership to a company, but it can grant the investor access to the services provided by the company. For most companies, this means that investors will have access to their blockchain, or an internal economy that is often created by using tokens. Like an IPO, receiving tokens can sometimes grant an investor governance powers. Some firms may allow investors to have a vote in certain decisions pertaining to the project for which they are raising funds. For the most part, the voting structure works much like an IPO where one token equates to one vote. The company may also give investors profit rights. This aspect is similar to claims to dividends for stockholders. A company that has performed an ICO may elect to return a portion of their profits from their project back to investors. Tokens are also commonly used as investment vehicles, akin to stock. This is often the main reason investors choose to participate in an ICO, and they hope for their token to appreciate so that they may sell it in the secondary market. Out of a sample of 253 ICOs from 2014-2017, the right to access services was granted to investors 68% of the time, voting powers were granted 24.9% of the time, and profit rights were granted 26.1% of the time (Adhami, Giudici, & Martinazzi, 2017).

3.4 Performance

3.4.1 Investor Perspective

In order to measure performance, I wanted to see what an investor could expect in returns over time, if they were to invest at the initial pricing of an ICO. In order to find these figures, I pulled the historical prices of 93 of the Top Cryptocurrencies by Market Capitalization from coinmarketcap.com. I found the daily returns up to one year after the ICO date in relation to the initial price to see what an investor could expect.

The returns vary significantly and have a high standard deviation. The average and the median returns differ drastically. For example, the average 1-day returns are around 1633%, while the median 1-day returns are only 1%. This means that a select few ICOs perform extremely well and skew the averages. Still, a few conclusions can be drawn from these results. First, it seems that buying a token at an ICO price and selling it by the end of day will tend to result in a slightly positive return on median. Also, It is interesting to see that there is often a negative return after a month of the initial release, and then almost even at the 60 day mark. The returns after six months, however, is significantly higher than what is seen in IPOs, experiencing 224% median returns for ICOs compared to 5% median returns for IPOs (Figure 8). From these results, an investor can conclude that they should either sell off the tokens immediately or hold for a few months. Another important conclusion to draw from these results is that there still isn't a very strong pattern that can be drawn between initial returns from investing in an ICO. I think there are a few reasons for this inconsistency. The first is due to the fact that most ICOs have a very low initial offering price. This means that a rise or fall in a few pennies will have a large impact on the percentage return calculated. The median initial price from the 93 ICOs analyzed above is $0.20 (Figure 9). Another possible reason for the inconsistency is due to the companies that are performing ICOs. These companies are mostly startups and so they all have very different financial positions. It is also harder to find a comprehensive history of their financial records than what you would find for a company trying to go public through an ICO. This makes it much harder for investors to price these companies, thus leading to more volatility. Lastly, the cryptocurrency market as a whole has experienced significant volatility over the last couple of years.

While the performance of the ICOs fluctuates significantly and may be risky as an individual investment, there is some merit for a portfolio manager. I compared the MVIS Cryptocompare Digital Assets 100 index, which measures the top 100 cryptocurrencies by size and liquidity, to other popular indexes, in order to find how it correlated with others. I found that for the most part, the Cryptocompare index had a correlation of less than .1 with the other indeces, especially US Treasury Bonds, the Russell 2000, and the S&P GSCI Gold index. This provides portfolio managers with the opportunity to further diversify their portfolio by adding cryptocurrencies as an additional asset class in order to hedge systematic risk. That way if the bond market or stock market were to underperform, the portfolio could still have the opportunity to capture returns through cryptocurrencies.

3.4.2 Borrower Perspective

When looking at the amount of money that has been raised for startups through ICOs, it easy to believe that ICOs have been very successful for borrowers. CoinSchedule reported over $3.8 billion was raised in 2017, and there has been over $5 billion raised already in 2018. The 435 successful projects in 2017 averaged about $12.7 million raised for each project (Williams-Grut, 2018). It seems that ICOs have completely taken over as a way for tech startups and blockchain companies to raise money. According to a study by Coindesk, Blockchain funding through ICOs exceeded the funding raised through Venture Capitalists by over 16 times the amount in the last quarter of 2017. This is up 8 times the amount in Q3 and about 3.5 times the

amount in Q2. It definitely appears that future blockchain companies will continute to prefer to get their funding through ICOs (Figure 10).

While a significant amount of money has been raised through ICOs, this does not mean that it has been completely successful. Of the 902 ICOs tacked by TokenData last year, 142 failed before funding ever began and then an additional 276 ICOs failed after their fundraising (Sedgwick, 2018). This means that only 54% of the ICOs last year were successful. This success percentage dwindles even further if "semi-failed" ICOs are included, which Bitcoin.com defines as companies that have stopped communicating on their social media, or they are so small that there projects can't feasibly survive. With the inclusion of 113 semi-failed ICOs, that brings the success rate to about 41% for 2017. This resulted in over $104 million of wasted funds.

3.5 Risks & Scandals

There are currently several risks associated with ICOs. Like discussed in the previous section, there is no promise that an ICO will succeed. This leads to the possibility of an investors losing all the money that they lent to the project. Investors may also have to worry about hacks. The digital platform allows for much more convenience for transactions, but exposes individuals to a higher risk of being hacked. Another pressing concern though, is the current lack of regulation surrounding ICOs. This allows investors to be exposed to more scams, Ponzi Schemes, and other illegitimate business practices. As of the end of November 2017, 10% of the ICOs have been considered scams (Chohan, 2017). Below I will discuss a couple of examples of failures within ICOs, but it is important to note that there are countless other examples of problems related to ICOs.

