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Examination of Initial Coin Offerings (ICOs) as a novel source for early stage financing

Supervisor

Ch. Prof. Diana Barro

Graduand

Gianluca Olivato

Matriculation Number 867449

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Index

Introduction	6
1 – Initial Coin Offerings and Blockchain	8
1.1 – The blockchain and its functioning.....	8
1.2 – The evolution of the Initial Coin Offerings over the years	11
1.3 – The Advantages and Risks of ICOs.....	20
1.3.1 – Advantages.....	20
1.3.2 – Risks.....	21
1.4 – Comparison of ICOs with main alternative sources of funding	25
1.4.1 – Comparison between Crowdfunding and ICOs.....	27
1.4.2 – Comparison between IPOs and ICOs.....	29
1.4.3 – Connections between Venture Capital funds and ICOs.....	31
1.4.4 – Size comparison between ICOs, IPOs and VCs.....	32
2 – Technical consideration about ICOs and their regulatory environment.....	34
2.1 – ICO process and design choices	34
2.1.1 – Pre-ICO phase	34
2.1.2 – ICO phase.....	36
2.1.3 – Post-ICO phase	39
2.2 – Token classification and Network effects.....	40
2.3 – ICOs regulatory environment.....	45
2.3.1 – Worldwide regulatory scenario.....	46
2.3.2 – US and EU approaches in applying security regulation to ICOs.....	49
3 – Determinants of ICOs’ success and Information asymmetry mitigation	55
3.1 – Determinants of ICOs’ success.....	55
3.1.1 – Whitepaper features	56
3.1.2 – Source code disclosure	61
3.1.3 – Social media activities and marketing programs.....	63
3.1.4 – Presales.....	65
3.1.5 – ICOs design variables.....	67
3.1.6 – Crypto market	71
3.1.7 – Blockchain and Token choices	72
3.1.8 – Countries characteristics and Legal systems.....	74
3.2 – The problem of Information asymmetry and its possible mitigation	77
3.2.1 – Higher level of voluntary disclosure	78

3.2.2 – Third parties’ independent ratings.....	80
4 – Performance analysis in the Post-ICO phase	84
4.1 – Aggregate performance of ICOs both in the short- and long-term	84
4.1.1 – Short-term ICOs’ returns.....	84
4.1.2 – Long-term ICOs’ returns	88
4.2 – Determinants of ICOs’ returns	91
4.2.1 – Crypto market	91
4.2.2 – ICOs design variables.....	92
4.2.3 – Regulation.....	96
4.2.4 – Whitepaper features	97
4.2.5 – Management team and ICO project.....	98
4.2.6 – Ratings	101
4.2.7 – Social media activities	101
4.2.8 – Effect of slowing the tokens liquidation on ICOs’ returns	103
4.3 – Post ICOs’ survivance, liquidity and volatility	104
4.3.1 – ICOs’ survivance rate	104
4.3.2 – ICOs’ liquidity.....	110
4.3.3 – ICOs’ volatility	114
5 – Empirical examination of three successful ICOs	117
5.1 – Iconomi (2016)	120
5.1.1 – Business idea analysis	120
5.1.2 – Tokens analysis	122
5.1.3 – Initial project implementation	124
5.1.4 – Transformation of the Corporate Governance structure	126
5.1.5 – ICOs’ design analysis	131
5.1.6 – Returns analysis	141
5.2 – EOS (2017)	148
5.2.1 – Business idea analysis	148
5.2.2 – Project implementation	151
5.2.3 – Tokens analysis and subsequent transformation.....	153
5.2.4 – ICOs’ design analysis	154
5.2.5 – Returns analysis	166
5.3 – TaTaTu (2018)	173
5.3.1 – Business idea analysis & Business model.....	173

5.3.2 – Project implementation	176
5.3.3 – Tokens analysis and subsequent transformation.....	178
5.3.4 – ICOs’ design analysis	180
5.3.5 – Returns analysis	193
5.4 – Final considerations	198
Conclusions	203
Bibliography	205

Introduction

The blockchain technology is one of the most revolutionary innovations of the last decade, which potentially has the capability to completely transform many aspects of our lives. The aim of this work, aside from initially explaining the origin, functioning and potential future avenues of the blockchain technology, is to concentrate on a specific innovation arising from that technology: the Initial Coin Offerings (ICOs), which are a new and alternative way for entrepreneurs to attract early stage financing, through the issuance of corporate tokens written on the blockchain, in exchange for rights/duties attached to that tokens.

The work will be developed into five different Chapters, the *first one* will initially introduce the concept of Blockchain, which is the wider framework allowing ICOs to take place and will continue by analysing their evolution over the years. Furthermore, it will also expose all the advantages and risks intrinsic of ICOs and will conclude by comparing them with the other main alternative for early stage financing: Crowdfunding, IPOs and Venture Capital investments. In particular, each comparison will be aimed at highlighting both the similarities and differences between the ICOs and each of these alternatives.

The *second chapter* will deepen the ICO phenomenon, by investigating the ICO process and the main design choices available to ventures when structuring their fundraising campaign. The chapter will, then continue by classifying the main types of tokens: “utility tokens”, “security tokens” and “cryptocurrencies”, by specifying all the different functions attached to them. Finally, it will be provided an overview of the current ICOs’ regulation scenario worldwide, concentrating on those counties with a higher ICO’s track record identified by the previous literature’s studies.

Chapter 3 and *Chapter 4*, differently from the previous ones, will be a literature’s review aimed at understanding, the main determinants of ICOs’ success and ICOs’ returns. In particular, Chapter 3 will concentrate on the analysis of the regressions carried out by the literature, in order to understand the final effect that different ICOs elements have on the final success of the fundraising campaign.

The fourth chapter, instead, will begin providing an overview of the average returns faced by newly created ventures, both short- and long term. However, in the subsequent sections will expose, similarly, to Chapter 3, the main findings coming out from previous

literature's studies about the most important determinants of ICOs' returns, liquidity and volatility.

Finally, Chapter 5 will analyse three different ICOs, selected over different timeframes, in order to understand if the way in which these ICOs were carried out changed as the crypto market evolved over time. In particular, the aim of this analysis is to investigate the business idea underlying the ICOs, the way in which the projects were developed over time and the choices about the blockchain and the tokens issued made by the relative founding teams. Finally, it will be provided an analysis of the returns faced by the three ICOs over time, in comparison with the two main cryptocurrencies (i.e. Bitcoin and Ethereum).

The aim of this work is to understand which features a company should have in case it wants to tokenize its business and attract new financing. However, this will not be an "ICO guide" for a series of reasons: *firstly* because, this work is not an empirical analysis on the ICOs' features influencing success and returns, but it is rather a review of the literature' results on what have been identified the main determinants of ICOs' success and returns. *Secondly*, it will be very difficult to find convergent results given that there are a lot of aspects to be considered, many interconnections between the different variables analysed and a lot of subjectivity in the measure of some variables. *Thirdly*, even if we try to find evidence from real ICOs of the main literature' results, actually the analysis might turn to be highly biased on the choice and number of ICOs selected.

Therefore, this work is not intended to be a guide on how to carry out a successful ICO, but rather it is an examination aimed at investigating the very novel and interesting ICOs phenomenon, which is worth to be analysed for the future innovation it could bring to Corporate Finance.

1 Initial Coin Offerings and Blockchain

1.1 *The blockchain and its functioning*

When listening someone talking about the blockchain, probably the first thought goes to Bitcoin, but actually, it is only the most known application of the blockchain, which, instead, is the technology that allows Bitcoin, and other cryptocurrencies, to work properly. It is the blockchain, rather than Bitcoin, to be the true innovation and in this first section we will go more in depth trying to understand what actually the blockchain is and what has been its development over the years.

Following Swan (2015), the word “Bitcoin” can simultaneously refer to three different things:

- The underlying blockchain technology platform;
- The protocol that runs over the underlying blockchain technology to describe how assets are transferred on the blockchain;
- The digital currency, which was the first and largest cryptocurrency.

A blockchain, in essence, is a distributed database. It collects pieces of information that are bundled in blocks and connected through a cryptographic procedure in a continuously expanding chain. The true innovation of the blockchain is the fact that there is no single authority guaranteeing the authenticity of the ledger containing the information. Rather, the entire chain is stored on many nodes, that are super computers held by miners (Hacker and Thomale, 2017). The blockchain is constantly growing as miners chronologically add new blocks to record the most recent transactions. Each node has a full copy of the related blockchain, which contains complete information about addresses and balances, from the very first transactions ever executed to the most recently completed block (Swan, 2015).

The blockchain is based on the principle that even in the situation in which one or more nodes are dishonest, the distributed network continues to remain accurate. It does so by creating incentives for each of the nodes to accurately maintain the network (Amsden and Schweizer, 2018). Specifically, there are three main features the blockchain owns in order to guarantee the validity of this information. *First*, new blocks cannot be added just by

anyone; rather, miners have to solve a cryptographic puzzle, and hence invest time and computing power, to add a new block. Those who are able to first add a block to the chain are rewarded through newly generated crypto coins creating incentives to constantly update the chain. *Second*, if two different blocks are added almost simultaneously to the chain on different nodes, two conflicting sub-chains are born. In this case, the chain that grows faster, meaning that attracts more computing power for the generation of the next blocks, is considered to be the authentic chain. *Third*, as the updated chain is propagated from node to node, the correctness of the new block is mathematically verified by each node, because if it is found that a block is incompatible with the previous elements of the chain, that block is rejected (Hacker and Thomale, 2017).

The potential benefits coming from the blockchain technology are huge and most importantly, as reported by Swan (2015), they are more than just economic. In fact, they can extend to political, humanitarian, social, and scientific domains, even if currently the technological capacity of the blockchain isn't already being fully understood and applied in the real world. An example that may help in the understanding the disruptive potential of this technology is reported in the book by Swan (2015): "*The blockchain can serve as the public records repository for whole societies, including the registry of all documents, events, identities, and assets. In this system, all property could become smart property; this is the notion of encoding every asset to the blockchain with a unique identifier such that the asset can be tracked, controlled, and exchanged (bought or sold) on the blockchain*". As we can imagine from this brief example, the blockchain is more than just a public ledger as its definition may suggest, it is really a technology that could lead to a complete change in all the aspect of our life.

The different kinds of existing and potential activities in the blockchain revolution are broken down into three categories (Swan, 2015):

- **Blockchain 1.0** is *currency*, the deployment of cryptocurrencies in applications related to cash, such as currency transfer and digital payment systems;
- **Blockchain 2.0** is *contracts*, meaning using the technology to incorporate many traditional economic and financial operations other than simple cash transactions, such as: stocks, bonds, futures, loans, mortgages, titles, smart property and smart contracts;

- **Blockchain 3.0** is blockchain *applications* beyond currency, finance, and markets, particularly in the areas of government, health, science, literacy, culture and art.

Whereas Blockchain 1.0 is for the decentralization of money and payments, Blockchain 2.0 is for the decentralization of markets more in general and comprises the creation and consequent transfer of many other types of assets different from cryptocurrencies. *Table 1* lists some of the different classes and examples of property and contracts that might be transferred with the blockchain.

Table 1 - Blockchain applications beyond currency

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

Source: Swan, 2015 – p. 10

It is important to highlight that Bitcoin was just the first of a series of coins based on blockchain technology that came out during the last decade. Since its launch in 2008, many different coins have been created, and each of them can work either using an independent blockchain protocol or being hosted by an already existing blockchain protocol.

As a consequence, it is possible to distinguish “*crypto-currencies*” which are broadly inspired by Bitcoin and operate in a their own blockchain protocol, examples include Litecoin or Ripple. Alternative to “*crypto-currencies*” are the so called “*infrastructure coins*” which are still built in a their own blockchain platform, but their aim is to offer that platform for developing smart contracts, through which it is possible to launch new crypto-

currencies and tokens, forming the third category called “*crypto-tokens*”. The latter are commonly simply referred as “*tokens*”, which are instruments providing their holders some sort of rights over the company which issued them (Bourveau et al., 2018). The different types of tokens which can be issued, will, however, be analysed in greater detail in the following chapter.

As the same authors reports later on in their paper, this division of possible coins which could be created, leads to a key division of the crypto market into two broad submarkets: the *crypto-currencies market*, which includes crypto-currencies and infrastructure coins, and the *crypto-tokens market*, which includes tokens.

The main objective of this dissertation is to deeply analyse, what has been previously labelled as Blockchain 2.0, because it is here that a true potential for innovation in the Corporate Finance domain arises, with interesting opportunities for companies to find new ways for growing and developing. In this sense, the most popular opportunity at the time of writing is represented by Initial Coin Offerings (ICOs), which are a novel and alternative way to raise capital for companies in their early development stage.

Furthermore, ICOs are also at the core of the crypto-token market, given that the two ways through which it is possible to obtain corporate tokens are: the *primary market* through the Initial Coin Offerings and the *secondary market* through the crypto-exchanges.

1.2 The evolution of the Initial Coin Offerings over the years

One of the outcomes of the financial crisis was a new cryptocurrency called Bitcoin, that provides a trusted peer-to-peer payments network not based on the traditional financial system. A decade later the blockchain technology has taken the world of finance by storm, creating an entirely new asset class that promises to be the future. The most significant and disruptive of all so far, has been the way start-ups and SMEs attract financial resources through Initial Coin Offerings (ICOs) (Boreiko and Sahdev, 2018).

A very simple way to explain the concept of ICOs is reported in the paper by Benedetti and Kostovetsky (2018), which describe them as the sale by entrepreneurs of branded tokens to raise capital and create an online platform where all transactions require the use of those tokens. After the ICO, tokens are usually listed on one or more online exchanges, providing liquidity to token-holders and a signal of the quality and future prospects for the

platform.

ICOs typically begin when the organization issuing the cryptocurrency publishes a Whitepaper, similar to the Prospectus issued by ventures right before an IPO, which details the project's goal, roadmap, team and the schedule for the offering. Interested buyers can, then, register in the area of the corporate site designated for the token sale and confirm their identities, mechanism called "Know-Your-Customer". Typically, the token offering is conducted in more steps, which may last even for several months, with earlier stages offering better price conditions most of the times restricted to preferred users such as, angel investors and venture capitalists (Benedetti and Kostovetsky, 2018).

Finally, as reported by Adhami et al. (2018), the issuer may accept the fundraising process to be in Bitcoin, Ether or Fiat money (i.e. Euros, Dollars etc.). Even in cases when commitments in traditional Fiat currencies are not allowed, cryptocurrencies are, in any case, easily convertible in traditional currencies, thus providing the expected inflow of capital needed for development, expansion, growth or for whatever other reason the ICO was launched.

It is important to notice that the issued tokens often do not have a countervalue or real-world usage at the time of the ICO. Instead, they entitle the holder to future participation in a project through the use of the tokens sold (Fisch, 2018).

The blockchain through ICOs not only has revolutionized and internationalized the funding process for SMEs, but it also allowed for considerable disintermediation of the post-issue market trading of new distributed tokens. The advantages of this financial innovation are doubles: from an investor standpoint, everyone from any part of the world is able now to buy and sell the tokens through various online exchanges without national boundaries, thus freeing investors from the so-called "home bias". From the point of view of entrepreneurs, it provides an alternative way to finance their investment, given that rarely internal funds are sufficient and, thus, the only two ways available until now were to borrow from local banks or to sell part of their companies to outside investors (Boreiko and Sahdev, 2018). Later on (i.e. see section 1.4), will be compared ICOs with the main alternative source of funding for companies in early stage financing.

Even though it is true, as reported by Fisch (2018), that ICOs are absolutely a disruptive innovation coming out from a revolutionary technology as it is the blockchain, because they simplify the way in which start-ups raise funds; it is also true that due to their highly

technological nature, ICOs are, nowadays, not applicable to every venture. Rather, they mostly appeal to ventures utilizing Distributed Ledger Technology (DLT) and companies offering online products/services. Anyway, as the adoption of blockchain increases, ICOs will become a viable vehicle for a wider set of ventures.

Before talking about the ICOs' evolutionary path, it is worth clarifying the difference between the ICO of a "cryptocurrency" or "infrastructure coin" with the one of a "crypto token". In the first cases, the ICO is launched before its blockchain is created and investors are sold a Simple Agreement for Future Tokens (SAFTs) as a promise of ownership of the coins once the blockchain is completed. This process is both technically challenging and costly in both the short and long terms. Doing so would also require the venture to create an ongoing incentive mechanism (mining) to attract users to validate the ledger.

In the second case the venture can immediately issue its tokens because the underlying blockchain is already operative. However, this latter way of launching an ICO is available only from 2015 when was created the Ethereum's blockchain, that enabled anyone to easily create an ICO on it through a mechanism called "smart contracts." Over time, the ERC20 standard (of the Ethereum blockchain) became so widely adopted that anyone can create his own token in a matter of hours. As the technical requirements decreased, the ICO market began growing exponentially (Amsden and Schweizer, 2018).

ICOs have not had a constant evolution over the years, rather, as highlighted by Boreiko and Sahdev (2018), their evolutionary path can be divided in five stages summarized in *Table 2*, that will be analysed singularly.

Prototype phase – The first documented and confirmed attempt to use blockchain for funding a start-up venture, as reported by the authors, is traced back to 2013 when it was proposed the idea to joint finance a new and more versatile protocol layer on top of Bitcoin, called Mastercoin. This first ICO opened the doors to many other in the following years, with relatively few ICOs taking place in 2013 (2 ICOs raised 630k \$), 2014 (11 ICOs raised 33m \$), and 2015 (14 ICOs raised 11m \$). A common denominator of these ICOs was to focus on the infrastructure and platform projects aimed to upgrade and expand the Bitcoin ecosystem. Moreover, the majority of them were done without providing a detailed description of the project through a "Whitepaper" or requiring registration to investors,

rather they were conducted with a simple bitcointalk.org forum announcements, no advertisement, legal or financial intermediation and social media campaigns. Those projects relied on already established communities composed of blockchain zealots and first investors who viewed an opportunity to invest money, receive tokens and become a part of the rapidly growing ecosystems within the blockchain industry (Boreiko and Sahdev, 2018).

One notable exception reported by the authors, is Ethereum's ICO in 2014 which, on the contrary, was carried out through a well-thought strategy and development plan. It completely changed all ICOs after its launch, because it aimed and succeeded in developing a token that allowed the implementation of the world's first programmable blockchain, the concept of automated protocols that execute predetermined actions when certain preconditions are met or better known as 'smart contracts'.

Early start-up phase - It took a full year for the first ICO to be run on the Ethereum blockchain. From 2015 the majority of ICOs continued accepting funds in Bitcoin but started also allowing investment with other altcoins. Unlike the first stage ICOs, the majority of these required some formal registration of the users prior to be allowed to invest and many started drafting the purchase agreements outlining the risks business plan and future roadmap.

The majority of ICOs offered deep discounts, up to 50%, for early buyers and were conducted mainly by putting a cap on the accepted funds (i.e. was put a limit to maximum amount of proceeds that could be potentially raised), even if there were cases of start-ups choosing the uncapped model where they were ready to accept unlimited funding from investors (Boreiko and Sahdev, 2018).

Late start-up phase - The subsequent year was characterized by rapid internationalization of the phenomenon, with 112 ICOs from 23 countries. The increased regulatory attention and legal uncertainties surrounding blockchain financing required a more thought strategy in the launch of an ICO. More than one third of them have explicitly chosen the governing jurisdiction for token sales. Furthermore, companies have started to target potential investors through PR activities such as: blockchain events, social media campaigns along with online channels and have started to allocate tokens to active private promoters through so-called "bounty campaigns" (Boreiko and Sahdev, 2018).

Early growth phase – The huge increase in the price of Bitcoin and other main cryptocurrencies during Q4 of 2017 brought increased media attention outside the “crypto community”. Many start-ups (blockchain-based or not), having understood an opportunity to raise funds quickly and cheaply, started running their token sales. Almost 2.5 billion USD were raised by 169 ICOs during this period (Boreiko and Sahdev, 2018).

As reported by the same authors, in that period the ICO phenomenon started to take the form as we know it today. Firstly, there were huge efforts to target big investors, business angels or venture capitalists who obtained tokens at huge discounts. Then the funds collected in these pre-sales were used to carry out more intensive advertisement campaign, needed to attract a wider portion of retail investors.

Furthermore, it became a standard to provide investors a detailed Whitepapers and to set-up an active communication with the investors’ community. The sold tokens were distributed automatically by smart contract, with the issuers arranging for listing the tokens on various online crypto exchanges, right after the conclusion of the public sale (Boreiko and Sahdev, 2018).

In 2017 regulation worldwide changed: the SEC decision to treat DAO’s token (i.e. the largest ICO of 2016) as securities and Chinese and Korean ban on all national ICO activity, being the most important facts. Also some ICOs themselves started approaching regulation and the most remarkable example is the US-based start-up for blockchain-based data storage network called Filecoin. They not only managed to raise \$284 million from institutional and private investors, but also tried to be compliant with any future forthcoming regulation on ICOs, by running KYC checks on all investors, allowing only accredited investors from selected jurisdictions to participate, and selling a new product called “Simple Agreement for Future Tokens” (SAFT), which represents an investment contract allowing investors to receive an amount of tokens proportional to the funds contributed, once the network is launched (Boreiko and Sahdev, 2018).

Late growth phase - What followed after Filecoin’s ICO was a flow of new token sales all over the world, even by non-blockchain-based start-ups, trying to raise capital before the activity was restricted or regulated, with the assumption that regulation would not have been retroactive. Over 1200 ICOs were conducted by the end of March 2018 (Boreiko and Sahdev, 2018).

Table 2 - Stages of ICO evolution

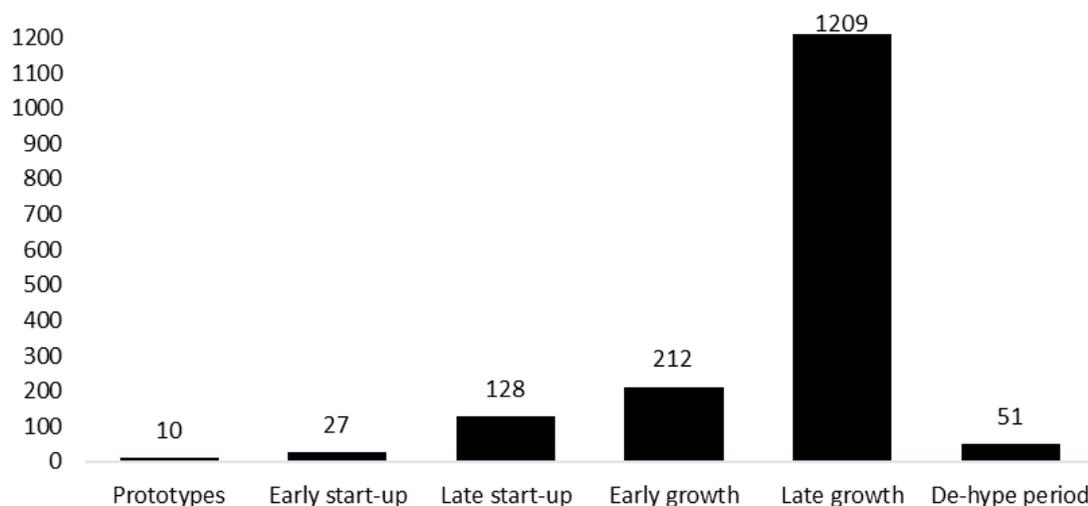
Stage	Period	N° of ICOs	Leading ICO	Stage features
1. Prototypes	Aug. 2013 - Aug. 2014	10	Ethereum	Marketing through bitcointalk.org forum mostly. Crypto enthusiasts and projects' community as investors. No legal entity or compliance thought except for Ethereum ICO.
2. Early start-up	Sep. 2014 - May 2016	27	The DAO	More frequent usage of social media and novel marketing campaigns. Experiments with various token sales types and starting adoption of smart contracts. The term "ICO" is used for the first time. Few VC-backed start-ups conducting crowd sales.
3. Late start-up	Jun. 2016 - May 2017	128	MobileGo	Fast growth of ICOs number, total and average funds raised. Higher investment in marketing campaigns. Tokens issued mostly on Ethereum blockchain with funds accepted in Bitcoin or Ether. Selection of benevolent jurisdiction and attempts for self-compliance using legal advice.
4. Early growth	Jun. 2017 - Sep. 2017	212	Filecoin	Exclusion or limitations for investors from selected jurisdictions. Large investors (whales) participation. Many tokens sales raise unseen before funds in very short time. Pioneering of SAFT sales.
5. Late growth	Sep. 2017 - Mar 2018	1209	N/A	Legal uncertainty about sold token's nature. Increased regulators' attention and comments. Increased participation of private and venture capital in private sales before / instead of public small presale followed by several rounds of main token sales. Stable number of new ICOs per month from January 2018.

Source: elaboration from Boreiko and Sahdev (2018) – p.29

It is important to highlight, however, that the analysis made by Boreiko and Sahdev (2018), was carried out in June 2018. However, as displayed in *Figure 1*, the ICO market came to a sudden and unexpected halt in the second half of 2018. With the aggregate

cryptocurrency market falling by over 85% from its peak within a few months and an increasing regulatory pressure, funding decreased by over 90%, with only 51 ICOs in our database successfully starting trading between July 2018 and February 2019 (Dittmar and Wu, 2019). The reason for such stop in the ICOs' expansion is mainly due to the increasing perception by investors worldwide about the risks related to investments in this highly new and speculative market. It is clear, without any doubt, that between the end of 2017 and the first half of 2018 there was an incredible bubble over ICOs and, more in general, over the crypto market. As many scholars expected, this led in the second half to an obvious "normalization" of the phenomenon, because it was not believable continuing having a yearly crazy number of ICOs as in the previous year. Only projects that are really worthy of funding based on the underlying idea, with very good management, a very clear roadmap, will receive money and trust from investors, as it happens in traditional finance.

Figure 1 – Number of ICOs by development phase



Source: own elaboration

The general hype around the ICO market in the last few years, might be explained also analysing the sources of demand for ICOs. As reported by Cohnen et al. (2019) the demand might come from the following sources:

- *Irrational exuberance.* What has been observed also by other authors is a general "fear of missing out" sentiment among people around the world (Ersnt & Young, 2017). This market sentiment around ICOs, may clearly explain such massive financial bubble and the fact that investors commit money without caring too much about the weak investor protection inherent of many projects (Cohnen et al., 2019).

- *Illicit activities.* This huge demand for ICOs tokens might simply be a method for money-laundering of black money coming from whatever type of illicit activity such as tax evasion, robberies, hacker attacks or kidnappings. This is a possibility given that originally Bitcoin when created was used for these kinds of things, and it may also explain why investors do not care so much about the underlying project of many ICOs (Cohney et al., 2019).
- *Crypto winnings.* A third possible source of ICO demand might be coming from investors who obtained huge gains in Bitcoin or Ethereum investments. These two cryptocurrencies appreciated enormously during their lifetime, leading to a massive wealth-creation. Therefore, ICOs might serve as an instrument to convert cryptocurrency holdings in fiat money without being worried that governments would investigate. But it is, also, easier to imagine investing in speculative assets, like ICOs, without caring too much about the details, when the stake you use to invest with is itself the product of recent, sharp, gains (Cohney et al., 2019).
- *Smart money.* Finally, ICO demand may also be driven by the so-called smart money, hence VC and Hedge funds. As reported by Cohney et al. (2019), they either invest directly, or through intermediaries in many ICOs, thanks to the huge discounts offered to them during pre-sales, hoping that, at least a small portion of them, proves to be successful when the platform is actually launched in the market. This might explain why many ventures received millions of dollars without even having a prototype or final product available at the time the ICO was launched.

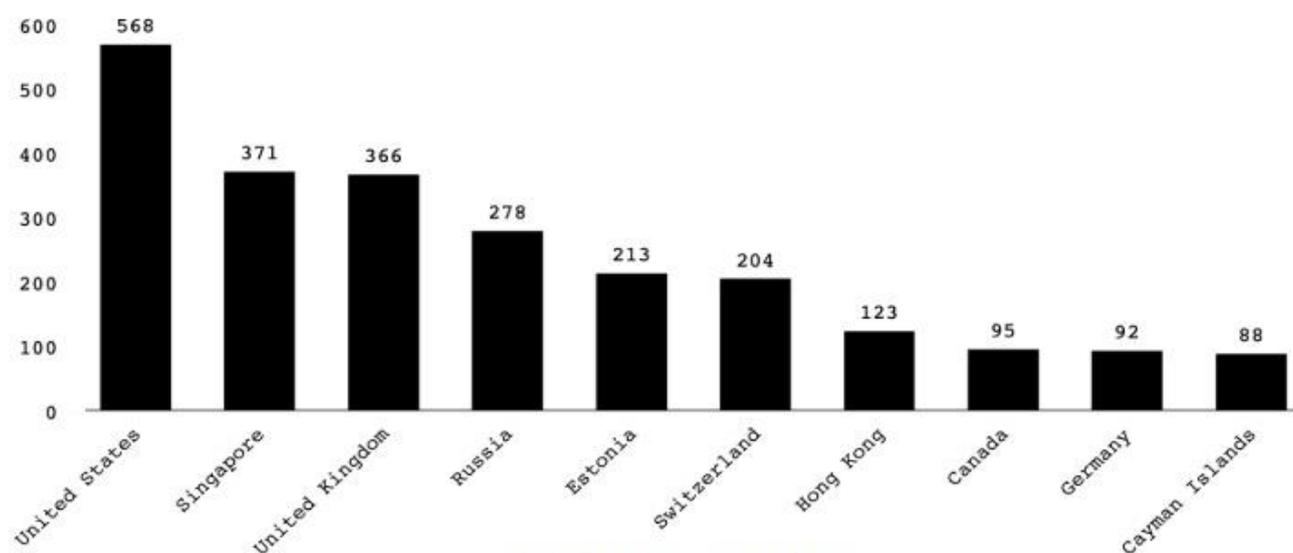
Before going more in depth in all other aspects regarding ICOs, I believe it is worth providing an overall picture of what was the geographic distribution and the industry segmentation of the ICO phenomenon worldwide since its beginning until May 2019 as reported in the paper by Momtaz et al. (2019).

Figure 2(a) illustrates the token offering activity by country. The market for token offerings is prevailing in the depicted 10 jurisdictions contributing more than 73% of worldwide token offerings. As it is possible to see there is a huge presence of ICOs in Anglo-Saxon countries, meaning that probably there is an important connection between ICOs and the financial culture of the county of origin of the management team. We can also see a very small ICOs activity in key countries of the EU area such as France, Spain and Italy. Finally, another very important observation made by the authors is that the dominance of countries such as Singapore and Switzerland is very likely due to the fact that they have

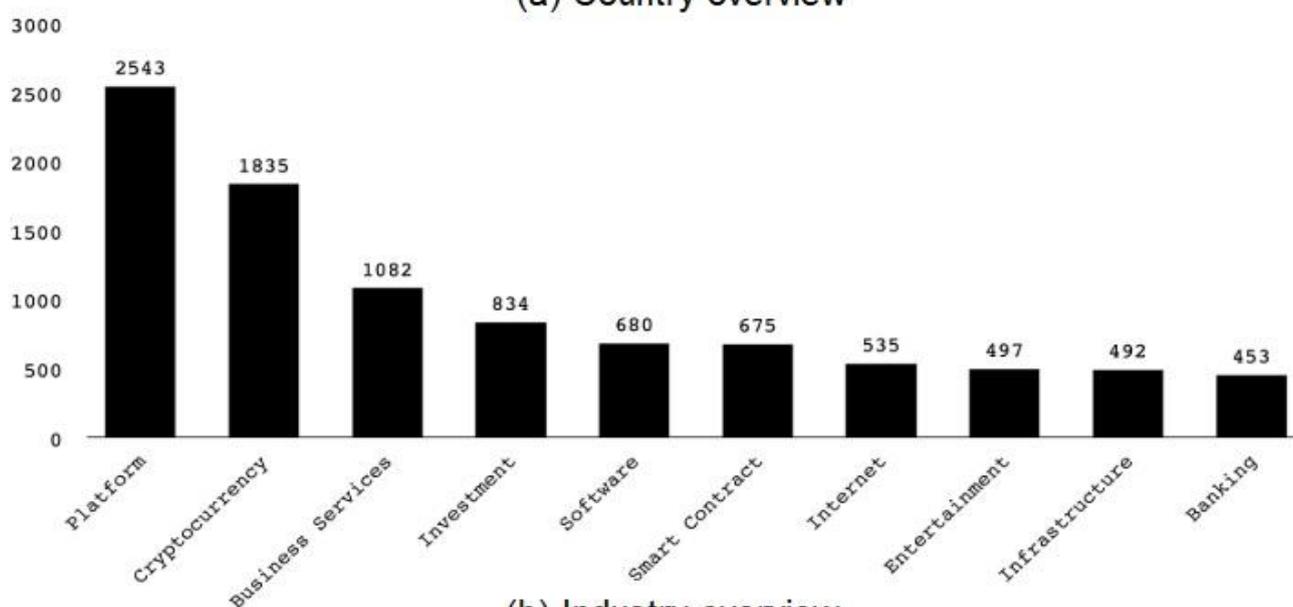
expressed regulatory standpoints that promote token offerings meaning that ICO activities foster more in markets with regulatorily mild circumstances and a lower degree of legal uncertainty.

Figure 2(b) shows, instead the distribution of ICOs per industry. The main share of token offerings takes place in platform services, cryptocurrency and business services, suggesting that probably we are still in an embryonal state of ICOs in term of application in the most variety of traditional industries, even if the authors highlight that even in industries such as healthcare and utilities, firms found ways to operate in the token market benefitting of innovative business models based on blockchain services.

Figure 2 – Token offering activity by country and industry



(a) Country overview



(b) Industry overview

Source: Momtaz, Rennertseder and Schröder (2019) – P. 15

1.3 The Advantages and Risks of ICOs

In this section we will analyse benefits and risks intrinsic of ICOs highlighted by the literature, in order to have a comprehensive picture about this phenomenon. Starting from the advantages and concluding with risks.

1.3.1 – Advantages

The *first* advantage, as reported by Howell et al. (2018), is that ICOs permit the venture to raise financing from future users when token issued are “utility” ones representing the right to access a future product/service developed in the platform (See section 2.2). The implication is that through ICOs companies can have an early signal about customers’ demand form their products/services, which, in turns, leads to better informed investments in building up all the ecosystem.

The *second* advantage reported by the same authors is that “utility tokens” combine payment and investment functions in a single instrument. This is completely different from traditional companies, where equity-holders who have claims on future cash flows are distinct from customers. This advantage could potentially redistribute network growth gains from financial intermediaries such as VCs to developers and consumers, thus “democratizing” investment opportunities in new ventures.

Another advantage is connected with lower transaction costs when using native tokens to purchase company’s products and services, instead of using other cryptocurrencies or Fiat currencies (Howell et al., 2018). It makes, all other else being equal, much more attractive products and services based on the blockchain, than traditional ones.

A *fourth* advantage is that, contrary to other sources of funding, ICOs allow promoters to avoid sacrificing equity in exchange for funds. Moreover, ICOs providing low barriers to entry for potential investors, increase the heterogeneity of start-up funding (Kaal, 2018). Finally, as reported by the same authors, ICOs are increasing dramatically efficiencies for capital formation, because they bypass the typical legal and business requirements by directly marketing to a worldwide pool of investors.

The *fifth* advantage, as reported by Kaal (2018), is the liquidity. Crypto exchanges provide access for tokens' trading from the earliest possible moment in the lifecycle of the business. In many cases, the token is tradable for cryptocurrency or Fiat currency within a few days from the ICO (Howell et al., 2018). However, as reported by the same authors, two considerations have to be made. First, some ICOs have lock-up periods, during which ICO participants may not sell their tokens. Second, liquidity is not guaranteed, because even if tokens are listed, a holder may not be able to find a counterparty if the surrounding project is not enough interesting.

Finally, ICOs financing allows entrepreneur to access a potentially unlimited investor pool thanks to the possibility to receive funds from retail investors all over the world (OECD, 2019). In traditional sources of financing, instead, entrepreneurs and SMEs typically are able to collect funds only locally either by a restrict number of big investors such as, VC and business angels or through the traditional banking system.

1.3.2 – Risks

Turning now to talk about risks and drawbacks of this source of funding, the first highlighted by Kaal and Dell'Erba (2017), is that in ICOs there are usually *intangible or no products*. As the authors continued in their paper, usually an ICO is launched when there is only the idea of a product based on a basic crypto platform, therefore initial investors invest in the future promise of the idea associated with the platform. While that works well with core infrastructure products such as Ethereum, many other platforms struggle to actually maintain that promise. A research of Ernst & Young made in 2017 highlight that actually only the 5% of their sample had pre-existing products at the time the ICO was launched, 11% could show prototypes and the majority, 84% were still in the idea stage. Furthermore, after a year of the 84% projects in the idea stages, only 8% percent became a final product and another 5% became a prototype. The 71% of ICOs projects after a year from the fundraising campaign were still in the idea stage (Ernst & Young, 2018a).

The problem is that basically, investors invest in something worth nothing hoping that it will raise in the future when the product/services are launched, and the crypto platform start to be used actively by people.

Associated with the lack of an existing product at the launch of the ICO, there is the *inability* of most crypto platforms *to generate*, during their lifetime, *revenues* to offset costs like traditional businesses and for that reason, ICOs' revenue are often required to last for the lifecycle of the platform. Accordingly, crypto platforms usually need to set aside a large number of tokens for future funding needs. Increasing the supply of platform tokens to satisfy future funding needs and the resulting dilution because demand for the tokens decreases if supply increases means that token holder's token value can be diminished without their ability to protect themselves against such events. To protect token holders against such supply side induced devaluation of tokens, issuers can include lock-up periods for tokens, which prohibits new emissions until certain objective are reached. Obviously, issuers have to face a trade-off, because this choice also decreases the flexibility to raise additional funds when needed. Therefore, the only real control token holders have to protect themselves is to sell their tokens post-ICO (Kaal and Dell'Erba, 2017).

A third problem related to ICOs is that "*early liquidity creates high volatility*" (Kaal and Dell'Erba, 2017). As the same authors explained in their paper, unlike any prior financing vehicles, ICOs provide the highest possible liquidity for investors, even if few information about the company are available. Traditional business, instead, encounter liquidity only after a long path made of reporting requirements under securities laws, accounting standards, legal infrastructure requirements for several years.

It creates a serious problem for investor protection, because this fast liquidity is often used by speculators who buy at large discounts in the very early stages to sell their token thereafter generating huge returns. Eventually this creates high volatility, because once sold given the very low level of information available, it is very difficult for investors to be able to invest properly, thus creating a situation in which there is little demand for tokens, which devaluate progressively until the moment when the platform is really able to prove its goodness to investors, activating a reverse mechanism. This mechanism makes prices highly volatile, thus unattractive for investors until the platform become useful (Ernst & Young, 2018a).

A fourth problem is the *weak legal protection* granted to ICOs' investors as reported by Zetzsche et al. (2017). Information provided by many ventures during they marketing activities is inadequate and consists, typically, of a description of technology that they wish

to develop and often little else about risks of unsuccess related to the project and who really stand behind the ICO itself. In conditions of such low disclosure and little information available, the impact of traditional laws liabilities as correcting factors are strongly limited (Zetzsche et al., 2017).

Worsening even more the situation, there is a *lack of a clear regulatory framework*, which increases dramatically the uncertainty and decreases, correspondently, the safety of investments in the ICO market (Kaal and Dell'Erba, 2017). In the next chapter we will analyse more in depth the topic of ICO's regulation, but what is important to highlight here is that a regulatory environment like that exposes investors to potential huge "scams". As reported by Kaal and Dell'Erba (2017), "scams", also called "zombie ICOs", are ICOs with really very little chance of creating a successful market for their tokens, because funders are not even able to answer core questions in their Whitepapers or doubts by possible investors. Obviously, they are an extreme situation, which was quite common especially in the earlier stages of ICOs' development, where funders after having collected a few millions through an un-capped ICO, then disappeared without even never launching the actual platform. Fortunately, the regulation scenario partially changed in the mid-time and those situations are no more very common, however there are still some aspects, highlighted by Kaal and Dell'Erba (2017), which should make investors doubting about ICOs, for instance:

- If the issuer allows the tokens to be traded before underlying protocol network or application is live;
- If there is not a clear cryptocurrency conversion plans into actual company reserves of the collected proceeds during the fundraising campaign, providing thus a sense of certainty about the future use of the funds collected;
- If there are manipulations to the smart contract in order to change ICO sales rules mid-course during the ICO.

The uncertain regulation scenario may have also an effect either on the success of the project launched, or on the value of the tokens themselves. In fact, as reported by Momtaz (2018a), ICOs project might be highly sensitive of future regulatory actions, such as the application of a very sophisticated regulation or a completely ban of ICOs. For the authors, regulatory actions as the one just reported could lead to an important depreciation of the token value, but even the completely bankruptcy of the project itself.