3.5.1 The DAO

The DAO was a decentralized autonomous organization created "to automate organizational governance and decision-making" (Jentzch, 2016). The DAO had a focus on venture capital funding through the use of smart contracts that, and it ran on the Ethereum blockchain. The DAO performed an ICO in May of 2016 and raised over $150 million (Morris, 2016). In June of 2016 the DAO was hacked and robbed of over $60 million. Developers originally hoped to just shut down the DAO and return the funds to the investors, but ran into problems due to the irreversible nature of blockchain technology. This led to a "hard fork" of the Ethereum blockchain, which basically rewrote the Ethereum ledger so that the tokens created from the DAO would be nullified.

3.5.2 Maksim Zaslavskiy-REcoin & DRC

In September of 2017, the SEC charged a man named Maksim Zaslavskiy for allegedly defrauding investors through two ICOs. The first of which was called REcoin and was considered by Zaslavskiy as "The first ever Cryptocurrency backed by real estate". The second of which was called the Diamond Reserve Club (DRC) which was similar in nature to the real estate coin but with precious gems (U.S. Securities and Exchange Commission, 2017). The SEC alleged that Zaslavskiy made no actual efforts to invest in real estate or precious stones. He was found not guilty in December by a New York court (Higgins, 2017). This proved that the SEC is paying attention to ICOs and will do what is necessary to ensure that investors aren't being scammed.

4. Initial Public Offerings

IPOs have a very long and rich history. The first IPO of the modern era was in 1602 when the Dutch East India Company first traded stock of their company to the public (Chambers,

2006). The first IPO in the United States didn't come around until about a century later in 1781 (Guzzetta, 2015). Since the 1900s to 2014, there has been over 17,000 IPOs in the United States alone, with over 10,000 more from the rest of the world (Burhop & Chambers, 2016) (Figure 11). Throughout the years, IPOs have evolved significantly in terms of the process involved, regulations surrounding them, and the performance.

4.1 Process and Access

Initial Public Offerings are go through a rigorous background check to ensure that companies credibility and to make sure that they have a good financial history and current position. The process for an IPO is very lengthy, expensive, and difficult for a company to go through. A company must first reach out to an investment banker (sometimes if it is a large enough company, they will use multiple banks) to provide underwriting for the public offering. That bank then creates and files a registration statement with the SEC. This statement includes all pertinent information regarding the company such as their financial statements, any past legal problems, management background, and then what the funds raised through the offering will be used for (Koba, 2012). The SEC will then investigate the company to ensure that all information discussed in the registration statement is complete and correct. Once the SEC has concluded their investigation and everything is cleared, the company and SEC will coordinate a date for the IPO (Figure 12). The bank will then put together a prospectus and will present that at what is known as a road show in order to find prospective investors. The bank will then start the book building process which consists of actually striking a deal with prospective investors and determining a set price for the shares. Most of the time, IPO shares are allocated to institutions rather than individual investors. The process is very long, and immense foresight and planning is necessary in order to be successful. According to PWC, the selection process for an underwriter should begin at least a year before the date in which a company wants to go public (Figure 13). Then it can take anywhere from 6-9 months to execute the process discussed above.

4.2 Regulations

The IPO process is extremely regulated and requires significant SEC oversight. One of the main examples of this is the necessity of having the prospectus that was briefly mentioned in the previous section. This document serves a very simple purpose, but is highly scrutinized. The document goes into extreme detail about the financial position of the company, possible opportunities for the company, and risks associated with the company. It serves as a comprehensive guide for investors to gain a full understanding of the company. The SEC goes even further to protect investors by explicitly requiring that the prospectus is written in plain English so that it is easier to understand (Mujalovic & Halbhuber, 2017).

Another piece of legislation that greatly affects companies wanting to go public is The Sarbannes-Oxley Act of 2002 or SOX. SOX was created in response to several accounting fraud scandals that came to light in the early 2000s that involved companies like Enron, Global Crossing, Tyco, and Adelphia (Bainbridge, 2007). The act was created to protect investors from investing in companies that have fraudulent accounting, and while SOX has done a good job in providing better assurance for investors, it has made it increasingly more difficult for growing companies to go public. Section 404 of SOX has the most affect on companies that want to go through an IPO. It requires that public traded companies must establish internal controls and these controls must be audited (Bochner, Avina, & Cheng, 2016). This can become very costly to a firm going public due to the fact that they have to greatly increase the size and competence of

their accounting and finance team to create and maintain proper internal controls. It also requires additional costs for annual audits.

In 2012, the JOBS (Jumpstart Our Business Startups) Act was signed into law by President Obama. This Act was created to help jumpstart smaller businesses after the economic crash in 2008, and aspects of the act greatly reduced the requirements necessary to pursue public funding for emerging growth companies, which are companies with less than a billion dollars in annual revenue. The Act allows these companies to bypass some of the more stringent accounting and disclosure requirements necessary to undertake an IPO. One example is that these companies can submit a draft registration to the SEC for them to review in confidence before they have to submit a public registration statement. This allows the company to make sure that everything is in order before the public has access to all of their information. Another provision is that these emerging growth companies only have to provide two years of financial information in the prospectus rather than five years (Shock, 2012). This act has greatly increased the ability for smaller firms to pursue an IPO and receive public funding.