These considerations suggest that it might be better for ventures willing to launch an ICO

to carry it out in countries with an already affirmed regulatory framework, even if requiring an high level of compliance, in order to avoid subsequent problems related to changes in the regulatory environment of the county in which the ICO was launched.

A further risk is related to the fact that Crypto businesses typically *open source codes*. It means that a token issued to the public, can at any time be recreated in another token with the same or essentially the same features at marginal costs (Kaal and Dell'Erba, 2017). However, this risk can be easily mitigated if the venture is able to easily create a network effect around its project, by reaching in short time a critical mass. In this case, even the best possible substitute token created will be dead as the history explains us with many different examples.

However, not only there is the risk of being copied by competitors, that as we just said is intrinsic of any industry, rather it provide the possibility for hackers to manipulate the code and steal all the funds raised during the ICO (Momtaz, 2018a). This is, in particular, what specifically happened to the most successful ICO of 2016, The DAO, an uncapped ICO that eventually met a tragic end. After having raised over \$150 million, due to a bug in the smart contract, hackers managed to steal approximately one third of the funds shortly after the fundraising campaign. The Ethereum community in this situation had opted for the hard fork, restoring the blockchain to the original pre-DAO state, and the funds were returned back to the DAO investors.

There is, also, the risk of *investors' security* which may face hack attacks during tokens purchase. As reported by Ernst & Young (2017), the most common method used by hackers is the so-called "phishing" in which they basically re-create web pages identical to those of the company launching the ICO in order to receive the funds from investors, which after having contributed, they actually do not receive any token in exchange.

Another very common method is to steal investor's information, such as: photocopies of ID documents, credit cards, phone numbers and bank or wallet details during the transaction and then used by hackers for illicit activities (Ernst & Young, 2017).

Finally, a very important risk is that *money raised* through ICOs actually *come from illicit activities*, such as money-laundering, tax evasion, kidnappings or robberies (Cohney et al., 2019). As reported by the same authors, this may explain the reason why, especially in the early stages, investors did not seem to care much about high-flying business plans found

in ICO Whitepapers or many other problems linked to ICOs, because, rather, they probably treated all ICOs like new printings of black-market money.

1.4 Comparison of ICOs with main alternative sources of funding

Cohney et al. (2019) explained very clearly the possibilities traditionally in the hands of start-ups when evaluating how to obtain seed financing. Specifically, imagine the situation of a group of entrepreneurs who want to create their own business and launch their products. Their first need is to obtain sufficient seed capital to develop the entire company and everything related. One option is to access the traditional banking system seeking for a business loan. Alternatively, they may try to obtain a few rounds of private venture capital funding, which if successful, might then lead to become a public company on a top stock exchange. The purchasers of those shares would then possess a series of rights to govern the corporation, together with residual claims on its assets in proportion to the number of shares they own (Cohney et al., 2019).

However, the recent financial crisis strongly affected the ability of the traditional banking system to supply a sufficient volume of loans market participants, phenomenon called credit crunch which lead to an even worse crisis (Boreiko and Sahdev, 2018). Bank loans have always been a key type of financing especially for European companies, the major favourable reason being the possibility to obtain financing without having to sell portions of equity. It is worth highlighting, however, that the suitability of this form of financing for start-ups highly depends on their development stage. In case of really seed financing, due the high level of risk of unsuccess and the inability to provide adequate warranties for the repayment of the debt, there are, usually, other preferred sources of funding.

Venture capital (VC) represents the main, and sometimes the only source of financial capital for potentially high-growth small and medium ventures. It is a form of equity financing where the outside investor provides, aside from external financing, also management expertise (Boreiko and Sahdev, 2018). However, obtaining rounds of investments from a VC for a company with an unproven track record and an inexperienced team is extremely complicated. Even if the VC agrees, he will likely insist on getting a large share of the ownership and having control over many aspects of the firm's management. This strong supervision can, however, provide benefits to the company letting the founders

more focused on the technology than the business (Conley, 2017). Private equity is one of the most diffused ways of funding start-up, especially in Anglo-Saxon countries.

Initial public offerings (IPOs) market are, instead, another traditional way to raise capital either available to rather large or successful firms or used as an exit option for VC funds. Offering shares to the general public require a lot of attention from the regulators and a lot of requirements for public disclosure of internal information, ending to be very costly (Boreiko and Sahdev, 2018). As reported by Conley (2017), doing an IPO costs a few million dollars plus about 7% of the capital raised. Thus, it is not a practical option for small companies seeking to raise modest amounts.

In response to these few options to obtain seed financing, in the last years emerged crowdfunding and peer-to-peer (P2P) platforms that connect lenders with borrowers through online platforms leading to the creation and explosive growth of what is called an Alternative Finance sector (Boreiko and Sahdev, 2018). The basic idea of crowdfunding is to raise money from many small investors, in small amounts, over the Internet (Benedetti and Kostovetsky, 2018). As reported by Boreiko and Sahdev (2018), crowdfunding having started from donation-based or reward-based, eventually turned out to be an alternative instrument to attract the needed seed capital for entrepreneurs or small firms that have limited access to more traditional financing sources, called equity-crowdfunding. A detailed explanation of all the different types of crowdfunding is provided by Mitra (2012).

Similar to crowdfunding and conventional IPOs in some respects, but completely different in many others are ICOs (Boreiko and Sahdev, 2018). ICOs allows entrepreneur to fundraise their activities and projects directly from the crypto community, bypassing both banking and non-banking entities, such as Venture Capitalists (Bourveau et al., 2018).

ICOs share, on the one hand, some characteristics with the secondary market created of IPOs, where firms sell a fraction of their equity to the public in a stock market (Huang et al., 2019). In both cases, participants exchange money for instruments that have some monetary value and are traded on the secondary market, with prices based on the market clearing mechanism (Bourveau et al., 2018). On the other hand, ICOs share similarities also with crowdfunding, where proponents raise money from a heterogeneous set of retail investors through online platforms (Huang et al., 2019), which facilitate transactions and, furthermore, both are suitable for start-ups in early stage financing (OECD, 2019).

An ICO is simply a hybrid crowdfunding campaign (Dittmar and Wu, 2019), that can theoretically be structured as a perfect substitute for all other funding mechanisms (Amsden and Schweizer, 2018). The idea is that an entrepreneur without access to public equity and debt markets having a positive-NPV project requiring external capital to develop could potentially finance it since through ICOs (Dittmar and Wu, 2019), because all the components and attributes of crowdfunding and security issuance are possible (Amsden and Schweizer, 2018). In particular, even if ICOs are a hybrid instrument sharing many features of other traditional corporate finance instruments, actually, their overall riskiness profile is very similar to the one of equity financing, mainly in its very early stage (i.e. Business angels and Venture Capital investments).

Aside from similarities, ICOs share also lot of differences with traditional sources of funding like crowdfunding and IPOs. We will now analyse singularly these differences, starting from crowdfunding and concluding with IPOs.

1.4.1 – Comparison between Crowdfunding and ICOs

When talking about differences, it is very important to consider what we are actually comparing. In fact, as reported by Mitra (2012), there exist three different forms of *Crowdfunding* (*donation, reward, equity-based*) and also three different type of *ICOs* based on the token issued (*utility tokens, security tokens, cryptocurrencies*), which will be analysed in the next chapter.

Reward-based crowdfunding are the most similar to ICO issuing *utility tokens* (that will be analysed in section 2.2), because both give the possibility to obtain something “for free” after having initially contributed in the venture. In both cases, in fact, it is possible to access, thanks to the investment made, to the products and services launched by the new created venture (Mitra, 2012). Therefore, it is a way for firms to pre-sell their products/services that have still to be built (OECD, 2019). However, there still remains a difference between the two because while in reward-based crowdfunding pre-sold products and access rights are non-transferable, utility tokens are freely tradeable on crypto-exchanges, thus giving investors almost immediate liquidity (Dittmar and Wu, 2019).

Also, *equity crowdfunding* and ICOs issuing *security tokens* (that will be analysed in section 2.2) share, in some sense, similarities, because both provide their investors with rights typical of traditional stock markets, hence dividends and voting rights. However, here the main and substantial difference is that while in the case of equity crowdfunding the company provide a portion of its ownership to investors (Mitra, 2012), in the case of ICO issuing security tokens, these rights do not involve the cession of ownership stakes in the company (OECD, 2019).

For what concern, instead, ICOs issuing *cryptocurrencies* and *donation-based crowdfunding* platforms, they are completely different and are the initiators of the two concepts (respectively ICO and Crowdfunding) then expanded and hybridized with other types of financing.

Generally speaking, the most remarkable difference between *ICOs* and *Crowdfunding* is that the latter investment is less liquid. In case of Crowdfunding it is very difficult to sell the right/stake coming from the investment made. Vice versa, when considering tokens generated in an ICO subsequently listed on exchanges, they provide the buyers liquidity and a potentially positive rate of return when they are sold at a higher price (Lee et al., 2018). To make a very simple similarity, it is like comparing on the one hand a company with stock issued on stock exchanges, and on the other hand a company with an ownership distributed among a quite large number of individuals, but still private. The former case has much higher rate of liquidity, just for the fact of being listed on the stock exchange which increases exponentially the demand for its shares.

Another key difference is that ICOs to be launched do not require any form of intermediation, while crowdfunding projects still need a crowdfunding platform as intermediary. However, it is worth saying that the fees to be paid to the platform (such as Kickstarter) are much lower than the ones required by an investments bank to launch an IPO (OECD, 2019).

Finally, as reported in the OECD paper (2019), an important divergence between the two types of financing lies in the pricing of the products. While a firm using crowdfunding as mean of financing, allowing for the pre-purchase of its products, needs to set the price of its products in advance, a firm launching an ICO do not require to do the same (OECD, 2019).

1.4.2 – Comparison between IPOs and ICOs

Moving to the differences between *ICOs* and *IPOs* which at the first glance seem to share lots of similarities, actually they present even more differences than what expected.

First, the regulation between the two markets is very different, with *IPOs* following a strict process defined by regulation where compliance is costly and mandatory, whereas *ICOs*' regulation is still developing among countries and in any case has fewer overall requirements (Bourveau et al., 2018). As reported by the same authors, there is usually little information available about the issuer performing an *ICO*, and none of the documents voluntarily shared during the *ICO* process, such as the Whitepaper, are audited. This explains why *ICOs* can be performed in a few weeks, in contrast to *IPOs*, which can take months to complete due to the auditing process, the need to put in place adequate internal controls, governance mechanisms and the extensive legal documentation requirements.

Second, while *IPOs* are typically conducted by firms with well-established technologies and products, the vast majority of *ICOs* are for projects that are at a very early stage, and only a few of the entities have pre-existing products (Benedetti and Kostovetsky, 2018). As already reported in the previous section, the researches by Ernst & Young (2017; 2018a) highlight that the 84% of their sample had only an idea in the *ICO* stage, and even after a year the 71% of them continued to have only an idea instead of a final product or a prototype. Put into another way, *ICOs* financing is most of the time project-based, allowing, thus, the specific projects to be undertaken, while in *IPOs* the financing is mainly company-based (OECD, 2019).

Third, from a traditional governance perspective, *ICOs* lack in several dimensions, including voting rights (they are intrinsic only of some security tokens which will be deeply analysed in section 2.2), anti-dilution protections, specific information on the use of proceeds, formal reporting and auditing mechanisms and elected board of directors to manage and oversee the entity (Bourveau et al., 2018). Moreover, token holders often are unable, unlike shareholders in traditional governance structures, to vote for or against directors or to nominate directors. While institutional investors may still have a strong bargaining power on the founders, retail investors typically don't have such influence and as only real control power they can decide whether to hold or sell their tokens when listed

on an exchange (Kaal and Dell’Erba, 2017). The same authors highlight that, again excluding security tokens, the majority of token issued typically do not convey also dividends rights, contrary to stocks and, in case of bankruptcy, the majority of token holders do not have neither any claim on the assets of the company.

Fourth, ICOs do not require the support of investment banks as underwriters, thus removing associated fees for the issuer and becoming far less expensive than IPOs (Kaal and Dell’Erba, 2017). To begin the IPO process, a firm absolutely needs an underwriter who helps the company in all the process starting from building-up the Prospectus, conducting “road shows” to meet potential investors and, finally, building a “book” by accepting orders from investors, who indicate the number of shares they desire and the price they are willing to pay, process needed to set up the public price of the IPO (Lee et al., 2018). Everything just said is not required in the ICO process leading to an overall less professional and self-made process.

Fifth, ICOs and IPOs vary in their pricing and valuation. For what concern stock prices, they should reflect the net present value of expected future company’s cash flows, applying the corporate finance theory on the company fundamentals (OECD, 2019). For crypto tokens the pricing should reflect an equilibrium between *token demand*, driven by the present value of expected future exchange within the token’s native ecosystem, and *token supply*, driven by the token’s monetary policy (Cohney et al., 2019). However, the complexity in measuring value creation and network effects, together with difficulties in applying standard corporate finance theory on blockchain-based networks, makes token valuation highly challenging (OECD, 2019).

Dittmar and Wu (2019) reported, nonetheless, that, as demand for issuer’s products increases, access rights to the product would become more valuable. The value of tokens offering these access rights would serve as a proxy for future consumer demand, thus future cash flows.

Sixth, while traditional capital market transactions are heavily mediated by laws, regulations and contracts, ICO transactions replace those mediators by executing and controlling transaction through codes written in smart contracts (Cohney et al., 2019).

Lastly, while IPOs allows future stock offerings, ICOs limit that flexibility of the issuer because the tokens created are limited and set prior to the launch of the ICO. If the venture wants to issue tokens in the future, it will need to reserve, during the ICO, a portion of tokens initially created. However, this choice is very important because it has a great effect on token valuation (OECD, 2019).

Furthermore, it is worth mentioning that, in contrast to both *IPOs* and *reward-based crowdfunding*, *ICOs* could have more than one price. This is because issuers could offer various discounts to early participants in the campaign. These practices make computing the ICO return nontrivial, which is mostly computed by using the highest “public sale” price as the main ICO price (Dittmar and Wu, 2019).

1.4.3 – Connections between Venture Capital funds and ICOs

To conclude, very important are also the connection between *Venture Capital funds (VC)* and *ICOs*. As reported in the paper of OECD (2019), VC funding can be considered to be complementary to *ICOs* offerings. However, they participated in a number of *ICOs* offerings either at the pre-ICO stage by taking part in private pre-sales or by funding the expenses of an *ICO*.

Such interest demonstrated by VC funds should be benefitted by start-ups undergoing *ICO* offerings, in order to take advantage of the non-monetary backing provided by these funds, consisting of expertise, industry knowledge, network of contacts, as well as managerial and strategic assistance. Substantially, VCs provide "coaching" to start-ups and play an active role in the monitoring of a firm's evolution (OECD, 2019).

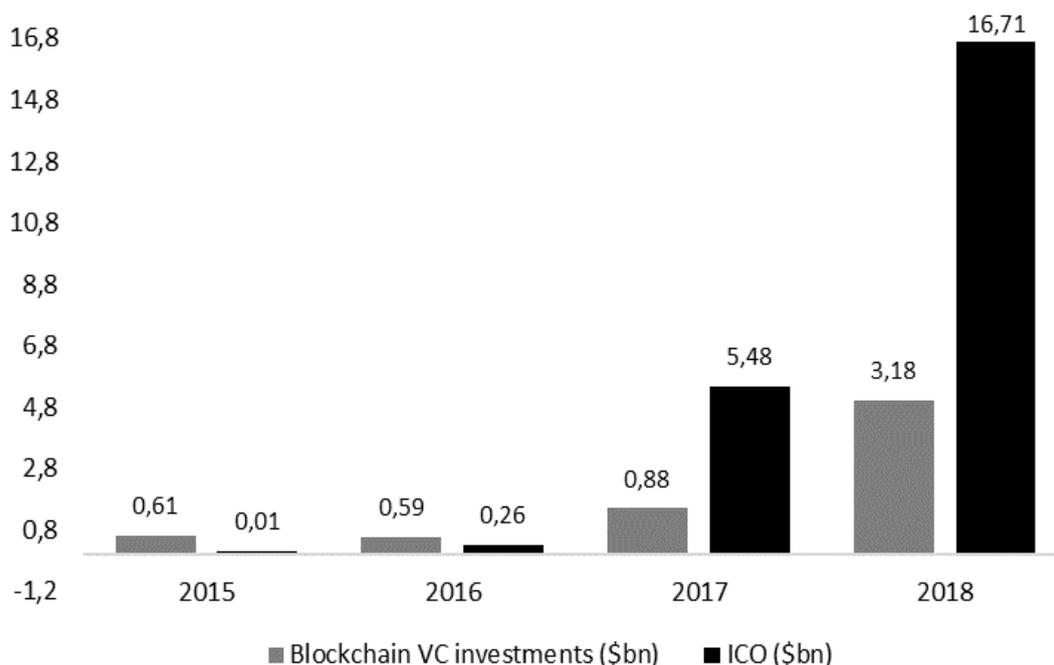
On the other hand, as reported in the same paper, *ICOs* are attractive also for VC funds themselves, because contrary to traditional investments in early stage financing which are extremely illiquid, taking usually several years for the fund to be able to exit the investment, *ICOs* offer them immediate liquidity by having the possibility to trade the tokens purchased on crypto exchanges.

1.4.4 – Size comparison between ICOs, IPOs and VCs

After having investigated all the similarities and differences between ICOs and the alternative sources of funding, it worth providing an overall picture of the volume of the ICO market over years, in comparison to the ones of the main traditional sources of funding: the Initial Public Offerings (IPOs) and the Venture Capital investments (VCs).

One of the main observation highlighted in many literature's studies, among which Kaal et al. (2017) and Ernst & Young (2017), is that the exponential growth of ICOs since 2015 culminated in 2017 with ICO fundraising outperforming Venture Capital investments in blockchain projects. This result can be observed in *Figure 3*, in which has been plot the volume of ICOs and blockchain VC investments, gathered from Coindesk (2018), in the timeframe 2015-2018. As it is possible to see, the ICO market largely surpassed the traditional VC investments in blockchain projects in 2017, thus highlighting the relevance that this innovative source of funding gained over traditional ones for supporting the financing of early stage start-ups in the blockchain industry.

Figure 3 – ICO vs Blockchain VC investments (volume in \$bn)

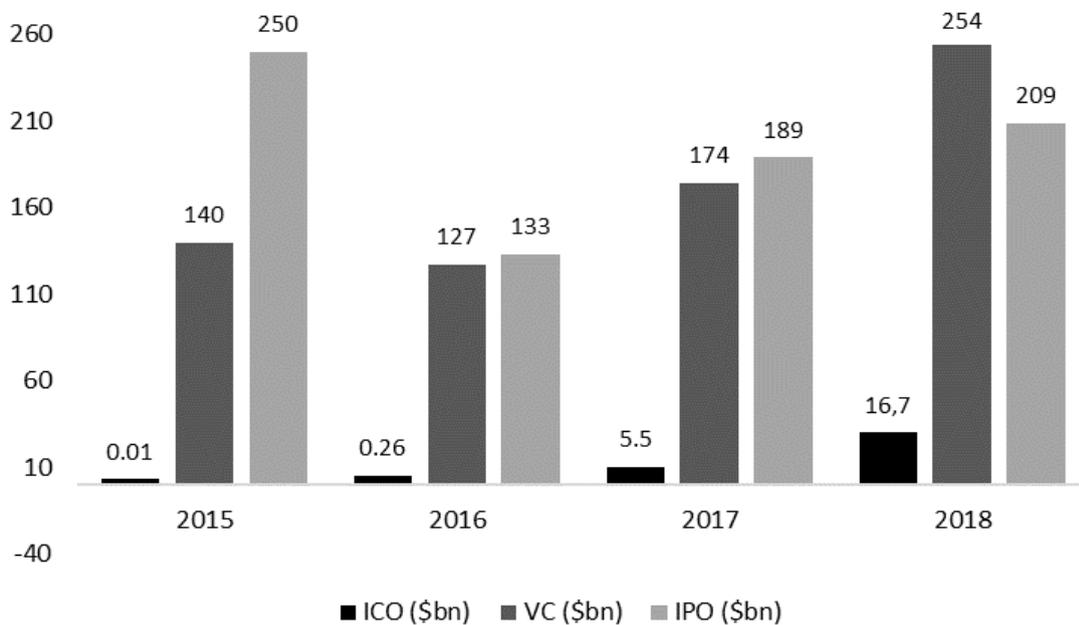


Source: own elaboration

However, the size of the ICO market suddenly become marginal when compared to the global volume of the IPOs and VC investments, as displayed in *Figure 4*, constructed with datas gathered from Coindesk (2018) for ICOs, KPMG (2016;2018) for Venture Capital investments and Ernst & Young (2018b) for IPOs.

The below reported graph clearly highlight the fact that the ICO market is still very marginal with respect to traditional sources of funding like IPOs and VC investments, with the former being in its most hyped period (i.e. 2018) only the 6,6% and the 8% of IPOs and VCs respectively. This result, a part from being a clear indication of the current marginality of the ICO phenomemon in the Corporate Finance domain, points also out the relatively low mainstream diffusion that the blockchain technology still has at the time of writing. Therefore, Initial Coin Offerings are far more interesting to be analysed for the innovation they could potentially bring when being applied for Corporate Finance purposes, rather than for their relevance in terms of size with respect to the other financing tools available for firms.

Figure 4 – ICO vs VC vs IPO investments (volume in \$bn)



Source: own elaboration

2 Technical consideration about ICOs and their regulatory environment

2.1 ICO process and design choices

In this section we give an overview on the ICO process to arrive to the actual public tokens' sale and we also provide some insights on the design choices for the ICO itself.

Starting from the ICO process, Ofir and Sadeh (2019) in accordance with the literature, divide it in three phases: Pre-ICO, ICO and Post-ICO. This division will be used for the rest of the work, specifically in chapter 3 we will analyse in detail the Pre-ICO phase, while in chapter 4 we will provide an analysis of returns in the Post-ICO phase.

2.1.1 – Pre-ICO phase

Within this phase we may distinguish a number of many different activities carried out by the venture in order to be able to conclude a successful ICO.

Once having created the core team with which there is a common vision over the development of a project, all successive activities until reaching the ICO itself are marketing based, needed to generate an interest to investors in the project to be developed (Momtaz, 2018a).

The first step is the *Initial announcement* in which the project is generally launched on the web, mainly through social media (i.e. Facebook, Telegram, Slack, Twitter) and cryptocurrency forums, such as Bitcointalk or Cryptocointalk (Ofir and Sadeh, 2019).

The announcement is usually followed, as reported by Kaal and Dell'Erba (2017), by an "executive summary" in which the project is presented to investors in order to obtain an early feedback by them. Comments on the project are, then, considered carefully by the management when drafting the Whitepaper.

Aside from all marketing activities carried out through social media, Ofir and Sadeh (2019) highlight also some *marketing programs* used by companies:

- *Bounty programs*, in which a venture offer digital tokens in exchange for performing certain tasks. For example, an ICO may reward rating websites for writing an article about the ICO, or individuals for translating their documents into different languages or fixing bugs in the underlying code (Ofir and Sadeh, 2019).

- *Airdrops*, in which a venture distributes digital tokens to investors entirely for free, in exchange for following the venture in social media channels. The rationale behind is to raise as soon as possible the critical mass able to generate network effects, increasing, thus, the awareness of the project and encourage the token's adoption (Ofir and Sadeh, 2019). Although such mechanism enable the rapid creation of the network around the platform, participants' incentives might only be used to speculate, therefore the utility become null (OECD, 2019).
- *Smartdrops*, which operate similarly to airdrops with the difference that they do not distribute tokens randomly, but only among those users with interest in the specific platform's innovation. Hence, they are a popular way of introducing the new technology to really interested potential early adopters and experiencing a fast community growth (Momtaz et al., 2019).

The second step reported by Ofir and Sadeh (2019) is the publication of the *Whitepaper*, that has the main purpose of disclosing all relevant information about the project, the ICO and its features, just like the Prospectus of an IPO, in order to support potential investors in their assessment of the project (Kaal and Dell'Erba, 2017). The main difference obviously is the fact that the latter is strongly regulated in terms of disclosure content, while the former not, therefore its structure and what information to include is a complete choice of the management team.

For the reasons just explained Whitepapers vary dramatically in terms of content. They generally include information about: the business model; the technical aspects and the source code; the type of token issued; the token supply and allocation rules; statements on the use of proceeds raised; information about the issuing entity and of the management team; the law applicable to the ICO; currencies that will be accepted during the token sale; and the project's course of development, also called roadmap (Ofir and Sadeh, 2019).

An important observation made by Kaal and Dell'Erba (2017) is that Whitepapers are not audited by any authority. Therefore, these preliminary steps are crucial for the issuer in order to build a general market credibility and investors' trust in the soundness of the project.

Usually together with the publication of the Whitepaper, companies also release the underlying code on an online code-repository, such as GitHub, giving the possibility to potential investors to access and analyse the code and, thus, making a more complete view of the whole project (Ofir and Sadeh, 2019).

The last and very important step in the Pre-ICO are the *pre-sales* and *private rounds* in which the venture set a low desired fundraising amount and offer its tokens to a group of selected investors at a discount with respect to the actual ICO (Momtaz, 2018a). The objective is multiple: *first* to finance the costs of promoting the ICO in the preliminary stage; *second*, as it happens in the book-building process in IPOs, early investments rounds provide an indication of the demand for the token, thus helping to determine an appropriate price for the launch (Ofir and Sadeh, 2019). *Third*, it may be useful to certify the issuer, particularly if well-known experts or institutions participate (Howell et al., 2018). The target group of investors in the pre-sale are usually large investors, mainly institutional one or venture capitalists offering them huge discounts in exchange for investing in early stages, thus taking more risk (Kaal and Dell’Erba, 2017).

2.1.2 – ICO phase

The ICO is the phase in which the main portion of token is sold to the public, hence to retail investors. There are two ways to conduct an ICO: either to be based on an own blockchain or to use a blockchain already established which allows to run smart contracts on it. In real world, most ICO are conducted using the Ethereum blockchain, which allows with its standard called Ethereum Request for Comment 20 (ERC20) to create token of other companies willing to base their projects on the blockchain. This protocol provides a list of rules that a token built on the Ethereum blockchain has to implement. The process of creating a token is very straightforward and a token can basically be created within minutes. The code can be downloaded from Ethereum’s website and then easily be manipulated along a dimension of parameters (Momtaz, 2018a).

The code over which companies write all the parameters linked to the ICO is a smart contract, that, as reported by Momtaz et al. (2019), works as follows: “*If investor i sends funds in the amount of x to token issuer j , then i automatically receives y tokens from j in exchange, where x/y is the exchange rate that has been fixed ex ante in the smart contract*”. The founding team basically creates an address to which the funds will be sent. The token will, then, be paired with other currencies, either cryptocurrencies or Fiat ones, that the project accepts as payment for its token (Momtaz, 2018a).

In terms of the amount of money raised, ICOs can be *capped* or *uncapped*, which is determined by different fundraising goals.

In the case of *uncapped ICOs*, the entity is willing to accept as much as it can raise. Large proceeds are a striking feature of many ICOs, however, it may also lead to some problems, such as unwanted publicity and the agency problems that arise when the founders have a large cash cushion (Howell et al., 2018).

In the case of *capped ICOs*, instead, the entity sets a limit on the funding accepted. In the choice of the capped amount ICOs usually seek to finance a specific development objective, and aim to raise a fixed, budgeted amount. Excess funds received over the limit are, eventually, returned to investors (Bourveau et al., 2018).

It is important to notice, however, that having an unlimited number of tokens sold during the sale brings the obvious risk that that buyers do not know what share of total supply a token represents. Moreover, not setting a cap on the total token supply can ultimately lead in an even lower token value with respect to the case of a capped ICO (Howell et al., 2018).

In both cases the venture can set a so-called “*soft cap*” that corresponds to minimum threshold of funding accepted. Failure to reach the soft cap amount cancels the ICO, and the funds are returned to participants (Bourveau et al., 2018).

For what concern the *ICOs’ pricing*, the simplest and most common mechanism is to sell a certain number of tokens at a fixed price on a first come, first served basis. As previously said, a help in defining the right token price may come from the presale of tokens (Howell et al., 2018).

A different approach is, instead, to use the Interactive Token Offering. It is a method in which the total token supply is sold in proportion to the bid amount with an ex-ante fixed token price. This dynamic bidding system allows investors to voluntarily bid and withdraw their bid during the book-building process, which may result in an efficient price equilibrium (Momtaz et al., 2019).

Another method is the so-called Initial Supply Auction which is based on a mechanism that discriminates the token price. In particular, tokens are sold at a high price that decreases gradually until the funding demand is covered. However, this model has received criticism as it does not reward early investors for taking higher risk and signalling quality to the market (Momtaz et al., 2019). Therefore, the other most used pricing model is to establish increasing sale prices as the ICO goes on (Howell et al., 2018), in order to easily reach the

critical mass needed to establish network effects and at the same time to reward with potential higher return for first movers.

Another very important aspect to keep into consideration in the ICO phase is the *token distribution*. This aspect will be analysed in greater detail in the next section when talking about ways to create as soon as possible the critical mass needed to generate network effects. However, the basic idea behind is to distribute as many tokens as possible in the lowest time in order to reach that critical mass, but this might be difficult given that a single buyer can use many addresses and masquerade as many small buyers (Howell et al., 2018). For that reason, “Know-Your-Customer” methods are usually used, they are processes aimed at identifying and verifying the identity investors. Information usually provided include full name, address, citizenship, bank statements, utility bills, a photo with a certain code etc. This is a procedure, nowadays required by many governments, that may facilitate identify money laundering, terrorism and corrupt acts (Boreiko and Sahdev, 2018). This procedure, finally could be very useful also to avoid having the same investor with many accounts, thus providing misleading information to the venture about the state of creation the critical mass for having a network effect.

Distribution is also complicated by the fact that most ICOs precede network launch. The most common approach is to create a pre-functional token that is useful only for being issued and traded on secondary market exchanges. This pre-functional token may, then, develop utility value when the network is functional, or it may be exchanged for a new token that is native to the network (Howell et al., 2018). An alternative is to record sales and promise to deliver tokens once the network is functional, using what is called Simple Agreement for Future Tokens (SAFT). The idea is to offer investors the right to receive future tokens when either the underlying blockchain isn't already been developed, or when the platform/project behind a utility token is still in its early stages (Momtaz et al., 2019).

A further important decision to take into consideration during this phase is whether or not to *lock-up* the token supply. Many token contracts include vesting periods for founders, which may help align developer incentives with those of token buyers (Howell et al., 2018). These tokens are generally locked in smart contracts for a specific period or until certain development milestones have been achieved. Such lock-up mechanisms prevent founders from dumping their tokens after the ICO ends and may increase investors' confidence and certainty about the use of proceeds (Ofir and Sadeh, 2019). In absence of lock-up periods

for entrepreneurs issuing ICOs, another way to protect investors is the transfer of collected funds to custodians who will only give back the funds to the issuer upon achievement of pre-defined milestones (OECD, 2019).

Finally, the venture has to decide which *type of tokens to issue*, however, this aspect will be covered in greater detail in the next section (i.e. section 2.2 regarding token classification).

2.1.3 – Post-ICO phase

Once having completed the token's sale and having raised the desired amount of money, the issuer must decide whether to apply to list on an online exchange, and if so, which ones (Ofir and Sadeh, 2019). The listing enables tokens to be traded, hence it provides liquidity, which, in turns, attracts new investors and make it possible to use the tokens as an actual means of payment to buy company's products/services (Momtaz, 2018a).

The listing of tokens is not a guarantee of the ICO's success, rather as reported by Momtaz (2018a) the majority of the cryptocurrencies end their journey with a delisting that is effectively a project's death as there is no platform for the currency to be exchanged. In February 2018, 46% of 2017's ICOs were reportedly failed.

Moreover, in the aftermath of the ICO other important events may still happen considering that not all 100% of tokens are actually distributed in the ICO phase. A portion of them is usually reserved for founders, employees, and platform development and/or for incentivizing future network contributors (Ofir and Sadeh, 2019). After the ICO, given that token left to founders and employees usually have lock-up periods, once the threshold set in the previous phases are met, then those tokens became potentially available for sale and it might, also, imply a turnover in the management team, thus potentially destabilizing the entire venture. In case, instead, the tokens are kept at reserve either for the development of the platform or for increase the network effects in the future, in that phase the company has to take proper decision in these directions in order to be compliant with what disclosed in the Whitepaper, keeping always in mind that these decisions have a strong impact on tokens valuation.

Finally, as previously reported by Howell et al., (2018), the venture has the possibility to issue pre-functional tokens in case the underlying blockchain or platform/project isn't available at the time the ICO is carried out. These tokens simply provide an official record of the tokens sold during the main sale, and they are useful only for being traded on secondary market exchanges. Following the launch of the native platform, these tokens generate value when the platform becomes functional, or become converted into new tokens issued on the native platform (Ofir and Sadeh, 2019). After the ICO, therefore, the company has to comply with these obligations, and these choices are fundamental both for token value, which will become zero in case the native tokens are never released for whatever reason, and for the expansion of the network effect in the future. The latter, in fact, becomes a real effect only when the actual platform becomes functional.

2.2 Token classification and Network effects

Not all ICOs are equal, and usually the most important difference between them is due to the type of token issued. This theme is also very important because it is at the core of the debate about which is the most suitable regulation for ICOs, depending on the token issued.

Depending on which features are implemented on tokens, it may be possible to shape the issued tokens as something between venture capital financing, a crowdfunding campaign, and an initial public offering. There is not a unique standard for the token classification and different authors over the years provided their own view. We will now provide a classification that comes out from the previous literature and that in our opinion best describes the intrinsic features of each token:

- *Currency tokens* are digital currencies, with Bitcoin being the most known and established example. These tokens issued are meant to function as a means of payment for goods or services external to the platform (Hacker and Thomale, 2017). Hence, this category of tokens does not represent a stake in a third party but derives their value from regular market forces like a commodity (Momtaz et al., 2019).
- *Utility tokens* have the feature of promising investors to be able to use the token like a voucher for the company's products or services. These tokens do not transfer ownership or control rights, and legal investor protection for this token type is currently almost non-existent (Momtaz et al., 2019). Moreover, the utility component has the

characteristic to provide token holders with access to a function provided directly and only to them by the issuer, in contrast with currency tokens that, instead, enables holders to pay for goods external to the token platform (Hacker and Thomale, 2017).

According to Ofir and Sadeh (2019), utility tokens vary dramatically in their nature, and may therefore be divided into two subcategories:

- *Usage token*: A token that a user must hold in order to gain access to services a specific platform provides. An example is ether: in order to use the Ethereum network to create or execute smart contracts, a user must pay fees that can be paid solely with ether.
- *Work token*: A work token gives the right to contribute to a platform, and be compensated in exchange for this work, usually with a native token. An example is Augur's Reputation (REP), a platform for prediction markets. The outcomes of Augur's prediction markets are made by users called "reporters". Reporters report on a market's possible outcome and if the report is "true" (i.e., consistent with the consensus reached by the other reporters), the reporter will receive a portion of the settlement fees from the platform in REP coin.
- *Security tokens* are a broad category that consists of all tokens that grant their holders financial rights, such as equity/debt-like rights and under certain circumstances, tokens may also represent ownership of an underlying asset (Ofir and Sadeh, 2019). In most jurisdictions they are subject to securities laws as their value is based on the performance of the underlying asset since if it performs well, then the token gains value and vice versa (Momtaz et al., 2019). A sub-category of security tokens identified by the latter authors are *equity tokens* that represent 100% a common stock, in terms of rights attached to the tokens, hence voting and dividends rights in proportion of their share of tokens with respect to the overall token supply.

As we already exposed in the previous sections, the blockchain may be used to create a digital token in place of a variety of assets (i.e. gold, cars, securities, and bonds), through the use of a smart contract. Therefore, another subcategory of security tokens may represent either an ownership right or a right to participate in the cash flow generated by the underlying asset (Ofir and Sadeh, 2019). Think, for example, at the possibility to generate a cash flow from the sale of a real estate, or any other good, written on a smart contract.

The reason why many countries decided to apply the security regulation to this types of tokens, is that they can be clearly assimilated to derivatives. In fact, the price of

these tokens, just like the price of a derivative, is dependent upon one or more underlying assets, therefore their value is determined by fluctuations in the underlying asset they represent (Beers, 2018). However, traditional derivative models are much more structured than security tokens, because they include lot of different specifications about time constraints, right/obligation clauses and different settlement models. Furthermore, even if security tokens behave like derivatives, actually, they are traded more like first-tier asset classes (i.e. listed stocks, bonds etc). Therefore, given the highly uncertain regulatory scenario surrounding security tokens, it might be possible to assimilate the latter to Over-The-Counter (OTC) contracts, rather than to listed derivatives, since security tokens can be customized by the venture's founding team, without having to follow predetermined rules, as it would be the case if they were traditional derivatives (Beers, 2018).

It must be stressed that not only security tokens are a major concern from a regulation stand point, but even tokens that mainly aspire to serve as a utility token typically will have an investment component as tokens can be traded, and hence sold at a profit, in crypto exchanges subsequent to the ICO. Hence, they represent a particular, and novel, hybrid type of finance-consumption product (Hacker and Thomale, 2017).

In the remaining part of the section we will focus on what is the true innovation behind Initial Coin Offerings, that are utility tokens, which are also the most widely used. Even if it is true, on the one hand, that Bitcoin and cryptocurrencies in general are very important, since they are the origin of everything providing the opportunity for all other ICOs to come in the following years, it is also true that it will not be possible to have an infinite number of cryptocurrencies to choose from for our payments. Furthermore, security tokens are not the real innovation too, since they are substantially the representation of corporate finance instruments (i.e. stocks, bonds etc.) in the blockchain language.

Utility tokens, instead, are at core of ICOs because they allow to raise capital, without selling part of the company's ownership and, at the same time, creating a network effect around them. In order to have an appreciation of the token sold and the success of the platform/project launched, an active tokens' usage by investors is needed.

Cong et al. (2019) in their paper highlight two salient features shared among Utility token issued during ICOs: first, they are used as means of exchange on the platform, also referred as “*token embedding*”. Second, their use exhibits network effects, also called “*user-base externality*”.

For what concern the first point, as reported by the same authors, blockchain platforms often use native tokens to settle transactions among their users, and there are several reasons for this common practice:

- Transacting via a common token is convenient and saves costs of exchanging currencies. Of course, paying a product or service through blockchain technology in Fiat currencies or other cryptocurrencies involve the exchange of currencies, thus transaction fees which will lead that product to be overprized with respect to substitute product even outside the blockchain. Moreover, if a certain coin is not very liquid, as it may be probable the case of many tokens at their launch, there may also be the possibility of not being able to exchange it at all.
- In blockchain applications, using a common unit of account eliminates the balance-sheet risk that would arise if assets and liabilities were denominated in different units of account. It is common sense also in the traditional world, companies, in fact, keep their balance sheets in a unique currency, to simplify everything. In that case the currency is their own token.
- Tokens provide incentives for entrepreneurs, programmers and miners who contribute to the platform. This aspect has been previously analysed in the first section when talking about the functioning of the blockchain. The intrinsic functioning of blockchain technology, need a form of incentive for the miners that help in keeping track of all the transactions. However, it is particularly relevant for ICOs running their own protocol, while it is not the case for ICOs launched in already established protocols.

For what concern the second point, “*user-base externality*” has been well recognized as a defining feature of P2P platforms. The utility of tokens increases, when more people use the blockchain platform, and thus, it is easier to meet transaction counterparties (Cong et al., 2019). When there is this type of cross-side network effects each user of the platform cares about the activities of the others, because the user’s benefits from transacting within a platform increases as the total number of transactions on the platform increases too (Li and Mann, 2018). This network effect is not restricted to blockchain platforms and is particularly important in all kind of platform of sharing economy (such as Uber or PayPal),

social media (such as Facebook, Twitter, YouTube or WhatsApp), and marketplaces (such as Amazon or eBay) (Li and Mann, 2018).

The user-base externality is mostly important for Utility tokens since the success of the ICO itself is strongly linked to the active usage of the issued tokens among users in the aftermath of the platform launch. In a minor way, however, it is also relevant for the other two types of tokens.

An important observation reported in the paper by OECD (2019) is that value creation by network effects cannot be created when tokens are only used for capital formation by non-blockchain firms which are not interested on the creation of a community around the product/service. Only tokens which have a hybrid use, both as instruments for capital raising and as medium of exchange, lead to accelerated platform adoption through network effects. The fact that there is no value creation due to network effects in the case of ICOs for pure financing is perhaps the main argument against the mainstream diffusion of ICOs for SMEs.

To properly understand the way in which this network effects works, Li and Mann (2018) developed a model to analyse the coordination problem arising in cases of cross-side network effects. As the same authors reported, a coordination problem arises *“if either side believes that the other will not participate at any time, it is rational for this side to not participate either, so a no-trade equilibrium exists despite the fact that trading is socially valuable”*.

The authors, in particular, studied two different scenarios: they started from studying the coordination dilemma in the easier case when the platform has already been launched and then extended their finding to the case of ICOs in which the platform isn't operative. Furthermore, in the first case, when the platform is already working, they analysed two different scenarios: one with an external token used for transactions and the other in which, instead, are used internal tokens (token embedded).

What they showed is that a token specific to the platform can overcome this problem by serving as a coordination device among the users. Thus, their analysis explains why users are willing to purchase tokens that have no use outside of a specific platform, showing that the token is valuable to the platform precisely because it is worthless elsewhere, as this makes a purchase decision a credible commitment to use the platform.

Moving to the second case of the ICO, when the platform isn't already functioning, Li and Mann (2018) found that even in this situation there is a same-side network effect, because the user's gain from participating in an ICO increases when a critical mass of same-type users participate too. Specifically, they proposed alternative ICOs' structures to solve this coordination problem:

- The simplest way to conduct an ICO is to distribute all the tokens in one shot. However, the common practise seen especially in the most recent years is to sell the tokens in an ICO that lasts multiple periods, during which the token price follows a schedule. Since the number of tokens that have been sold is public knowledge at all times, thanks to the transparency afforded by the blockchain, a multiperiod ICO effectively converts an otherwise simultaneous-move game (of ICO participation) into a sequential-move one.

This explains why ICOs often have escalating price schedules over time within prolonged campaign windows. Moreover, users participating immediately, not only increase payoff but also avoid the coordination failure. For that reasons usually purchase activities during an ICO are concentrated in the beginning of the campaign, creating what is called "rapid uptake" (Li and Mann, 2018).

- An alternative approach is for the entrepreneur to conduct a discounted pre-ICO, in which a selected group is invited to purchase a limited number of tokens at a discount before the ICO opens to the general public. The selected users will rationally purchase the token, as they will enjoy a positive utility from using the platform at this low price regardless of whether the other selected user eventually buys the token or not (Li and Mann, 2018).
- Finally, the probably most powerful alternative approach toward the same-side network effect is to include a soft cap in the ICO smart contract, which automatically reimburses ICO participants if a pre-set funding target is not met by the end of the campaign. A soft cap effectively provides an insurance to ICO participants against missing the critical mass (Li and Mann, 2018).

2.3 ICOs regulatory environment

In this section will be, finally, provided an overview of which is the ICOs' regulation scenario worldwide, concentrating on those counties with a more active ICO's activity identified by the previous literature. Will, then, be provided an analysis of the regulatory

approach which should be held in the decision whether or not to classify tokens as investments.

Given the rapidly growing importance of the crypto-tokens market in recent years and the increasing concerns about investor protection, regulators worldwide are still currently debating the merits of classifying some tokens as securities, which would bring them under the jurisdiction of existing securities regulation. The regulatory environment, at the date of writing remain still uncertain, except for a few countries, because there is not still a unanimous approach to regulation (Bourveau et al., 2018).

2.3.1 – Worldwide regulatory scenario

For what concern the overview about the regulation in the various different countries, we will start from the countries which observed a higher number of ICOs as to May 2019, highlighted in the paper by Momtaz et al. (2019). Since the regulatory environment is highly changing, the purpose of this paper is only to provide an overall idea of the regulatory approach of these top ICOs countries.

What emerges in the paper by Kaal (2018), is that governments, in general, adopted the approach of using existing laws to regulate cryptocurrencies and ICOs, there are, then, a few cases of complete ban of these activities, but the majority of the countries still do not have taken any position and are waiting to understand better the phenomenon.

United States over the years had the greater number of ICOs and their regulatory approach is one of the most discussed by the literature and, thus, will have an extensive examination also in this work. Specifically, the approach applied by the Securities and Exchange Commission (SEC) was particularly harsh, because it issued many different warning announcements about the little information disclosure concerning lot of ICOs and, therefore, the high possibility to incur into ICOs “scams” (Zetsche et al., 2017). Moreover, being investor protection the main objective for the SEC, they started to do random due diligences on ICOs performed, and if they were considered issuing tokens similar to securities, they had to apply the security regulation. Their basic idea is that *first* ICO issuers must be able to demonstrate that their tokens are not securities or that they follow securities laws. *Second*, they also have to ensure that their activities do not undermine

anti-money laundering and “Know Your Customer” obligations (Lee et al., 2018).

What is sustained by the SEC is that substance, rather than form, should determine whether the sale is an investment contract or not. Therefore, not only security tokens have to apply security regulation, but also for utility tokens must be evaluated the substance of their nature if it can be assimilated to the one of traditional securities (Bourveau et al., 2018).

Another very important country for ICOs is United Kingdom, which had an approach to regulation very similar to USA. As reported in the paper by Kaal (2018), the Financial Conduct Authority (FCA) in charge of regulating financial activities in the country, took the position to apply security regulation to ICOs on a case by case analysis as reported in their last update on Initial Coin Offerings made in February 2019. They argue that different aspects and rights provided to the token holder must be carefully evaluated in order to assess whether or not they can be assimilated to security, thus approaching the theme substantially in the same way as the SEC. As a result, FCA determined that the current regulatory framework of the country is flexible enough to keep up with the latest advancements in the blockchain technology.

Countries such as Switzerland or Singapore, very active in the ICO market as highlighted in the paper by Momtaz et al. (2019), adopted a regulatory approach different to the one of FCA and SEC. Specifically, the Swiss Financial Market Supervisory Authority (FINMA), issued in February 2018 a series of guidelines regarding how they will deal with ICOs in their supervising activity. If applying these guidelines an ICO results to be issuing token similar to securities, then the latter regulation will be applied (Kaal, 2018). Therefore, they are neither creating a new regulatory framework for ICOs, nor using a “case by case analysis”. Instead, they provide a descriptive analysis of their method for evaluating ICOs, thus providing higher certainty both to issuers and to potential investors. US ICOs, instead, have to use as guidelines investigation reports issued by the SEC, which are very different one from another, therefore requiring much more efforts for the issuers to comply with US regulation.

The Monetary Authority of Singapore had an approach to ICOs identical to the one of the FINMA, thus they issued a guideline with their approach in evaluating ICOs. Then, as it happens in Switzerland, in case the ICO results to be equip arable to securities, the Security and Futures Act (SFA) regulation will be applied (Kaal, 2018). The last guideline

for evaluating initial coin offerings was issued by the Monetary Authority of Singapore on April 2019.

A very different approach is the complete ban of ICOs in the country, as it happened in China in September 2017. In particular, the People's Bank of China, believing ICOs are dangerous because of the high probability that potential Chinese investors incur into frauds, decided to completely ban both the possibility for companies to launch ICOs and to trade tokens on crypto exchanges (Kaal, 2018). As reported by Zetzsche et al. (2017), aside from banning everything regarding the blockchain and cryptocurrencies, they also asked to all complete ICOs to refund the investors and threatened any of the mentioned entities with extreme repercussions if they did not comply.

For Lee et al. (2018) the approach pursued by China has been the most stringent worldwide, and it indicates either that the country believe its current regulation on securities is not adequate to be applied to ICOs, or that the blockchain is not the future, but only a temporary financial bubble. Moreover, Zetzsche et al. (2017), correctly highlighted that these solutions even if appearing to provide legal certainty with a low regulatory cost, actually might be an overly strict response, because it overemphasizes the risks intrinsic of ICOs and underemphasizes all their advantages which have brought a real true innovation over the traditional financial system.

Lastly, Russia, which is another huge player in the ICO market, as reported by Kaal (2018), did not took any precise position regarding ICOs and cryptocurrencies for very long time. Starting from January 2018 the Ministry of Finance of the Russian Federation presented a draft for Digital Financial Assets regulation, in which, among other things, was proposed an ad hoc regulatory system for cryptocurrencies, ICOs, mining and token's trading (Kaal, 2018). Their approach is, therefore, completely different from the one of the countries we talked so far, because it is basically indicating that they do not believe security regulation can be extended to ICOs, which, instead, will need a personal type of regulation. In an article published by State Duma of the Federal Assembly of the Russian Federation (Mag. 2018), the draft law on digital financial assets proposed in January was successfully approved in the first reading by the Russian parliament, but was later on sent back in the next stages because were lacking major key concepts. At the time of writing there has not been any final approval of the regulation "On Digital Financial Assets",

therefore we may say that Russia still has an unregulated environment for ICOs, even if a complete regulation is expected to come in the near future.

2.3.2 – US and EU approaches in applying security regulation to ICOs

After having depicted the ICOs' regulation scenario of the countries which, following the analysis made by Momtaz et al. (2019), received the highest number of ICOs until May 2019, it is now time to deepen slightly the theme, analysing which are the considerations made by US and EU regulators in deciding whether or not to make an ICO applying security laws.

As reported in a paper by Hacker and Thomale (2017), one of the most pressing issues for ventures launching an ICO is whether they have to register and deliver a Prospectus. This is by all means the most important element, which makes the issuance of "securities" much more cumbersome, with the respect to the simple issuance of a Whitepaper.

Talking about US regulation on securities, it almost entirely governed by the Securities Act of 1933, which states that whenever a security is offered to the public, it needs to be registered and redact a proper Prospectus. The '33 Act lists a number of instruments which are defined as securities but includes also whatever is not defined using the term "investment contracts". To determine whether the token issued during an ICO is considered a security, it needs to be performed the Howey Test made of four elements whose aim is to define and clarify the characteristic of the investment contract under analysis, that in this case is the token (Hacker and Thomale, 2017).

The four elements of the Howey Test, as defined by the SEC (1946) are the following:

- an investment of money is made by the purchaser;
- the investment of money is in a common enterprise;
- the success or failure of the enterprise depends entirely on the efforts of a promoter or a third party;
- there is an expectation of profits from the investment.

As argued by Bourveau et al. (2018), the first two points are applicable for sure also to every kind of token, while the last two require a much deeper analysis.

What results from the application of this test is that whenever profits are expected from significant efforts of others, a principal-agent-conflict and hence information asymmetry

arises between investors and funders. It is precisely in these situations that the SEC believes that a Prospectus containing detailed information about investment project needs to be absolutely delivered (Hacker and Thomale, 2017).

The first investigative report made by the SEC was carried out in July 2017 when they precisely applied the Howey test to The DAO case (Hacker and Thomale, 2017). It is considered by the literature a good way, for futures ICOs, to understand which process the SEC pursue to arrive defining token issued as a security.

Firstly, as reported by the same authors, for the SEC it is irrelevant the fact that contributions to the ICO are made in cryptocurrencies instead of Fiat money, because the purchase of tokens is still considered an investment of money. Secondly, the SEC considered the DAO a common enterprise as it would be a company issuing common stocks. Further, as reported in the investigative report from the SEC (Jul. 2017): *“According to promotional materials, The DAO would earn profits by funding projects that would provide DAO Token holders a return on investment”*, therefore also the last two points of the Howey test have been considered fulfilled.

After that investigation, the SEC pursued many other investigative reports and came to classify as securities also token which have all the feature typical of utility tokens. While the DAO had characteristics very similar to traditional securities such as voting rights and dividends promises, therefore it was expected a decision from the agency, in the other case it was much more unexpected.

One of these cases is the Munchee’s ICO, which, as reported directly by the SEC (Dec. 2017), aimed to fund the venture consisting of a payment system for restaurant reviews. It works in a way that when a customer makes a review on a restaurant within the Muchee app, in exchange it receives a MUN token, which then can be used to pay in other restaurants within the platform.

What specifically emerged by this investigation made by the SEC, is that the third and fourth point of the Howey Test, when applied to ICOs, not only refer to profit coming from future cash flows of the company payed trough dividends, but also any other expectation of profit coming from the appreciation of the tokens. What just said can be clearly understood in a brief extraction by the SEC investigative report on that case (Dec. 2017): *“Purchasers reasonably would have viewed the MUN token offering as an opportunity to profit. Purchasers had a reasonable expectation that they would obtain a future profit from*

buying MUN tokens if Munchee were successful in its entrepreneurial and managerial efforts to develop its business. Purchasers would reasonably believe they could profit by holding or trading MUN tokens, whether or not they ever used the Munchee App or otherwise participated in the MUN “ecosystem,” based on Munchee’s statements in its MUN White Paper and other materials. Munchee primed purchasers’ reasonable expectations of profit through statements on blogs, podcasts, and Facebook that talked about profits”.

This investigation, together with many others made during the same years, revealed which is the SEC thinking about ICOs: not only security tokens are considered securities, but also any other token which allows investors to obtain a return. If we think carefully, it is basically the case of all of token issued, which are presumed to gain value once there is a network effect around the platform.

Moreover, many common elements of ICOs’ design which create expectations to obtain future profits such as: bounty programs, huge initial discounts or destruction of unsold tokens are perceived by the SEC as fulfilling the last two point of the Howey test, therefore ICOs having these features are considered issuing securities.

Nonetheless, as of May 2019, US are still the country with the higher number of ICOs performed and this is in some sense inexplicable, but as we will analyse in the next chapter, there are many other factors influencing ICOs success aside from regulation.

We still have not talked about which is the approach in deciding whether or not to classify tokens as security within European Union. As reported by Hacker and Thomale (2017), in the EU area there has not still been any regulatory agency that published reports comparable to those of the SEC, therefore, legal guidance for token sales in EU remains more pressing than under US law. Moreover, differently from US, a problem for interpreting the EU security regulation is that, aside from the security regulation at European level, there are additional regulation at member state level which differ from country to country.

Hacker and Thomale (2017), however, made a good analysis on the features determining whether the tokens issued during an ICO are considered a security under the EU law. Specifically, the approach used by the authors was to verify if tokens issued share features typical of traditional securities, such as stocks or bonds.

The first important element to consider is *Transferability*. Prospectus regulation under the EU framework applies only to instruments that are transferable to other people. Provided that token can generally be sold on crypto exchanges in the secondary market, the author conclude that they satisfy this requisite. Even in cases when there are limitations to the transferability such as lock-up clauses, the tokens are still considered transferable because such clauses regard only a portion of them and are set for a limited period of time (Hacker and Thomale, 2017).

The second element is *Ease of trading on a capital market*. To fully analyse this point, Hacker and Thomale (2017) look at two different aspects:

- *Negotiability*. This concept is different from transferability, because the latter refers to the simple possibility to change the ownership of the token, while negotiability refers to the simplicity with which ownership can be transferred. However, negotiability implies transferability.

An instrument can be defined easy to transfer when it is traded on capital markets and given that token are generally effectively traded on crypto exchange, the authors concluded that they are a negotiable instrument.

- *Standardization*. It implies that tokens issued and ready to be negotiable share a number of characteristics so that they can be considered a class. This aspect is very important, because non standardized assets usually are not easy to transfer, thus, not negotiable. Given that an issuer can offer different classes of instruments, like it happens very often with shares, to be considered standardized it is sufficient that tokens issued by a venture in one round of financing share the same relevant features.

The last important element to be considered is *Functional comparability with other securities*. In particular, these securities can be broken down in three categories as reported by Hacker and Thomale (2017): stocks; bonds and other forms of securitized debts; and any other securities giving the right to acquire or sell any such transferable securities, such as stock options.

Typically, tokens of whatever kind are neither exactly stocks nor bonds. Stocks are issued in exchange of an equity stake in a corporation, while this does not happen with tokens, which is their own point of advantage. Bonds, in turn, are fixed-income securities which consist of purely financial claims against the issuing company, while tokens usually lack a repayment obligation. Finally, tokens usually do not allow their holders to acquire or sell

other securities. However, depending on their exact structure, tokens can share similarities with shares or bonds, thus they clearly constitute securities (Hacker and Thomale, 2017).

As reported by the same authors, pure security tokens typically must be considered securities, while pure currency and utility tokens have to be exempted from securities regulation in the EU. However, details are fundamental since many tokens exhibit components of two or all three types together. Therefore, a case-by-case analysis of the specific structure of the token is necessary and, for the authors, hybrid tokens should not be considered securities unless either the issuers, through their promotion materials and communication with investors, raise significant expectations of profits, or in case the majority of investors buy the specific tokens to sell them for profit, and the issuer knows it (Hacker and Thomale, 2017).

What emerged so far is that the decision whether to consider issued tokens as securities depends largely on the features of the security regulation intrinsic of each country. However, as it may be possible to observe from the analysis of US and EU securities regulations applicable to ICOs, the conclusions are somehow similar even if the two approaches start from different concepts.

Moreover, what we analysed is the applicability of security law in cases where tokens issued can be substitutes of other securities. However, what has been possible to notice is that many problems arise when talking about utility tokens, which being new instruments and very different to any other instrument, are not so easy to regulate. Among the major countries analysed no one created an ad hoc regulatory system from cryptocurrencies, even if Russia is working on, but it might be the optimal solution to have an overall more certain regulatory environment.

Furthermore, another very important element concerning the regulatory environment for ICOs, as reported by Bourveau et al. (2018), is that in many cases information about issuers' country of origin and their team members is not known, therefore it might be difficult for a certain country to apply its regulatory framework to that ICO. As highlighted by the same authors, after many investigative reports by the SEC and the ban of Chinese and South Korean governments, many ICOs excluded these citizens from the potential investor base in order to avoid incurring in regulatory problems, especially if eventually they turn to be retroactive.

Finally, it is worth saying that in this section we only analysed the approach which under the EU and US regulation leads to the application of security laws to ICOs. However, we have not deepened what actually implies, in practical terms, the application of such regulation during an ICOs. In particular, within security regulation there are many different aspects: information disclosure, third party review (auditors) and taxation. In this work we concentrated on information disclosure through prospectus regulation, because it is surely one of the most critical aspects regarding token sales, which in many cases bring with them very low investor protection.

3 Determinants of ICOs' success and Information asymmetry mitigation

This chapter will concentrate on all these elements that should be considered by the management team in the Pre-ICO phase and that have an important effect on the success of the fundraising campaign.

3.1 *Determinants of ICOs' success*

This section aims to critically analyse all the most important factors determining the success of a an ICO. Specifically, it will review all previous studies carried out by the literature around this theme, trying to look for coherence among them, but also for intrinsic elements of specific papers. However, as reported by Ofir and Sadeh (2019), results are often inconsistent, because there are no official data sources, therefore databases are most of the time constructed manually. Furthermore, analysis have been carried out in different time periods and, as a consequence, they were based on different samples, which surely had a strong impact on the results obtained.

As reported by Amsden and Schweizer (2018), it is very difficult to differentiate *successful* versus *unsuccessful* ICOs because many factors need to be considered. Many ventures undergoing ICOs aim to create revolutionary new technology, or decentralizing existing ones, with time horizon usually measured in years. Moreover, as already reported by a research made by Ernst & Young (2017), only 5% of ventures had running projects, 11% had prototypes, and 84% were merely ideas. Even more important after a year still the 71% of ventures found themselves in an "idea" stage. Therefore, most project will face major challenges from the end of the ICO to the final launch of the product (Amsden and Schweizer, 2018).

For the purpose of this paper will be considered three different forms of ICOs' success:

- in terms of completion of the actual public sale of tokens (i.e. in many cases coincident with reaching the soft cap);
- in terms of amount of funds raised during the fundraising campaign;
- in terms of tradability of the tokens in crypto exchanges once having completed the ICO.

The last way of thinking to ICOs' success, as reported by Amsden and Schweizer (2018), is very important for two reasons: *first*, these exchanges, especially the most important ones, before listing a token conduct detailed due diligence in order to avoid listing "scam ICOs". *Second*, it is the only method to assess the success of both security and utility tokens. For the former, in fact, listing on an exchange enable investors to monetize their investment, while for the latter it is necessary to be able to create a network effect around the project.

It must still be taken into consideration, however, that even if an ICO lists in a crypto exchange, it does not mean that it is successful, because there might be the possibility of being delisted if the project itself is either never launched, or it is simply failed, for whatever reasons. In fact, as reported by Momtaz (2018a), in February 2018, 46% of 2017's ICOs were reported to be failed, therefore highlighting the extreme difficulty in surviving in such a competitive environment, even after successfully concluding the actual fundraising campaign.

In the following analysis on the determinants of ICOs success will be divided into macro categories, in order to report and compare the results obtained by different authors on the same factors.

3.1.1 – *Whitepaper features*

The main source of information for investors willing to invest in an ICO is the Whitepaper disclosed by the management team during the Pre-ICO phase. The Whitepaper was, also, one of the elements in which emerged the first differences among the various literature's studies about its effect on ICOs' success. On the one hand, Adhami et al. (2018) regressing a dummy variable equal to zero in case no Whitepaper was released during the ICO and one otherwise, found no significant correlation with ICO success. On the other hand, Howell et al. (2018) by regressing in the same way "Whitepaper" on "Liquidity", found a positive and significant correlation at 1% statistical significance. Liquidity, as defined by the authors, is another primary measure of success for the ICO, because it captures whether tokens are actually used and traded, therefore, if the market is interested on the issued tokens. Finally, Bourveau et al. (2018), observed that, contrary to any expectations, more failed ICOs (86%) than successful ones (79%) decided to release a Whitepaper.

These, very different results, might suggest that the quality of the Whitepaper is relevant, rather than its simple disclosure, given that it is an unaudited document and there is no external party guaranteeing the quality and correctness of the document (Adhami et al., 2018). Moreover, another important consideration might be that investors tend to prefer verifiable technical information, instead of unaudited general and marketing information typically disclosed in whitepapers.

A slightly different result, but still not very sophisticated in terms of analysis on the quality of Whitepaper's disclosure can be found in the paper by Amsden and Schweizer (2018). The authors argued that, given the high level of information asymmetry intrinsic of the ICO market, the Whitepaper's information content is fundamental to understand how much confidence the entrepreneur and its team have in the success of their blockchain-based projects. Ventures with a high confidence of success will, very likely, be more willing to share technical details, projected timeframes and competitor analysis. Conversely, ventures with a lower confidence may hide or tarnish relevant information from their Whitepaper (Amsden and Schweizer, 2018). Therefore, the authors assumed that the smaller the number of pages in the Whitepaper, the greater the venture uncertainty, because of the higher omission of relevant information. They tested this hypothesis empirically through an OLS regression and found that the variable "# WP Pages" is positively correlated at 1% of statistical significance to ICO success in terms of amount of funds raised and at 5% in terms of ICO tokens traded after the completion of the ICO. This result was confirmed also by the analysis of Fish (2018) and Bourveau et al. (2018), in which the "Whitepaper length" was found to be positively and reliably correlated with the amount of ICOs' funds raised in both cases.

Florysiak and Schandlbauer (2019) using a different approach, also analysed the effect of Whitepaper's length on ICOs' success in terms of number of characters. What the authors found, consistently with the previous presented analysis is that a longer number of characters positively and reliably influence ICOs' success. However, when regressing the variable "number of characters/page count" on the same independent variable, the authors found a negative and significant correlation. The last variable introduced measure the number of characters per page, and the lower the amount, the higher the use of figures and graphs in the Whitepaper. Therefore, a reasonable interpretation of the result obtained by the authors is that the more pictures are used instead of text, the more likely investors perceive ICOs as potential frauds. Similarly, Bourveau et al. (2018) went over

Whitepaper's length, by analysing also the concept of Whitepaper's readability through the variable "Whitepaper opacity", that was found to negatively influence the amount of funds raised at 5% statistical significance.

At the end of an overall analysis, emerged that it is far more important that the Whitepaper can be easily read and understood by potential investors, rather than how much pages it contains. Offering them too much information, with complex vocabularies and sentence structures, could eventually expose the issuer to the opposite result than what expected. This was also confirmed by an analysis carried out by Florysiak and Schandlbauer (2019) in which they regressed the "Gunning-Fog index" (i.e. a measure of Whitepaper's readability based on the combination of average sentence length and the proportion of complex words) on the funds raised. What the authors observed, consistently with the results obtained by Bourveau et al. (2018), is a negative and reliable correlation between the two variables, especially during "cold" ICO market periods, when few ICOs take place and investors are more careful and meticulous about the information provided by ventures.

Therefore, what emerged by literature's studies so far is that it is far more important Whitepaper's informativeness than its simple disclosure or its length. This was also confirmed by an analysis carried out by Bourveau et al., (2018), which found the variable "Informative Whitepapers", based on the assessment provided by ICOBench, to be positively and reliably correlated to the successful completion of the ICO.

A more comprehensive analysis on the effect of a well-built Whitepaper on ICO's success was carried out by An et al. (2017), which broke down Whitepaper's information in five different dimensions in order to understand, if each of them, singularly, has a significant effect, both positive or negative, on ICO's success measured in terms of amount of funds raised. The five dimensions are the following: *risk*, *use of proceeds*, *management team*, *roadmap* and *operating country*. As reported by the authors, being ICOs a funding method especially oriented to retail investors, the disclosure of these information is very important because they provide useful signals about project quality to carry out well thought investment decisions. The main results obtained by the authors are the following:

- The coefficient *Disclosure (risk factor)* appeared to be positive and different from zero at 5% of statistical significance (An et al., 2017). This result reveals that investors appreciate risks' disclosure, because it means that the company fully acknowledge the working environment in which it intends to operate and the major risks to which the

project is exposed. Moreover, it might demonstrate, also, that the venture has already thought on possible mitigation strategies for these risks.

- *Management team* is another important element of whitepaper disclosure, and its coefficient resulted to be significantly different from zero, showing a positive correlation with the dependent variable (An et al., 2017). Start-ups at early stage may lack of credibility and reputation, because are substantially unknown to the public and the disclosure of manager team's information would be a great signal for investors to acquire knowledge about who is behind the new venture. ICOs who decide to avoid disclosing such information, would very likely be perceived as possible "scams" by investors. On the same variable also Bourveau et al. (2018) carried out a research which revealed a surprising opposite effect, suggesting that probably there are other more relevant information for investors, rather than the simple management team disclosure, which will still remain highly unknown to investors after the few lines written within the Whitepaper.
- Disclosure on the *Use of proceeds* and the future *Roadmap* for the project are both of them positively correlated with the amount of ICOs fundraising and statistically significant respectively at 5% and 1% level (An et al., 2017). These results evidence that for investors is extremely important whether the entrepreneur launching its blockchain-based ventures have a clear idea of where intends to go with the money raised and what should be the likely expectations in the next future. Avoiding disclosing such information might be perceived by potential investors as the likelihood of incurring in a "scam" ICO. Another surprising opposite result was obtained by Bourveau et al. (2018), relatively to the use of proceeds raised, which was found to be positively, but not significantly correlated to ICOs' success. This result is surprising, because the same authors in their univariate analysis comparing completed and failed ICOs, found that more completed ICOs (49%), than failed once (45%) disclosed this type of information, confirming, in some sense, the outcome obtained by An et al., (2017).
- Finally, avoiding to disclosure the *country of origin* of the ICO (i.e. the operating country of the venture), was found to be negatively and reliably influencing the ICO's fundraising ability (An et al., 2017). Once again, this omission by the issuer might be perceived by potential investors as the company is hiding something, therefore, in order to avoid incurring into frauds, they decided to stay out from the investment. This result was also confirmed by Adhami et al. (2018), which observed that the disclosure of ICOs' jurisdiction to positively influencing ICOs' success.

Another very interesting analysis was carried out by Florysiak and Schandlbauer (2019), which focused on verifying the similarity between different Whitepapers, also dividing the analysis between “hot” and “cold” ICO market periods. To carry out this analysis the authors calculated the “cosine similarity”, an index already developed by the literature in the analysis of IPOs’ Prospectus similarity, which allowed to understand the degree of standardization in Whitepaper’s content. The following results obtained by the authors had been consistent with IPOs’ literature:

- Whitepapers of ICOs placed in the same market environment, meaning same country or same industry, are more similar.
- During periods of “hot” ICO market (i.e. when ICOs’ popularity is high), Whitepapers are more similar if they are written around the same time, whereas the opposite is the case in cold periods.
- ICOs that comply for the same type of regulation, including applying KYC standards, have more similar Whitepapers.
- Whitepapers of ICOs with similar team and product characteristics are positively influenced by document similarity.
- The more similar is Whitepaper’s length in terms of number of characters, the more documents tend to be similar.

Florysiak and Schandlbauer (2019) analysed also the impact on ICOs’ success of having both a “standard Whitepaper”, meaning sharing a high level of similarity with the others, and an “informative Whitepaper”, meaning able to provide unique and specific information about the project being launched by the venture. While reasoning on the overall sample both the variable seems to be uncorrelated with the amount of funds raised, when focusing on “hot” and “cold” ICO market periods, the result changed and it was found that having informative Whitepapers during “hot” periods positively and reliably influence the fundraising capability of the company. The reasoning behind is that in a period with lot of ICOs being launched, it is extremely important to issue a Whitepaper that is able to distinguish from the mass and provide unique information, rather than standardized ones. Another interesting detail analysed by the same authors was the effect of the way in which the Whitepaper is written, on ICOs’ success. Specifically, they analysed both “sentiment polarity”, a variable measuring the number of positive versus negative words, and “sentiment subjectivity”, measuring objective versus subjective words. The result they obtained was an uncorrelated effect of both variables with respect to the funding raised,

both when looking at the overall sample, and when deepening the analysis between “hot” and “cold” ICO market periods.

The main focus of this section until now was on Whitepaper’s informativeness, however, Fisch (2018), analysed also the impact of a “technical Whitepaper” on the total amount of funds raised by the venture. Specifically, they regressed a dummy variable called “White paper: technical (dummy)”, equal to one in case the Whitepaper contained information about the venture’s technology and zero otherwise. In particular, the authors to increase the robustness of the variable, not only considered the Whitepaper “technical” through expert ratings, but also manually checking if the majority (i.e. > 50%) of its pages concern venture’s technology, the technical architecture and ecosystem, or token specifics. The results showed that having a technical Whitepaper strongly influences the amount raised, because the variable was found to be positive and significantly different from zero at 1% of statistical significance.

However, the link between a technical Whitepaper and higher technological capabilities is not completely straightforward. It should be more the ability to describe highly technical problems in a very nontechnical and understandable way, that should increase the fundraising capability of the venture. Moreover, there may be the risk that ventures with low technological capabilities try to hide themselves behind technical language (Fisch, 2018). In any case, the results coming out from this regression, indicate that investors seem to be persuaded by a more technical appearance of the Whitepaper.

3.1.2 – Source code disclosure

Another very important element increasing the credibility of the newly created venture is the public disclosure of the source code of the smart contract which will run on the blockchain. Different authors analysed if the disclosure of such code is actually able to influence ICO’s success. In particular, Adhami et al., (2018) found that the “code availability” has a positive and highly significant effect on the probability of ICO success. This result is very different from the result the same authors obtained with respect the effect of simply disclosing the Whitepaper, that has been already reported. While information disclosed in the Whitepaper are far more important than the disclosure of the document itself, in the case of the source code it seems that it is enough for investors to simply have the code, instead of what there is written inside. The availability of the code,

even a partial one, is perceived by investors as a proof-of-concept by the entrepreneurs initiating the venture even if actually they are not able to read it and understand the real potential of the project (Adhami et al., 2018).

However, Cohney et al. (2019) carried out an interesting empirical analysis in which they identified all the “promises” disclosed in many Whitepapers and then searched if they were actually written within the source code. The main results coming out from their inquiry are the following:

- Many ICOs while promising to protect investors against insider self-dealing, actually manifest the opposite within the code.
- A significant fraction of issuers retained centralized control through the possibility of subsequently modifying the code, thus the entities’ governing structures, without disclosing elsewhere this information.

Specifically, the last result is surprising given that the blockchain and ICOs are become so popular for their advantage of being based on a trustless economy (Cohney et al., 2019). These results are also meaningful, because they highlight how issuers purposely manage source codes as they want, knowing the absolute inability of the majority of investors to analyse and compare in great detail the information contained within Whitepapers and Source codes.

Another interesting analysis was obtained by Fisch (2018), which regressed not only the availability of source code on GitHub, the most important code repository, but also the number of code’s defects fixed on GitHub. The logic behind introducing GitHub variables, as reported by the authors, is that logically projects without quality code will likely not establish an account on GitHub and will thus be less likely to succeed. The regression showed that the only presence of the code on GitHub is positively correlated with the amount of funds raised but was not statistically significant. Similarly, Amsden and Schweizer (2018), found that the presence of the ICO’s source code on GitHub has no significant effects on the amount of funds raised during the ICO. However, they found it to be highly significant at 1% of statistical significance with the probability of having tradable tokens in the aftermath of the ICO, which as we explained at the beginning of the section is another very important measure of ICO’s success. These results reveals how the disclosure of the source code is far more useful for concluding the ICO and have the token traded, rather than for the purpose of raising more funds, even though the reason for such result is unclear.

To the contrary, Fisch (2018) found that an increase in the “defects fixed” corresponds to an increase in the funds raised, and it was highly significant at 1% statistical significance. This result can be interpreted that investors seem to consider the venture’s source code quality in their investment decision, as it happens with the Whitepaper, and not only its disclosure. However, in that case investors rest on the assumptions that the number of defects fixed improve the source code’s quality, rather than by specifically checking the actual quality of the source code.

3.1.3 – *Social media activities and marketing programs*

Another very important element to keep into consideration in the arrangement of an ICO is to promote the launch through marketing activities. As it was already shown when distinguishing the different phases through which an ICO takes place, marketing activities divide both in *social media activities* (i.e. Twitter, Telegram and Crypto forums), and also through *marketing programs* providing incentives to early investors. Will now be analysed the effects of both marketing activities on ICOs success.

Starting from the influence made by *social media activities* on ICOs’ success, Fisch (2018) found that higher level of Twitter activities are correlated with a higher amount of funds raised at 5% of statistical significance. Similarly, the active presence of the venture on the communication application Telegram was found by Amsden and Schweizer (2018), to have a positive correlation with ICO’s success measured in terms of funds raised. The reason for these results is that these two means of communication, particularly the latter, give the possibility to interested potential investors to communicate directly with the management team in order to address any question in few time, thus reducing a lot the venture uncertainty intrinsic of this market (Amsden and Schweizer, 2018).

These results were, in general, also confirmed by Bourveau et al. (2018), which regressed “social media activity” measured as an aggregate indicator of the company’s social media disclosures, provided by ICObench. In particular, this variable resulted to be positively correlated with ICOs’ success both in term of completing it, and in terms of amount of funds raised. Furthermore, Florysiak and Schandlbauer (2019) consistently with the results obtained by previous studies, found that the higher the number of social media channels, the higher will be the amount of funds raised through the ICO, and the result was highly statistically significant both during periods of “hot” and “cold” market. It confirms the

importance of building and carrying out a well thought multichannel communication strategy, in order to inform as many people as possible about the venture's project and make them willing to participate to the token sale.

Turning to the analysis about *marketing programs* promoted to reach the sooner possible the critical mass needed for generating network effects, the results seems to be not in favour of this practice. In particular, Bourveau et al. (2018), introduced in their regression "ICO participation incentives", a dummy variable equal to one if the issuer provides bonuses, bounties or other incentives to incentivize participation, and zero otherwise. This variable was found by the authors to negatively influence both the amounts of funds raised and the successful completion of the fundraising campaign, but while it was not statistically significant in the latter case, it was significant at 10% of statistical significance in the former one. Consistently, Adhami et al. (2018) found no significant correlation between "bonus" and successful completion of the ICO, while Florysiak and Schandlbauer (2019) found "bonus" to be negatively and reliably correlated with ICOs' success in terms of amount of funds raised. Similarly, Lee et al. (2018) found the same result in terms of amount of funds raised, but differently from the previous studies they found also ICOs bonus to be negatively and significantly correlated also with the successful completion of the ICO. Contrary, Amsden and Schweizer (2018) analysing the effect of "ICOs Bonus" on the amount of funds raised, found it to be not statistically significant. However, the latter authors, by regressing the same variable on ICO success in terms of subsequent tradability of the tokens, found ICO bonus to be positively correlated and highly significant at 1%.

The overall result seem to refuse the hypothesis under which this type of incentives is able to generate interest on investors, which eventually lead to successful fundraising campaign. Because, if, on the one hand, it was expected a negative and significant relationship between the amount of funds raised and ICOs bonus, since they involve lower tokens' sales prices; on the other hand, it was expected a positive effect in terms of successful completion of the ICO, given that their main aim is to provide incentives to early investors in order to create the sooner possible the critical mass for generating network effects. The only fact that bonus were found by Amsden et al. (2018) to be positively and reliably correlated with the subsequent tradability of the tokens, is not enough to conclude in favour of their beneficial effect.

An interesting result in this regard was provided by Lee et al. (2018), which analysed the determinants for tokens' subscription after the first day of public sale, therefore, all those aspects relevant to generate network effects. What they found, consistent with the predictions, "investor subscriptions on the first day" to strongly determine token sales on the second day and during the next four days or fourteen days. If tokens' sales on the first day are the main reason for the subsequent sale in the next days, we might assume that they are also the most important reason for generating network effects, since they allow to reach the required critical mass. The authors, then, went more in depth by analysing the determinants of first-day subscription and among the only two significant variables, "high bonus" was found to be negatively and highly reliably correlated with the dependent variable. This last result is very important and might potentially be the ultimate explanation for the result above reported: ICOs' bonus are an instrument which should not be used by ventures either to carry out a successful fundraising campaign, or to reach the critical mass needed for the network effects. Confirming this conclusion there is also the comparative analysis between successful and failed ICOs carried out by Lee, Li and Shin (2018), revealing that high bonus (i.e. 20% or more), are more prevalent in failed ICOs, than in successful ones, with the difference between the two significant at the 10% level. This results suggest that the management team should concentrate more on other elements influencing the first-day market subscription, rather than on providing incentives to early investors.

3.1.4 – *Presales*

Having a presale can be a huge source of advantages, because it allows both to know the potential customers/investors interested on the project, and to finance the real public token's sale. However, empirically speaking, the effect of a presale on ICOs success is doubtful.

Adhami et al. (2018) and Lee et al. (2018) found that having a presale increases the probability of concluding the ICO successfully and the result showed to be statistically significant. Fisch (2018), instead, found the variable to be always positively correlated with the amount of funds raised, but never statistically significant. The same result was obtained by Florysiak and Schandlbauer (2019) when they analysed the effect of presales during periods of "hot" ICO market (i.e. when lot of ICOs take place). The opposite result

was obtained by Amsden et al. (2018) and Lee et al. (2018), which found “Pre-ICO” negatively influencing ICOs’ success in terms of funds raised and the same result was, also, obtained by Florysiak and Schandlbauer (2019), which found presales to be highly significant during periods of “cold” ICO market.

A possible explanation for these results might be that when few ICOs take place, ventures might be forced to increase bonuses to early investors (i.e. smart money), thus worsening the amount of funds raised; instead, the opposite happens in the reverse situation when there is a much active market for ICOs, since offering small bonus could eventually increase the funds raised, even if this result was never found to be statistically significant. Overall, the results obtained by the literature might lead us to conclude that presales are far more useful to successfully conclude ICOs, rather than for increasing the amount of funds raised.

Another potential explanation for the significant and negative relationship between Pre-ICOs and ICOs’ success, is that ventures launching presales might be perceived by early investors as insecure about their own project, thus disincentivizing the subsequent investment during the actual ICO phase (Ofir and Sadeh, 2019). However, the positive and significant relationship between Pre-ICOs and successful ICOs’ completion found by Adhami et al. (2018) and Lee et al. (2018), actually highlight how presales might be much more used to attract smart money, thus increasing the credibility of the venture towards potential retail investors when launching the real ICO.

Furthermore, Lee et al., (2018) comparing the characteristics between successful and failed ICOs observed that nearly 40% of successful ICOs included a presale before the main token sale, 18.2% higher than failed ICOs and this difference was found to be highly statistically significant. The main explanation for this result provided by the authors is consistent with what already concluded, thus, a successful presale can boost the momentum of the main sale, because are interpreted by subsequent investors as evidence that earlier investors (i.e. smart money) held favourable information, encouraging them to invest regardless of their own information. Therefore, in the absence of underwriters, a presale is a clever way for insiders to gauge demand from informed investors such that they can set a more informed price for the main ICO. Given the market power these early investors enjoy, it is not surprising that presales often provide a steeper discount than the main sale.

3.1.5 – ICOs design variables

It is also worth considering the effect of specific ICOs' design features on ICOs' success. In particular, the analysis will be divided by different characteristics and will be reported for each of them, the main results obtained by previous literature's studies.

Token allocation

For what concern the effect of the *number of tokens issued* on ICO success, Amsden and Schweizer (2018), found them to be positively and highly correlated both with success in terms of funds raised, and in terms of subsequent tradability on crypto exchanges. The same identical result was also found by Fisch (2018). These findings are quite surprising for two reasons: first, the number of tokens sold should not infer any reference to the underlying quality of the project (Fisch, 2018). Second, tokens have the possibility to be split up almost infinitely, therefore their number should have not any effect on the fundraising capability of the venture (Amsden and Schweizer, 2018). However, it seems that investors appreciate having more tokens available, even though it may imply a lower value. As reported by Fisch (2018), this result might be explained by previous researches showing that investors are attracted by lottery-type stocks characterized by cheap prices and tiny probabilities of achieving huge rewards.

A more recent study carried out by Florysiak and Schandlbauer (2019) by analysing the determinants of ICOs' success in terms of amount of funds raised found, however, a complete uncorrelation between the number of token issued and the dependent variable, as it might be expected at first thought.