4.3 Utility of a stock

If an investor participates in an IPO, they receive a share of the company's stock. Besides holding value as an investment vehicle, owning stock has several other utilities. The first of which is ownership and governance powers. By purchasing a share of a companies stock, an investor technically owns a portion of said company. With ownership of the company comes voting rights. This means that shareholders have the ability to vote for things, such as elections of the board of directors. Many companies even allow for a proxy vote, which means that shareholders can vote by absentee ballot and don't even have to attend the shareholder meetings. Another utility of a stock is the opportunity to receive dividends. Dividends are claims to the income that the company does not reabsorb as retained earnings. This gives investors the opportunity to earn a consistent cash flow from holding a stock rather than just the opportunity for a lump sum from selling the stock in the secondary market. It is important to note that dividends are discretionary and are not guaranteed by the company (Saunders & Cornett, 2015).

4.4 Performance

4.4.1 Investor Perspective

I measured performance using a similar method to ICOs. I pulled the data of 93 IPOs that took place in 2017 from NASDAQ (NASDAQ). I found the 1 day, 30 day, 60 day, and 6 month returns relative to their IPO pricing. This allows us to see what an investor could see if they decided to sell their shares in the short-term, mid-term, and early long-term.

The results still have a relatively high standard deviation, but the returns are much more focused than that found for ICOs. The IPOs averaged a 12% return on the first day and would have given investors around 20% from 30 days to the 6 month. The median returns are drastically lower, with 1 day returns being around 5%, 9% for 30 day returns, and then bouncing back down to 5% for 60 day and 6 months (Figure 14). This shows that stock prices are relatively underpriced with the offering price. If an investor is able to get a share of a stock at the IPO price, then it will yield positive returns most of the time. Another aspect of the results is that the offer price for IPOs is significantly higher than what was found with ICOs. The average offer price was $15.16 and the median price was just a little lower at $14.00 (Figure 15). Companies that choose to go public are usually fairly mature companies who have quite a few years of financial statements. This allows the company to release enough historical information for

investors to better gauge a fair price for the stock. As discussed earlier, this is still a large problem for ICOs and could be a reason for the wildly inconsistent returns after the initial offering and why the initial offer price is only about $3.23 on average.

4.4.2 Borrower Perspective

Companies that go through IPOs would often say that they are very successful. In 2017, the top 10 IPOs raised almost $10 billion between them. The biggest of which, Snapchat, raised almost $4 billion alone (Weintraub, 2017). This eclipses Sirin Labs top ICO deal in 2017, which raised a meager $157.9 million. It seems that the big money for companies is still in IPOs. This is evident in the fact that the amount of companies still going public by means of IPO has remained constant since the creation of ICOs. There were a little less than 6,000 IPOs in 2017, and there have been over 1274 through Q1 2018 (Figure 16).

While an IPO can bring in a significant amount of capital for the firm and can allow it to grow substantially, it is important to know how it affects their profitability. When measured in terms of ROA, ROE, net profit margin, and operating profit margin, companies actually perform better the year before their IPO than a year after their IPO (Pastusiak, Bolek, Malaczewski, & Kacprzyk, 2016). This can be fairly misleading though, because they noted that a firm will often perform significantly better the year before than previous years due to something known as window dressing. The researchers also concluded that the years after the IPO will also seem less profitably than the years preceding the year before an IPO. This is because that a lot of companies are not ready for such a significant growth and do not know how to properly expand. While there isn't as much failure as what is seen in ICOs, it still does not mean that an IPO can be considered the golden ticket for companies.

4.5 Risks and Scandals

IPOs may not be exposed to hacking risk like their ICO counterparts, but they are still not free from risk. It is still very much possible for an investor to participate in an IPO and then lose all of the money that they put into the company due to underwriters setting up IPOs for companies that are not reputable. Accounting errors also pose a large risk for IPOs. If a company hasn't been audited well in the few years preceding their going public, it can lead to a drastic misprice at the IPO. There is also the problem of information asymmetry. Sometimes institutional investors that are involved with the underwriting will know about material information well before that of the individual investors. Below are a couple examples of problems from an IPO.

4.5.1 Dotcom Bubble

The Dotcom bubble was a period in the late 1990s when the market grew significantly due to the rise in Internet-based companies. The bubble popped in early 2000, and investment banks were at the center of criticism due to the fact that they were choosing to underwrite a significant amount of low-quality IPOs. Between 1997-2000, 20 of the IPOs that Merrell Lynch underwrote experienced an 82% drop in on average in 2000 when compared to its IPO price. Credit Suisse First Boston experienced a similar phenomenon during the same time period. The share prices in 2000 were 41% lower than the initial offer price (Agrawal & Cooper, 2009). A company known as Pets.com was an example of a low-quality IPO. This was a company that was expected to perform well by institutional investors and even had some backing from Amazon, but went bankrupt in November of 2000 only nine months after their IPO (Richtmyer, 2000).