More interesting than the total amount of token created, it is the *percentage of the overall token supply* to be actually *delivered* during the public sale. Specifically, Amsden et al. (2018) and Lee et al. (2018) regressing the percentage of tokens distributed during the ICO, found it to be highly negatively correlated with ICO success both in terms of subsequent tradability of the tokens and with the amount of funding raised. Similarly, Florysiak and Schandlbauer (2019) found the same variable highly negatively correlated with ICOs' success especially in periods of "cold" ICO market. To the contrary, Fisch (2018) found the variable to still be negatively correlated, but not statistically significant.

The general expectation of all the authors about the effect of this variable on ICOs' success, was that by retaining a larger fraction of tokens ventures might signal

commitment and alignment of interests with investors and employees as it happens in the traditional stock market (Amsden and Schweizer, 2018). Therefore, offering higher proportion of tokens leads to a lower ICO's success because investors perceive that the venture is not committed in the project and that the different interests are not aligned.

Furthermore, Lee et al. (2018) when comparing successful and failed ICOs observed that the firsts sold 57% of generated tokens to outsiders, compared to 61% of failed ones, with the difference being significant at the 1% level. This is a strong indication that investors embrace token sales in which management retains more stakes, because it could play a vital governance role to align insiders' and outsiders' interests.

One of the main problems highlighted in the previous chapter when talking about the ICO design choices was that investors might be afraid that the venture will use that retained tokens to finance future needs, thus devaluating existing tokens. Therefore, the higher the portion of tokens retained, the lower is ICOs' success. However, this latter hypothesis was not even marginally supported by empirical evidence in one of the previous studies, meaning that it is not an issue for potential ICOs' investors.

Duration

It is very important, also, to consider the effect of the length of the ICO on the amount of funds raised during the ICO. This variable was considered in the analysis carried out by Fisch (2018), which found that the longer the duration of the public sale, the lower is the ability of the venture to collect funds and the same result was obtained also by Florysiak and Schandlbauer (2019), especially during "hot" ICO market periods. Furthermore, both these results were found to be highly statistically significant at 1%.

As reported by the same authors, they expected this result because it is in line with previous researches in equity and crowdfunding campaigns, which revealed that campaigns that reach their goals quicker are more successful, even if it might seem that longer campaigns have the potential to collect higher amounts of funding simply because they run longer.

No other authors analysed directly the effect of duration on ICOs' success, however, Amsden and Schweizer (2018) analysed the duration effect on the success of Pre-ICOs in terms of amount of funds raised. What the authors found is that the same result obtained by the previous authors, statistically significant at 10%, therefore, we may conclude that empirical evidence demonstrated that the shorter the public sale, the better it is for ICOs'

success.

In the comparative analysis between successful and failed ICOs carried out by Lee et al. (2018), what emerged is that successful ICOs on average took 30 days to complete, shorter than the almost 38 days of failed ones, with the difference being significant at the 1%. This is because although most ICOs are scheduled for about one-month length, successful ICOs often finish early when hitting the hard cap.

Token currency

The effect of the currency accepted by the venture during the ICO was analysed by Amsden and Schweizer (2018). They found that *accepting traditional Fiat currencies* to buy tokens during the public sale, is loosely correlated with the amount of funds raised. In fact, it was firstly positive and statistically significant at 10%, but then lose significance when other variables were introduced in the model. On the other hand, they found the same variable to be negatively correlated to the subsequent tradability of the tokens and statistically significant at 5% in the most complete model. The authors concluded that this negative significant relationship is explained by the fact that entrepreneurs who decide to open the fundraising to “Fiat investors” signals insecurity to raise required funds from “cryptocurrency investors” and also expose the venture to the possibility of interventions by regulators such as blocks in bank accounts.

Soft cap and Hard cap

As previously discussed, ventures launching an ICO can choose to put caps, either soft or hard, in their fundraising campaigns. Will now be analysed singularly the effect of these caps on ICOs’ success.

As far as *soft caps* are concerned, their effects on ICOs’ success was analysed by different authors, but it is still unclear their final effect. On the one hand, Amsden and Schweizer (2018) regressing a dummy variable “soft caps” on ICOs’ success both in terms of funds raised, and of tradability of the tokens, found it to be positively and reliably correlated with both forms of ICOs’ success. On the other hand, Bourveau et al. (2018) regressing the same variable on ICOs’ success both in terms of successful conclusion of the public sale and in terms of amount of funds raised, found a negative and statistically significant correlation among the two variables. Similarly, Florysiak and Schandlbauer (2019) found the same variable to be negatively and reliably correlated with the amount of

funds raised during the ICO, especially in “hot” ICO market periods.

When thinking about soft caps, the main argument is that they are an essential instrument to reduce investors’ uncertainty about the venture, because in case the minimum required threshold of investments is not reached, then they can be sure that the money contributed will be returned back by the management team. Therefore, the expectation is to find a positive correlation with ICOs’ success as obtained by Amsden and Schweizer (2018). However, the fact that in the other two studies was obtained the opposite result, together with the univariate analysis showing that soft caps are not very used in practice (32% of Amsden et al. (2018) sample and 24% of Bourveau et al. (2018) samples) led to an uncertain conclusion about their effects on ICOs’ success.

For what concern *hard caps*, Amsden and Schweizer (2018) analysed the effect of having one of them during a Pre-ICO, however, their result can be extended when talking about ICOs. The authors found a positive and highly significant relationship between having a hard cap and have a successful Pre-ICO in terms of funding raised. Similarly, Florysiak and Schandlbauer (2019) analysed their effect on the funds raised during the ICO and the result was a positive and highly statistically significant correlation between the two variables, especially during periods of “hot” ICO market.

The reason behind these results is that without a hard cap and an open goal, investors may find it difficult to assess the success of the project and this increases the venture uncertainty. Clearly setting the financial resources needed to carry out the project, reduces the uncertainty because investors are more willing to believe there is a thought strategy behind the project and that it is less likely to be a fraud.

However, attention has to be made in the threshold for the hard cap to be set. As reported by Ofir and Sadeh (2019), previous studies found that ICOs tend to set high hard caps that they are unlikely to reach. Moreover, as the same authors continued, higher hard caps are negatively correlated with the amount of funding raised. These results are in line with IPO literature, according to which large offerings send a negative signal to the market.

In the comparative analysis between successful and unsuccessful ICOs, Lee et al. (2018), observed that the average hard cap in the first case was \$88 million, more than double the amount for failed ones, even if that difference was not statistically significant. Another interesting result highlighted by the authors is that successful ICOs on average achieved 59% of the hard cap, while unsuccessful ones obtained just 15.4% of the hard cap,

revealing what has already been pointed out as a possible problem: setting too much ambitious hard caps, might eventually lead to an unsuccessful ICO.

3.1.6 – *Crypto market*

The literature analysed also the effect of the crypto market performance on ICOs' success. What emerged from the studies carried out by Fisch (2018) and Bourveau et al. (2018), is that the success of a public sale is not significantly related to the trend of Bitcoin. Specifically, the first analysed the correlation between "Bitcoin price" and ICO success in terms of amount of funds raised. The second, instead, regressed "BTC momentum" which represented "*the prevailing market conditions at the time of the ICO based on the past (three-month) return performance of the Bitcoin crypto-currency*" (Bourveau et al., 2018), on the amount of funds raised during an ICO.

A different analysis was, instead, carried out by Amsden and Schweizer (2018), which regressed "ETH value", representing the value of Ether, on ICOs success both in term of subsequent tradability of the tokens and in terms of funds raised. The reasoning behind this analysis is the fact that the majority of ICOs takes place using the Ethereum blockchain, therefore Ethereum represents an opportunity costs for potential investors. As the same authors explained, they found that higher values for Ether decrease the likelihood of participation in an ICO, because ICOs become less appealing to investors, with respect to keeping their money in Ether. Moreover, they also analysed the effect of "ETH volatility" on ICOs success and what they found is that higher levels of Ether volatility, for instance because of increasing regulatory uncertainty, can foster investments in ICOs. This result might derive from the fact that investors fear missing out on a potentially highly rewarded investment opportunity (Amsden and Schweizer, 2018).

Things changed when the authors moved from analysing the tradability of the token to the analysis on the funding raised. Here "ETH volatility" became no more statistically significant, while "ETH value" remained statistically significant, but changed from being negatively to positively correlated. The authors explained that this result might be due to the fact that many newly created tokens are priced relative to Ether, therefore, when Ether appreciates, so does the amount raised.

3.1.7 – Blockchain and Token choices

The choice of the platform in which to write the smart contract needed to run the ICO is extremely important. As it has already been written many times, the most diffused platform on which to launch an ICO is Ethereum, because it allows to raise capital without having to build a blockchain protocol from zero, which is very cumbersome in terms of capabilities and resources needed. Moreover, as emerged by the studies carried out by Fisch (2018) and Amsden and Schweizer (2018), the use of Ethereum, by a newly created venture willing to raise capital selling its branded tokens, is able to positively influence ICOs' success and both the results were found by the authors to be statistically significant.

As far as which is the token's type most preferred in terms of ICOs success, there is not much previous studies carried out by the literature on the theme. Fisch (2018), for example, analysed whether or not issuing utility tokens through a dummy variable, is able to influence ICOs' success. The result he obtained was that there is no correlation between the two variables. Adhami et al. (2018) by regressing the variable "token service", a dummy variable equal to one if the token can be used to pay or access services, on ICOs' success in terms of successful completion of the fundraising process, found them to be positively and highly significant correlated. This result might suggest that the choice of issuing utility tokens is more important to successfully carry out the public sale, rather than to raise a higher amount of money.

Another approach is to understand the relationship between the rights attached to the tokens and ICOs success. An et al. (2017) analysed singularly the effect of different rights on ICOs success in terms of funds raised, together with a series of control variables. Specifically, the singular rights analysed by the authors are the following:

- *Voting right* is a dummy variable which equals one in the case investors have the possibility to participate and influence the decision-making process of the company, and zero otherwise;
- *Dividend right* is a dummy variable which equals one if investors are allowed to receive future cash flows generated by the company, and zero otherwise;
- *Disclaimers right* is a dummy variable which equals one if the venture announces in its public sale that purchasing tokens do not represent an investment in the company, thus there will not be any guaranteed rights or future income.

The results obtained by An et al. (2017) are the following: a positive and statistically significant relationship between token holders' *voting right* and ICO fundraising; and a surprising insignificant correlation between, both *dividend* and *disclaimer rights*, and the amount of funds raised. It means that tokens' buyers are more willingly to invest in companies that allow them to have control power over the management team (An et al., 2017). For what concern, instead, the insignificant correlation between the other two types of rights and ICOs' success, the authors were particularly surprised about dividend rights, because they are a fundamental stone in traditional finance. The two possible explanation for this result, provided by the authors, are the following: the *first* is that ICOs' investors do not care about dividend payment, because they value more the potential capital gain from the investment. Considering the high ICOs' returns, dividend payment may logically not be the first priority from the investors' view. The *second*, instead, is that investors might not believe in promises disclosed within Whitepapers, since ICOs are a new type of financing, being unaudited by any third party (An et al., 2017).

Adhami et al. (2018) analysed in a similar way the effect of token's rights on ICOs' success, but this time in terms of successfully completion of the fundraising campaign, however the results are quite different. Specifically, they regressed two dummy variables "token governance" and "token profits", the first being equal to one if the token grants governance rights to its holder, while the second equals to one if the token grants them profit rights. What resulted from this regression is a positive and statistically significant relationship between profit rights and successfully completion of the ICO, while a negative but not reliable relationship between voting rights and ICO's completion.

A possible explanation for this difference in the results (i.e. opposite outcomes), might be that An et al. (2017) analysed the rights' effect on ICOs success singularly by using other control variables, while, Adhami et al. (2018) analysed rights' effects all together. It might, therefore, have caused an interrelate effect between rights when put all together, with one right more significant than others.

Another observation that can be made is that the model developed by Adhami et al. (2018) has a higher R^2 compared to the one coming out from the regression made by An et al. (2017), both having a similar number of observations. Therefore, it might mean that the second regression analysed better explains ICOs' success compared to the first one, even if it is worth to say that both the regression have not a high R^2 in absolute terms.

A final observation is that, as it has been previously said, the two regressions differ in the type of ICOs' success analysed, while Adhami et al. (2018) analysed it in terms of

successful completion of the public sale, An et al. (2017) analysed it in terms of amount of funds raised. While investors prefer receiving tokens with dividends rights, for fundraising purposes it might be better for ventures to offer tokens with voting right.

The final effect of tokens' type on ICOs' success, considering the results obtained by the few previous literature's studies, remain still unclear, also because there is not the possibility to make further consideration between a larger number of studies. Therefore, our suggestion to ventures interested in launching an ICOs, it to focus on other ICOs' characteristics to obtain a successful fundraising, and to issue the tokens they think to be most suited for their project, rather than the ones that mostly affect ICOs' success.

3.1.8 – Countries characteristics and Legal systems

A final consideration to be made is on the variables influencing the likelihood of a country to host ICOs. On this theme, Huang et al. (2019) carried out a very well built and thought analysis, which might potentially be one of the core explanations for ICOs success, more than many technical aspects analysed so far.

The variables considered by the authors and the main results are the following:

- *Financial development index* is a variable aimed at testing the hypothesis whether “ICOs occur more frequently in countries with more developed financial systems”. It resulted to be positively and reliably correlated with the number of ICOs in a given country, thus confirming the assumption made by the authors (Huang et al., 2019).
- *Equity market index*, instead, is a variable aimed at understanding if “ICOs occur more frequently in countries with more developed public equity markets”. As expected by the authors, the variable was found to be highly significant and positively correlated with the number of ICOs in a country, confirming once again the assumption made by the authors. Moreover, this result is reasonable because of the similarities ICOs share with IPOs that have already been discussed in the previous chapters (Huang et al., 2019).
- *VC index* is a variable set to analyse if “ICOs occur more frequently in countries with more developed private equity markets”. Contrary to the previous assumption, in this case it was not found any significant effect between the two variables. Moreover, the correlation was negative, suggesting that between VC and ICOs there is not any type of reciprocal effect. Even though it is true, as reported by the authors, that VC invested large amounts of money in many different ICOs over the years, thus expecting a

positive and significant effect of the variable; however, they also argue that as blockchain evolved, the related development of ICOs might have put in question the traditional VC model, and this is the reason why an insignificant effect emerged between the variables (Huang et al., 2019).

- *Banking index* is a variable aimed at testing whether “ICOs occur more frequently in countries with more developed debt markets”. In this case too, the variable was found insignificantly related to the number of ICOs in a country and the reasons is somehow similar to the previous one, thus that as blockchain evolved, a lower need of resources from traditional finance was needed (Huang et al., 2019).
- *ICT market development* is a variable introduced to analyse if “ICOs occur more frequently in countries where the Information and Communication Technology is more advanced”. What resulted from the regression was a significant and positive correlation between technology improvements and the number of ICOs in a given country and, as reported by the authors, it is linked to the fact that most blockchain-based projects are highly technological and ambitious to disrupt the traditional world (Huang et al., 2019).
- *ICO regulation* is a variable aimed at understanding if “ICOs occur more frequently in countries with more developed digital regulation environment”. This variable was found to be highly statistically significant and positively correlated with the dependent variable (i.e. the number of ICOs in a country), meaning that ICOs occur more frequently in countries providing a clear regulatory framework for this source of funding. This is a very important result because it was a question left unanswered in the previous chapter when analysing the worldwide regulatory scenario. It might be the explanation why venture’s founding team decided to base their ICOs in countries like Switzerland, Singapore or US even if all of them, in different ways, regulated ICOs. Ventures prefer more having countries with legal ICOs certainty, than countries without ICOs regulation (Huang et al., 2019).
- *Crowdfunding platforms* is a variable set to analyse whether ICOs and crowdfunding campaigns play substitutional or complementary roles in financing ventures. With respect to this variable the authors found a positive and reliable correlation of the variable with the number of ICOs in a country, meaning that ICOs and crowdfunding play complementary roles, therefore, ICOs occur more frequently in countries with more developed equity crowdfunding markets. Furthermore, this result is consistent with the one found for equity markets, highlighting once again the similarities between ICOs and crowdfunding campaigns (Huang et al., 2019).

Another interesting analysis was carried out by An et al. (2017), which deepened the relationship between legal protection and ICOs' success in terms of amount of funds raised. The authors wanted to understand if countries with common law systems are successful in carrying out ICOs, therefore, they regressed three different indexes developed by the literature, measuring different form of legal protection: from the ones in favour of minority shareholders, to the one guaranteeing creditors. What emerged is, on the one hand, a positive and significant correlation between minority shareholders legal protection and the amount of funds raised. Therefore, common law's countries, which have a long tradition of providing high levels of investors protection, seem to be more successful than others in concluding ICOs. On the other hand, instead, emerged an insignificant relationship between creditors' protection and funding raised. However, it is mainly due to the fact that ICOs are seen as a financial channel more related with equity financing, rather than debt financing, this is why creditors protection might not be perceived as so relevant (An et al., 2017).

The results obtained by An et al. (2017) are also consistent with the one obtained by Fisch (2018), even if using two completely different approaches. Fisch (2018) regressed two dummy variables: "Location US", that equals to one when the ICO is carried out in United States, and "Location EU", that equals to one when the ICO is carried out in the European Union. The author found the first variable to be positively and reliably correlated with the amount of funds raised during the ICO, while, the second one was found to be not statistically significant. Given that US have always been related with Common Laws and EU with Civil Laws, we might conclude that the result obtained by Fisch (2018) is consistent with the one obtained by An et al. (2017).

Finally, it is important to take into consideration the effect of restricting investors from certain countries (i.e. mainly US and China), in order avoid falling under the magnifying glass of their regulatory body. Specifically, Amsden and Schweizer (2018) by regressing the variable "Restricted areas" on ICOs success (both in terms of subsequent tradability of the tokens and in terms of amount of funds raised), found the two variables to be not significantly correlated. However, Bourveau et al. (2018) by regressing the variable "USA restricted" on ICOs' success (both in terms of successfully completion of the tokens' sale and in terms of funds raised), found them to be positively correlated highly statistically significant. The same result was also obtained by Florysiak and Schandlbauer (2019),

which by regressing the dummy variable “Restriction” on the amount of funds raised, found a positive and highly statistically significant correlation. Therefore, the final effect of restricting the investor base in order to avoiding having to deal with certain regulatory bodies, seems to favour ICOs’ success.

The final result, even considering the comparative analysis carried out by Lee et al. (2018) is highly uncertain. In fact, they found that 10,5% of successful ICOs restricted token sales in certain countries, contrary to nearly 11% of failed ones, however, this little difference cannot be used to clearly conclude that restricting the investor base leads to either successful or unsuccessful fundraising campaigns.

3.2 The problem of Information asymmetry and its possible mitigation

One of the more pressing problems inherent of the ICO market and that already emerged in the chapters so far analysed is a huge degree of information asymmetry. As reported by Ofir and Sadeh (2019) information asymmetry is a very common phenomenon in every public market where retail investors have substantially inferior knowledge, about the company’s strategy and technology, relative to the issuing entity. Furthermore, the authors highlighted how information asymmetry increases with the complexity of the venture’s product, strategy and technology, as it is the case for ICOs.

Empirical evidence documented many examples of information asymmetry and poor disclosure among ICOs. One of the most emblematic examples is the analysis carried out by Cohney et al. (2019), that has already been discussed in the previous section, about the discrepancies between information disclosed within Whitepapers and actual source code of the ICO.

Other authors found elements of information asymmetry in the ICO market, for example Zetzsche et al. (2017) observed that the majority of Whitepapers do not provide information about the entrepreneurs launching the venture or the applicable law. Adhami et al. (2018), instead, documented poor disclosure regarding the use of proceeds raised during the ICO. Furthermore, as highlighted by Ofir and Sadeh (2019) the problem even increases because venture launched are most of the time in very early stage, being only an idea with very ambitious purposes of revolutionizing traditional products, services or way to do things.

Information asymmetry has to be considered an important problem because it increases the efforts to be made by potential investors to find good projects on which to invest in.

Empirical evidence showed how much of the time, given the little information provided, investors' decisions cannot be entirely rational (Ofir and Sadeh, 2019). Furthermore, information asymmetry make also difficult for venture launching an ICO to be able to distinguish among many "scams" project. It is, however, worth highlighting that this problem was more accentuated on earlier ICOs stages when the was a complete run towards this new source of funding for the fear of missing out.

The main aim of this section is to analyse how the problem of information asymmetry could be, or had been, resolved over the years. Clearly, not all potential investors usually have the knowledge or the capabilities to understand on their own the goodness of a project. Therefore, either they are helped by a good company's disclosure, or it comes into play a third part by analysing ICOs' projects and issuing a rate, making it easier for investors to evaluate different projects by comparing rates. The generically called third parties, take specifically the name of rating agencies, which are a very common and reliable way of reducing information asymmetry in traditional public markets.

3.2.1 – Higher level of voluntary disclosure

Providing investors better venture's information might be obtained in two different ways: either through a much stronger ICOs regulation, which, however, is not the purpose of this paper, or through a greater level of voluntary disclosure by the venture. The latter of the two option is the underlying of the paper by Fisch (2018), which analysed in great detail the applicability of the signalling theory to the ICO market, arguing that that high-quality ventures should send signals to potential investors informing them about the venture's higher quality. In turn, those ventures will be able to attract more funding because of the reduced information asymmetry. Therefore, the benefit for a higher level of information disclosure is twofold.

Moreover, the same authors specified that the signalling theory must have two criteria to function correctly: *first*, the signal must be observable, because if the receiver does not notice the signal, information asymmetry will not be reduced. *Second*, the signal must be costly (not necessarily in monetary terms) to realize and imitate, otherwise it will be easy to imitate and thus will not serve as an effective signal of the venture's underlying quality (Fisch, 2018).

ICOs quality depends on the level of technological capabilities. Rational ICO investors will prefer to invest in ventures with higher technological capabilities, as their higher quality is likely to be reflected in a higher token's value. The problem is that technological capabilities are often not directly observable, while, rational investors usually base their investment decision on observable characteristics (Fisch, 2018). Within the ICO market the problem is even bigger, because the blockchain is still an unknown technology and quite complicated in its functioning, therefore, there is the paradox of having lot of technical information to disclose, but the difficulty of sharing them to the majority of the population.

As reported by Fisch (2018), being able to efficiently communicate the venture's technological advances is fundamental to capture investors' attention. The author proposed three ways ventures could use to signal their technological capabilities: patents, technical Whitepaper and high-quality source code. He, then, tested the effect of each variable in terms of ICOs' success, which can be interpreted as a measure of information asymmetry reduction. The results were statistical significance for the technical Whitepaper and the high-quality source code, while it was found no statistical significance for patents. The meaning for these results have already been discussed in the previous section when analysing the determinants of ICOs' success, what it is worth highlighting here, is that a positive and significant relationship of these variable with ICOs' success means that investors appreciated this type of disclosure, because ideally reduced the venture's information asymmetry.

However, as it has already been previously discussed, in many cases this type of disclosure (i.e. especially the source code) hide more information asymmetry, because is too complicated to understand for average investors. Therefore, aside from the technological capability which is surely the most important element of ICOs' quality, actually many other important elements, already analysed in the previous section, if disclosed, are able to reduce the information asymmetry between entrepreneurs and investors, leading to a higher probability of ICOs' success. What is important is to be able to provide investors all the relevant information, either technical or not, in order to allow them to understand the true venture's potential.

3.2.2 – *Third parties' independent ratings*

The alternative way, already mentioned at the beginning of the section, is to base investment decision on the judgment provided by rating agencies, which are third parties created with the aim of reducing, once again, information asymmetry.

As reported by Florysiak and Schandlbauer (2019), rating experts in the ICO context can be any person since there is no accreditation. The expert is expected to rate an ICO on pre-defined rating categories that reflect some measure of quality of the ICO, such as the quality of team members, the vision or the business idea.

It is costly for rating experts to produce a rating, which raises the question how they are compensated and one of the doubts pointed out by the literature is that ICO issuers actually buy expert ratings (Florysiak and Schandlbauer, 2019).

Before going in depth in the analysis of ratings and rating agencies, it is worth highlighting their relevance in terms of ICOs' success. Bourveau et. al (2018) found "rating" to positively influence both the successful completion of the ICO and the amount of funds raised. Furthermore, the results were in both cases highly statistically significant at 1%. The same result was confirmed in the analysis carried out by Florysiak et al. (2019) and Lee et al. (2018), which additionally found the "number of analysts" to be positively and reliably correlated with fundraising success.

These result highlight that information intermediaries seem to be able to capture venture's quality, and crypto investors view them as a reliable information source in their investment decision and due diligence process (Bourveau et al., 2018).

It is possible to arrive at the same conclusion by reviewing the analysis carried out by Lee et al. (2018) which examined the factors affecting first-day market subscriptions. Interestingly, the authors found the average rating from independent experts is a strong predictor of first-day subscriptions, therefore a better analyst rating foster token sales in earlier periods, all else being equal.

Given the importance of reputation systems across a variety of contexts, in 2018, Rhue carried out an analysis which combined data from three reputation systems in order to analyse the relationship among different sources: ICO Drops, ICO Rating and Etherscan (Rhue, 2018). The author found that none of the platforms had full coverage of all ICOs, but while ICO Drops and Etherscan provided scores for the majority of cryptocurrencies

they contained, ICO Ratings had ratings only for a small part of them (even if containing an overall larger number of ICOs). Across all sites the most common reputation score was “neutral”, which is absolutely meaningless and useless to investors (Rhue, 2018). Furthermore, the authors found a weak ICOs’ rating consensus among the three ICO reputation systems, highlighting an even bigger problems for potential investors, which found themselves to invest without solid and rational investing decisions, most of the time based on trust and perception.

Another very important rating platform in the ICO context is ICO Bench, which as reported by Lee et al. (2018) is the oldest rating platforms on ICOs and arguably maintains the most comprehensive database on ICOs. Interesting it is the functioning of this information intermediary because it combines together both an objective and a subjective rating system, which are then weighed in order to obtain the final rating. The objective evaluation is obtained through an assessment algorithm that uses more than 20 different criteria and divides the evaluation into four different areas: team, ICO information, product representation, and marketing/social media. As far as the subjective evaluation is concerned, it is provided by independent experts which assign their ratings taking into considerations: team, vision and product. Both the ratings are provided on a scale from 1 to 5, which are, then, bundled together through a weighted average in order to obtain a very complete final rating (Lee et al., 2018).

In the objective assessment: a *team* is considered more trustworthy if any member has participated in multiple ICOs, either as an advisor or team member. *ICO information* refers mainly to token distribution, ICO start and end dates, soft and hard caps. For *product presentation*, the algorithm checks the availability of such information through Whitepapers, milestones, and video presentations. Finally, the algorithm monitors activity on various *social networks* to determine whether an ICO team reaches potential investors (Lee et al. 2018).

In the subjective evaluation, independent analysts consider a *team* strong and trustworthy if it keeps the community updated with project progress and/or has participated in other cryptocurrency-related projects. *Vision* mostly concerns what a platform aims to achieve in the mid-term and long-term future. Finally, when evaluating *products*, experts take into consideration: product maturity level; technology behind; specific problems with products/services; product roadmap and projects’ commitment (Lee et al., 2018).

An interesting analysis on ICO Bench was carried out by Florysiak and Schandlbauer (2019) which tried to understand the relationship between ICOs' information contents and the rating provided by intermediaries. Beyond the ICO listing site, the Whitepaper is surely the most important information source used in the ICO's rating assessment and they wanted to test the hypothesis whether Whitepapers with higher information content (i.e. less standardized) are associated with lower information asymmetry. What the authors expected to find is that more informative Whitepapers will: receive higher average ratings due to less opaqueness; be subject to a closer rating consensus; receive more ratings. The results obtained with respect to these three assumptions are the following:

- *Level of ratings.* The “standard content” of a Whitepaper was found to be positively related to the overall rating while “informative content” did not reveal statistical significance. However, this was the overall rating, then, the authors split the analysis between algorithmic and expert ratings. In the first case, the rating was positively and reliably influenced by standard Whitepaper's contents. This result is not surprising considering the way in which it is calculated. As far as the rating provided by independent experts, it resulted to be not significantly influenced neither by standard, nor by informative Whitepaper's content. In this case the result is a bit surprising because it leads to the question of which information sources experts actually use (Florysiak and Schandlbauer, 2019). The biggest expectation was to find a highly positive and significant effect of informative Whitepaper's content on expert ratings.
- *Rating disagreement.* In this regard “informative content” was found negatively related to rating disagreement, especially during cold market environment, meaning that more informative Whitepapers lead to a higher expert' rating consensus for the same ICO. This result might be interpreted in the fact that during cold market phases, being ratings, more monitored by investors, actually it requires experts to put more effort in their rating production, by deeply analysing hundreds of informative Whitepaper's pages (Florysiak and Schandlbauer, 2019).
- *Number of ratings.* What emerged is a negative correlation between both Whitepaper's contents and the number of ratings produced. Consistently with findings for rating disagreement, this correlation is particularly present during cold market periods, because given that rating production is more costly, the number of ratings per ICO naturally decreases (Florysiak and Schandlbauer, 2019).

Overall, the authors argued that the idea of having a certification of how well ICOs score on properly defined rating categories is good and could be a fundamental tool for helping

investors in their investing decisions through a reduced information asymmetry. However, *rating levels*, *rating consensus* and the *number of ratings* produced was shown to be mostly unrelated to the information content of Whitepapers and the trade-off between producing more accurate ratings and its costs, faced by rating experts shows that the current market for ratings is deeply flawed and unsustainable. Moreover, uninformative ratings are currently very powerful as they influence ICO success and funding amounts to a great extent (Florysiak and Schandlbauer, 2019).

As it was reported so far, information asymmetry thanks to well build informative Whitepapers can be strongly reduced, eventually leading to higher probabilities of ICOs success. However, there have been many examples of successful “scams” ICOs which eventually failed after a year later, with 46% of the ICOs that were initiated in 2017, already failed in 2018 (Momtaz, 2018a). This points out the doubt that potentially fraudulent ICOs either disclose more false information content to attract investors with a “new and extraordinary story” or disclose less information content by “mimicking others” (Florysiak and Schandlbauer, 2019).

An interesting analysis carried out by Florysiak and Schandlbauer (2019), revealed no significant association between potential fraud and informative or standard Whitepaper’s content, neither in the overall sample, nor when differentiating between “hot” and “cold” market periods. However, they found highly significant results when taking into consideration the number of peers in the ICO market. When the number of peers is sufficiently high (i.e. >10), an increase in “standard contents” significantly increases the probability of having a “scam” ICO, while the contrary happens in case of an increase in “informative contents”.

The interpretation for these results is that potential fraud ICOs provide less informative content, therefore, use more terms found in peer or recent ICOs, to avoid attracting excessive attention, thus “mimicking” non-fraud ICOs (Florysiak and Schandlbauer, 2019).

4 Performance analysis in the Post-ICO phase

The last topic remaining to be analysed is the performance intrinsic in the ICO market, in order to understand the reasons why this new form of financing has been so successful and appreciated by investors, despite its many downfalls in terms of information asymmetry and potential “scams”.

The analysis will be carried out in different phases, firstly analysing the short and long terms success, then focusing on the determinants of ICOs’ returns and, finally, concentrating on ICOs’ surveillance, liquidity and volatility.

4.1 Aggregate performance of ICOs both in the short- and long-term

Different authors analysed ICOs’ returns, both short-term (i.e. the returns coming out from the first day of trading), and long-term (i.e. the returns experienced by ventures up to three years after the tokens listed on one of the major crypto-exchanges). The main source used by literature’s studies for gathering price data is CoinMarketCap which is considered the best available data source for cryptocurrencies’ volume and prices.

One of the main problems in carrying out this type of analysis, as identified by Benedetti and Kostovetsky (2018), is that not all the token issued are subsequently listed. Only 25% of their sample, listed the tokens in the 60 days after the end of the ICO, while the other 75% represents either token listed with longer timeframes or illiquid tokens, useless until the platform is built and they can be used to buy product/services on it. However, as a mitigation for this problem, the same authors also identified that almost all the money actually invested in ICOs are for tokens that go on to list, so the ones with data are the ones that actually matter to the typical investor (Benedetti and Kostovetsky, 2018).

4.1.1 – Short-term ICOs’ returns

The most important measure of short-term performance is the return investors are able to generate from the purchase of the tokens, to the first available opening price after the listing of the tokens on one, or more, crypto exchanges. This type of returns are particularly relevant because they are a measure of ICOs underpricing and, in absolute terms, they are also a measure of the money left on the table during the public sale.

Although the market structure of ICOs is quite different from that of IPOs, it is useful to examine whether underpricing also exists in the ICO market (Lee et al., 2018). IPOs underpricing arises when the stock price set for the public sale is lower than the potential market value of the company being listed. The choice of stock price for the IPO is very important because it is able to influence both IPOs' success in terms of amount of funds raised, and the profits for the underwriter (i.e. investment bank). For the reasons just explained, this choice usually involves disputes between the entrepreneurs and the investment bank, because the former has all the incentives to set the price as high as possible in order to maximise the funds raised, while the latter usually wants to set a lower price in order to increase the volume of stock sold and, most importantly, to maximize its profits. An higher level of ICO underpricing consequently influences the amount of money left on the table by the venture, because if the true market value of the tokens on the first day of trading is much higher than the ICO price, it means that the founding team is actually raising an amount of funds lower than what they would have raised by setting a higher ICO price, much closer to the true tokens' market value.

ICO market dynamics are different from the IPOs' ones, firstly because there is not an underwriting following the public sale of tokens, secondly because usually token pricing is not straightforward as in the case of IPOs. Moreover, the fact that in many cases there are also Pre-ICOs make it even more difficult to compute ICOs underpricing and evaluate the money left on the table.

First-day return or underpricing, as computed by Lee et al. (2018) is equal to:

$$r_1 = \frac{P_1}{P_{ICO}} - 1 \quad (1)$$

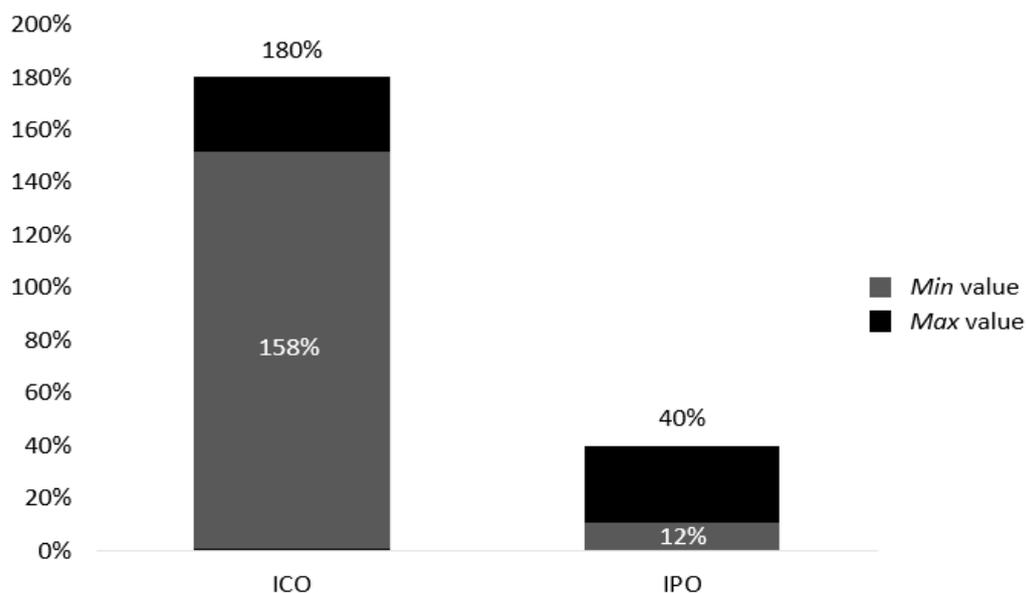
in which P_1 and P_{ICO} are first day closing price and offer price, respectively. The average first day return found by the same authors was 158%, substantially higher than the average IPO underpricing of 12% - 40% documented in earlier research studies. However, they also highlight how the median ICO underpricing is only 24%, a much lower value compared to the average one, indicating that the distribution of ICOs' first-day returns are highly skewed to the right, with the majority of tokens facing low, or even negative, first day returns and a small portion of them experiencing extremely high first day returns, due to a very high ICO underpricing. Furthermore, the average figure of money left on the table was

\$42 million, but also it was highly right-skewed, with a median equal to nearly \$1.3 million. This result is extremely important considering that the average gross proceeds collected by ICOs is \$21 million, therefore indicating that ICOs on average leave on the table the double of the money on average collected (Lee et al., 2018).

Comparable results have also been observed by Dittmar and Wu (2019), which in their analysis revealed an average first day return equal to 180%, but once again highly skewed since the median return is 15%. Moreover, also Benedetti and Kostovetsky (2018) found an ICO underpricing equal to 179%, even though here we do not have a measure of the skewness in the returns since he did not compute median results, however, in average terms the returns seem consistent with the previous presented results.

These results, summarized in the below reported *Figure 5*, highlight how underpricing, aside from being a common feature of IPOs, it is also a key feature of ICOs, with the main difference being the fact that the latter experience, on average, much larger levels of underpricing with respect to IPOs, because ventures tend to offer their tokens at a much favourable price with respect their true market value, that emerges at the first day of trading. This is where the main conceptual difference between traditionally financed projects and blockchain-based ones arises, because the absence of an underwriter in ICOs, make it possible to observe such huge values of ICO underpricing.

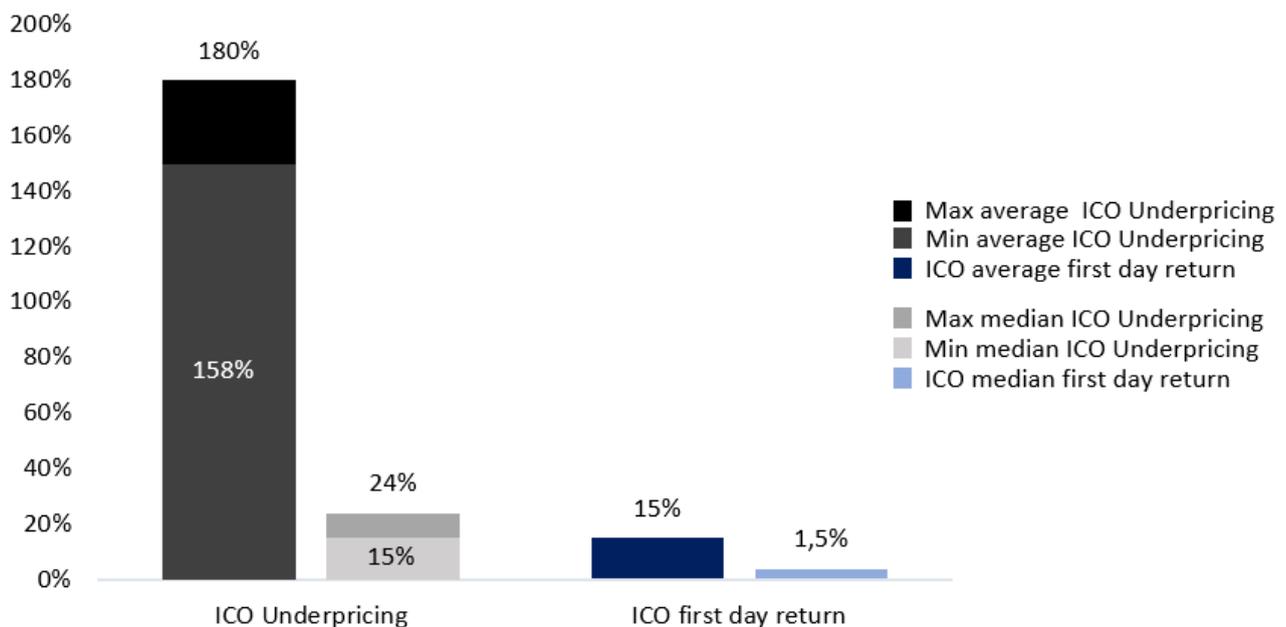
Figure 5 – ICO vs IPO Underpricing



Source: own elaboration

An alternative analysis of first day returns is the one proposed by Momtaz (2018c), which investigated only the returns coming out from the first day of trading, thus, excluding the abnormal returns due to very advantageous prices. What the author found is a much lower average first day return equal to 14,8% and a median equal to 1,5%, meaning that even excluding underpricing, there are other factors which cause a high skewness in the results. One of them, as highlighted by the same author, is that four out of ten ICOs reported negative first-day returns, which is for sure a relevant explanation for such important difference between mean and median returns. Comparable values have been obtained also in the analysis carried out by Benedetti and Kostovetsky (2018), which found an adjusted average first day return equal to 15,1%.