4.5.2 Facebook

In 2012, the social network giant went public, it was one of the largest tech IPOs of all-time. However, during the middle of the IPO roadshow, analysts of the underwriters lowered their estimates for the company. This is because a business executive told the institutional investors that they probably weren't going to hit their estimates, but this fact was only told to institutional investors. This meant that the institutional investors were well aware that the estimates would be cut and Facebook wasn't going to hit their targets for the next quarter after the IPO, but individual investors were left in the dark. While there were no legal repercussion from this event, it left individual investors at a major disadvantage (Blodget, 2012).

5. Conclusion

The use of Cryptocurrencies does not appear to be slowing down anytime soon, and with that the use of Initial Coin Offerings looks to continue to grow as well. I would expect that legislation will continue to grow surrounding the use of Cryptocurrencies and ICOs. This could continue to increase the trend of blockchain startups to prefer funding through ICOs over VC firms, and could lead to more institutional investors being involved. The shift to institutional investors could end up being a huge drawback for individual investors who are attracted to the ability for anybody to be involved with ICOs. This is all conjecture though, as it is still too early to tell what direction ICOs will go. As of now though, it is important for investors to remember that ICOs are highly unregulated and performance is extremely volatile. Investors need to keep those risks in mind and continue to perform due diligence into what the company is actually providing, as they would do for investing in an IPO or stocks. Some questions that are important to think about moving forward are: Will ICOs ever see the regulation necessary with IPOs? How will further regulation affect lender and borrower sentiment toward ICOs? Are ICOs just a bubble and will startups move back to more traditional means of funding?

References:

Adhami, S., Giudici, G., & Martinazzi, S. (2017). *Why do Businesses Go Crypto? An Empirical Analysis of Initial Coin Offerings.* Universita Bocconi, Milan.

Agrawal, A., & Cooper, T. (2009). *Accounting Scandals in IPO Firms: Do Underwriters and VCs Help?*

Aziz. (n.d.). *Coins, Tokens, & Altcoins: What's the Difference?* . Retrieved from Master the Crypto: https://masterthecrypto.com/differences-between-cryptocurrency-coins-and-tokens/

Bainbridge, S. M. (2007). *The Complete Guide to Sarbanes-Oxley: Understanding How Sarbanes-Oxley Affects Your Business.* UCLA School of Law. Avon, MA: Adams Business.

Blodget, H. (2012, May 22). *Exclusive: Here's the Inside Story of What Happened on the Facebook IPO*. Retrieved from Business Insider: http://www.businessinsider.com/exclusive-heres-the-inside-story-of-what-happened-on-the-facebook-ipo-2012-5

Bochner, S. E., Avina, J. C., & Cheng, C. Y. (2016). *Guide to the Initial Public Offering* (8th ed.). St. Paul, MN: Merrill Corporation.

Burhop, C., & Chambers, D. (2016). *Financial Market History: flections on the Past for Investors Today.* CFA Institute Research Foundation .

Catalini, C., & Gans, S. J. (2018). *Initial Coin Offerings and the Value of Crypto Tokens.*

Chambers, C. (2006, July 14). *Who Needs Stock Exchanges*. Retrieved from Mondovisione: http://www.mondovisione.com/exchanges/handbook-articles/who-needs-stock-exchanges/

Characteristics of CryptoCurrencies. (2017, July 29). Retrieved from Block Fortune: http://www.blockfortune.com/2017/07/characteristics-of-cryptocurrencies/

Chohan, U. W. (2017). *Initial Coin Offerings (ICOs): Risks, Regulation, and Accountability.* University of New South Wales, Canberra.

Chronobank. (2017, August 31). *Token vs Coin-What's the Difference?* Retrieved from Chronobank.io: https://blog.chronobank.io/token-vs-coin-whats-the-difference-5ef7580d1199

Guzzetta, M. (2015, June 30). *9 of the Most Important IPOs in U.S. History*. Retrieved from Inc. : https://www.inc.com/marli-guzzetta/ipos-changed-america.html

Higgins, S. (2017, December 4). *Alleged ICO Fraudster Pleads Not Guilty in New York Court*. Retrieved from CoinDesk: https://www.coindesk.com/alleged-ico-fraudster-pleads-not-guilty-new-york-court/

Jentzch, C. (2016). *Decentralized Autonomous Organization to Automate Governance.*

Koba, M. (2012, April 20). *Initial Public Offering: CNBC Explains*. Retrieved from CNBC: https://www.cnbc.com/id/47099278

Lagasse, P., & Columbia University. (2017). Cryptography. *The Columbia Encyclopedia*. New York, NY: Columbia University Press.

Madey, R. S. (2017). *A Study of the History of Cryptocurrency and Associated Risks and Threats.* Utica College.

Marr, B. (2017, December 6). *A Short History of Bitcoin and Crypto Currency Everyone Should Read*. Retrieved from Forbes: https://www.forbes.com/sites/bernardmarr/2017/12/06/a-short-history-of-bitcoin-and-crypto-currency-everyone-should-read/#46ce59503f27

Marshall, A. (2017, March 7). *ICO, Explained*. Retrieved from CoinTelegraph: https://cointelegraph.com/explained/ico-explained

Matonis, J. (2012, September 27). *Bitcoin Foundation Launces To Drive Bitcoin's Advancement*. Retrieved from Forbes: https://www.forbes.com/sites/jonmatonis/2012/09/27/bitcoin-foundation-launches-to-drive-bitcoins-advancement/#26215f4dd868

Morris, D. Z. (2016, September 4). *The Bizarre Fallout fo Ethereum's Epic Fail*. Retrieved from Fortune: http://fortune.com/2016/09/04/ethereum-fall-out/

Mujalovic, I., & Halbhuber, H. (2017). Going Publin in the USA: An Overview of the Regulatory Framework and Capital Markets Process for IPOs. *Initial Public Offerings 2017*.