Figure 6 – ICO Underpricing vs ICO first day return



Source: own elaboration

In the above reported *Figure 6*, it has been summarized all the literature’s results so far presented about the first day returns, both including and excluding the ICO underpricing, highlighting in both the scenarios average and median values. In particular, for what concerns the ICO underpricing it has also been reported both the maximum and the minimum average and median returns coming out from the literature’s studies above presented. As it is possible to observe, aside from the huge underpricing intrinsic of the ICO market, given by the difference between the two measures of first day returns, *Figure 6* clearly highlight, also, the noticeable skewness in the ICOs returns already discussed, given by the huge difference existing between average and median returns.

Finally, very interesting is also the further analysis carried out by Lee et al. (2018) that analysed the first day turnover. It is defined as the first day trading volume divided by the number of tokens issued. The authors found it to be on average equal to 6.7%, with the median equal to 1.3%, then, they compared it to previous results found by literature relative to IPOs. In particular, the latter show on average higher first day trading volumes, about 66%, highlighting the illiquidity intrinsic of many listed tokens. However, this aspect of post ICO performance, will be analysed in greater detail in the last section of this chapter.

4.1.2 – Long-term ICOs' returns

In this section the aim is to understand the average returns experienced by ICOs from the first day of trading up to three years later. One of the most comprehensive literature's studies in terms of timeframe considered is the one carried out by Dittmar and Wu (2019), which analysed ICOs returns up to 180 days since the beginning of tokens' trading. However, one of the problem intrinsic of this analysis is that returns were computed starting from the selling price, thus not excluding ICOs underpricing, therefore it showed very important long-term average returns, even if, in median terms, returns became negative. Specifically, when analysing average returns, the raw returns faced an inexplicable pattern mainly due the Bitcoin trend over the same timeframe. Much more meaningful is the pattern of market adjusted returns which showed a progressive decreasing trend, which decreased up to 100% in 180 days since the first day return. More important than the average returns are the median returns which revealed that ICOs faced negative returns after 30 days of trading. Starting from 15% of first day median return, it arrived at around -50% after 180 days of trading.

These results highlight how investors might be incentivized to sell early the tokens initially purchased instead of holding on to them for eventually utilizing the associated product/service. It might also be interpreted as a red flag for all the ICOs that had the aim to create a network effect around the project: if investors become more interested in selling the earlier possible the tokens in order to generate huge returns (after having bought the tokens at high discount), rather than to keep them to access venture's product/services, there is the risk of not being able to create such network effect. In this respect an analysis on liquidity a volatility of tokens might provide a more complete answer.

Another observation which could be made is that also over the long run there is a strong

skewness in the results, meaning that even if the majority of ICOs underperformed with respect to the first day, actually there were some of them which performed particularly badly.

Lee et al. (2018) also analysed ICOs performance after the first day of trading, however, they carried out an analysis partially different from the previous one because they excluded from their long-term returns, the first day returns. In this case too, the analysis over the long run requires to analyse market adjusted returns, rather than raw returns, in order to neutralize the trend of other cryptocurrencies in the same timeframe. What the authors observed was a drastic decrease of one-week return (i.e. from 143% first day return to 14,6% one-week return), which, then, started to increase to approximately 46% one- and three-month returns. The massive decrease from the first day return to one-week return, however, is not warning, because it is mainly due to the exclusion of first day performance for the analysis of long-term returns. Another analysis on long-term ICOs performance was carried out by Benedetti and Kostovetsky (2018), which found slightly higher results in terms of average adjusted returns, but with the same progressively increasing trend over the years. Moreover, he went over by analysing ICOs returns up to a year of trading, finding a cumulative return equal to 1294%. Similarly, Momtaz (2018c) analysed ICOs returns up to 3 years of trading revealing the same increasing trend of average ICOs' returns over time, as found by the previous two authors. In particular, the author found 1600% return from the first day to the third year of trading.

In terms of numbers obviously the different works are not fully comparable, because the three authors used samples with different dimensions and the researches had been carried out in different timeframes. Furthermore, being ICOs highly subjected to skewness in the results, it might easily be that ICOs not comprised in other works, experienced either extremely high, or low, results, thus influencing the final average returns.

The massive returns found by the authors of more than 1000% after a few years, might lead us to positively conclude about blockchain and ICOs, highlighting how they can be an extraordinary potential investment for investors, possibly able to completely replace the traditional financial system. However, as it will be possible to see, median returns will depict a completely different result. The analysis of median returns revealed, in fact, a common pattern among the different authors and this result is even more meaningful since it allows to depict a more sincere overview of ICOs performance, making it easier to understand the size of skewness in the results.

Specifically, in the analysis carried out by Lee et al. (2018), median returns turned to be negative after one week of trading (i.e. from 24,4% first day return to -12,9% one-week return) and, then, continued to decrease up to -37% three month after, therefore showing an opposite trend with respect to average results. Similarly, Momtaz (2018c) found comparable slightly higher median returns: -26% in three-month periods, increasing to -37% after a year of trading, and then decreasing to -30% after two years. Interestingly, after three years from the listing of the ICO, median returns turned to be positive and equal to 11%.

The overall overview of previous literature's studies about ICOs, highlighted how skewness is intrinsic of the ICO market even in the long-term. Furthermore, it was also possible to observe how it increases as the time passes by, meaning that there is a large discrepancy between successful and unsuccessful ICOs, with a small number of large ICOs over performing with respect to the median one. However, it is important to notice that, a part Dittmar and Wu (2019), the other studies presented did not have the same number of observations for each timeframe analysed (i.e. three-month, six-month, one-year, three-year periods), because many listed tokens had a much shorter history. Therefore, while for shorter timeframes is it possible to extend the literature's results to the whole population, being them based on a representative number of observation, it might be not do the same for the literature's results over longer timeframes. In fact, the latter being based on a progressively lower number of observations, the longer the timeframe considered, they cannot be extended to the whole population, because their sample is not enough representative as the one for shorter timeframes.

Another very important observation made by Lee et al. (2018) is that it seems that the underperformance of the median ICO with respect to the benchmarks (i.e. ETH and BTC) in the periods after the listing, is consistent with the long-run anomaly of IPO overpricing found in previous literature's studies. This underperformance seems to be overpassed after three years, even if it cannot be used as a general approximation since there is only the paper by Momtaz (2018c) to carry out such a long analysis on long-term ICOs performance.

Momtaz (2018c), also examined the risk-adjusted profitability of ICOs by comparing the distribution of Sharpe Ratios for different investment horizons. As reported by the same author *"The average Sharpe Ratios are clearly below the commonly agreed 'success*

threshold' until the end of the second month, which is marked by a Sharpe Ratio of 1.08. For longer holding periods, the Sharpe Ratios increase continuously to values of 3.16, 13.02, and 20.57 for one-year, two-year, and three-year holding periods, respectively". These results highlight how the balance between risk and returns in early periods is unbalanced in favour of risk, while, as the time passes by, things progressively reverse, with a higher return for the level of risk assumed by investors.

At first glance, this result is surprising, because by looking at the huge returns experienced by tokens in the first day of trading, the impression is to be in presence of a very rewarded investment, even considering the huge risk assumed by investors. However, as it was further analysed, ICOs' returns are hugely skewed, with median values far lower than the average ones, meaning that actually only few ICOs faced very high first-day returns, while the majority of them faced far lower, or even negative, first day returns, and this might explain the very low Sharpe ratios observed by Momtaz (2018c) in the early periods of tokens' listing. Therefore, only those ICOs experiencing huge short-term returns had an adequate balance of risk and returns, while the majority of them experiencing lower, or even negative returns, were unbalanced in favour of risk.

4.2 Determinants of ICOs' returns

The aim of this section is to understand the determinants of ICOs' returns, by analysing, similarly as it was done in the previous chapter, different literature's studies. The analysis will be oriented both to the determinants of first day and long-term returns, following the same logic used in the previous chapter, thus reviewing the findings of different authors on the same aspects.

4.2.1 – Crypto market

An important finding regarding ICOs market conditions was revealed by Lee et al. (2018), which found "first day return" to be positively and reliably correlated with "first day market return", highlighting how a hot overall cryptocurrency market substantially boosts investors' sentiment in newly listed tokens. The same result was obtained, also, when analysing the determinants of one-week and one/three-month returns, which were significantly and positively influenced respectively by one-week, one/month market returns (Lee et al., 2018). These results have also been confirmed in an analysis carried out by Momtaz

(2018a), which found “market sentiment” to be positively and reliably correlated both with first day returns, and with the probability of obtaining first day positive returns.

Therefore, as expected by the literature, ICOs returns, both short- and long-term are influenced by the overall trend of the ICO market. The hotter it is the cryptocurrency market, the higher is the probability of obtaining higher returns from ICOs investments.

Another study, carried out by Benedetti and Kostovetsky (2018), analysing the determinants of ICOs underpricing, revealed a negative and statistically significant relationship between the “date” of the ICO and the First opening price/ICO price. In particular, an ICO launched one year more recent than another, was found to yield approximately a 25% lower return. A possible explanation for this result is that as the crypto market grew, more ICOs were launched and there was a greater awareness around the ICO market, thus, ventures could set much more market reflecting prices (i.e. avoiding offering tokens at very low prices, thus with a high underpricing). This result is confirmed by another analysis carried out by Florysiak and Schandlbauer (2019), which found ICOs returns (i.e. 22 days return) to be negatively and significantly related to the “number of ICOs per month”. Even though this analysis is very different from the previous one, the result obtained is meaningful because it seems to arrive at the same result, thus the higher the number of ICOs to take place, the lower the returns. However, this result has not to be confused with what obtained by Benedetti and Kostovetsky (2018) and Momtaz (2018a), because while those were analysis on the performance of the overall crypto market, in the latter cases it was an analysis more correlated with the number of ICOs that took place and between the two there might not be a perfect relationship.

4.2.2 – ICOs design variables

Pre-ICOs

Having a presale before the actual ICO, was found by Benedetti and Kostovetsky (2018) to cause a negative and reliable effect on the first day return. This result is very important, because it points out that learning about the market value of their token during the pre-ICO, actually helps entrepreneurs to properly price their tokens at the ICO. The same result was found by Dittmar and Wu (2019), which found that venture having previously had a Pre-ICO, obtained significantly lower returns, in both first day and long-term, with respect to ICOs without presales. The same authors carried out, also, analysis in which

they isolated the ICOs happened in the de-hyped period (i.e. end of 2018 and 2019) in order to understand whether this effect continues persist also during periods of lower ICO activity. The result they obtained is that, also in this case, presales campaigns are significantly negatively related to both initial and subsequent returns. Similarly to the previous studies, Florysiak and Schandlbauer (2019), confirmed that having a presale negatively and reliably influence ICOs returns (i.e. 22 days returns).

Lee et al. (2018), instead, contrary to the results just reported, found not only an insignificant relationship between having had a presale and ICOs returns, but also a positive correlation between the two variables. A possible explanation for the last result obtained by the authors, might be that presales are much more useful to sell in advance tokens, likely offering huge discounts to early investors, which actually lead to obtain higher returns when the tokens get listed.

However, considering that the majority of the results pointed out a negative and significant relationship between Pre-ICOs and ICOs returns, both short- and long-term, it seems that presales are much more useful to understand the market and to set a proper token price (i.e. reducing underpricing), rather than to sell earlier a portion of tokens. Furthermore, it is also consistent with what emerged in the previous chapter, in which presales were found to be very useful to conclude a successful ICO campaign.

Bonus

What Lee et al. (2018) found regarding presales, even if it was not a statistically significant result, pointed out a potential link with ICO bonus. Also in this case, literature results regarding the effect of discounts on ICOs returns is doubtful.

While, Lee et al. (2018) found a significant and negative relationship between the two variables, both for what concern first day and long-term returns, many other studies found no significant correlation between bonus and ICOs returns. Bourveau et al. (2018), found “ICO participation incentives” to be not reliably correlated with ICOs returns, neither in terms of first day returns (i.e. from opening to closing of the first day of trading), nor in terms of ICOs underpricing. Similarly, Florysiak and Schandlbauer (2019) found neither of the two variables “bonus” and “bounty” to be significantly correlated with ICOs returns. Finally, Dittmar and Wu (2019) found that the bonus structure to be not significantly related to returns when comparing ICOs offering incentives, with others offering no discounts. Instead, when analysing ICOs in the de-hyped period, the same authors found a negative and significant relationship between ICOs incentives and returns.

These results are quite surprising, because the first expectation about the effect of this variable on ICOs returns, was to be positive. Higher level of bonus offered, translate in lower purchase prices, which eventually lead to higher ICOs underpricing (i.e. higher ICOs returns). Instead, the fact that the majority of the authors found not significant correlation between the two variables, confirms the result obtained in the previous chapter: marketing programs are not a relevant tool to be leveraged in order to increase the likelihood of obtaining a successful ICO.

ICO price level and Number of tokens issued

The results just reported about Pre-ICOs and Bonus have an important implication on the effect of the tokens price on ICOs returns. Specifically, Benedetti and Kostovetsky (2018) found that the “log ICO price” was negatively and reliably correlated with ICOs underpricing. Similarly, Dittmar and Wu (2019) found, especially during hype ICO market periods, that higher token prices lead to lower returns, both short- and long-term.

As it was possible to capture from previous literature’s studies, ICO bonus have not an effect on ICOs returns and presales are primarily needed to set up proper token prices. Therefore, lower token prices are not due to the offering of high discount, but from a proper understanding of the correct price at which to issue the tokens, through a well build Pre-ICO. In this sense, the findings coming from the previous chapter with regard to the number of tokens issued, revealed that investors suffer from nominal price illusion, which causes higher demand for ventures issuing a higher number of tokens with low nominal prices, and low demand for highly priced tokens. Therefore, by setting low tokens price, ventures are able to lower ICOs underpricing, consistently with the result obtained both by Dittmar et al. (2019) and Benedetti et al. (2018).

If a venture decide to adopt the strategy of setting very low prices for the tokens in order to activate lottery-behaviours on investors, it will automatically need to increase the number of tokens issued. This result has also been confirmed by Florysiak and Schandlbauer (2019), which revealed that the “number of tokens” is positively and reliably correlated with ICOs returns (i.e. 22 days returns). Therefore, it might be concluded, how presales are a very powerful way of both obtaining a successful ICO and the money left on the table, by correctly understating the price at which investors are willing to buy venture’s token. From empirical evidence, it seems that potential investors prefer to buy low priced tokens, rather than highly priced ones.

Campaign length

An important signal for any crowdfunding campaign is its length. Intuitively, a higher-quality ICO would take less time to reach its goal than a lower quality one. Consequently, returns should be higher for shorter campaign lengths (Dittmar and Wu, 2019). However, results coming by other literature's studies seem to not confirm this assumption. The same Dittmar and Wu (2019), in their analysis found an insignificant relationship between ICO duration and returns, both in hype and in de-hyped market periods. Similarly, Benedetti and Kostovetsky (2018) found "Length of ICO" to be not significantly correlated with first day returns, and the same result was also obtained by Florysiak and Schandlbauer (2019). Therefore, it might be possible to conclude with enough certainty that the length needed to conclude the ICO has not a relevant effect on the returns expected from the investment.

ICO gross proceeds

Another related quality signal, as reported by Dittmar and Wu (2019), is the total amount of fund raised, and how close they are to the stated funding target. The expectation is that campaigns that raise more funds are more likely to be high quality campaigns, and therefore lead to higher returns. The results obtained by the literature seem to confirm this expectation, in fact, both Benedetti et al. (2018) and Momtaz (2018a) found in their regression a positive and significant relationship between "ICO gross proceeds" and first day returns. This result highlight how most successful ICOs, able to collect the higher amount of funds, are also those most successful in terms of returns collected after having listed the tokens.

It is also important to consider the relationship between the funding caps and the money collected, because based on how they are set in the first place might be an important quality signal (Dittmar and Wu, 2019).

As reported by the same authors, if the soft cap is hit, and funds are not returned to investors, then the project will be only partially implemented. Thus, a low ratio of soft cap to hard cap may suggest a willingness of the issuer to proceed regardless of whether the project can be fully successful, and therefore represent a negative signal for investors (Dittmar and Wu, 2019). The result obtained from empirical evidence, consistent with what expected, is that a low ratio correspond to significantly lower short-term returns, confirming that these ICOs are perceived riskier by investors, since with the money collected, the venture will only be able to partially implement the project. Furthermore, the same result

was also obtained during period of de-hyped ICO market, in which it was found significant both for short- and long-term returns.

Another important ratio to be considered is “amount raised/hard cap”, which highlight if the venture was able to collect the desired amount of funds, needed to fully implement the project. Therefore, when the ratio of the total amount raised to the hard cap is high, Dittmar and Wu (2019), assumed that the ICO is of higher quality and should therefore be expected to have a higher return. Instead, ICOs falling significantly below the hard cap may indicate issuer overvaluation of their projects. The result obtained by the authors was that ventures raising funds close to the hard cap received significantly higher returns in the first 90 days, therefore, a result consistent with the prediction previously made.

4.2.3 – Regulation

Analysing the effect of regulation on returns is not simple. A first attempt was carried out by Benedetti and Kostovetsky (2018), which found the variable “country rule of law” to be not reliably correlated with first day returns. However, it is very difficult to capture the overall effect of regulation within a unique variable.

A much more meaningful analysis was, instead, carried out by Momtaz (2018a), which analysed the sensitivity of first day returns to adverse industry events. Among the most important events happened to the ICO environment there was, for sure, the ban from the Chinese and South Korean governments, of all blockchain and ICOs activities.

To capture the events’ effects, Momtaz (2018a) included, in his regression model, binary variables equal to one if an ICO took place one month after the focal event, and zero otherwise. What the author found is that ICOs concluded after these government’s ban faced reliable lower first day returns. This result confirms how regulation has a strong impact on ICOs performance, differently from what obtained by Benedetti and Kostovetsky (2018).

Another interesting analysis carried out by the literature, was aimed at understanding the effect of restricting the investor base from the ICO participation. The results obtained by Bourveau et al. (2018), Florysiak et al. (2019) and Dittmar et al. (2019) however, seem to agree that “country restrictions” have no significant effect both on short- and long-term ICOs performance. Instead, when focussing on the determinants of ICOs returns in de-hyped market periods, Dittmar and Wu (2019), found the variable “US investor prohibited”

to be negatively and significantly correlated with both first day and 30 days returns. These results might mean that while excluding some investors from investments in the ventures seem to not affect returns when there is a hot ICO market, in a cold market period when there is lower interest on ICOs, excluding potential investors is penalising in terms of returns.

4.2.4 – Whitepaper features

For what concern the information content of the ICO Whitepaper, literature's studies analysed its effect on short- and long-term returns in different ways. The main expectations is to find evidence of a negative and significant relationship between short-term performance and information content of Whitepapers, both informative and standard, since lower level of information asymmetry should lead to lower underpricing (i.e. there is no need to set low prices). For what concern, instead, longer-term returns, it is not expected to find an association between information content and returns, as any relevant information is more likely to be embedded in prices (Florysiak and Schandlbauer, 2019).

The actual result obtained, however, are only loosely correlated with expectations. In particular, Bourveau et al. (2018) found the variable “informative Whitepaper” to be not significantly correlated with first day returns. Moreover, the same authors did not find overall significance neither in the subsequent regression in which they substituted “informative Whitepaper” from ICO Bench, with manually chosen variables.

Florysiak and Schandlbauer (2019), instead, when analysing the effect of “standard” vs “informative” Whitepapers, found, consistently with their expectations, an insignificant relationship between Whitepaper information content (both informative and standard) and longer-term returns. For what concern shorter-term returns, they still found an insignificant effect of “informative content”, but they also found a positive and significant effect of “standard content”. A possible explanation for this last result, might be that more standard Whitepapers actually increase the level of information asymmetry, thus leading to a higher underpricing, with translates in higher short-term returns.

Overall, empirical analysis on the effect of Whitepapers informative content on ICOs returns, seem to confirm that prices over the long run correctly incorporate many information about ICOs projects. As far as short-term ICOs' performance is concerned, instead, evidence seem to discard previous expectations, pointing out that having

informative, rather than standard, Whitepapers does not influence returns.

Another interesting analysis on the content disclosed within the Whitepapers, was carried out by Dittmar and Wu (2019), which analysed the effect of the Whitepaper's net overall tone, in order to examine if it had an effect on ICOs' returns, both short- and long-term. What the authors found is an insignificant correlation between the two variables. The same result was also obtained by Florysiak and Schandlbauer (2019), which found no statistical significance for the variable "sentiment polarity" in terms of ICOs' returns. These results suggest that the Whitepaper's sentiment is not a cause neither of underpricing, nor of longer-term returns, also because over the long run all the relevant information about the project will be incorporated within tokens price.

However, when Dittmar and Wu (2019) deepened the determinants of ICOs' returns in the de-hyped period (i.e. from the end of October, and during 2019), they found that project with more cautious and risk-related discussions, thus with a more negative overall tone, were associated with lower ICO returns in the post-hype sample. This result highlight how in period of cold ICO market, when interest and number of ICOs are low, investors likely make attention also to little details as the disclosure's tone.

To conclude, Florysiak and Schandlbauer (2019) analysed the effect of "sentiment subjectivity" on ICOs' returns. What the authors found is a negative and significant effect of the variable on shorter-term returns, pointing out that probably more than the tone of the Whitepaper, investors value more receiving an objective description of the project, unbiased by subjective considerations. In any case, this result cannot be generalized since this is the only work which analysed the subjectivity effect on ICOs performance.

4.2.5 - Management team and ICO project

Momtaz (2018a), by analysing the determinants of first day returns and the probability of obtaining first day positive returns, found the variable "management team", to be positively and reliably correlated with ICOs returns. In particular, the variable is based on ICO Bench, and captures the quality of the management team and the experience of external consultants. As reported by the same author, the main reason for this result is that absence of management quality will translate after the completion of the ICO (i.e. when the tokens will get listed), into a significant token price deterioration, because, very likely,

managers will fail to meet self-set milestones or might incur into hacks due to erroneous coding. This result was also confirmed by another analysis carried out by the author analysing the effect of the same variable on the “money left on the table”, finding that project with higher management team quality leave on average more money on the table.

Consistently with the results obtained by Momtaz (2018a), another study carried out by Bourveau et al. (2018), revealed “past success of the ICO team” to be positively and significantly correlated with first day returns. In fact, the main expectation of the authors was that teams with successful ICOs track records, very likely will have higher knowledge, thus will less likely incur into errors when implementing the project after the end of the ICO.

However, attention should be made in the fact the results obtained both by Momtaz (2018a) and Bourveau et al. (2018), are only related to first day returns. Even though it could be reasonably an approximation also for long-term results, actually there is not any other study deepening the analysis, thus a generalization of this result should be evaluated carefully.

Another interesting analysis carried out by Momtaz (2018a) concerns the effect of visionary projects on ICOs returns. Specifically, he regressed, similarly as he did with “management team”, the variable “vision”, once again extracted from ICO Bench, which measures whether, or not, the ICO project is visionary. What the author found, is a significant and negative effect of the variable on first day returns.

When building their model, the author had two opposite expectation about the effect of this variable: either positive, because more visionary projects are also those able to make the difference if being successful; or negative, because the more a project is visionary, the more it will be difficult to be implemented and the more likely it will fail. The final result obtained is that “vision” is negatively and highly reliably correlated with ICOs returns, therefore suggesting that visionary projects, will receive lower first day returns, because will be more likely to fail when trying to be implemented.

One observation though, is that risk and returns should always be inversely correlated, thus more visionary project, perceived riskier by potential investors, should also receive higher returns in order to compensate the higher level of risk. However, from the result above exposed, it seems that this relationship does not hold in this case.

In any case, it is important to highlight that the result just presented only refers to the effect

of “vision” on first day returns and, as it has been previously said, it cannot be generalized for long-term returns. In fact, the vast majority of ICOs project remain in the idea stage after a year (Ernst & Young, 2018a), and the evaluation of the effect of “vision” on ICOs returns should be evaluated in a longer timeframe. Furthermore, the first day of trading is usually 30 days after the completion of the ICO (Dittmar and Wu, 2019), which is a quite short amount of time to assess the failure of a project. Therefore, the result obtained simply reveal that visionary project are not underpriced as it might possible to think at first glance, but it cannot be used to completely conclude that visionary project obtain, in general, lower returns. Finally, it is worth mentioning that the results obtained by Momtaz (2018a) are not confirmed by any other study, thus the final effect of project “vision” on ICOs returns, should be evaluated carefully.

Related to project quality, Dittmar and Wu (2019) investigated the effect of pre-ICO project activities and progress on post-ICO returns. Intuitively, the authors argued that more work that have already been undertaken, and human capital invested, prior to the ICO, the more legitimate is the offering, as abandonment becomes more costly. Given that most ICOs, as it was pointed out in the first chapter, are software based, the authors leveraged information about code update activities and accounts as proxies for project work and progress. The results they obtained confirmed the initial hypothesis: ICO projects with more frequent code updates and codes contributed by more experienced accounts obtained significantly higher returns, than ICOs without these characteristics.

This result suggests how investors care about the actual progress of the proposed projects even after the end of the ICO campaign and prefer projects with more tangible activities as they likely offer higher-quality products (Dittmar and Wu, 2019). Consistently with the effect of “management team quality” on short-terms performance, the findings obtained by Dittmar and Wu (2019) seem to confirm the same effect also in the long run, since higher management quality, will likely work harder in the effective implementation of the disclosed project. Furthermore, this result also highlight how investors seem to value more the planned evolution of the ICOs project, rather than how “visionary” it is. Because, if the project is too complicated and futuristic to be actually realized, then very likely that tokens will face lower returns also in the long-term.

4.2.6 – Ratings

In the previous chapter it was revealed how judgments provided by external parties on ICOs had a very positive effect on ICOs success. The main expectation in terms of effect on ICOs returns, is the same. However, results seemed to be slightly different. In fact, Bourveau et al. (2018), found the variable “rating” to be only loosely correlated with first day returns, from opening to closing prices. Instead it was found not statistically significant in terms of ICO underpricing (i.e. from the ICO price). A similar result was obtained by Lee et al. (2018), which found analyst ratings to be uncorrelated with underpricing.

However, the same authors found the variable related to ratings to be positively and highly correlated with three-month returns. Lee et al. (2018), correctly explained that this result is due to the fact that ratings focus on team, vision and product, all of which are long-term indicators of the start-up quality. Furthermore, independent analysts, do not have financial stakes in ventures undergoing an ICO and do not control the pricing process, unlike investment banks, who likely have incentives to underprice IPO stocks as it was found by previously IPOs’ studies.

4.2.7 – Social media activities

An interesting analysis on the relationship between social media and ICOs’ returns was carried out by Benedetti and Kostovetsky (2018), which, specifically, focussed the analysis on ventures’ Twitter activity.

He started by analysing Twitter intensity held by different types of ventures both during and after the ICO, in order to get an overview of the level of social media activity during the overall ICO path. The results obtained by Benedetti and Kostovetsky (2018) are the following:

- Unsuccessful ICOs, with active accounts during the ICO phase, quickly diminished their Twitter activity from an average of 1.48 Tweets per day during the ICO to 0.28 Tweets per day in the fifth month.
- Successful ICOs, which did not immediately list, had higher Twitter intensity, although partially declining from the ICO period, but stable at around 0.8 Tweets per day.
- For listed ICOs, Twitter intensity is even higher than for the first two categories and also is stable over time, remaining at around 1.5 Tweets per day.

What the author observed is a general reduction of venture's social media activity after the completion of the fundraising campaign, except for listed ICOs, which continue to keep almost unchanged their social presence. Therefore, a first insight coming out from this analysis is that most successful ICOs continue to keep unchanged their level of social media activity even after the end of the ICO, meaning that very likely it has some sort of effect in terms of returns. In fact, social media are a very powerful mean of maintaining hype around the project launched and generate interest around the tokens needed to have profitable and liquid tokens.

The same author, then, deepened the analysis by investigating in the sample of listed ICOs, how daily Twitter activity is related to market returns. The author proceeded by progressively introducing variables aimed at understanding the effect that Twitter activity, on different time horizons, has on ICOs returns. What was extracted by this analysis, on the one hand, is that past levels of high social media activity are generally correlated with lower returns, an indication of overreaction to news and reversals. On the other hand, returns are positively associated with today's activity likely due to a bias for good news in company announcements. Therefore, for cryptocurrency returns, the motto should be: "no news is bad news" (Benedetti and Kostovetsky, 2018). Even this result is very important, because it highlights which is the communication strategies adopted by blockchain companies in managing their day-to-day events and news.

Finally, Benedetti and Kostovetsky (2018) analysed the relationship between the growth in the venture's market capitalization with respect the number of Twitter subscribers. He showed that there is a positive and convex relationship between the two variables, in which for each 1% increase in users, the market capitalization increases by 1.2%.

The result just reported is consistent with the increasing returns to user adoption in peer-to-peer platforms found in previous literature studies (Benedetti and Kostovetsky, 2018). The more users get involved within the platform, the more the value of the venture grows, confirming how important it is for companies willing to launch an ICO to create as soon as possible a network effect.

This detailed analysis on social media activity carried out by Benedetti and Kostovetsky (2018) removes all the doubts found in previous literature's studies analysing simply the effect of a single variable on ICOs returns. The same author, in his overall model, found

the variables “Twitter age” and “ICO Twitter intensity” as not significantly correlated with first-day return. Similarly, Bourveau et al. (2018) found “social media activity” to be not reliably related to first day return and ICO underpricing. Finally, Florysiak and Schandlbauer (2019) found the “number of social media channels” to be, once again, uncorrelated with ICOs short- and long-term performance. The reason for these results, is either due to the fact that the variable used weren’t able to completely analyse the relationship between social media activity and ICOs’ returns; or it might be due to the fact through a simple variable it is impossible to carry out a comprehensive analysis as the same Benedetti and Kostovetsky (2018) subsequently did in his paper.

4.2.8 – Effect of slowing the tokens liquidation on ICOs’ returns

Finally, another interesting analysis on the determinants of first day returns was carried out by Benedetti and Kostovetsky (2018), which investigated the effect on ICOs underpricing of postponing the tokens’ sale after the first day of trading.

Starting from the standard observed situation of 180% returns by selling the token purchased at the opening price of the first trading day, the authors analysed what happens with three different scenarios for selling price: selling at the average selling price of the first \$1 – \$10 – \$50 million trading. The logic behind this analysis is to understand the average returns investor could get if they basically postpone the sale.

The results across these three different scenarios revealed that not immediately liquidating the position, helps investors to get better results, since tokens increase in price after the listing date. Raw returns shifted from 180% from liquidating tokens on the first opening day, to 220% from selling the tokens at the average price of the first \$1 million token sold. Things changed when investors are forced to slower the liquidation of their tokens, in fact raw returns become 180% in case of selling the token at the average price at the first \$10 million trading, and to 150% in the case of the \$50 million trading.

These results should, however, be evaluated carefully, in fact Benedetti and Kostovetsky (2018) in evaluating the effect of postponing the moment of the sale, reasoned in terms of volumes and not taking into consideration different price levels. The overall outcome of his analysis seem to highlight that investors waiting to sell their tokens, can obtain higher returns, but waiting too much can lead to the opposite result. When, in fact, too much tokens are in circulation, the basic supply and demand relationship imply that each token is worth less.

It is worth highlighting that this kind of behaviour is for those investors who want to speculate on the tokens purchased. Investors who instead invested in that ICO either because interested to buy the venture's products/services, or because interested on the development plan over the long run, will not try to sell the token the sooner possible, but will wait the implementation of the ICO project presented.

4.3 Post ICOs' survivance, liquidity and volatility

The last topic worth to be analysed for what concern the Post-ICO phase is the ICOs survivance rate, which reveals how much of them are likely to succeed after the conclusion of the fundraising process. Moreover, interesting to be analysed is also the liquidity and volatility of ICOs after the listing of the tokens, in order to understand the level of interest investors continue to reserve to ICO projects after the end of the fundraising process and during their implementation. Therefore, the following analysis will conclude the overall study regarding the ICO market began in previous chapters, leading to the construction of a more concrete picture about the theme.

4.3.1 – ICOs' survivance rate

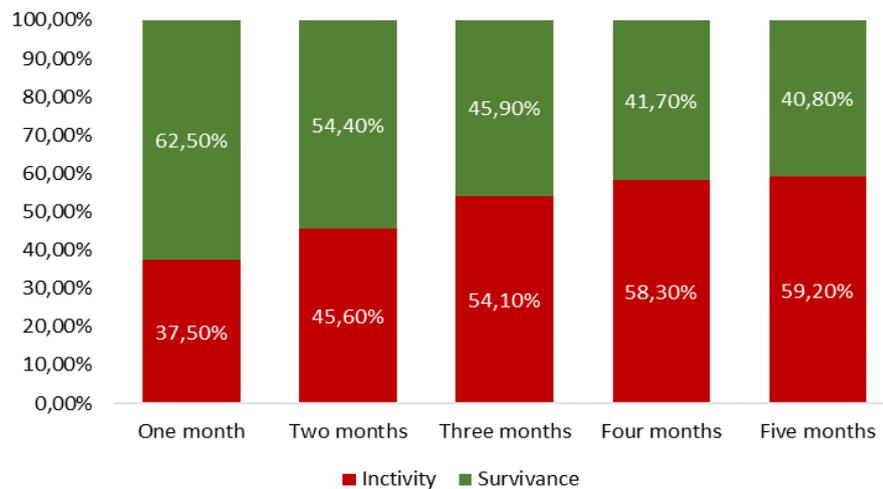
Before beginning with the analysis of the most important aspects influencing the subsequent failure of the ICO project, it is worth starting with an empirical analysis of the ICOs survivance rate. In particular, Benedetti and Kostovetsky (2018) in order to get a better understanding of how many ICOs were failures or scams, used Twitter activities as a proxy to quantify, both the level of potential frauds during the ICO phase, and their survival after the end of the capital rising process. Specifically, the author distinguished between three different types of ICOs encountered during the analysis:

- *ICOs that did not report raising any money and that did not list on an exchange.* Here, Benedetti and Kostovetsky (2018) noticed that, out of 694 observations of this sample, 51.4% of them never opened a Twitter account and an additional 7.8% opened a Twitter accounts but had no activity during the ICO. This result highlight how many ICOs never overcame the earliest planning stage, thus they should be considered failed project from the beginning.

Furthermore, when turning to the analysis of the survivance rate, the author observed, an increasing trend in the inactivity rate, starting from 37,5% after a month and, then,

increasing to 45,6%, 54,1%, 58,3% and 59,2% respectively after two, three, four and five months from the ICO (i.e. see *Figure 7*). As it is possible to see the inactivity rate sharply increase, even if it seems to stabilize after four/five months. Consequently, the survivance rate observed after few months from the end of the fundraising process resulted to be lower than 50%, which is quite warning.

Figure 7 - ICOs that did not report raising any money and that did not list on an exchange, five months survivance rates



Source: own elaboration

- *ICOs that reported raising capital but did not list.* In this category, out of a sample of 420 ICOs, 21.2% never opened a Twitter account and another 5.2% opened a Twitter account but had no activity during the ICO. These figures are much smaller than the one observed in the previous category; however they still highlight how nearly one fourth of ICOs successfully concluded, but still not listed, have high probabilities to be potential scams (Benedetti and Kostovetsky, 2018).

When analysing the survivance rate, the authors found a slightly improved situation, with respect the previous sample, with inactivity rates equal to 15,9%, 21,4%, 27,2%, 28,6% and 35,2% respectively from the first to the fifth month after the conclusion of the ICO (i.e. see *Figure 8*). This ICO category, which for sure is composed by higher quality ventures (i.e. since at least they communicated having raised funds), has a higher survivance rate, in fact, almost 65% of the active ventures during the ICO, survived also after a few months from the conclusion of the ICO.

Figure 8 - ICOs that reported raising capital but did not list, five months survivance rates



Source: own elaboration

- *ICOs that listed.* Finally, Benedetti and Kostovetsky (2018) found that only 2.7% of the 440 most successful ICOs, never opened a Twitter account and another 6.8% were not active during the ICO. Such low figures are consistent with the high quality intrinsic of these ICOs, which highlight how among the listed ICOs the probability of founding potential scams is very tiny (Benedetti and Kostovetsky, 2018).

As far as the survivance rate is concerned, here the author found that the survivance is far higher with respect the previous scenarios, in fact the inactivity rates were 1%, 5,5%, 6,5%, 7%, 6,8% respectively from the first to the fifth month after the conclusion of the ICO (i.e. see *Figure 9*). Therefore, after few months still more than 80% of ICOs project continued to be operative, once again highlighting the quality of their projects.

Figure 9 – Listed ICOs five months survivance rates



Source: own elaboration

The findings obtained by Benedetti and Kostovetsky (2018), should, in any case, be considered carefully, since his analysis using Twitter activity as a proxy for potential scams and survivance rates is only an approximation of reality. Moreover, the study carried out by the author, correctly distinguished between different types of ICOs, however, in the real-world investors face the whole ICO market. Especially during the ICO phase, investors are not able to know in advance if the ICO in which they are willing to invest, will subsequently list or not.

The outcome of this analysis highlight that observing the ventures social media activity, might be used by potential investors to forecast likely future intentions of the management team.

Interesting are also the analysis on the determinants of crash risk, project death or delisting, aimed at understanding which are the most important forces influencing the failure of ICOs project during their implementation.

The first relationship investigated by Bourveau et al. (2018) was the effect of *market conditions* on price crash risk. In particular, the authors examined ICO survival in two different models: one having as dependent variable “extreme negative returns” (i.e. less than -75%) and another having “negative return skewness”, both measured over three- six- and twelve-months after the end of the ICO. What they found, in both the models, was a strong positive association between crash risk and opening day ICO returns, suggesting that ICOs experiencing strong first day trading, tend to crash in the following three-, six-, or twelve-month period (Bourveau et al., 2018). This result might also explain the reason for the huge difference between average and median returns: there are few outsiders making incredible high returns, and many others facing negative returns.

Another finding coming out from this study, observing a positive and significant value of the coefficient “BTC momentum”, is that issuers seem to be strategically timing their ICO during hot markets and engaging in ‘pump and dump’ strategies that eventually harm investors, since most of them will likely crash in the following months (Bourveau et al., 2018).

With respect to measures related to the *information environment*, Bourveau et al. (2018) found “source code disclosure” to be positively and reliably correlated with “extreme negative returns”. The explanation provided by the authors is that the disclosure of the code represent proprietary information that might subsequently erode the competitive

advantage of issuers and allow others to mimic or build off their technologies. Howell et al. (2018), instead, in their analysis found not significant relationship between the disclosure of the code and ICOs failure, therefore the final effect has to be considered doubtful.

Turning to the Whitepapers information content, Bourveau et al. (2018) observed that ICOs with longer and more opaque Whitepapers have more probabilities to crash after the conclusion of the ICO. Instead, providing information about the founding team was found to significantly decrease the probability of price drops. Taken together, the authors argued that these results highlight the importance of transparent disclosure in mitigating crash risk.

However, attention should be made with regard the disclosure of sensible information, such as the source code, given that ultimately, it might lead to the opposite result with respect to what originally intended.

Interestingly, Bourveau et al. (2018) observed that the *founding team* has a very important effect on ICOs survivance rate. In fact they found the variable “past success of ICO team” to be negatively and reliably associated with the dependent variable, indicating the importance of the ability of the team, and their previous experience in the crypto market, in the successful implementation of the ICO project. This result was also confirmed by Momtaz (2018a), which found “management team” to be negatively and reliably correlated with both “delisting” and “project death” after the conclusion of the ICO. Therefore, high management team quality is a fundamental requisite in order to see the project survive after the conclusion of the fundraising campaign.

Another interesting finding was also obtained by Howell et al. (2018), which found that ICO teams composed, among others, by computer experts are less likely to fail in the implementation of the project. This result is consistent with the high technological nature of both ICOs and blockchain in general, moreover, it is also meaningful because it highlights that it is not only important having a high overall management team quality, but it also required a certain computer science expertise in order to be completely successful.

Turning to the analysis of the relationship between *ratings* and subsequent venture’s crash, Bourveau et al. (2018) observed a negative and significant correlation between the two variables. This result highlights once again how information intermediaries in the crypto market play a vital role in monitoring issuers (Bourveau et al., 2018). Moreover, evidence seem to confirm the goodness of the judgements provided by rating agents, in

assessing the actual quality of the ventures, since higher ratings were associated with lower probabilities of price crashes.

When analysing the effect of *marketing activities* on crash risk, Bourveau et al. (2018) firstly analysed the effect of social media activities, finding a negative and reliable relationship between the two variables. This result is consistent with what previously found when analysing ICOs' returns, thus continuing to remain active with the investors community after the conclusion of the ICO, is vital to keep up investors' interest which eventually helps obtaining higher returns and, consequently, avoid the failure of the project. The same finding was, also, confirmed by a similar study carried out by Howell et al. (2018), which deepened the effect of social media activities on ICOs failure, introducing two different variables for Twitter and Telegram, the two main social media channels.