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System.*

Pastusiak, R., Bolek, M., Malaczewski, M., & Kacprzyk, M. (2016). Company Profitability Before and After IPO. Is It a Windows Dressing or Equity Dilution Effect? *Prague Economic Papers, 25*(1), 112-124.

Richtmyer, R. (2000, November 7). *Pets.com at its Tail End*. Retrieved from CNN Money: http://money.cnn.com/2000/11/07/technology/pets/

Saunders, A., & Cornett, M. M. (2015). *Financial Markets and Institutions.* New York, NY: McGraw Hill Education.

Sedgwick, K. (2018, February 23). *46% of Last Year's ICOs Have Failed Already*. Retrieved from Bitcoin: https://news.bitcoin.com/46-last-years-icos-failed-already/

Shock, L. (2012, June 9). *Outline of Dodd-Frank Act and JOBS Act*. (InvestEd 2012) Retrieved from U.S. Securities and Exchange Commission.

U.S. Securities and Exchange Commission. (2017, September 29). SEC Exposes Two Initial Coin Offerings Purportedly Backed by Real Estate and Diamonds. Washington D.C.

Weintraub, S. (2017, July 5). *Top 10 Largest IPOs of 2017 by Company Valuation*. Retrieved from Stash Learn: https://learn.stashinvest.com/largest-ipos-by-company-valuation

Williams-Grut, O. (2018, January 31). *Only 48% of ICOs Were Successful Last Year-But Startups Still Managed to Raise $5.6 Billion*. Retrieved from Business Insider: http://www.businessinsider.com/how-much-raised-icos-2017-tokendata-2017-2018-1

Young, J. (2018, Feb 9). *SEC Hints at Tighter Regulations for ICOs, Smart Policies for "True Cryptocurrencies"*. Retrieved from Coin Telegraph: https://cointelegraph.com/news/sec-hints-at-tighter-regulation-for-icos-smart-policies-for-true-cryptocurrencies

Figures

Figure 1:

Top 5 Coins by Market Capitalization as of 4/15/18

(Data provided by coinmarketcap.com)

Name	Market Cap	Price (USD)	Circulating Supply
Bitcoin	$140.5 billion	$8275.23	16,979,550 BTC
Ethereum	$51.6 billion	$522.22	98,839,839 ETH
Ripple	$26.2 billion	$0.67	39,122,794,968 XRP
Bitcoin Cash	$13.2 billion	$775.17	17,075,088 BCH
Litecoin	$7.3 billion	$130.36	56,097,488 LTC

Figure 2:

Top 5 Tokens by Market Capitalization as of 4/15/18

(Data provided by coinmarketcap.com)

Name	Platform	Market Cap	Price (USD)	Circulating Supply
EOS	Ethereum	$6.6 billion	$8.32	794,945,938
TRON	Ethereum	$2.8 billion	$0.04	65,748,111,645
Tether	Omni	$2.3 billion	$0.99	2,287,140,814
VeChain	Ethereum	$1.8 billion	$3.43	525,770,505
Binance Coin	Ethereum	$1.5 billion	$13.07	114,041,290

Figure 3:
Total Market Capitalization of Global Cryptocurrencies from April 2013-April 2018. Data shown in log scale.
(Data provided by coinmarketcap.com)

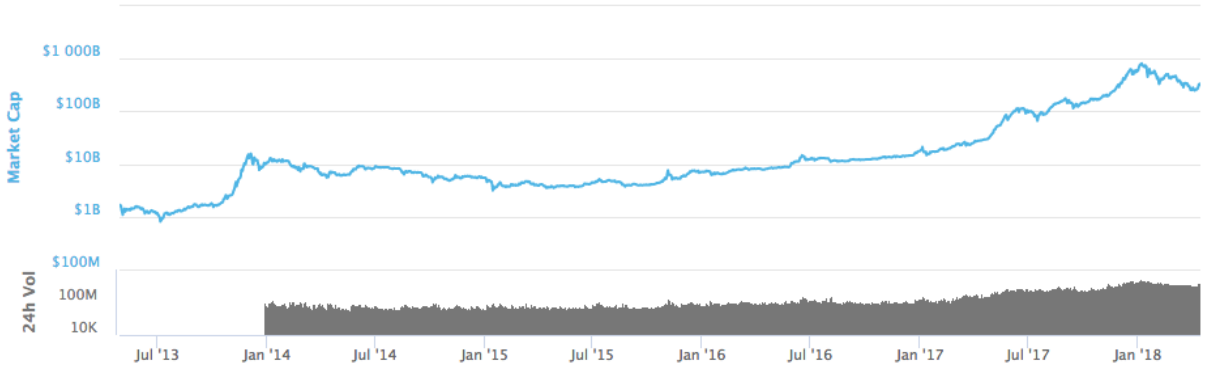

Figure 4: Funds raised by ICOs in 2016 by month
(data provided by coinschedule.com)