Offering "participation incentives", instead, was found by Bourveau et al. (2018) to be positively and significantly associated with "extreme negative returns". The explanation provided by the authors was that lower-quality ICOs tend to offer bonuses and bounties to increase investors demand but subsequently fail. Once again, this result is consistent with what found in the previous section, confirming not only the non-utility of these instruments, but also highlighting the true nature of the ventures deciding to use these marketing programs: they have poor project in their hand, and use these instruments to cover their lack of quality.

Different authors also analysed the effect of various *ICOs characteristics* on ventures' survival, for instance Howell et al. (2018), found that ICOs clearly setting their objectives in terms of money needed to fully implement the project, by specifying soft and hard caps, have less probabilities of subsequent failure. This result is meaningful, because it highlights that only having a good project might not be enough to succeed, rather it is fundamental to have behind a well thought strategy.

The same authors also noticed a negative and reliable correlation between utility tokens and ICO failure. A possible explanation for this result might be that this type of tokens, differently from security tokens, are much more functional to create a solid ecosystem, which eventually stimulate the creation of a successful network effect around it. Security tokens, instead, seem to be much more used for financial purposes (i.e. obtaining high dividends), rather than for a true success of the ICO project. However, it is worth saying that the authors did not analysed the effect of all the different types of tokens, therefore the explanation that it was provided might be confuted by more specific studies, and there

might be other reasons for the significant negative relationship between utility tokens and ICO failure.

Finally, Momtaz (2018a) observed that restricting the investors base during an ICO is helpful to avoid a subsequent delisting or project death. This result is meaningful, because a punitive decision from a regulatory body on the tokens issued, during the implementation of the ICO project will be a completely game changer, able to destroy all the work carried out until that moment.

To conclude, another interesting result obtained by Momtaz (2018a), is that the more a *project* is visionary, the higher are the probabilities of subsequent delisting or project death. This result once again is consistent with what was found when analysing ICOs' returns in the previous section, that is that more visionary projects will face more difficulties when it is time to shift from mere idea, to the actual implementation, eventually leading, in some cases, to the complete abandonment of the project.

4.3.2 – ICOs' liquidity

Liquidity might be considered as a measure of ICOs' success, because it captures the market depth and interest in the venture's tokens. It is also a central benefit for early stage investors because it indicates whether, or not, they have the possibility to get out easily from the investment when needed (Howell et al., 2018). As highlighted by the same authors, in fact, the decision to join a token-based platform depends positively on token trading volume.

Specifically, the authors analysed liquidity as the negative of the "Amihud price impact" measure (i.e. Illiquidity formula (2) reported below), averaged over the past five days (Howell et al., 2018). This statistic provides the volume needed to move the price by 1 percent.

$$Illiquidity_t = \frac{1}{5} \sum_{t=t-5}^t \frac{\left| \log \left(\frac{p_t}{p_{t-1}} \right) \right|}{p_t volume_t} \quad (2)$$

To be able to assess the liquidity of ICO tokens, Howell et al. (2018) compared ICO tokens liquidity with NASDAQ stocks over the same period. The choice of NASDAQ stocks was for them a natural benchmark because relative to other large exchanges, they are weighted towards internet and technology stocks, as well as towards smaller companies.

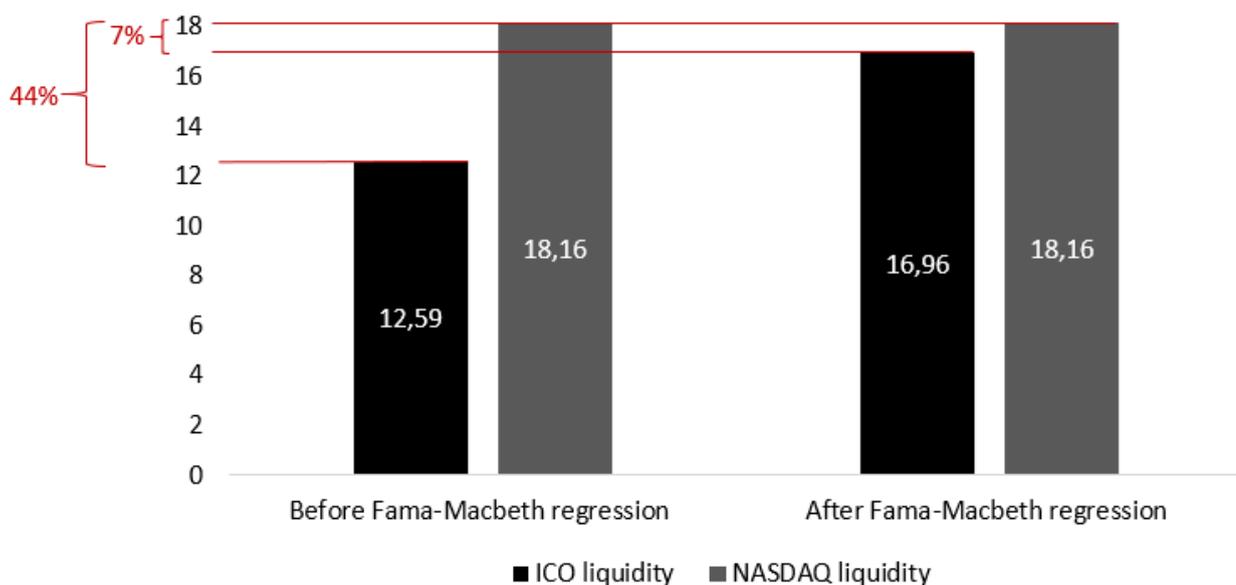
The results obtained by the authors and reported in *Figure 10*, showed that NASDAQ stocks have an average liquidity measure equal to 18.16, much higher than the ICOs' one equal to 12.59 (i.e. about 44% higher), with the difference being statistically significant at 1%. Furthermore, the authors also found that ICOs have higher standard deviation with respect to NASDAQ stocks.

However, in order to test whether the previous result reflected also basic characteristics of the assets analysed, the authors carried out also the following Fama-Macbeth regression (i.e. Liquidity formula (3) reported below), where t denotes a week and i an asset (Howell et al., 2018).

$$Liquidity_{i,t} = a + \beta ICO_i + \gamma_1 Volatility_{i,t-1} + \gamma_2 Volume_{i,t-1} + \gamma_3 \log(Price_{i,t-1}) + \varepsilon_{i,t} \quad (3)$$

After controlling the liquidity measure for volatility, volume and price, the coefficient for being an ICO resulted to be equal to -1.2 and highly statistically significant. This result has to be interpreted that actually the ICO tokens average liquidity is 1.2 lower than the benchmark one and, thus, equal to 16.96 (i.e. 18.16 – 1.2). Therefore, eventually ICOs are on average 7% percent less liquid than a conventional benchmark (i.e. NASDAQ stocks), which, however, is a much smaller delta with respect the first measure of liquidity obtained by the authors before the Fama-Macbeth regression (Howell et al., 2018). All the liquidity results have been summarized in the below reported *Figure 10*.

Figure 10 – ICOs vs NASDAQ stocks average liquidity measures



Source: own elaboration

Bourveau et al. (2018) and Howell et al. (2018), went over the simple analysis of the liquidity, by trying to understand also its main determinants.

Interestingly Bourveau et al. (2018) found that liquidity is negatively and significantly correlated with “three months volatility”. This result is consistent with the traditional relationship existing between volatility and liquidity, in fact higher levels of liquidity (i.e. easier to buy and sell tokens) are usually associated with lower levels of volatility, meaning that there are lower probabilities of facing huge price changes.

For what concerns *marketing activities*, as always, the analysis will be divided between social media activities and marketing programs.

Bourveau et al. (2018) found a positive and significant relationship between liquidity and “social media activity”. Similarly, Howell et al. (2018) confirmed the positive relationship between a good venture’s communication with its community and the liquidity of its tokens, in fact, they found “Telegram group”, “Telegram members” and “Twitter followers” to be positively and reliably correlated with the dependent variable.

As far as other marketing activities, such as “initial investors bonus” or “airdrops”, are concerned, their effect on liquidity seems to be insignificant (Howell et al., 2018), confirming their useless function also for generating easier tradable assets. In fact, only initial investors will benefit these promotions, while all other subsequent investors will not. Furthermore, bonus will create an excessive token supply when initial investors will likely sell their tokens in order to monetize the surplus, thus generating an illiquid asset in case the demand for these tokens is not enough.

Different results, instead, have been obtained by the authors with regard the *founding team*. Bourveau et al. (2018) observed that having a management team with successful crypto experience, is associated with higher tokens’ liquidity. Differently, Howell et al. (2018) by analysing the effect of different aspect of founder background, such as crypto, finance and entrepreneurship experience, found to be positively and reliably correlated with liquidity only the last one. Therefore, what emerges by their analysis is that more than crypto experts, it is important to have at the back a previous entrepreneurial experience, which is a characteristic that seems to be appreciated by investors, when having to take decision about venture’s tokens, in the secondary market.

Convergent are, instead, the findings dealing with the *information content*. Howell et al. (2018), observed that having a well-built Whitepaper is positive and reliably correlated with ICO liquidity, consistently somehow with the result obtained by Bourveau et al. (2018) which revealed that opaque Whitepapers were negatively correlated with liquidity. Therefore, the final effect of providing good information disclosure seems to increase the likelihood of easily transact tokens in the aftermath of the ICO, meaning that investors continues to capture information from the Whitepapers even after the conclusion of the ICO.

Furthermore, Howell et al. (2018) analysed, also, the effect of the “source code disclosure”, which was found to be positively and reliably correlated with tokens liquidity, thus confirming how good level of information disclosure, of any kind, help ventures in creating tokens which are then easily transferable in the aftermath of the ICO.

Finally, Bourveau et al. (2018) found that ratings provided by information intermediaries increases the liquidity of their tokens. This result reveal, once again, how ratings are fundamental in every aspect related to ICOs so far analysed.

Turning to the analysis of the effect of different *ICO characteristics* on tokens liquidity, the most relevant results obtained by Howell et al. (2018) in this respect are the following:

- First, they found that launching utility tokens, either on a proprietary blockchain or on Ethereum, positively and significantly affects the liquidity of tokens after the conclusion of the ICO. These results highlight how ICO projects which decide to tokenize their business through utility tokens have the possibility to make their tokens more liquid, because the fact that they are basically the only way for buying the venture’s products and services, eventually lead to an active tradability of the tokens in the secondary market.

Furthermore, among the ICO protocols available in the market, only Ethereum is able to provide tokens’ liquidity due to the fact that being it the most diffused platform, actually there are more potential investors with which to trade the tokens.

- Second, Howell et al. (2018) found that the more successful the ICO was in terms of funds raised, the more likely it will be liquid when listed. The main explanation for this finding is that more successful ICOs are able to capture greater attention and interest by potential investors also in the secondary market, therefore it will be much more ease to buy and sell these tokens.

- Third, with respect to the effect of setting in advance the goals to raise during the ICO, the authors found that setting soft and hard caps increases the liquidity of the tokens, while failing to raise the desired amount of money (i.e. hard cap), imply a lower level of tokens' liquidity.

The reason for these results is that ICOs that clearly stated their goals are perceived having higher quality than others, because it means that they have a thought strategy behind the project and its implementation. ICOs that did not reach the hard cap, instead, are considered as a partial unsuccess, since, very likely, with the money raised, they will not be able to fully complete the planned project, therefore they will be perceived as riskier by potential investors, making the tokens less liquid.

- Fourth, Howell et al. (2018) found that the longer it takes for the ICO to get listed from the moment the ICO ended, the more illiquid will be the tokens. This finding is easily explicable and expected, since the more time passes, the more the interest generated by the ICO on the venture's project will diminish and the more potential investors might perceive lower quality of the management team.
- Fifth, the authors found that "presales" are positively and reliably correlated with liquidity. This result is, also, confirmed by another finding, revealing that ICOs having obtained venture capital investments have more liquid tokens than others. The main explanation for this result is consistent with what already concluded when analysing the determinants of ICOs' success. In fact, the fact the very important institutions invested in the project, increase the credibility of the venture towards outside interested investors, making thus easier to trade the tokens after the listing on crypto exchanges.
- Last, Howell et al. (2018) analysing the effect that different countries have on tokens liquidity, found, as expected, that countries with a more active ICO market (i.e. USA, Singapore, Switzerland and UK) are also the countries providing higher liquidity in the post-ICO phase.

4.3.3 – ICOs' volatility

Another very important aspect to consider, aside from liquidity, is the volatility, which is a measure of how much prices of a certain instrument vary within a specific timeframe. Tokens with high volatility are riskier, because they expose investors to the possibility to face very huge price changes, both in positive and in negative terms. Instruments with high volatility are usually more suited for speculators, while rational and common investors

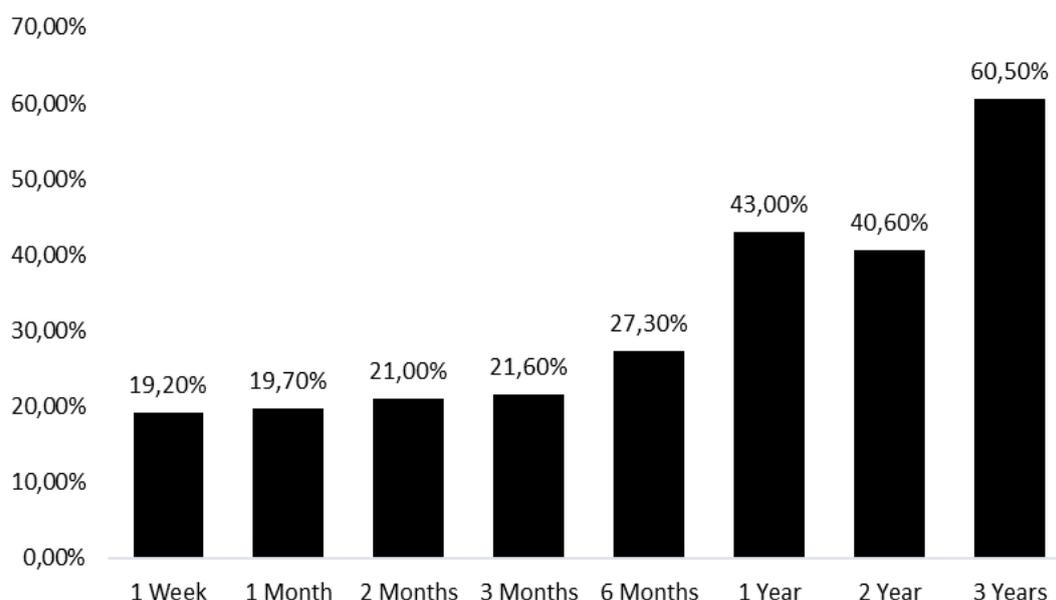
usually tend to prefer assets with a more stable trend over time.

Volatility is quite related to liquidity, since, as it was explained in the previous section, the higher the level of liquidity, meaning the easier it is to buy and sell tokens, the lower will be the volatility. Tokens with a constant high demand, in fact, will very unlikely face very important price changes, which are much more common in case of tokens not very requested by the investor community.

Momtaz (2018c), analysed the volatility of the ICO market up to three years from the end of the ICO and the summary results have been displayed in *Figure 11*. As it is possible to observe, the volatility remained relatively stable in the first three to six months (i.e. from 19.2% to 27.3%). Only cryptocurrencies that are traded for a year or longer show evidence of higher volatility levels between 40.6% and 60.5%. However, it is worth highlighting that the result over longer timeframes are highly biased by the very low number of observations with respect to shorter timeframes. Therefore, these results cannot be extended to the whole population as it is possible to do for shorter timeframes, even if all the results showed to be highly statistically significant.

Contrary to liquidity, there is not any literature study comparing the level of volatility of the ICO market, with those of a traditional market. However, if the relationships between the two variable holds also in this case, it might be possible to expect ICOs tokens to more volatile than traditional stocks.

Figure 11 – ICO volatility over time



Source: own elaboration

Bourveau et al. (2018) and Howell et al. (2018), similarly as they did with respect to liquidity, also analysed the determinants of ICO volatility. Here will be reported only the most relevant findings obtained by the two authors.

The main results obtained by Bourveau et al. (2018) were very similar to those obtained with regard ICO liquidity. Therefore, they found that ICOs with higher ratings, more informative Whitepapers and a management team with proven previous ICO track records face lower level of volatility.

More interesting are instead the results obtained by Howell et al. (2018), which found that creating new tokens in the future increases the volatility of the tokens, while restricting the investor base during the ICO has the opposite effect. Both the results seem reasonable, the first because increasing the number of tokens in circulation has a huge negative impact on tokens price; the second, instead, because, in case the investor base is not restricted and certain regulatory body take decision on that ICO, it will very likely have important effect on the price of those tokens.

Furthermore, the authors also found that having a Telegram group helps in reducing the volatility, because the management team can easily communicate to all interested people in case important information able to influence tokens' price come out. However, in the analysis carried out by Bourveau et al. (2018), social media activity was found to be insignificantly correlated to volatility, therefore even if the explanation for the result obtained by Howell et al. (2018) seem to be reasonable, actually the final effect has to be considered doubtful in absence of further studies in this regard.

Finally, analysing the effect of different ICO projects in terms of price volatility, they found that ICOs tokenizing real assets or creating new payment systems/wallets have less tokens volatility with respect those ICOs creating new blockchain protocols or data storage/computing services (Howell et al., 2018). A possible explanation for these results might be due to the fact that while for the first two type of project there is still room for blockchain developments, especially for the tokenization of real assets, since there has been only a loosely expansion in this direction so far. For what concerns the last two type of project, instead, they have already been developed, with plenty of project especially for the creation of new blockchain platforms.

5 Empirical examination of three successful ICOs

This final chapter is aimed at investigating if the results obtained by different literature's studies holds in real ICO cases. Specifically, the objective is to compare features and returns of three different successful ICOs carried out over different timeframes, in order to understand the similarities and differences between them. Furthermore, it will be also important to investigate if the main findings obtained in Chapter 3, regarding the ICOs' success, and Chapter 4, regarding ICOs' returns and liquidity, are confirmed by real ICOs cases.

The choice of the ICOs to be analysed for the purposes of this work, is driven by the following assumptions:

- The ICOs to be selected for each timeframe have to be the top successful ICO in terms of amount of funds raised. Therefore, from this analysis have been excluded all those ICOs that were successful in other ways, such as in terms of returns or subsequent tokens' tradability. Furthermore, this analysis does not consider neither many other successful ICOs which raised considerable amount of funds, but less than the top ones. However, even though there are lot of exclusions from this analysis, the choice of selecting only the top ICO for each timeframe allows to carry out a comparable and fair analysis.
- The ICOs picked-up do not have to be the one launched on proprietary blockchains. The main reason for this choice is that the aim of this work is to understand how it should be approached the launch of an ICO for a company who wants to tokenize its business. Even though it is true that this is not a "guide to ICOs", actually the initial research question was: "Can ICOs be considered a new and alternative source of funding?". Therefore, the attention has always been on the possibility of common enterprises to launch their ICO, without having the competencies to set up a new and revolutionary blockchain, but, rather, to launch it in an already existing blockchain such as Ethereum.
- Those ICOs that completely failed after the conclusion of the ICO, for whatever reason, have to be excluded, because it will be difficult to carry out a true comparable and exhaustive analysis with the other ICOs selected. In particular, this was the case for "The DAO" launched in 2016, which obtained lot of attention since it was the most

outstanding ICO of that year, but completely failed after a few months due to an hack in the source code, which allowed to stole part of the funds raised.

- There is the need of having the same sources of information for all the ICO selected, which means: ICO Bench for general information about the fundraising campaign and the ratings provided, CoinMarketCap for the tokens historical data, Whitepaper, Social media channels and Corporate website. This clause is fundamental to allow a comparable analysis between the ICO selected.

Table 3 – ICOs selected for each timeframe

	2016	2017	2018
ICO name	Iconomi (ICN)	EOS (EOS)	TaTaTu (TTU)
ICO period	25/08/2016 - 29/09/2016	26/06/2017 - 2/06/2018	24/05/2018 - 30/06/2018
Funds raised	\$10,5 millions	\$4.197 millions	\$575 millions
Most successful of the year?	No (The DAO)	Yes	Yes
Country	Slovenia	Cayman Islands	Cayman Islands
Industry	Financial	Platform	Entertainment
MVP	No	No	Yes
Blockchain used for the ICO	Ethereum (ERC-20)	Ethereum (ERC-20)	Ethereum (ERC-20)
Rating (ICO Bench)	2.8/5	4.1/5	3.3/5
Pre-ICO	No	No	Yes
Token supply	100 million	1 billion	10 billion
ICO price	\$0,1050	n/a	\$0,25
Tokens distributed	85%	90%	57%
Soft cap	\$1 million	n/a	\$250 millions
Hard cap	\$10,5 millions	n/a	\$575 millions
Tokens listed after the ICO	Yes (up to July 2019)	Yes (still listed)	Yes (up to February 2019)

Source: own elaboration

The final ICOs selected for each timeframes have been summarized in the above reported *Table 3*, including also their key characteristics. The choice of the timeframe for the three ICOs analysed, started from *Table 1* reported in the first chapter, showing the evolution of the ICO market over the years. In particular, the most important event identified by Boreiko and Sahdev (2018) was the launch of Ethereum in 2014, which allowed the proliferation of many other ICOs in the subsequent years. However, the starting year of a conspicuous ICOs spread identified by the two authors was the 2016 and, for this reason, the first ICO selected was *Iconomi* launched in august 2016 on the Ethereum platform and concluded a month later. Specifically, it was not the most successful ICO of 2016, which, instead, was

“The DAO”, but considering that it failed a few months later because of an hacker attack that stole all the funds raised, the final choice for the 2016 ICO to analyse went on Ionomi, which was the second most successful ICO of that year.

As reported by Boreiko and Sahdev (2018), the true explosion of the ICO market happened in 2017, even though by the end of the year there started to be an increasing regulatory concern, with a great attention of some regulatory agencies, like the SEC, and even with some country completely ban both the blockchain and the ICOs, like China. For this reason the second ICO selected was *EOS*, carried out starting by June 2017, in the middle of this turbulent ICO market environment. *EOS* aside from being the most successful ICO of 2017, it was also the most successful ICO of the history in terms of funds raised.

Finally, the last ICO was selected from the first half of 2018, which, as reported by Boreiko and Sahdev (2018), was still a high growth phase of the ICO market, but more controlled from a regulatory standpoint. In particular the ICO chosen for 2018 was *TaTaTu*, which was also the most successful ICOs of the history. This token sale was conducted in June 2018, right before what is considered by Dittmar and Wu (2019) the starting of the ICO decline started from the second half of 2018 to 2019.

There was also the intention to pick-up an ICO conducted in 2019 in order to give representation also of the de-hyped ICO phase, however, it would have been impossible to carry out a comparable analysis, because of the absence of enough development after the conclusion of the ICO. Furthermore, the biggest token sale of 2019 was not an ICO, but an IEO, which seems, at the time of writing, to be the main trend for selling tokens, going to replace the traditional ICO market as it has been analysed during this work. Being IEOs a new concept of tokens' sale we believe it is better avoiding analysing them together with traditional ICOs, since they have not been the topic of this work.

In any case, a brief explanation of the IEOs phenomenon is due, since it is anyway a form of selling venture's tokens to raise new financial resources. The main difference with respect to traditional ICOs, is that IEOs are not opened to the public. Ventures, instead of selling tokens autonomously to potential investors, as it happens through an ICO, they sell the same tokens trough a crypto-exchange platform, which acts as an intermediary between ventures and investors (Chiang, 2018). One of the main reasons why IEOs raised in popularity has been because ICOs are not monitored by any third party. Anyone can

basically launch an ICO, what it is needed is a Whitepaper able to convince investors to believe in the venture's project. Crypto-exchange platforms, instead, before launching a token sale (i.e. IEO) on their platform carry out a preliminary due diligence on the venture's project, which provide a sort of protection to potential investors. This convergence of interests between the management team and the crypto exchange lead to a lower probability for investors to incur into scams projects, because the exchange has all the incentives to carry out an exhaustive due diligence. In fact, in case of a project failure the reputation of the crypto exchange will very likely fall, ultimately leading to both less ventures and less investors joining the platform (Bond, 2019).

Another advantage identified by the same author is that the tokens sold are immediately listed on the crypto exchange after the conclusion of the IEO, thus avoiding the possibility of never seeing the token tradable as it happens in many cases in the ICO market.

Finally, an established and known exchange platform gives the possibility to the venture to reach a wider range of potential investors, thus increasing the probability of meeting the caps set (Bond, 2019). In this way the management team and the crypto exchange can, in fact, jointly manage the marketing efforts needed to carry out a successful fundraising campaign.

The following sections will analyse singularly the three different ICOs selected, starting from Iconomi (2016), EOS (2017) and, finally, TaTaTu (2018).

5.1 Iconomi (2016)

Iconomi was an ICO launched in Slovenia the 25th of August 2016 and ended the 29th of September of the same year. They were able to raise about \$10.5 million in nearly one month and it is considered the second largest ICO of 2016. The biggest ICO of that year in absolute terms was, instead, *The DAO* which raised \$150 million, however, it has been decided to not analyse it in this section for the reason above explained.

5.1.1 – Business idea analysis

Before going to investigate the technical features of the ICO conducted by Iconomi, it is worth starting by trying to understand the vision of their blockchain project as they communicated it through the Whitepaper. The idea behind Iconomi, was to create an *Open*

Fund Management platform (OMF), offering different types of financial instruments aimed at providing valuable investment opportunities to investors looking for high profits, not possible to be obtained in the “old economy” (Zagar et al., July 2016). Specifically, in order to accomplish this vision they planned to offer investors three different financial instruments, each of them oriented to a specific type of investor:

- The *Coin Traded Funds (CTFs)*, are financial instruments oriented towards non-experienced investors, which might want to invest with lower risk and price volatility. This result is achieved through a careful preselection of tokens included in the funds carried out by experts selected by the Iconomi team, that, when needed, will rebalance the portfolio composition in order to keep unchanged the expected risk-return relationship.
- The *Coin Managed Funds (CMFs)*, instead, are funds able to grant their participants the highest performance possible, by being actively managed by a team of experts, such as financial analysts, mathematicians and cryptocurrency community professionals. Basically, the objective of these funds is opposite with respect the previous fund presented, because they are built for riskier investors, who want to maximize their returns even bearing a higher level of risk.
- Finally, Iconomi planned to make it possible for traders to enter their ecosystem and create their own investment fund, called *Create your own fund*. Obviously, this is a product oriented towards highly experienced investors with sound crypto knowledge.

Even though CTFs and CMFs at first sight might seem very similar, with the unique difference being the level of risk-performance level investors are willing to afford, actually they are substantially different. The only common thing between the two funds is that both of them will issue their own tokens, which are obviously different from Iconomi’s token (Zagar et al., July 2016), however, the relationship between all these tokens will be better explained in the following sections.

It is now time to explain the two main differences between the Coin Traded Funds and the Coin Management Funds:

- CTFs is a passively managed funds, which means that they are created through the combination of a series of already existing cryptocurrencies and, then, from times to times they are rebalanced following some transparently communicated criteria. They are passive funds in the sense that they follow the trend of the underlying cryptocurrencies, and do not attempt to beat the market (Zagar, 10th Aug. 2016).

CMFs, instead, are actively managed funds, meaning that Iconomi's experts are active on the ICO market to find some gems able to grant their investors higher returns with respect to the one easily obtainable by simply following the market, even though it means to bear higher levels of risk (Zagar, 10th Aug. 2016).

- Another difference is that, CTFs' tokens will be available to the general public by being traded on all major crypto exchanges, thus, providing a high level of liquidity to its investors since it is like investing in other cryptocurrencies. To the contrary, CMFs' tokens were planned to be accessed only by invitation, which, obviously, was granted to ICO investors. Furthermore, they cannot be traded on crypto exchanges, but only within the Iconomi platform due to their high hand nature, which consequently lead to a relative lower tokens' liquidity with respect to the one of CTFs (Zagar et al., July 2016).

As it is possible to understand from these first passages, Iconomi's idea was to provide products and services similar to the ones offered in the traditional economy by asset management companies, such as Vanguard and other index funds. Unlike these types of companies, however, Iconomi planned to offer not only passive managed funds (CTFs), but also active ones (CMFs). Therefore, it can be interpreted as a hybrid between a passive asset management company and a private equity fund, with the plus of offering also the possibility to the most experienced investors to create their own funds.

Moreover, the founding team planned to offer multiple products to its investors, a few of them offered and managed by Iconomi itself, and the majority offered by Digital Assets Array (DAA) managers on the same platform. These managers have the possibility to create, within the Iconomi's platform, their own index funds by combining different crypto assets put available by the same Iconomi (Zagar et al., July 2016).

5.1.2 – Tokens analysis

Specifically, Iconomi during its one-month ICO issued 100 million tokens called ICN at a price of \$0.1050, which represented the 100% ownership of the Iconomi platform. As it was already explained, the token issued were Ethereum based using the ERC-20 protocol which enabled the venture to launch the fundraising campaign without setting up a new and proprietary blockchain protocol, but rather benefitting of the Ethereum ones through the establishment of a smart contract on that blockchain.

ICN tokens were not labelled, neither security, nor utility tokens within the Whitepaper,

however, they were described as follows: “100 % of the Ionomi tokens represent 100 % ownership of the ICONOMI platform, comprising of all assets and liabilities, as well as each and every right and obligation, including but not limited to intellectual property rights, branding and trademarks...ICN tokens represent ownership of the Ionomi platform, allowing their holders to receive dividends and vote on Ionomi related issues” (Zagar et al., July 2016). Therefore they might, without any doubt, be interpreted as security tokens from the very beginning, even though information providers such as ICO Bench, labelled them as having “utility value”.

By reading the communication made on the Medium blog by the co-founder Tim Zagar in March 2017, it might be easily perceived the very early stage period of the crypto market, in which this ICO took place, with still no well-defined boundaries and features of the token issued. In that post he was introducing the way they chose to distribute profits to token holder, and he started by saying: “*The distributed economy established new asset classes - ICN is one of them. New asset classes require new standards and features, as the concepts from the old economy are no longer viable. One of those is the distribution of created value.*

Today companies are using three main mechanisms to return value to financiers: dividends, stock, interests and buybacks. The first one is practically impossible to realise in the distributed economy because it needs 100% collaboration with exchanges. Interests are also not relevant for our case. The third common form of value distribution to asset holders are buybacks.

Many companies in the traditional financial system frequently employ the buyback method...Technically speaking, we will systematically buy ICN tokens on exchanges and “burn” them. That means that we will actually return their contribution at the current market value of the token. “Burning” means that purchased tokens will be taken off the market, with the consequence that the total supply of ICN tokens will decrease. This option represents a fair way for everyone, especially if conducted transparently” (Zagar, 28th Mar. 2017).

Specifically, the buyback program was carried out regularly from April 2017, by buying from the market a number of ICN tokens equal to 1000 ETH on a weekly basis. The only limit was that the purchased volume should never reach more than 20% of total ICN volume traded in the previous 24 hours (Zagar, 28th Mar. 2017).

Over time, however, it was also provided utility value to ICN tokens by allowing to pay fees with them instead of using ETH or traditional Fiat currencies. Until March 2018, all the fees attached to Ionomi's products had to be paid mainly in US dollars, but specifically on 14th of that month, the CFO Matej Tomazin announced that ICN tokens acquired utility value, by making possible to pay the fees related to the creation of DAA funds, the periodic rebalancing of the funds by the DAA managers and to the tokenization of the funds created by DAAs' managers.

Therefore, it might be possible to conclude that ICN tokens initially were meant to function as securities, even though it was not clearly stated anywhere, and, then, over time they gained some utility value. However, by weighting the two functions attached to the ICN tokens, it might be easily possible to state that it is much heavier the security function with respect to the utility one, because using the tokens to pay the fees related to the Ionomi's platform is not the unique way, since investors and managers can still continue to pay them through traditional Fiat currencies.

5.1.3 – Initial project implementation

Among the promises contained within the Whitepaper, the management team stated that their objective was to start the implementation of the whole project by issuing the first CTF named ICONOMI.index, whose tokens were labelled as ICNX. The second step, instead, would have been the creation of the first CMF named ICONOMI.performance, with the tokens named ICNP (Zagar et al., July 2016).

All these milestones have been successfully completed in the following months with the first one being the ICONOMI.performance fund launched on the 13th November 2016 with the first investment in an ICO named Golem, an ICO willing to create a decentralised global market for computing power (Zagar, 13th Nov. 2016).

The ICONOMI.index, instead, was initially presented in terms of features and composition on the 25th of September 2016 (Mele, Sep. 2016), therefore before the end of the ICO. It was, then, further studied and refined for a couple of months, providing eventually to potential investors a simulation of the performance that the index would have been from the beginning of 2016. From the 21st of December 2016, it was opened to some alpha

testers the access to the fund, together with the initial version of the Open Fund Management (OMF) platform (Zagar, 19th Dec.2016), until the 1st of March 2017 when the platform entered the beta testing phase. First beta users had the possibility to deposit/withdraw funds from their account, and purchase/sell ICNX tokens (Ursic, 1st Mar. 2017).

The final and official opening of the OMF platform was on the 1st of August 2017, when all ICO's and potential other investors could register in the platform and fully use it to manage ICNX tokens (Zagar, 1st Aug. 2017).

The founders said that the reason for such process in the release of Iconomi's platform, was *"to ensure that the technology is running smoothly and will continue to do so now that registration is open to the public"* (Zagar, 1st Aug. 2017). This approach of the founding team in the development of the OMF platform is appreciable, because it highlight the meticulousness they used in the development of their project, with absolute care of the customers to which the platform was oriented to, even though it was needed nearly eight months to receive the final version, from the very initial one.

However, from that point on, the analysis on the project development pointed out a little bit of confusion by the founding team since they started to introduce modifications to many things already created and to operate, in some circumstances, differently from what originally communicated.

On the 11th of August 2017, the co-founder Tim Zagar proudly communicated their first Digital Asset Array manager: Columbus Capital LTD. This is consistent with what emerging from the original Whitepaper, in which was stated the objective to establish partnerships with outside entities, denominated Digital Asset Array managers (DAA), entitled to create their own CFTs and CMFs to put beside the already existing ICONOMI.index and ICONOMI.performance created and managed by Iconomi itself (Zagar et al., July 2016).

Together with the disclosure of the partnership with Columbus Capital, they also communicated that: *"We are appointing Columbus Capital, an asset management company specialising in global emerging markets and strategic investing in both traditional and alternative funds, to manage Iconomi's existing DAAs (ICNX and ICNP)"* (Zagar, 11th Aug. 2017). They further specified that the ICONOMI.index fund (ICNX) and the ICONOMI.performance funds (ICNP) would have been renamed respectively as Columbus

Capital Blockchain Index (BLX) and Columus Capital Pinta (CCP), even though maintaining unchanged the features and objective of the two original funds.

This decision allowed Iconomi to better concentrate on the development of the platform and attraction of new DAA partners in order to increase the available options in the hands of potential investors. At the same time Iconomi's funds had the possibility of being tightly managed by experienced people, with the supervision of Iconomi's management team.

By the end of 2017 and during the whole 2018, the company announced the partnership with a series of DAA managers, which consequently lead to the offering of multiple indexes to its customers, thus providing greater choice on investors' investment decisions. On top of that, they also continued to increase the number of assets available for DAA managers to be used in the construction of their indexes, thus providing greater portfolio's diversification (Toji, 7th and 14th Dec. 2017; 4th Jan. 2018).

Iconomi also enlarged the investor base to more countries over time (Tolj, 9th Jan. 2018; Kobal, 6th Mar. 2018) and released the mobile app of the Iconomi's platform, both for iOS (Ursic, May. 2017) and Android (Ursic, Oct. 2017) users. Furthermore, they enlarged the Iconomi's management team in order to being able to keep up with all the project development (Zagar, 21th Dec. 2017).

5.1.4 – Transformation of the Corporate Governance structure

Even though up to the mid of 2018 there was not anything to complain about the behaviour assumed by Iconomi as a potential red flag, what happened next leaves a series of question still opened. In particular, 2018 was a year full of news by the management team, the first being on the 27th of September in which the co-founder Zagar announced a "New Chapter for Iconomi" translating in the transformation of Iconomi's Corporate Governance and Issuance of Equity tokens. Furthermore, on the 12th of October 2018 they also announced the "Restructuring of Pinta and BLX" (Iconomi, 12th Oct. 2018).

As reported by the CFO Matej Tomazin, the need for this transformation arised because: *"we have seen that legal frameworks are not yet able to support the kind of corporate governance we envisioned for Iconomi and that our current corporate setup is not the best way to achieve the ideal position for token holders. We have therefore made the decision to move toward a traditional legal structure for the company itself by establishing a joint-*

stock company in Liechtenstein while at the same time making it future-proof by tokenizing its shares and issuing security tokens (eICN)” (Tomazin, Sep. 2018). However, the interpretation of this decision might be twofold: either as a potential backward movement and partial failure since the project originally born on the blockchain and with this move actually transforms itself in a more traditional company. But it might also be interpreted positively, indicating that the founding team has been clever and careful in how the blockchain market developed, thus ready to take the right decision when needed in order to make the best for its investors and for the success of the company itself.

The actual implementation of the transformation, which at the time of writing is still working in progress, started with the creation on the 12 of October 2018 of a joint-stock company based in Liechtenstein, named Iconomi AG. This company has a share capital of CHF 50.000 divided into 50.000 registered shares all owned by eICN foundation. The latter is a charitable foundation established by the same Iconomi’s original founding team and has the only aim to implement the decision taken by eICN holders, which will be those ICN investors who will decide to convert their ICN in eICN security tokens (Iconomi, Jun. 2019). These eICN security tokens issued by Iconomi AG have been described in the Prospectus as: *“Profit Participation Securities...issued on the basis and in line with the Liechtenstein legislation known as “Genussscheine.” The Securities will form a new class of securities in Iconomi AG. Securities are not part of Iconomi AG’s share capital and do not have a nominal value. Securityholders will be registered in the Securityholders Register of Iconomi AG, wherein no physical certificates will be issued to Securityholders”* (Iconomi, Jun. 2019).

The intention of Iconomi’s founding team with this transformation was to continue to be still blockchain based, because they recognize the goodness of the technology, but, at the same time, they also wanted to be more grounded on the traditional legal system due to the uncertain regulatory scenario surrounding the blockchain. Therefore, they wanted to create an institution which provided its investors the same rights attached to traditional shareholders, but at the same time being still blockchain based, and they clearly stated it in one of their post on the corporate Medium blog: *“ICN token holders are from all over the world and that we cannot limit their rights based only on their geographical location. At the same time, we wanted to make sure we were still at the cutting edge of technological and legal progress; tokenization was not just an option for us, but a must”* (Iconomi, Dec.

2018).

Traditionally, Genussschein's securities are instruments aimed at having only profit distribution, without providing voting rights, however, Iconomi's founding team found a way to bypass this feature in order to make it possible the creation of the Corporate Governance they thought. The newly issued eICN will have, in fact, the same feature of traditional shares, thus voting right in the General Annual Meeting and Dividend distribution of the profits coming out from the Iconomi operations.

As far as voting rights are concerned, they stated that *"despite the fact that Securityholders have no voting rights in the General Meeting of Iconomi AG, they are able to indirectly participate in votes on resolutions in connection with Iconomi AG through the Assembly of Securityholders, which is convened by the eICN Foundation as the sole shareholder of Iconomi AG. The eICN Foundation is obliged to vote in the General Meeting of Shareholders of Iconomi AG in line with the resolutions of Securityholders at the Assembly of Securityholders"* (Iconomi, Jun. 2019). Furthermore, the issuance of these security tokens will allow all the investors to participate in the General Annual Meeting through the Iconomi's platform, rather than through the physical presence as it would happen with traditional shares (Iconomi, Dec. 2018).

For what concerns Dividend distribution, instead, even if the only shareholder of Iconomi AG is the eICN foundation, actually, because of the specific arrangement studied by the founding team, *"the foundation will not receive any share of the profits whatsoever. Instead, the foundation will vote on the profit distribution according to the voting done by eICN token holders. eICN token holders will receive the entire distributable portion of the profit. The profit-sharing scheme (i.e., the distributable portion of the profit) will be determined by a resolution of the General Meeting of the shareholders of Iconomi AG, where the eICN token holders will be represented by the foundation as the only shareholder"* (Iconomi, Dec. 2018).

Finally, it worth to say that, in order to carry out this transformation, it was given investors the possibility: either to convert their existing ICN tokens into eICN security, or to exchange that tokens in Ethereum (ETH), therefore exiting the investment in Iconomi. Specifically, the second option might be reached either by selling ICN tokens on exchanges, or, if trading on exchanges stops, Iconomi would take over and buy ICN tokens from token holders in exchange for ETH at an exchange rate set at 0.0019 ETH

(Tomazin, Sep. 2017).

Moreover, as reported by the same CFO, with this conversion process from ICN to eICN securities, starting from the 31th December 2018 it was discontinued the utility function attached to the ICN tokens, and all the payment systems have to be done either in ETH or in Fiat currencies (Tomazin, Sep. 2017).

Another relevant information worth to be provided, is that there is the impossibility for US ICN token holder to convert them in the new eICN securities, in order to not incur under the SEC regulatory framework, which is very cumbersome when dealing with securities. In their prospectus, in fact, Iconomi officially stated that *“The offering of Securities and Securities have not been and will not be registered under the U.S. Securities Act of 1933, as amended (the “U.S. Securities Act”) or with any securities regulatory authority of any state or other jurisdiction in the United States and shall not be offered in the United States of America to U.S. Persons”* (Iconomi, Jun. 2019).

Aside from the constitution of Iconomi AG, the founding team has in mind larger reorganization aimed at creating a group established in different countries and having as holding company Iconomi AG itself. However, the investigation of these themes is not the aim of this work.

At the beginning of this section have been reported that Iconomi had to face two changes during 2018: the transformation of the Corporate Governance, which has already been deeply investigated, and the restructuring of the two main funds available BLC (former ICNX) and Pinta (former ICNP).

On the 12th of October 2018, with an announcement on their Medium blog, they stated that *“We have decided to end our ties with Columbus Capital and reposition BLX to follow a passive structure, while underlying Pinta assets are moved to Iconomi’s balance sheet”* (Iconomi, 12th Oct. 2018). Basically, with this decision they decided to return to manage themselves their two main funds, by making BLX even more a passive structured index, while the Pinta fund assets were moved from the funds to Iconomi’s assets. From what it was possible to understand this decision allows those assets, which basically are investments in newly created ventures, to be used, also, by DAA managers in the construction of new and different indexes. What, however, has not been specified was what happened to CCP (i.e. Columbus Capital Pinta) tokens in the hand of investors, and if it will still be possible to invest in any sort “private equity” fund within the Iconomi platform.

After having quite deeply investigated all the happenings occurred around Iconomi, from its ICO to the time of writing, it is now time to make some considerations about this company. First of all, it seems that the founding team is quite flexible in understanding the overall crypto market, and this transformation is a clear example of that. At the same time, however, they are not very clear in their communications regarding the conversion process, in fact, quite often they report the conversion of *“ICN tokens into eICN security tokens”* (Iconomi, Dec. 2018), but actually they are only converting tokens (ICN) in traditional securities (eICN). The tokenization of this securities (eICN), as reported in the Prospectus, will be re-evaluated in a second moment *“as soon as there will be (technical) standards to tokenise securities, venues where such tokenized securities can be traded and a clarity within the legal framework as to whether such kind of securities can be offered. If the result of such re-evaluation is in favour of the tokenisation, the Board of Directors of the Issuer will pass a resolution for tokenization as well as listing of (tokenized) Securities to the trading venue. Nevertheless, the Issuer reserves the right to freely decide on the timeframe of such tokenisation”* (Iconomi, Jun. 2019). The essence of what just reported highlights the distance between their announcements in the blog, with the actual truth: they are not remaining within the blockchain framework because they consider it a must, rather, for the moment, they are completely exiting the blockchain environment and becoming a traditional company. In addition to that, these securities will not be listed until a decision on their tokenization will be taken, therefore investor find themselves in a completely different situation from the one the intended to be, when they initially invested in ICN tokens.

To conclude the whole reasoning, several questions still remain un-answered, which somehow undermine the overall initial quality of the company and its founding team. The *first* question has to deal with the stop of the buyback program and the utility function attached to ICN tokens, until the completely conclusion of the transformation process, which, however, was not clearly stated. The only certain date they provided was the 31th of December 2019 for the conversion of ICN tokens either in eICN securities or in ETH, but no specific date was provided for the actual profit distribution, listing and tokenization of eICN securities. The *second* question has to deal with the lack of specification about how will be handled the performance fund by Iconomi: if the Pinta tokens are still in the hand of the investors who purchased it in the initial stage and whether they can still be traded

within the Iconomi's platform. *Finally*, the last observation coming out after all the changes implemented by Iconomi during these years, lead us to question the willingness of potential and existing investor to believe in this project, since it might be easily that in a few months the founding team decides another major change/reorganization which potentially diminish drastically the liquidity of the securities issued and increases dramatically their volatility (i.e. if listed obviously). One of the most recurrent question shared by investors on various blogs, such as Reddit, is: "What is the current value of eICN securities?" Obviously, the question still has not a real answer.

A partial reassurance for potential investors from the above exposed warnings might be the very important milestone Iconomi reached in April 2018: the blockchain audit carried out by Deloitte. Specifically, as reported by the co-founder Tim Zagar on the 20th of April: "*Deloitte verified that the digital assets on our platform have been reported accurately and that Iconomi is solvent. On April 5, 2018, Iconomi had \$133.6M of liabilities and \$210.2M of reserves, distributed across 80 digital assets, fully covering all liabilities. With this step, Iconomi has become the first blockchain-based company to be blockchain audited by a "Big Four" professional services firm*".

However, it is important to highlight that the Proof of Solvency does not constitute any type of financial statement audit. It is defined as a process in which blockchain technology is used to prove the existence and/or ownership of digital assets, which make sure to investors that all account balances are correct and that all company liabilities have been calculated accurately (Iconomi Website).

5.1.5 – ICOs' design analysis

ICO structure

Iconomi founding team decided to not carry out a *pre-ICO* in their fundraising process, rather they went directly publicly without passing through a round of private investments from Venture Capital funds or other selected big investors. This choice is consistent with what analysed in the first chapter, in fact, in the first phases of ICO market development there was not still the interest of traditional finance companies (i.e. VC funds), furthermore, given the low number of raising ICOs with respect the following years, it was much easier to sell the tokens and raising the capital required.

As far as funding caps are concerned, interestingly Iconomi's founding team set a *soft cap* equal to 2000 BTC (i.e. equal to about \$1 million at the time the ICO was launched), which was successfully reached in just 6 days (Zagar, 31th Aug. 2016). As the same author continued in the same article, this minimal capital requirement was needed for *“technical infrastructure development, the start of the two funds, and development of the platform”*. Furthermore, as highlighted within the Whitepaper, in case the ICO failed to reach the soft cap, all funds collected until that moment would have been completely returned (Zagar et al., July 2016).

Even though initially it was not set a *hard cap* *“Because of Iconomi's disruptive potential we expect to attract more investment”* (Zagar, 31th Aug. 2016), actually after seeing the initial success the ICO was having, the founding team decided to set an hard cap equal to 21.000 BTC (i.e. \$10.5 million) during the ICO. Specifically, on the 2nd of September 2016 (i.e. 9 days after the beginning of the ICO), the co-founder Tim Zagar released an article on their Medium blog stating that *“to avoid overfunding we have decided to set the upper limit (cap) for the Iconomi ICO at 21,000 BTC. When this is achieved, the ICO will be closed. The limit is necessary because of the ICONOMI performance fund policy and the fact that current investment opportunities are limited”*.

The fact that Iconomi, which has been a successful ICO, set both a soft and a hard cap, confirms the results reviewed in the third Chapter (i.e. positive correlation with ICO success), revealing that the founding team had a clear overall knowledge of what was exactly needed in order to implement the project underlying the ICO. Furthermore, it is also a reassurance for the very early investors, since if the minimum capital required is not collected, they will receive back the money invested.

The *duration* of the fundraising campaign was slightly higher than one month, surely it was not one of the fastest of all the time, since there were cases of ICOs selling all their tokens in a few days, but in general terms it might be considered having had a quite fast fundraising process. To make a real assessment, however, it should be considered to the ICOs which will be analysed in the following sections.

In any case, the duration of the fundraising process was found by previous literature's studies to not influence the success of the ICO, therefore differences in length among different ICOs, should not be considered negatively.

For what concerns the *currencies accepted* during the ICO, no specific information was contained within the Whitepaper, however, thanks to the articles posted on the Medium blog, it was possible to gather the information that they accepted payments in Bitcoin (BTC), Ethereum (ETH), Lisk (LSK) and traditional Fiat currencies.

During the overview of previous literature's studies conducted in Chapter 3, no robust conclusion was achieved about the effect of letting ICOs' investors contributing with Fiat currencies aside from the most known cryptocurrencies. However, the fact that Ionomi was a successful ICO, which allowed its investors to participate through Fiat currencies, might be an indication that allowing potential investors to participate in Fiat currencies is an element able to increase the probability of concluding a successful fundraising campaign. Before arriving to this conclusion, in any case, it will be needed also the analysis of the other two ICOs selected (i.e. EOS and TaTaTu).

Of the 100 million ICN tokens created, Ionomi's founding team decided to *distribute* to the public only the 85%, while the remaining 15% was decided to be reserved "*for the original development team, advisors, bounties and the earliest adopters/contributors*" (Zagar et al., July 2016). This result is consistent with the findings reviewed from previous literature's studies, which revealed that founding teams which decide retain a portion of the overall tokens for themselves, actually helps to conclude a successful ICO campaign, because it communicates to investors that their interests are somehow aligned with those of the founders (Amsden and Schweizer, 2018).

However, within the Whitepaper no information were provided with regard vesting periods related to the tokens reserved for the founders. This lack of information could have been potentially warning at the time the ICO was conducted, because there could have been the risk that the founders exited the company before actually implementing the whole project. However, this ex-post analysis revealed that there was no need to be concerned since the management team has always remained the same until the time of writing.

The last aspect to be analysed for what concerns the ICO structure, is the relationship between the *tokens offering price* during the ICO and the *number of tokens* decided to be created. As it has been revealed both in Chapter 3, and 4, investors seems to be highly attracted by lottery-type investments (Fisch, 2018), characterized by cheap prices and a large number of instruments offered. This result seems to be confirmed also by Ionomi,

which offered its ICN tokens at a very low unit price (i.e. \$0.1050) and in a very large number (i.e. 100 million, of which 85 million available to the public).

Marketing activities

As it has always been analysed in the previous chapters, marketing activities can be divided between *marketing programs* and *social media activities*.

As far as the first of the two is concerned, they offered a 15% *bonus* to “*all early-bird investors...during the first week of our ICO*” (Zagar, 25th Aug. 2016). But they also carried out an important *bounty program*, composed by 2 million ICN tokens (i.e. 2% of the total amount) overall valued about \$200.000 (Valjavec, 10th Oct. 2016). It started before the launch of the ICO on the 18th of August and ended with the end of the ICO on the 29th of September. The program was well structured and the total number of ICN available had been divided as follows (Valjavec, 18th Aug. 2016):

- Newsletter subscribers – 100.000 ICN.
- Facebook likes – 300.000 ICN.
- Twitter followers – 300.000 ICN.
- Signature campaign – 600.000 ICN.
- Blogs – 300.000 ICN.
- Translations and Forum moderation – 400.000 ICN.

Being this a bounty program and not simply an Airdrop or Smartdrop (i.e. See Chapter 2 for the differences), it required an active user’s participation in order to receive a portion of ICN tokens “for free”, which were distributed within one week from the end of the ICO (Valjavec, 18th Aug. 2016). All the instructions that needed to be performed in the different social media channels in order to receive the “free tokens” were clearly exposed by the developer Jani Valjavec in a post on their Medium blog (Valjavec, 18th Aug. 2016), for this reason it can be considered a well-developed marketing program.

Turning now to the analysis of Iconomi’s *social media activity*, the main channels they used, both during and after the ICO, are Facebook, Twitter, Rocket chat, Telegram, Bitcointalk, Reddit and Medium. The first two are social media channels, the last three are blog platform, while Rocket chat and Telegram are two communication platforms.

Among the *social media platforms*, the most successful was Twitter, as it is possible to observe from the below reported *Figure 12* and *13*, captured by CoinMarketSocial, a website which tracked the user’s growth both on Facebook and Twitter of the majority

cryptocurrencies. Even though it was not possible to find the Iconomi users' growth from the early moment in which they created their accounts in 2016, but only from nearly a year later (i.e. July 2017), these graphs (i.e. *Figure 12* and *13*) are still able to provide a good overview of the social media growth faced by Iconomi over time.

In particular, in July 2017, Facebook and Twitter accounts amounted respectively at 5.700 and 13.100 subscribers, while at the 28th of August 2019, they count respectively 46.700 and 8.400 subscribers. These numbers clearly depicts what has already been said at the beginning of the section, that is the supremacy of Twitter in the Iconomi's social media strategy.

Figure 12 – Iconomi's Facebook user growth



Source: CoinMarketSocial

Figure 13 – Iconomi's Twitter user growth



Source: CoinMarketSocial

For both Facebook (i.e. *Figure 12*) and Twitter (i.e. *Figure 13*), the number of subscriber grew until the beginning of 2018, from that point on the number of subscribers remained more or less unchanged up to the time of writing, even though meticulously analysing the

graph in *Figure 13*, it might be possible to observe a slight decrease in the overall users. Specifically the company lost nearly 4.000 Twitter subscribers (i.e. equal to 8%) from the peak reached in June 2018 to the time of writing (i.e. August 2019), and the timing seems to reflect the period in which the founding team disclosed the intention to transform Iconomi's Corporate Governance. The continuous changes happened in 2018, especially the transformation of the Corporate Governance, might have very likely reduced the overall investors consensus, even though the reason might as well be another considering that the 8% is a very tiny percentage with respect the whole number of Twitter subscribers.

For what concern the *Blog activity*, the most used channel is without any doubt Medium, in which each member of the management team, for the respective field of interest, regularly published many different types of information: from the quarterly financial statements, to any sort of announcement or update regarding Iconomi's development and, finally, also relevant insights regarding the crypto market. Medium was the main channel through which they kept the investor community updated during the ICO and during the early stages of the platform development, and for that reason, it was fundamental to backwardly build the history of Iconomi, from the ICO to the time of writing.

The other blog platforms, such as Reddit and Bitcointalk, where used much less than Medium and basically as a sort of amplifier by republishing announcements and articles already published on Medium.

Information disclosure analysis

Many things need to be said about the information disclosure carried out by the venture, both during and after the ICO. First and most important is the analysis of the *ICO's Whitepaper*, which, is considered the weakest point of the whole disclosure strategy. In fact, it was very short (i.e. 10 pages), with respect to the average pages found in previous literature's studies, and this feature consequently negatively influenced also the quantity of information contained, which were not enough for completely understanding the project.

In particular, in the 10 pages of Whitepaper there was a satisfactory explanation of the business idea underlying the project and a brief explanation about the ICO structure, meaning the overall number of ICN tokens, the types of tokens they represented and the percentage of them available to the public. However, it was completely lacking a section introducing the founding team and their previous experiences or a good explanation about the business model underlying the idea presented. Furthermore, there was no information

explaining the utility/rights/duties attached to the tokens issued, the time forecasted for the listing of the tokens on the various exchanges, the planned use of the proceeds raised, the time needed for the implementation of the project presented and the marketing programs (i.e. bonus and bounties) planned in order to publicize the company and its project. Finally, there was not any mention neither regarding an overall market analysis underlying the project presented, nor about possible competitors, even in the traditional economy, which could have been interrelated with the products they intended to issue.

The overall tone of the Whitepaper was informative, for more than the 90%, since there was not any section containing a business model or a forecast about a possible platform's adoption path.

However, it is worth to say that many of the information lacking from the Whitepaper have been successfully disclosed on the Medium *blog*, especially during the actual ICO. For example, there they published all the information regarding the bonus granted to early investors and the bounty program for investors interested to receive a number of "free" ICN tokens. Furthermore, on Medium they also released all the information regarding the distribution of profits through the buyback program and the utility attached to the tokens for the payment of the fees related to the usage of the platform.

The results obtained by the literature, and reported in the previous chapters, revealed that the most important element regarding the ICOs' Whitepaper in order to carry out a successful ICO campaign is the informativeness it is able to provide to potential investors, rather than the number of pages/characters it contains. However, in this specific case, aside from being very short in terms of length, it lacked to provide very important information (i.e. risk analysis, business plan, use of proceeds, founding team, bonus and bounty programs). It is true that part of these information were available elsewhere, but it should have been better to address everything within the Whitepaper, and then specify some of the most important theme also on other channels (i.e. blog/website).

The analysis of the other two ICOs selected for this analysis will be important to understand if the structure of this Whitepaper was unique of the Ionomi's ICO, or if it shares similarities with other successful ICOs.

As far as the disclosure of the *Source Code* is concerned, the result from the analysis carried out revealed that Iconomi neither has an open account on the most famous code repository Github, nor disclosed its source code to the public. The reason for this choice might be linked to what was pointed out by Bourveau et al. (2018) and reported in the previous chapters: the source code represents proprietary information that, if disclosed, might subsequently erode the competitive advantage of issuers and allow others to mimic or build off their technologies. However, the final effect of the disclosure of the source code on the success of the ICO campaign, resulted from previous literature's studies to be doubtful, therefore, empirical evidence coming from the analysis of the other two ICOs selected, might point if the source code disclosure is actually needed, or not, to carry out a successful ICO campaign.

Founding team

Even though there was not enough information about the team members within the Whitepaper, actually there was a good disclosure of them on the Medium blog, furthermore, each of them for his/her field of interest, regularly kept investors updated with the most important announcements and updated, communicating an overall quality and professionalism of the management team.

Deepening the previous working experience of the team by investigating their LinkedIn profiles, what emerged is that all of them, in 2014, founded another blockchain related company named Cashila, which was a licensed Euro and Bitcoin payment processor. It stopped to provide retail services in June 2017, because as reported in their website "*the team that made Cashila possible is fully dedicating itself to bringing you Iconomi*" (Cashila website). Also in the Iconomi's Whitepapers there was a mention for Cashila, stating that "*Cashila...will serve as the first service operator of the Iconomi platform. Having at its disposal the required knowledge, technical skills and manpower, as well as the status of a financial institution and a longstanding relationship with both the crypto and investment communities*" (Zagar et al., July 2016).

In any case, the fact that Iconomi's founding team had previous crypto experience might be a very important element explaining the success of this fundraising campaign, both in terms of funds raised, and in terms of subsequent survival and development over the years, thus confirming the results obtained by Momtaz (2018a) and discussed in the fourth chapter.

Legal framework

The *country of origin* of Iconomi is Slovenia, which even though it was not among the top 10 countries identified by Momtaz et al. (2019), and reported in Chapter 1, it can still be considered a friendly country in which to launch an ICO. In fact, it was comprised in both the papers by Kaal (2018) and Huang et al. (2019) as one of the most active European countries for hosting ICOs.

For what concern, instead, the *investor base* to which the Iconomi ICO was oriented, it is worth highlighting that the company did not ban any of them. This characteristic might be due to the fact that it was carried out before the periods in which regulatory bodies in different countries took strong positions with regards the blockchain world (i.e. Chinese ban and SEC position on security tokens).

The only limitation to the investor base, was set by the management team, in the process of transformation of the Corporate Governance, by prohibiting US investors to convert their ICN tokens into eICN securities. However, in this case we are not talking about the actual ICO, but of a subsequent company's transformation. In any case this choice clearly depicts the general fear of crypto companies of the SEC judgements when dealing with securities.

Ratings provided

As highlighted in Chapter 3 the ratings provided by information intermediaries were found by previous literature's studies to be positively correlated with both ICO's success and returns, indicating that they seem to be able to capture quite well the overall quality of a venture. The most diffused ratings providers are: ICO Drops, ICO Rating, Etherscan and finally, ICO Bench, which contains the widest ICOs database and applies an interesting evaluation method already been presented in Chapter 3.

As far as Iconomi is concerned, the only rating provided among the information intermediaries just named, is the one resulting from ICO Bench, which valued the ICO with an overall rating equal to 2.8/5 (ICO Bench). Even if at first sight it might appear to be relatively low, thus suggesting that the rating does not well depicts the quality of the venture, actually before making any conclusion it is needed a deeper rating's analysis.

The 2.8 overall rating was composed by a 2.1 score obtained in the objective ICO's evaluation (i.e. weighted 63%), and the remaining part of the evaluation coming from three expert's evaluations, which together weight the 37%. The ratings provided by the experts

were overall higher than the one resulting from ICO Bench algorithm, in fact, all three experts valued 4/5 the *Team*; two out of three experts valued 4/5 the project's *Vision*, while the other one valued it 5/5; finally, the *Product* Iconomi promised to offer was valued 4/5 by only one of the three experts, while the other two valued it at maximum score 5/5. The overall weight of the subjective ICO valuation (i.e. experts' evaluations) was only one third with respect the objective one (i.e. ICO Bench algorithm), because all the weights of the valuations provided by the experts were reduced of 50%, since they contained only scores, without a descriptive review attached (ICO Bench).

For what concerns the low score (i.e. 2.1/5) coming out from the objective evaluation carried out by the ICO Bench algorithm, it was mainly due the lack of the disclosure of certain relevant information in the Whitepaper, which is one of the main sources of information analysed by the algorithm. In particular, the missing information for ICO Bench were the one regarding bonus, bounties and soft/hard caps and a general lack of true informativeness of the Whitepaper. Furthermore, the algorithm of the rating provider also valued negatively the non-disclosure of the source code and the lack of any video presentation of the whole project (ICO Bench). Basically, the same elements valued as missing by ICO Bench are the same that have been previously pointed out in the section "Information disclosure analysis".

Therefore, as a final thought on the quality of the ratings provided to Iconomi and their ability to measure the quality of the venture, it is possible to state that the rating was able to capture both the pros thanks to the very high ratings provided by the experts, and the weakness captured by the algorithm rating. However, the final rate of 2.8 do not seem to communicate the same thing, due to the lack of a descriptive review by ICO Bench experts, that considerably lowered the overall rate. But by investigating deeper, actually the ratings provided could still be helpful for potential interested investors to acquire a greater knowledge of the venture.

The next analysis will be very important to understand if the problems of this rating were intrinsic of the Iconomi ICO, probably because it was among the earliest to take place and the ratings were still not so diffused, or if, instead, the rating providers seem to not be able to capture the overall quality of successful ICOs campaign contrary to the results obtained in previous literature's studies.

Industry and Minimum viable product (MVP)

Finally, for what concern the industry in which to collocate Iconomi, it might be positioned in the generally defined *financial industry*, even though to be more precise, it has specifically to deal with the niche of the FinTech Investment sector, which Momtaz et al. (2019) found to be the fourth most diffused industry among all the ICOs carried out so far.

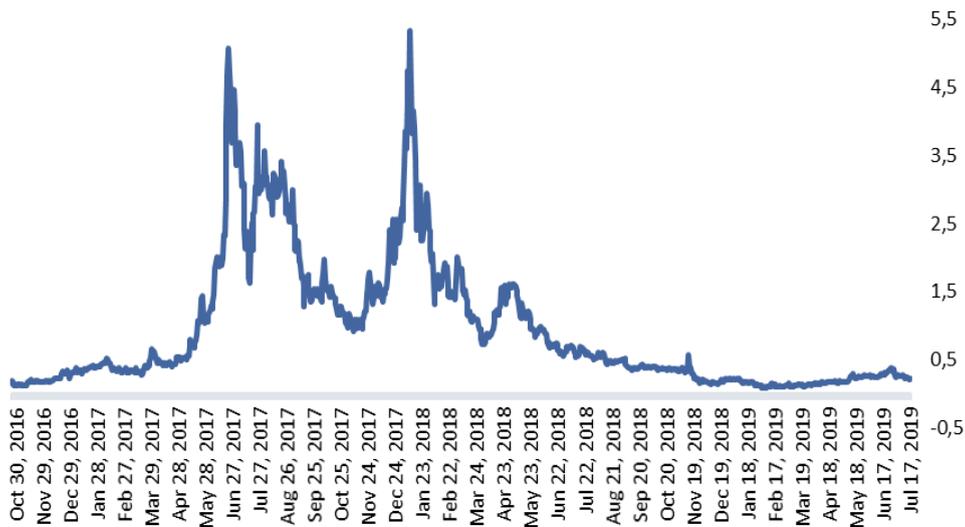
Turning to talk about *Minimum Viable Products (MVP)*, it is worth to say that Iconomi at the time the ICO started on the 25th of August 2016, did not have any prototype to show to its investors, but only a good explanation provided by the Whitepaper. However, they worked hard also during the lunch of the ICO, because they unveiled on Medium, the 24th of September (i.e. 5 days to the end of the ICO), one of the two funds promised: the ICONOMI.index (Mele, Sep. 2016) and on the 13th of November (i.e. 44 days after the ICO end) they announced the establishment of the second fund: the ICONOMI.performance with its first investment thanks to the money raised during the ICO (Zagar, 13th Nov. 2016). For what concerns the release of the whole Iconomi platform it was needed, as predictable, more time, even though the first beta version was announced on the 19th of December 2016 (i.e. less than three months from the end of the ICO) (Zagar, 19th Dec. 2016). Therefore, the management team seemed to be very committed and organized in the actual implementation of the project, even though they did not have a MVP before the launch of the ICO, which could have potentially made the ICO even more successful than what it was.

5.1.6 – Returns analysis

The last aspect remaining to be analysed about Iconomi is the returns it was able to generate over its lifetime, from the end of the ICO, to the time of writing. To be precise, however, it is possible to carry out this analysis only up to the 17th of July 2019, the last available price on CoinMarketCap, due to the delisting of ICN tokens waiting for the tokenization and re-listing of the new eICN tokens.

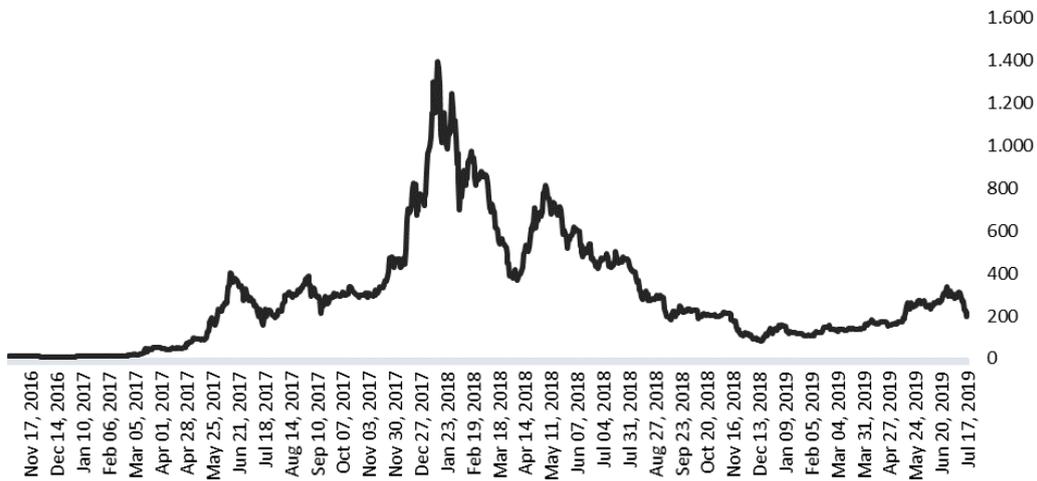
Before going to analyse the actual returns obtained by Iconomi in the aftermath of the ICO, it is worth having a look to the historical path of ICN tokens price (i.e. *Figure 14*), by comparing it also to those of Ethereum (i.e. *Figure 15*) and Bitcoin (i.e. *Figure 16*) on the same timeframe, which are the two most important cryptocurrencies, together they compose more than the 75% of the total cryptocurrencies market capitalization (CoinMarketCap).

Figure 14 – Iconomi tokens (ICN) historical price chart (ICN-USD)



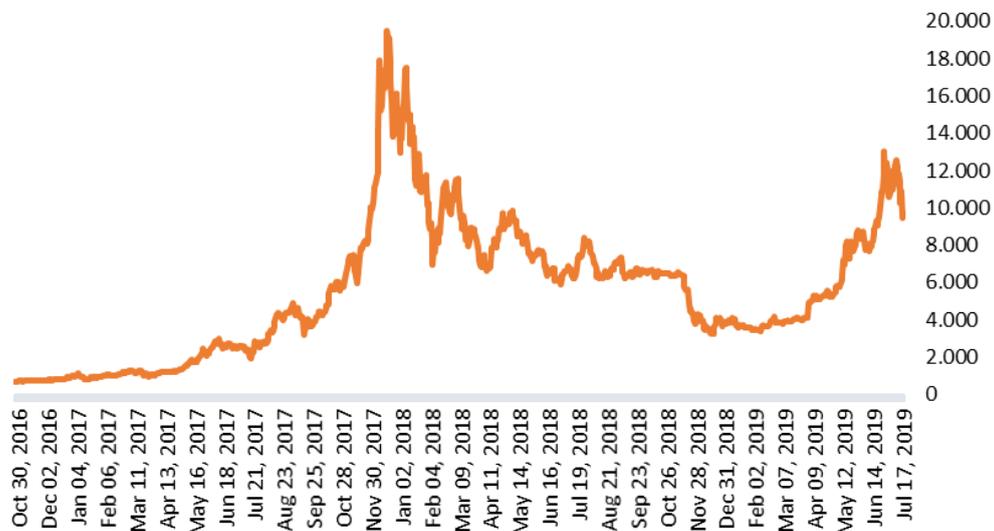
Source: own elaboration using data from CoinMarketCap

Figure 15 - Ethereum tokens (ETH) historical price chart



Source: own elaboration using data from CoinMarketCap

Figure 16 - Bitcoin tokens (BTC) historical price chart



Source: own elaboration using data from CoinMarketCap

Iconomi listed its tokens on the 25th of October 2016, therefore a month after the conclusion of the ICO on the September 29th. This was surely a positive signal of project quality and team reliability, since in Chapter 4 it was discussed about the fact that some only 25% of the ICOs listed crypto exchanges after 60 days from the conclusion of the fundraising campaign (Benedetti and Kostovetsky, 2018).

As it is possible to see from the above reported *Figure 14*, ICN tokens faced a sharp increase starting from May 2017, reaching the peak at the end of June of the same year, with the price shifting from \$0,5 to \$5,07 (i.e. +914%) in a month and a half. In the following months it sharply decreased until returning to \$0,95 in November 2017 and, then, started increasing again up to the historical maximum of \$5,34 in January 2018.

The first thing to be investigated is whether these price movements are somehow correlated with the overall trend of the crypto market or if, instead, they are due to something happened specifically to Iconomi during that timeframe. The answer is something in between, in fact the sharp increase from the end of 2017, to the beginning of 2018 observable in *Figure 14*, can be clearly observed also in both *Figure 15* and *Figure 16*, respectively representing the historical prices of Ethereum and Bitcoin over the same timeframe. The growth started slowly in May/June 2017 and then suddenly sharply bounced towards the end of the same year (i.e. October/November), reaching the historical maximum in January/February 2018, which is considered the period of most “hype” around the crypto market, with Bitcoin reaching its peak of almost \$20.000 and a huge number of ICOs being launched.

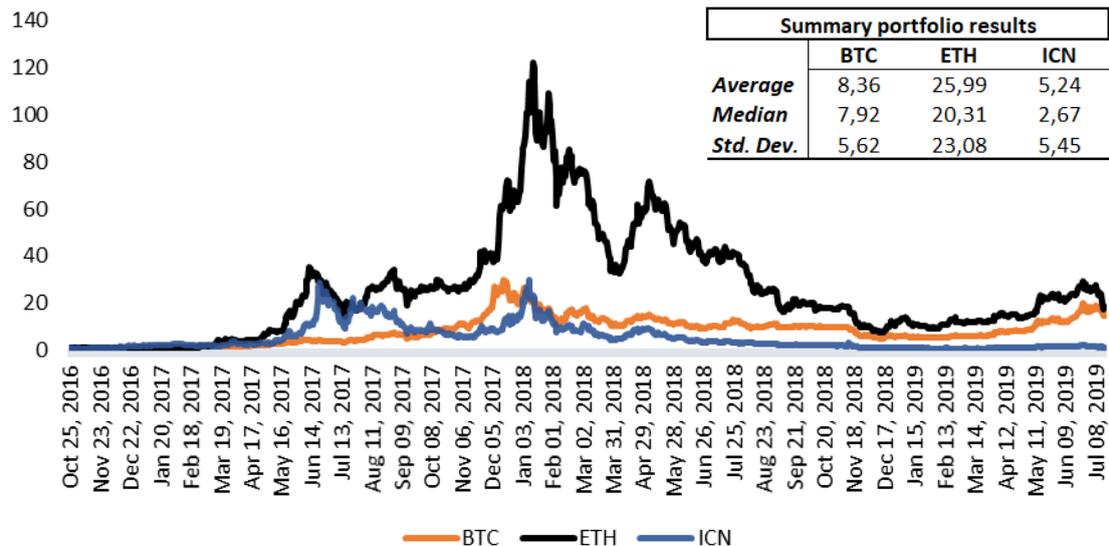
The key difference between ICN trend and the ones faced by BTC and ETH is that in the middle of a progressive growth, in June 2017 the ICN price dramatically increased reaching a value very close to the historical maximum which would have, then, reached in January 2018. After this sharp increase, ICN price started to progressively decrease, until bouncing again up at the end of 2017 together with the overall crypto market.

Even though it is normal that different crypto instruments have different historical trends, due to specific events occurring to each of them during their lifetime, actually when such differences are clearly observable like in this case, and are not correlated with the overall growth of the crypto market, the causes have to be carefully investigated.

Specifically, by reviewing the previous sections in which have been analysed the Iconomi’s development phases it was possible to observe that May/June 2017, were the months in

which they launched and opened to the public the Ionomi platform, which can be considered the most important milestone of the whole project related to that ICO. That jump in price, might therefore very likely reflect the appreciation of investors for that important result reached by the venture, given that it would have allowed the implementation of the whole initial Ionomi's project.

Figure 17 – Daily returns of equally weighted investments in ICN, ETH and BTC



Source: own elaboration using data from CoinMarketCap

An alternative and interesting analysis of the past performance of the ICN tokens, with respect the other two main cryptocurrencies, Ethereum and Bitcoin is reported in *Figure 17*. In particular, this graph represents the performance that would have been obtained by investing equally \$1 in all the three instruments (i.e. ICN, ETH and BTC), starting by the first day of trading of the Ionomi's tokens.

What it possible to understand from that graph, is that even though the three instruments shared a comparable historical price pattern, actually in term of performance Ionomi underperformed with respect Ethereum and Bitcoin, both in terms of average and median results. To be more specific, the Ionomi's performance are much more comparable to the ones of Bitcoin, with respect to the ones of Ethereum. Very outstanding was the performance of Ethereum in this timeframe, since the \$1 invested would have become on average \$25, with respect the \$8 of Bitcoin and the \$5 of Ionomi. However, another interesting aspect to be considered is the volatility of these three instruments, measured by the standard deviation and reported in *Figure 17*, which was extremely high for Ethereum, while much lower both for Bitcoin and for Ionomi. The problem is that even if

Iconomi had a volatility similar to Bitcoin, actually its tokens provided a lower return with respect to the latter, therefore they would not have an optimal risk-return.

The next step is the analysis of the returns faced by Iconomi after the conclusion of the ICO, starting by the Underpricing and then continuing investigating both the Short- and Long-term returns, showed in the below reported *Table 4*. All of them will be, then, compared with the average results exposed in Chapter 4, in order to understand whether Iconomi shared similarities with the average returns observed by previous literature's studies.

Table 4 – Iconomi short- and long-term returns

ICO price \$0,1050		Underpricing 332,89%	
Short-term returns			
First day return *	69,45%	First day return	-60,86%
		One-week returns	-23,19%
Long-term returns			
One-month returns	-3,64%	Three-months returns	111,93%
		Six-months returns	173%
One-year returns	613,80%	Two-year returns	88,59%
		Three-year returns^o	22%
<small>* computed without excluding the ICO underpricing <small>o precisely it is two years and 8 months (i.e. until the last available data before the tokens delisting)</small> </small>			

Source: own elaboration using data from CoinMarketCap

As it is possible to see from *Table 4*, in order to analyse the short-term performance of ICN tokens, have been computed different types of returns.

Firstly it has been computed the *Underpricing*, computed as the % increase in price from the one paid by investors during the ICO, to the first day of trading opening price (i.e. the 25th October 2016). The ICO price set by the Iconomi's founding team for their ICN token was \$0.1050, which in the first opening price was valued \$0.4545, thus leading to a huge Underpricing equal to 332,89%.

This result highlight that also Iconomi in its ICO experienced a huge underpricing, even though if we consider the whole first day of trading, thus computing the return from the ICO price to the closing price of the first day (i.e. *First-day return**), the results are much different, with a return equal to 69,45%. In particular, this second type of return was the

same method used by Lee et al. (2018), Dittmar et al. (2019) and Benedetti et al. (2018) to compute the average first day returns reported in Chapter 4. The results, however, are not fully comparable, in fact, these authors found average first day returns double with respect to the one of Iconomi.

The reason for this very big difference in these two types of returns, might be explained by extreme negative performance of the ICN tokens during the first day of trading (i.e. from the opening to the closing price), indicated in *Table 4* as *First-day return*. Iconomi's tokens, in fact, starting the trading from a value of \$0.4545, ended the day being valued only \$0.1779, thus leading to a – 60,86% price variation. Also in this case, the return obtained is not comparable to the average first-day returns computed in the same way by Momtaz (2018c) and Benedetti et al. (2018) and reported in Chapter 4.

One of the possible explanations for the divergence between Iconomi's returns and the average ICOs' returns found by the literature is that, the latter were highly skewed, with median returns much lower than the actual average returns (i.e. See Chapter 4). Therefore, if there were few ICOs outperforming extremely well, actually the majority of them performed badly and Iconomi might be one of them.

Iconomi, consistently with the results obtained by the literature, experienced a huge underpricing and one of the main causes for that might be the fact that the founding team decided to not carry out a pre-ICO. It could have surely allowed them to better understand the true market value for the ICN tokens, and consequently to set a fairer price. However, as it was possible to understand from the previous chapters, there are many interrelations between the different variables composing an ICO and finding the true reason for that underpricing might be very difficult, since it could have been caused by a combination of them.

For what concerns, instead, the extreme negative of the *First-day return* (i.e. from the opening to the closing price of the first day of trading), a possible explanation might be the excessive exuberance of investors, especially those who benefitted from early bonuses and free tokens from the bounty programs, which having seen a such huge underpricing in the first day of trading, decided to immediately monetize their initial investment, in order to obtain an extremely high ROI.

Aside from the short-term returns, it has also been investigated the returns obtained by Iconomi over longer timeframes (i.e. one-week, one-month, three- six-months, one-year and two- three-years) and reported in *Table 4*. The results obtained have also been discussed in light of the previous analysis regarding the historical trend of ICN tokens' price, with respect to BTC and ETH.

What it is worth highlighting is that all the returns which will be discussed, have been computed by excluding the first day of trading, in order to provide a more realistic picture of the real trend faced by ICN, without considering the abnormal value of the Underpricing. This was the same method used by Lee et al. (2018), Benedetti et al. (2018) and Momtaz (2018c) in their analysis and reported in the previous chapter.

As it is possible to see from *Table 4*, starting from the negative return resulting from the first day of trading, the ICN tokens' price progressively increased over time, reaching the break-even point nearly after a month of trading. Iconomi's performance continued to sharply increase in the following months, obtaining a return equal to 111,93% after three months of trading and reaching 613,80% after a year. Obviously, this returns' growth partially reflects the overall growth of the crypto market as already previously discussed when analysing *Figure 14*, but it also likely reflect the fact that the investor community appreciated the Iconomi's project and the way it was developed over time.

Moving forward of another year, the ICN returns after two year of trading, however decreased to 88,59%, which further diminished to 22% after nearly three years. This second pattern in the performance of the ICN token, aside from being partially explained by an overall decrease of the crypto market, actually very likely reflect also an investors' disappointment for the transformations announced and implemented during the 2018, the most important being the one of the Corporate Governance, which ultimately lead to the delisting of the ICN tokens. In particular, that decision left many questions still unanswered making the future of Iconomi highly uncertain for its investors. One of the most important is the fact that basically Iconomi became a "traditional company" until the newly created eICN (i.e. in exchange of ICN), will be tokenized and listed again on major crypto exchanges. Furthermore, until the entire process of transformation will be completed, investors will not receive any Iconomi's profits distribution and all these considerations are key determinants of the ICN token price.

By carefully thinking, the actual ICN return at the time of writing, might easily be negative, since the current ICN market price, as a consequence this Corporate Governance

transformation, is very likely lower than the one it had on the last day of trading. However, the true Iconomi's value will remain unknown until the newly created eICN tokens will turn to be listed again one or more crypto exchanges. Therefore, it is impossible to make sound consideration on the current return which would have been obtained by buying the ICN tokens at the first day of trading and keeping them until the time of writing.

5.2 EOS (2017)

EOS was the biggest and longest ICO of all the time, launched by a company named Block.one based in the Cayman Islands. In particular, the ICO started on the 26th of June 2017 and officially ended the 2nd of June 2018, through a very articulated ICO structure which will be discussed in the further sections. As far as the amount raised is concerned, EOS during its 341 days ICO was capable to raise roughly \$4 bn (i.e. \$ 4.197.956.135 to be precise), which is considered to be the most successful ICO campaign of the history in term of funds raised (ICO Bench).

Furthermore, as reported in the CoinMarketCap website, EOS is the seventh cryptocurrency for market capitalization (i.e. equal to \$3.451.622.270 million at the time of writing), therefore, aside from being the most successful ICO of the history, EOS is also one of the most important cryptocurrencies of the entire crypto market.