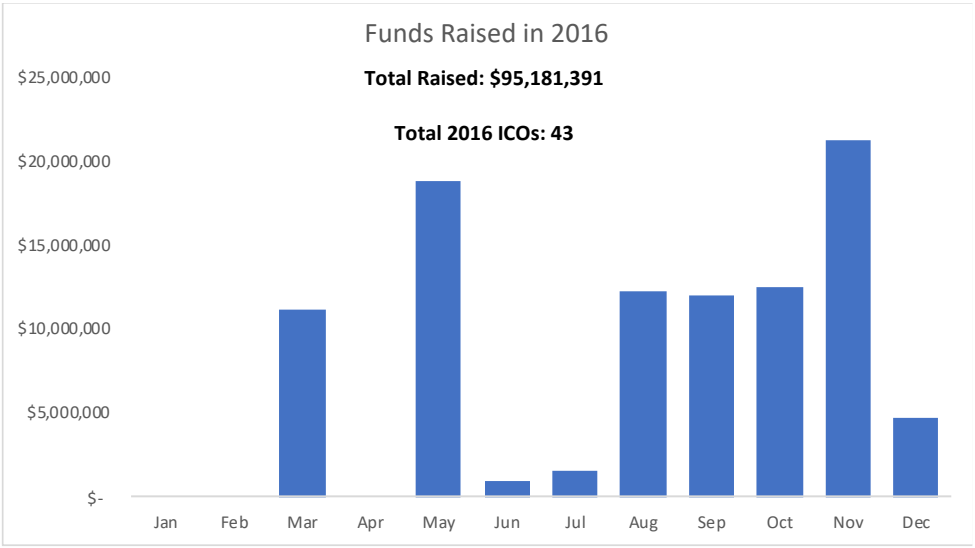

Figure 5: Funds raised by ICOs in 2016 by month
(data provided by coinschedule.com)

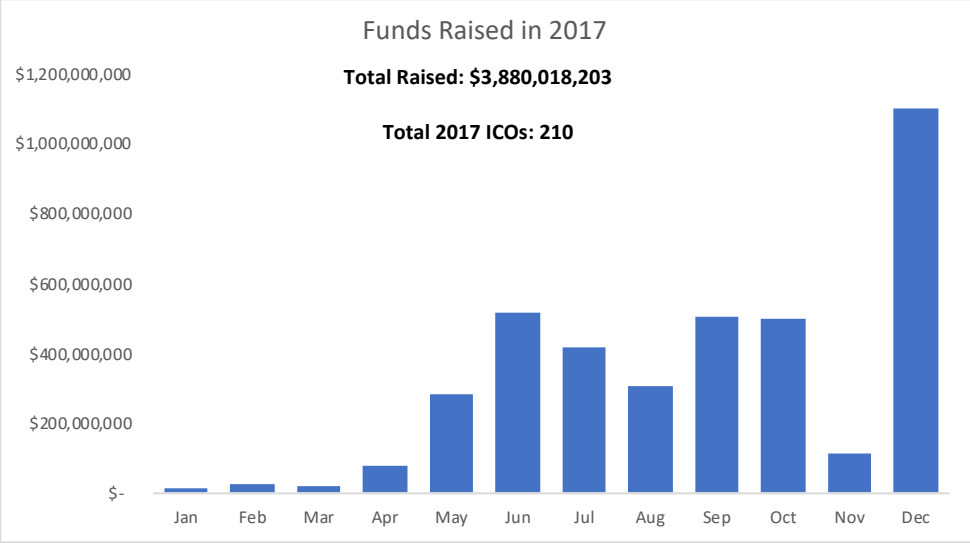

Figure 6: Funds raised by ICOs in 2016 by month
(data provided by coinschedule.com)

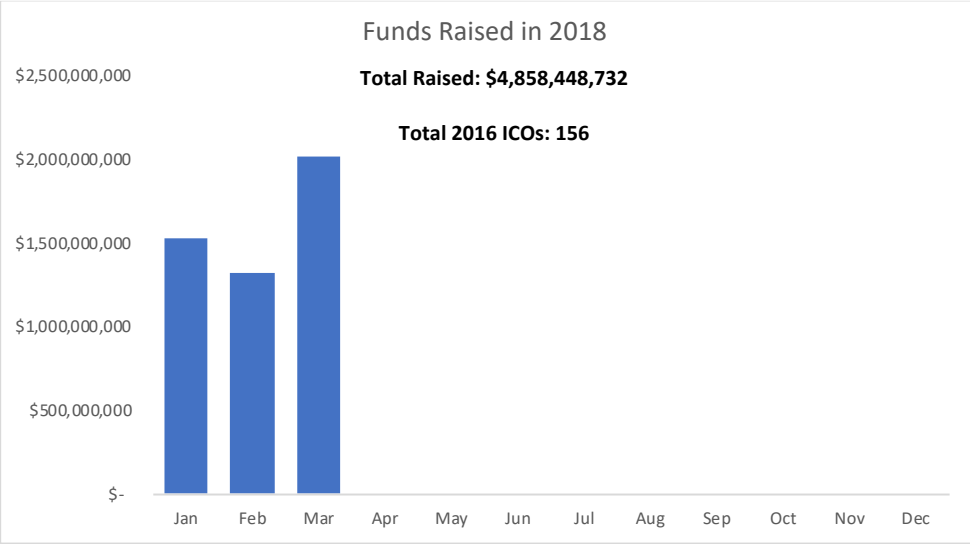

Figure 7: ICOs by Industry 2016-Q1 2018
(Data provided by coinschedule.com)

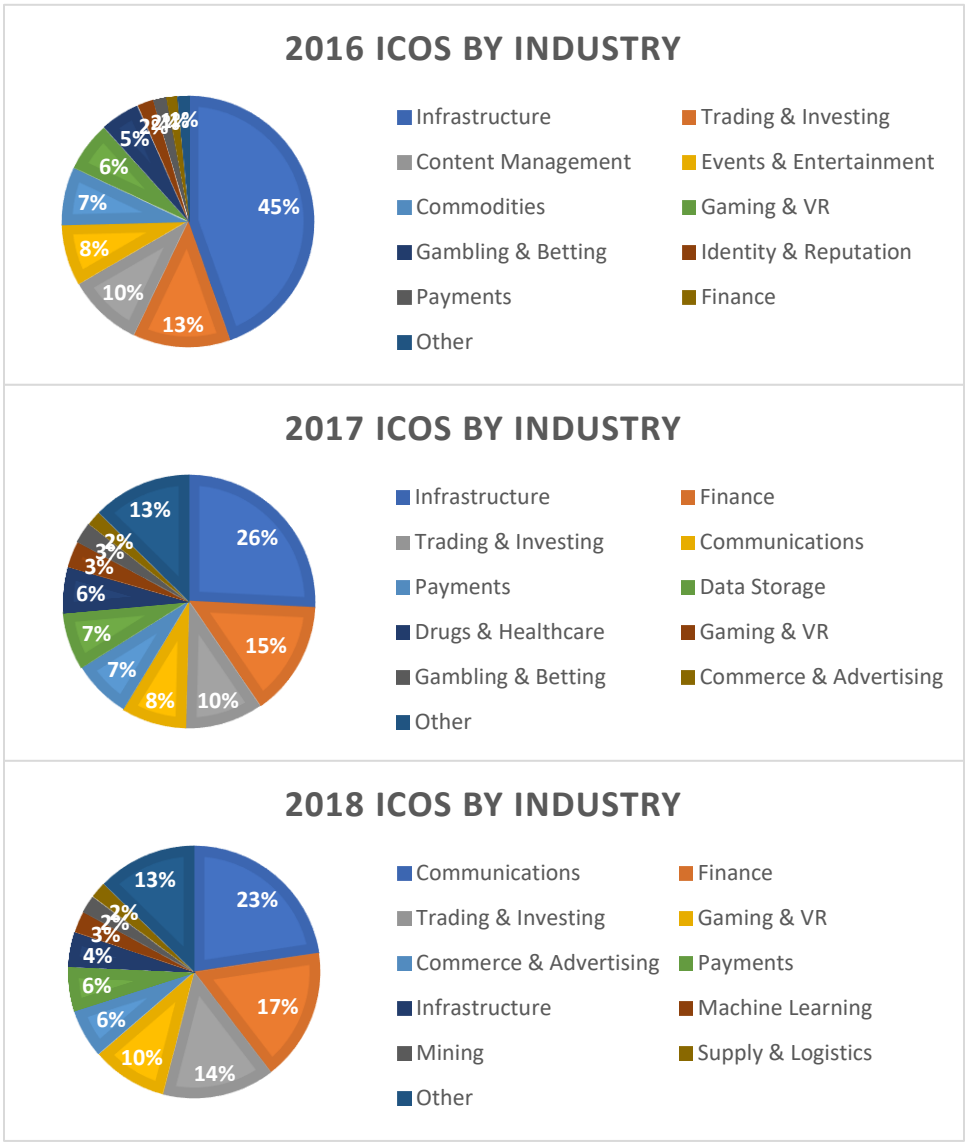

Figure 8:

Returns after n number of days after ICO (sample size: 93)

	1-Day	30-Day	60-Day	6 months
Average	1633%	1205%	1633%	2467%
Median	1%	-10%	1%	224%
Standard Deviaton	15683%	10337%	15683%	10515%
Max Return	151250%	98125%	151250%	81250%
Min Return	-66%	-96%	-66%	-89%
% of ICOs with a positive return	55%	44%	53%	74%
% of ICOs with a negative return	45%	56%	47%	26%

Figure 9:

Average, median, max, and min initial price of ICOs (sample size: 93)

	Average	Median	Max	Min
Initial Price	$ 3.23	$ 0.20	$ 48.96	$ 0.000035

Figure 10: ICO Funding compared to Venture Capitalist Funding in Q4 2017
(data provided by Coin Desk-State of Blockchain-Q4 2017)

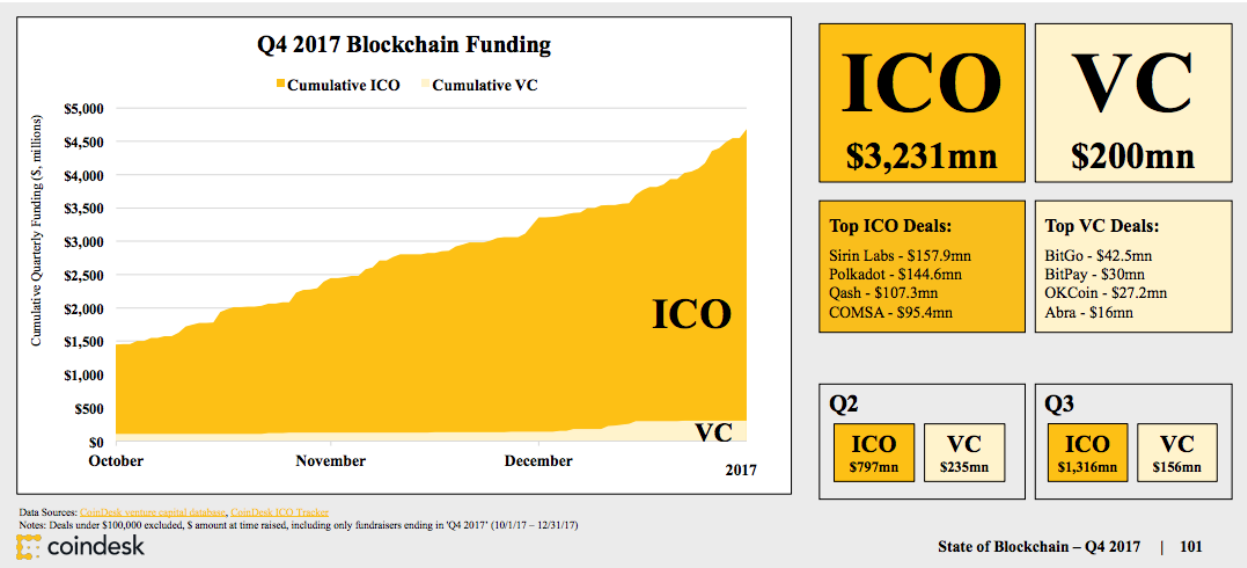

Figure 11:
Number of IPOs by Decade since 1900
(data provided by CFA Institute Research Foundation)

Year	UK	US	Germany	Rest of Europe
1900s	486	–	223	528
1910s	445	–	95	453
1920s	662	297	241	682
1930s	397	105	1	131
1940s	269	141	3	105
1950s	348	447	38	178
1960s	548	2,661	26	122
1970s	267	1,640	34	78
1980s	762	4,866	141	225
1990s	641	5,202	352	241
2000s	1,175	2,065	504	233
Total	6,000	17,424	1,658	2,976

Figure 12: Breakdown of the IPO process and where Underwriters are involved
(Provided by Dr. Alexey Malakhov)

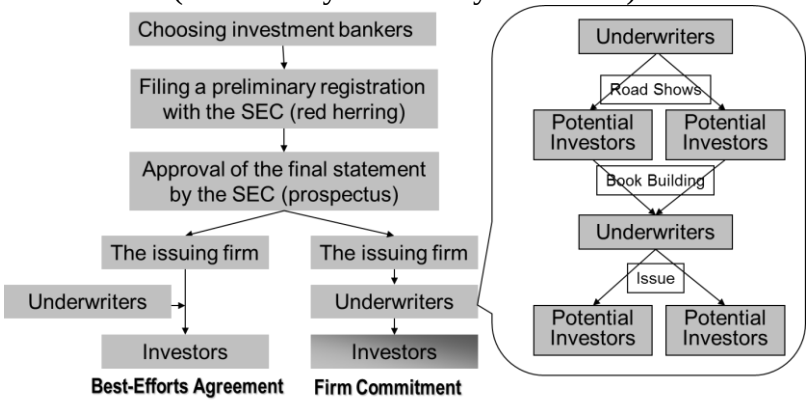

Figure 13: IPO timeline from planning until the company is public
(provided by PriceWaterhouseCooper)

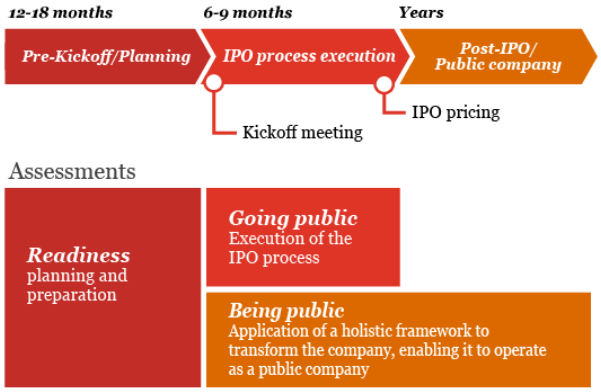

Figure 14:
Returns after n number of days after IPO (sample size: 93)

	1-Day	30-Day	60-Day	6 months
Average	12%	22%	20%	21%
Median	5%	9%	5%	5%
Standard Deviation	23%	58%	48%	62%
Max Return	79%	460%	232%	342%
Min Return	-28%	-41%	-48%	-62%
# of IPOs with positive returns	63	65	64	60
# of IPOs with negative returns	30	28	29	33

Figure 15:
Average, median, max, and min initial price of IPOs (sample size: 93)

	Average	Median	Max	Min
Offer Price	$15.16	$14.00	$128.90	$4.25

Figure 16: The number of IPOs performed globally from 2013-Q1 2018
(data provided by S&P CapitalIQ)