5.2.1 – Business idea analysis

In the Whitepaper the business idea was initially explained as follows: *“The EOS.IO software introduces a new blockchain architecture designed to enable vertical and horizontal scaling of decentralized applications. This is achieved by creating an operating system-like construct upon which applications can be built. The software provides accounts, authentication, databases, asynchronous communication, and the scheduling of applications across many of CPU cores or clusters. The resulting technology is a blockchain architecture that may ultimately scale to millions of transactions per second, eliminates user fees, and allows for quick and easy deployment and maintenance of decentralized applications, in the context of a governed blockchain”* (Block.one, 16th Mar. 2018).

The EOS project was born by the identification of several major problems in the way the blockchain technology worked until that moment. In particular, as reported in the Whitepaper: “*Blockchain technology was introduced in 2008 with the launch of the Bitcoin currency, and since then entrepreneurs and developers have attempted to generalize the technology to support a wider range of applications on a single blockchain platform*”, but the main problem of these platform was that they were “*burdened by large fees and limited computational capacity that prevent widespread blockchain adoption*”.

Therefore, the main objective of the Block.one team through the launch of the EOS ICO was to address these problems, so that it would have been possible to widespread use of the blockchain technology, however the underlying blockchain protocol needed to have the following features (Block.one, 16th Mar. 2018):

- *Support millions of users*: competing with businesses such as eBay, Uber, AirBnB, and Facebook, require blockchain technology capable of handling tens of millions of active daily users.
- *Free usage*: a blockchain platform that is free to use for users will likely gain more widespread adoption. Developers and businesses can then create effective monetization strategies.
- *Easy upgrades and Bug recovery*: companies building blockchain-based applications need the flexibility to enhance their applications with new features. Furthermore, the platform must support software and smart contract upgrades, aside from being robust enough to fix bugs when they inevitably occur.
- *Low latency*: a good user experience demands reliable feedback with a delay of no more than a few seconds. Longer delays frustrate users and make applications built on a blockchain less competitive with existing non-blockchain alternatives.
- *Sequential performance*: applications such as exchanges need enough sequential performance to handle high volumes. Therefore, the platform should support fast sequential performance.
- *Parallel performance*: large scale applications need to divide the workload across multiple CPUs and computers, so to being able to replicate multiple times the same level of performance

Specifically the EOS.IO software, which was defined by the founding team as a “Blockchain operating system”, satisfies all the above explained features by using “*the only known decentralized consensus algorithm proven capable of meeting the performance*”

requirements of applications on the blockchain, called Delegated Proof of Stake (DPoS)" (Block.one, 16th Mar. 2018). Before going into the detail on how this consensus mechanism works, it is worthwhile providing a brief overview of the other main mechanism used before the creation of the DPoS.

The first cryptocurrencies, such as Bitcoin, used as consensus mechanism the Proof of Work (PoW) method in which each new block created on the blockchain needed to be mined (i.e. large computers solving very complicated mathematical problems) by all the nodes of that blockchain, and this process aside for being very energy inefficient, was also very slow, making it impossible for these blockchain to be inexpensive and able to handle a large pool of users.

Over the years, to solve all these problems, it was introduced the Proof of Stake (PoS) consensus algorithm, in which there is no mining and the validation of new blocks is dependent on the number of coins being "staked" by each nodes. The more staking coins a person holds, the higher the chances of being picked as a block validator. While PoW systems rely on external investments, represented by power consumption and hardware, a PoS blockchain is secured through an internal investment, that is the amount of cryptocurrency itself (Binance Academy, 12th Sep. 2019).

In 2014, the Daniel Larimer (i.e. that is one of the EOS's founders), developed a new consensus algorithm called Delegated Proof of Stake (DPoS), in which there is a voting system where stakeholders outsource their work to a third-party. In other words, they are able to vote for a few delegates (i.e. block producers) that will secure the network on their behalf and the voting power is proportional to the number of coins each user holds. If an elected block producers misbehaves or does not work efficiently, it will be quickly expelled and replaced by another one. For what concerns the performance, DPoS blockchains are more scalable, being able to process more transactions per second, when compared to PoW and PoS (Binance Academy, 12th Sep. 2019).

In the EOS's case, the block producers are 21 in total and each blocks is produced exactly every 0.5 second. Furthermore, only one producer is authorized to produce a block at any given point in time, therefore the DPoS blockchain does not experience any forks because, rather than compete, the block producers cooperate to produce blocks. In the event there is a fork, consensus will automatically switch to the longest chain (Block.one, 16th Mar. 2018).

Aside from the technical details about EOS.IO, the key idea behind this project was the launch of an open source platform, which allowed to run smart contracts for the creation of decentralized application (i.e. dApp), very similar to Ethereum. The main difference with the latter, however, is that EOS.IO through the use of the very sophisticated DoPS consensus mechanism allows to make everything much faster and without transaction costs, thus making it possible to support industrial-scale decentralized applications, with millions of daily active subscribers and thousands of transactions per second, which was the main limit of already existing blockchains like Ethereum.

Furthermore, their aim was not only to run smart contracts for the development of dApp, but to provide a platform with a complete operating system for decentralized applications by offering cloud storage, user authentication, and server hosting, as reported in the Whitepaper: *“With a blockchain that uses EOS.IO software, there are three broad classes of resources that are consumed by applications: 1. Bandwidth and Log Storage (Disk); 2. Computation and Computational Backlog (CPU); and 3. State Storage (RAM)”* (Block.one, 16th Mar. 2018).

5.2.2 – Project implementation

The Block.one team together with the Technical Whitepaper released also a document containing the roadmap for the development of the whole EOS project. In particular, the plan was developed in five different phases. The first two phases had to deal with the pure development of the EOS.IO platform, thus the creation of the Minimum Viable Product of the EOS’s project, which was planned to be concluded by fall 2017. The third phase had to deal with the test of the EOS.IO prototype developed in the previous two phases, in order to assess its smooth functioning and the security of the overall system. At the end of this phase, planned for spring 2018, they would have released the version 1.0 of the EOS.IO platform. Finally, the last two phases had to deal with the overall optimization of the version 1.0 (Block.one, 27th Jun. 2017).

To verify if the original plan released at the beginning of the ICO was actually respected in the real implementation of the project, or if there have been some differences between what planned and what actually realized, it will be reviewed all the announcements made by the founding team on the different social media channels and on the corporate blogs Steemit and Medium.

As declared the Block.one team on an update article written in September 2017 on the Steemit blog: *“you will be happy to know that we are ahead of schedule. Phase 1, The Minimal Viable Testing Environment...is complete”*, furthermore, *“we have already completed half of Phase 2, the Minimal Viable Test Network. This phase is scheduled for completion in Fall 2017...We are confident that we will complete Phase 2 on schedule”* (Block.one, 3rd Sep.2017). In particular the first official release of the Minimum Viable Testing environment was on the 15th of September 2017 with the presentation of the EOS.IO SDK (Software Development Kit), which contained all the *“documentation and guides for developers to build a private P2P network to test smart contracts”* (Block.one, 15th Sep. 2017).

The second major pre-release regarded the Minimum Viable Test Network, made on the 4th of December of the same year, in which the Block.one management team announced a “public test network” by providing all blockchain’s and network’s codes (i.e. Dawn 2.0) necessary to launch and operate a private network (Block.one, 4th Dec. 2017). On the 26th of January there was a further release of an alpha codes’ versions (i.e. Dawn 3.0), which could be used, as well, for private testing (Block.one, 26th Jan. 2018).

The official release of the first EOS.IO version was on the 2nd of June 2018, perfectly respecting the original schedule and exactly the last day of public tokens’ sale. The Block.one team on an article on the Medium blog stated: *“Today Block.one is pleased to release version 1.0 of our open source EOSIO blockchain software. This software enables businesses to rapidly build and deploy high-performance and high-security blockchain-based applications”* (Block.one, 2nd Jun. 2018). After the first release there has been a continuous update of the EOS.IO platform, with the last version (i.e. version 1.8) released in April 2019.

Aside from the implementation of the EOS.IO software, however, the Block.one management team introduced over the years series of other functions and services: first of all the EOS VC, born from a partnership between Block.one and the venture capital firm TomorrowBC on January 2018, which was followed in the subsequent months by further partnerships with other relevant FinTech related companies all over the world. In particular as stated in corporate website *“Block.one has committed to deploying funds through the EOS VC business unit, which focuses on the growth and expansion of the EOSIO ecosystem. EOS VC provides support through venture capital partnership funds that*

primarily aim to achieve sustained utilization of the EOSIO ecosystem by investing in a concentrated and diversified portfolio of blockchain-focused companies building on the EOSIO software” (EOS VC Website).

The second introduction was the EOSIO LABS in April 2019, a portal in which they released their Open Source Software, aimed at encouraging the ongoing improvements of the standards by the EOSIO developer community, in order to push the boundaries of what is possible within the industry and EOSIO™ software (Block.one, 3rd Apr. 2019).

Finally, they introduced in July 2019, the EOSIO Webinar Series, which are *“free, live, online events that will give seasoned developers as well as newcomers a chance to learn new skills and keep up-to-date with the latest features and capabilities of EOSIO. Members of the Developer Relations team will also be there to field the community’s questions”* (Block.one, 8th Jul. 2019).

5.2.3 – Tokens analysis and subsequent transformation

The first and most important consideration to make is that EOS initially had not a proprietary blockchain as it emerged by a statement on their Token Purchase Agreement *“EOS Tokens purchased under this Agreement are not tokens on the EOS Platform”* (Block.one, 4th Sep. 2017). In fact, as the same founding team declared: *“EOS Tokens will be distributed as an ERC-20 compatible token on the Ethereum blockchain... ERC20-based tokens on the Ethereum platform (“EOS”) will be sold over a period of approximately one year”* (Blockchain, 9th Jun. 2017).

The EOS token were issued by Block.one on top of the Ethereum network in order for markets to participate and determine the market value of the token before the real EOS tokens could deploy their new proprietary blockchain protocol (TM Lee, 2018). Once launched the EOS.IO platform and, therefore, created their own blockchain, the Block.one communicated to the EOS ERC-20 token holders that they would have had to swap to the EOS Mainnet tokens before the launch of the EOS.IO platform or they could have risked to have those tokens frozen and no longer transferable from the Ethereum network (Block.one, 28th May 2018). Therefore, the Block.one team, basically “used” the Ethereum platform (i.e. which was intended to be their main competitor) during the very long ICO phase, as a mean to reach interested investors and spread out their revolutionary project. Then, the sooner they launched their own blockchain protocol, they transformed the EOS ERC-20 tokens into EOS ones, becoming by all means a direct Ethereum competitor.

As far as the functions of the tokens issued is concerned, on the Token Purchase Agreement the founding team stated that “*The EOS Tokens do not have any rights, uses, purpose, attributes, functionalities or features, express or implied, including, without limitation, any uses, purpose, attributes, functionalities or features on the EOS Platform*” (Block.one, 4th Sep. 2018). In particular, in the same document they, also, specified that: “*The purchase of EOS Tokens: (a) does not provide Buyer with rights of any form with respect to the Company or its revenues or assets, including, but not limited to, any voting, distribution, redemption, liquidation, proprietary (including all forms of intellectual property), or other financial or legal rights; (b) is not a loan to Company; and (c) does not provide Buyer with any ownership or other interest in Company*” and that “*Buyer should not participate in the EOS Token Distribution or purchase EOS Tokens for investment purposes. EOS Tokens are not designed for investment purposes and should not be considered as a type of investment*”. Therefore, the Block.one team did not label its tokens in any particular way, neither utility, nor securities or cryptocurrencies, even if they basically excluded them to be securities.

However, in subsequent articles on the Steemit blog, the “utility” of the EOS tokens came out, in fact the Block.one team stated that “*The EOS.IO software allows each account to consume a percentage of the available capacity proportional to the amount of tokens held in a 3-day staking contract. For example, if a blockchain based on the EOS.IO software is launched and if an account holds 1% of the total tokens distributable pursuant to that blockchain, then that account has the potential to utilize 1% of the state storage capacity*” (Block.one, 16th Mar. 2018). Nevertheless, what it needs to be highlighted is that, until the EOS.IO platform was launched in June 2018, this utility was absolute null, and this might explain why they did not label the EOS tokens in the original Token Purchase Agreement.

5.2.4 – ICOs’ design analysis

ICO structure

Very peculiar was the way in which the EOS’s ICO took place, in particular for what concerns its structure, which basically broke all the paradigms presented in the first two chapters.

The first, and most important feature is the *duration* of this ICO, which lasted 341 days, from the 26th June 2017 to the 2nd of June 2018 (Block.one, 22nd Jun. 2017). The almost

one-year ICO length carried out by Block.one was the longest ICO of all the time, and this is a very important information, because it confirms one of the results obtained by previous literature's studies, that the duration of the fundraising campaign does not have any effect on its success. In particular, as already discussed in Chapter 3, there was the perception that shorter ICO campaigns were more successful because communicating to investors a higher quality of both the project and the management team. However, the fact that EOS was the longest ICO ever carried out, together with the fact that it was the most successful of all the times in terms of funds raised, clearly confute that early thinking.

Another very unusual decision was the *tokens offering price*, the *total number of tokens created* and the way in which they were *distributed*. The discussion of these three aspects need to be carried out at the same time, because it is one of the most interesting features of the whole ICO. As reported by the same founding team: “A *total of one billion (1,000,000,000) ERC-20 compatible tokens will be distributed during that time. Two hundred million (200,000,000) or 20% of the total number of EOS tokens will be distributed during the first 5 days and an additional seven hundred million (700,000,000) EOS tokens will be distributed in two million (2,000,000) increments every 23 hours thereafter. Lastly, one hundred million (100,000,000) or 10% of the total EOS tokens to be distributed will be reserved for block.one as the developer of the EOS.IO software and cannot be traded or transferred on the Ethereum network for the entire distribution period*” (Block.one, 22nd Jun. 2017). Therefore, the 90% of the overall token supplied was actually *distributed* to the public, while the 10% was reserved for aligning the interests between investors and the management team. This result once again confirms one of the main findings reported in Chapter 3, successful ICOs reserve parts of the overall token supply for the founding team in order to align their interests with the investors' ones.

The choice of this scheme in the tokens' distribution process was driven by the following reasons (Block.one, 22nd Jun. 2017):

- To provide an even higher alignment of incentives between the founding team and the investors, since, it leads to a quicker development to complete as early as possible the project initially presented to investors, which in the meanwhile are watching.
- To allow equal opportunity to investor participation, because in this way people have sufficient time to learn about the project and understand all the features. Furthermore, in this way they were able to reach a larger investors' pool.

- To receive the participation of interested investors with technical skills, rather than only people with lot of money, ready to immediately invest in all the promising fundraising campaigns, hoping to catch a star among them.

Also the choice of the *offering tokens' price* was very peculiar, in fact, the EOS team decided to not set a fixed price, but, rather, to sell them at market price. As it was explained by the EOS team “*The EOS token distribution approximates an auction where everyone gets the same price and that price is equal to the highest price anyone is willing and able to pay within a given period. At the end of the 5-day period and at the end of each 23-hour period referred to above, the respective set number of EOS tokens set forth above will be distributed pro rata amongst all authorized purchasers, based on the total ether (“ETH”) contributed during those periods*” (Block.one, 22nd Jun. 2017). This type of token pricing was really innovating, because they basically eliminated the underpricing problem that is a constant of the ICO market. Even though it is not possible to know the token's market price before the launch of the ICO, the EOS team found a way to replicate it in an alternative way, in fact, as themselves stated “*markets can take the form of exchanges or auctions so long as they are public, transparent and open to many*” (Block.one, 22nd Jun. 2017).

As a consequence of all these design choices Block.one did not carry out a *pre-ICO*, which in previous literature's studies was found to be fundamental in providing credibility, in case some big venture capital fund decides to invest and the rights insights in determination of the tokens' price for the actual ICO. However, the choice of the founding team to set the price of the tokens dynamically over time based on the actual demand for that tokens, eliminated the need to carry out a presale aimed to “taste the market”.

This result is very important, because it highlights that not all the factors that were found to be significantly able to influence the success of an ICO campaign, actually need to be implemented in order to have a successful ICO. If the management team has a clear and consistent idea in mind on how to structure their ICO, in order to arrive at the same objective, that is the success of the campaign itself, actually there is no absolute need to follow the trend.

The peculiar ICO structure also influenced the choice of not setting caps, neither soft, nor hard. For what concerns the *hard-cap*, the choice of not setting an upper limit to the money collectable during the ICO, was driven the last of the three above reported reasons explaining the EOS ICO structure, as highlighted by the Block.one team “*capped distributions favour those with money and technical skills to automate a fast order*” (Block.one, 22nd Jun. 2017). Furthermore, by carefully thinking, the choice of letting prices to be driven by market forces has the main objective of maximizing the potential of the venture, without having the imposition of a fixed price, that could let money on the table. And by setting a hard cap what we are, basically, doing is to limit the EOS’s potential, which is clearly contrary to the ideology behind the structure the founding team decided to implement for their fundraising campaign.

As far as the *soft-cap* decision is concerned, the reason why it was not set a minimum amount to be reached is harder to understand. An explanation might be an overconfidence of the founding team about their fundraising campaign, indicating that they were pretty sure of delivering a visionary project which would have attracted millions of investments. In any case, the decision of not committing to give back the money collected, if a certain amount of money is reached, could have been warning for the people interested in investing in the EOS project, because possibly indicating that the management team only wanted to maximize the funds raised and did not have a precise idea of the money needed to implement the project.

Finally, in order to conclude the analysis of the ICO structure, it is worth talking about the types of *currencies accepted* to purchase the EOS tokens. In particular, differently from Ionomi, which accepted both cryptocurrencies and traditional Fiat currencies, EOS only accepted payments in Ethereum (ICO Bench). The main explanation for this decision is, once again, due to the pricing technique the management team decided to implement, which had as the essential requisite of receiving payments in a unique currency, so to avoid having to deal with multiple currencies, which would have made the whole system even more complicated. In fact, if different investors would have been allowed to contribute in different currencies, the EOS team, aside from having to set many different prices based on the willingness to pay of each investor, would have also needed to discriminate them on the basis of currency adopted for the payment.

Marketing activities

Starting from the investigation of the *marketing programs* adopted by EOS team in order to promote their ICO, it is worth to highlight that from the review of the corporate blog, the Technical Whitepaper and of various articles found on crypto newspapers websites, it seems that the company did not initially carry out neither a bonus, nor a bounty/airdrop program. By carefully thinking this is, once again, consistent with the above exposed ICO structure: if their aim is to maximize the funds to raise, reach the most interested people, then distributing free tokens is not the best way to achieve the result. Furthermore, given that a fixed price was not set up and the price is, basically, set by the investor based on its willingness to buy, it would have been impossible to accord a discount on that price, aside from being not consistent with their main objective of maximizing the funds raised.

The only form of bounty program implemented was called “Bug bounty program”, released in at the beginning of June 2018, together with the presentation of the first version of the EOS.IO platform. With this program the Block.one team wanted “*to engage the developer community to help us to continue to secure the integrity of the EOSIO software...the program is designed to leverage community involvement and put us ahead of the curve on any potential security vulnerabilities relating to the software. The program allows third parties to benefit from reporting bugs that pose a risk to the functionality of the core software. It utilizes monetary rewards for skilled third-party ethical hackers and researchers who are able to identify such weaknesses before they are exploited*” (Block.one, 31st May. 2018). However, this cannot be considered a marketing program aimed at promoting the ICO to a wider pool of potential interested people, also because it was carried out right at the end of the fundraising campaign, and the aim, as clearly understandable from the statements above reported, were mainly to verify the secureness of the new platform launched.

Turning to the analysis of the *social media presence* of the company, both during and after the ICO, it can be divided between: the social media platforms, the most used by the EOS team being Twitter and Facebook; the blog platforms (i.e. Steemit, Medium and Reddit) and, finally, the chat applications (i.e. Slack and Telegram).

Starting by the firsts, *Figure 18* and *19* reported below, respectively depict the EOS user’s growth in Facebook and Twitter, captured by the CoinMarketSocial. As in the Iconomi’s analysis, CoinMarketSocial started to track the EOS user’s growth after the actual moment in which the company created the accounts, however, also in this case, the graph are

enough to capture the information needed for the purpose of this investigation.

Figure 18 – EOS’s Facebook user growth



Source: CoinMarketSocial

Figure 19 – EOS’s Twitter user growth



Source: CoinMarketSocial

In particular, in July 2017 (i.e. nearly 1 months from the start of the ICO), Facebook and Twitter accounts amounted respectively at 859 and 6K subscribers, while at the 7th of September 2019, they count respectively 13K and 195K subscribers. These numbers depicts an image similar to the one of Iconomi, that is a supremacy of Twitter in the EOS’s social media strategy.

For both Facebook (i.e. *Figure 18*) and Twitter (i.e. *Figure 19*), the number of subscriber grew at a high rate until the mid of 2018, which was the moment in which Block.one concluded the ICO and released the first version of the EOS.IO platform, from that point on the number of subscribers started to decrease the growth rate, until stabilizing and remaining substantially unchanged from the ends of 2018, to the time of writing.

One noticeable and peculiar thing from *Figure 19* is that the Twitter account is not named “EOS”, but “block_one_”, which is the company that launched the EOS ICO to the market.

Investigating the contents posted within this page, however, it is immediately understandable that they are, basically, all about the EOS.IO platform. In any case the choice of naming the main social media channel with a name different from the one of the actual ICO, could have led problems to the diffusion of their idea, aside from being more complicated for potential interested investors to gather needed information.

For what concerns the EOS's *blog activity*, they used it very actively to disclose all the information related to the ICO and the subsequent project updates, aside from all the conferences and meeting they carried out around the world in order to spread out their idea. Initially they used the Steemit blog platform, until February 2018, when in a post on their blog stated: "*Going forward, Block.one will be using Medium to publish new content about EOS.IO...Here you will be able to find new posts, tutorials, and upcoming community opportunities all in one place. You will still be able to view old content on our Steemit blog*" (Block.one, 13th Feb. 2018).

Even though the number of subscribers on the blog platforms are much smaller than the ones on the social media platforms, in fact, the old Steemit blog has nearly 7,5K subscribers, while the new Medium blog 5,5K (i.e. in the transition they lost 2K subscribers), actually it is not so important, because they are only used as a mean to write articles more comfortably and, then, they used their traditional social media channels (i.e. Twitter and Facebook) to amplify the reach.

Information disclosure analysis

Even the most successful ICO of the history did not have a perfect information disclosure strategy, which seem to be a constant in the ICO market. The main problem with EOS is the fact that the *Whitepaper* released for the ICO, was technical, containing all the information needed to understand the underlying project, focussing on many specific and technical aspects, however, it was completely lacking a more informative part dealing with the explanation of the structure and features of the ICO they would be going to carry out. In order gather all the information more specific to the ICO campaign, rather than the ICO project, investors and interested people needed to find them either in other documents such as the Token Purchase Agreement, or in the articles published in the corporate blog, which, as reported in the previous section, were then amplified by re-posting them in other social media channels (i.e. Twitter, Facebook, Reddit).

In particular, all the information regarding the ICO structure, therefore how many tokens

would have been created, the distribution path and price of these tokens, the length of the token offering, and the ways required to participate, the features of the tokens issued and the risk attached to the tokens' purchase were reported in the Tokens Purchase Agreement document. However, this decision of not introducing these all these information within a unique document (i.e. the Whitepaper), as in the IPOs' Prospectus, was even more strange considering that their ICO structure was very innovating and different from all the other ICOs.

By analysing both the Technical Whitepaper and the Tokens Purchase Agreement, however, there were some declaration that could have been potentially warning to investors willing to purchase the EOS tokens during the ICO. In particular, the first one contained in the Whitepaper states: *"This EOS.IO Technical White Paper v2 is for information purposes only. block.one does not guarantee the accuracy of or the conclusions reached in this white paper, and this white paper is provided "as is"* (Block.one, 16th Mar. 2018). Furthermore, in the Token Purchase Agreement instead, while exposing the risk attached to the purchase of the EOS tokens, they stated that: *"The EOS.IO Software and the EOS Platform and all of the matters set forth in the White Paper are new and untested. The EOS.IO Software might not be capable of completion, implementation or adoption. It is possible that no blockchain utilizing the EOS.IO Software will be ever be launched and there may never be an operational EOS Platform"* (Block.one, 4th Sep. 2017). Although these statements and disclaimers in the main documents disclosed for the token sale might have made investors feel unconfident in believing in the EOS.IO project, actually this ex-post analysis revealed that it was an extraordinary successful ICO and that investors had not been worried about the above reported statements.

Another consideration on the EOS's Whitepaper, is about its format. While generally the Whitepaper is released in .pdf format and can be downloaded, in this case Block.one published the document in their GitHub account and could only be read, without possibility of downloading. Obviously, this is not a problem, and can easily be a way adopted by the founding team to increase investor protection by eliminating the possibility of having a proliferation of fake EOS Whitepaper online, very similar to the original one, issued by hackers with the aim of thieving people.

In light of the main findings reported in the third and fourth chapter for what concerns the information disclosure of the Whitepaper, it is worth highlighting that the choice of disclosing a Technical Whitepaper explaining in very detail the specificities of the EOS project, combined with the fact that the EOS ICO was the most successful of the whole history in terms of funds raised, seem to confirm the good effect of the release of this kind of Whitepaper on the success of the fundraising campaign. However, another very important aspect to consider in the analysis of an ICO's Whitepaper, is the informativeness it is able to provide to potential investors and, in this case, even if it was very informative in the whole explanation of the EOS project, actually it resulted to be very informative with regard many other useful information which have already been reported above. Even though it is true that most of these information were available to investors in other corporate channels, actually investors should find all the information they need to understand the whole project in a unique place.

Finally, in order to conclude the analysis of the information disclosure, Block.one set up a GitHub account and used it very actively by publishing, aside from the Technical Whitepaper and other relevant ICOs' information, also the EOS's *Source code*. Being the Block.one's choice different from the one made by the Ionomi's founding team, before making any conclusion about the empirical evidence about the effect of disclosing the source code on the success of the fundraising campaign, it will be needed to carry out also the TaTaTu's analysis.

Founding team presentation

Block.one, the founder of the EOS ICO, defines itself as: "*a global leader in high-performance blockchain software*" (Block.one website). The choice of naming the ICO differently from the name of the constituting company is quite peculiar, since in the majority of the cases, included Ionomi and TaTaTu, the two denominations actually corresponded. However, far more important than the company behind the ICO project, are the people who founded this company and that launched the actual EOS ICO campaign. Specifically, the original team was founded by 4 people: The CEO Brendan Blumer, the CTO Daniel Larimer and two Partners, respectively Ian Grigg and Block Pierce. By reviewing their LinkedIn profiles it was possible to gather their previous working experience:

- *Brendan Blumer*: his past experience mainly had to deal with entrepreneurship, in fact he founded 4 other companies before Block.one, respectively “Gamecliff” in 2001 and subsequently sold in 2005; “The Accounts Network” in 2007 and sold after three months; “Okay.com” in 2009 and merged with Asia Pacific Properties in 2011 and, finally, “ii5” in 2013.
- *Daniel Larimer*: he was the more technical mind of the team and his last three working experiences were crypto related, by being from 2015 to 2016 the CEO of “Cryptomex”, then from 2016 to 2017 he was the CTO of the blog platform “Steemit”. Furthermore, and most important, in 2014 he created the revolutionary consensus algorithm for block validation named Delegated Proof of Stake, which will be at the earth of the EOS platform.
- *Ian Grigg*: he is an advisor for Block.one from the far 2017 when they launched the EOS ICO. He is also an advisor for other companies both crypto and traditional and his consultancy has mainly to deal with software development.
- *Brock Pierce*: as Ian, he is an advisor and co-founder of Block.one and he has a sound experience in the crypto world being the Chairman of The Bitcoin Foundation since 2015.

Evidence from the analysis of the EOS founding team seem to confirm what has already been noticed both in the Iconomi’s analysis, and in the literature’s review reported in Chapter 3, that is that a sound crypto experience of the ICO’s founders is a fundamental aspect able to highly influence the success of the campaign itself, because it provides more credibility to the newly created venture.

Furthermore, during the implementation of the EOS’s project, the founding team appeared to be very committed in the development of their blockchain platform, given that in a few months they released two beta version of the platform and, after a year, they released the first version of the EOS.IO software. This approach was for sure fundamental in being able to carry out a so successful year long token sale, considering also the very peculiar structure chosen for the ICO.

Legal framework

As far as the *country of origin* is concerned, from the information gathered within the corporate website, Block.one results to be based on the Cayman Islands, which was also the country chosen for carrying out the ICO campaign. Interesting, however, is that in the

presentation of the management team within the corporate website, the majority of the members, included the co-founders Blumer, actually operate in Hong Kong, while other two team members, the Chief Information Security Officer Eddie Schwartz and the co-founder Larimer, operate from Blacksburg (i.e. Virginia) in the United States.

In general, the Cayman Islands are very common country in which to launch ICOs, in fact they have been found to be the tenth country for the overall number of campaigns carried out until May 2019 in the research by Momtaz et al. (2019) reported in the first chapter.

For what concern, instead, the *restriction of the investor base*, no information were indicated within the Whitepaper, however, in the Tokens Purchase Agreement the Block.one team stated that: *“The EOS Tokens are not being offered to U.S. persons or Chinese persons. U.S. persons and Chinese persons are strictly prohibited and restricted from using the EOS Distribution Contract, using the EOS Token Contract and/or purchasing EOS Tokens and Company...If a U.S. person or a Chinese person uses the EOS Distribution Contract, uses the EOS Token Contract and/or purchases EOS Tokens, such person has done so and entered into this Agreement on an unlawful, unauthorized and fraudulent basis and this Agreement is null and void”* (Block.one, 4th Sep. 2017). This statement clearly highlight the concern of Block.one to fall into the regulatory attention of US and Chinese governments and it was, also, one of the main expectations emerged when selecting the 2017 ICO, given that it was the year in which the ICOs’ regulatory environment started to change.

Ratings provided

In order to carry out a consistent analysis among the three ICOs selected, also in this case it will be investigated only the ICO Bench rating. In particular, the overall rating provided to EOS was 4.1/5, which is a very high overall rate, composed by a 3.4/5 (i.e. weighted 39%) resulting from the objective evaluation carried out by the ICO Bench’s algorithm and the remaining 61% resulting from independent experts’ reviews, which compose the majority of the overall rate (ICO Bench).

As in the case of Iconomi, the rating provided by the experts are higher than the one provided by the algorithm, which increase the overall EOS’s rate. However, differently from Iconomi, in this case there are more experts’ ratings, eight to be specific, and the majority of them provided also personal reviews, thus valuing more each of the individual rates.

The missing information for the ICO Bench algorithm mainly regarded the ICO’s structure,

such as the overall number of tokens for sale, the distribution process, the presence of any bonus for the promotion of the ICO and, finally, information about soft/hard caps attached to the tokens' sale. Even if the lack of these information contributed to an overall rate equal to 3.4/5, actually the overall informativeness of the Whitepaper was valued very positively, since it provided a very satisfactory and technical explanation of the EOS project (ICO Bench).

As far as the subjective evaluation part of the ICO Bench rate is concerned, there are both extremely positive rates (i.e. five stars in both Team, Vision and Product) and more critical rates (i.e. 3 stars in some of the three areas analysed). The overall rates coming from these subjective evaluation made by crypto experts are 4,6/5 for the *Team*, 4,7/5 for the *Vision* and 4,4/5 for the *Product*, pointing out the extremely positive opinion of the experts about this ICO, especially for what concern the vision of the project. Furthermore, it is worth highlighting that there were both reviews dated back to 2017/2018 when was still going on the ICO and more recent reviews dated 2019, which are able to provide a wide assessment base, because containing evaluation of the project also during its implementation phase.

Eventually what it is possible to say about the rating received by EOS from ICO Bench is that it was able to provide valuable insights to interested investors, both during and after the ICO. Surely the objective evaluation part highlighted some problems in the way in which relevant information about the ICO structure have been released, that have been observed and reported also in the section "Information disclosure analysis". However, the subjective evaluation part correctly pointed out all the positive aspect related to this ICO, from the quality of the founding team in the project implementation, to the vision of the project, which was, and still is, very revolutionary.

Industry and Minimum viable products (MVP)

In the classification made by Momtaz et al. (2019) of the most popular industries for newly issued ICOs and reported in the first chapter, it may be possible to collocate EOS in the "Platform" *industry*, which was also the one with the highest number of ICOs carried out up to May 2019 (i.e. 2543 to be precise). Therefore, Block.one team launched their ICO on a very competitive sector, even though it is worth highlighting that potentially their technology is superior to the one of any competitor, Ethereum first.

For what concerns the *Minimum Viable Products (MVP)*, as it has already been explained in the analysis of the project's development, at the moment the ICO was launched there was not any kind of early platform prototype. However, in the first six months of ICOs the Block.one team provided its investors a beta version of the EOS platform, which was then officially released after less than a year from the beginning of the ICO, specifically, the last day of fundraising campaign. Therefore, even if at the beginning of the ICO there was any MVP, actually during the ICO, the founding team put lots of efforts in the development of the project, providing in the first months two version of the prototype EOS platform.

In any case, the commitment shown by the Block.one team, starting from the precise roadmap disclosed at the very beginning, was surely fundamental for the success of the overall ICO campaign.

5.2.5 – Returns analysis

The last aspect remaining to be analysed about the EOS ICO, is the returns it was able to generate over its lifetime, from the first available market price, to the time of writing. However, before going to analyse the actual returns obtained by EOS in the secondary market, it is worth having a look to the historical path of EOS tokens price (i.e. *Figure 8*), by comparing it also to those of Ethereum (i.e. *Figure 9*) and Bitcoin (i.e. *Figure 10*) on the same timeframe, which as it might be possible to observe from the CoinMarketCap website, together compose more than the 75% of the total cryptocurrencies Market Capitalization.

The fact that EOS tokens were listed basically during the whole ICO campaign, since their first day of trading in the secondary market was after just 5 days from the start of the ICO, was a very important feature of this ICO, because it surely influenced the success of the subsequent one-day ICO rounds. In fact, the Block.one team needed to continuously develop their project and being committed in its effective implementation following the roadmap disclosed before the launch of the ICO, otherwise this would have impacted the relative tokens' price and success of the whole ICO campaign.

However, this ICO structure make also difficult to compare the EOS with the other ICOs selected for this analysis for two reasons: the *first* being the fact that, basically, there is not an official ICO price, because of the fact that the price were different for each ICOs round, therefore no calculation of ICOs underpricing will be possible. *Second*, the token historical

pattern from the 1st of July 2017 (i.e. first day of trading) to the 2nd of June 2018 (i.e. launch of the EOS.IO platform and conversion of the tokens) was not only influenced by the dynamic of the EOS' tokens in the secondary market, but also from the actual success of the various different ICO rounds in the primary market. In fact, interested investors could either buy tokens during the various one-day ICO rounds, or in the secondary market by token holders interested to sell their EOS' position and this double effect will be impossible to be split in the EOS's returns analysis.

Figure 20 – EOS tokens (EOS) historical price chart (EOS-USD)



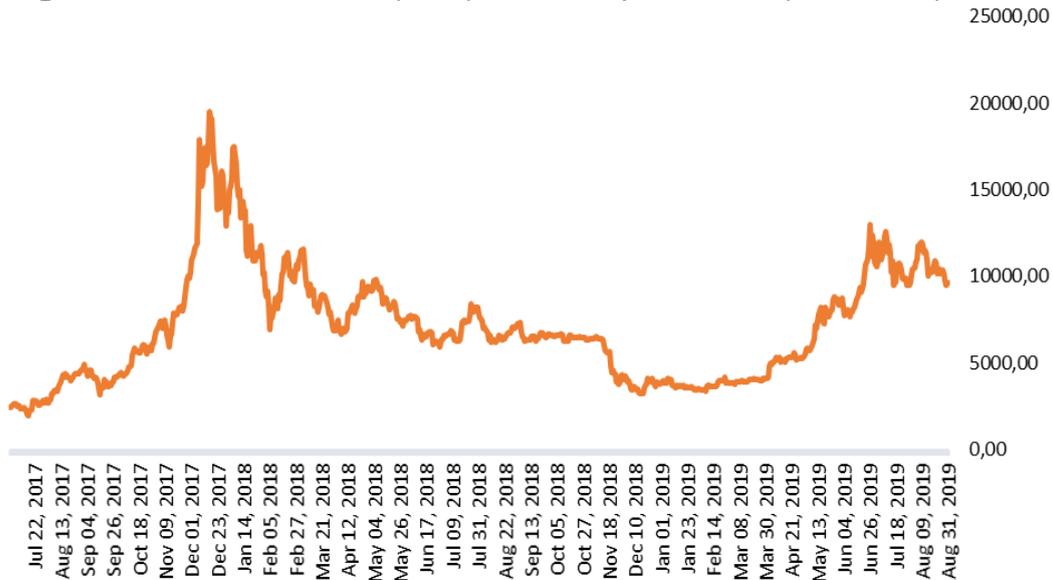
Source: own elaboration using data from CoinMarketCap

Figure 21 – Ethereum tokens (ETH) historical price chart (ETH-USD)



Source: own elaboration using data from CoinMarketCap

Figure 22 – Bitcoin tokens (BTC) historical price chart (BTC-USD)



Source: own elaboration using data from CoinMarketCap

From the analysis of the three graphics reported above, respectively depicting the historical trend of EOS (i.e. *Figure 20*), Ethereum (i.e. *Figure 21*) and Bitcoin (i.e. *Figure 22*) prices, it is possible to observe an overall correlation among the three instruments, especially between EOS and Ethereum, even if there are, in any case, some obvious intrinsic differences.

As it is possible to see from the above reported *Figure 20*, the EOS tokens after having started very well in the first days of trading, then progressively decreased in the following months reaching the lowest value of \$0,78 in November 2017. Actually, this pattern cannot be traced neither in *Figure 21* (i.e. Ethereum), nor in *Figure 22* (i.e. Bitcoin), in fact, both the cryptocurrencies in the same timeframe faced a slow but progressive increase.

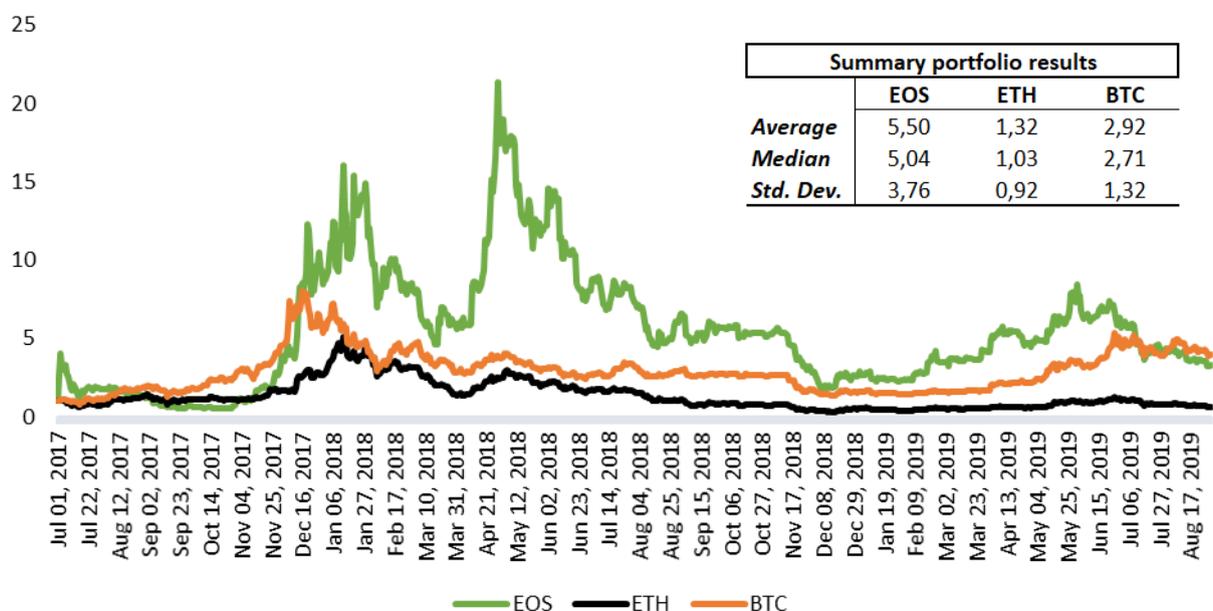
By the end of the year, however, the EOS price started to sharply increase up to January 2018 when the tokens reached a peak of \$15,02, experiencing a 1825% increase in just three months (i.e. from the beginning of November to the end of January). Differently from the previous trend, this one can be clearly observed both in *Figure 21* (i.e. Ethereum) and *Figure 22* (i.e. Bitcoin), in fact the period in question is considered the one of most “hype” of the crypto market, with Bitcoin reaching its peak of almost \$20.000 and a huge number of ICOs being launched, especially on the Ethereum platform. Therefore, the EOS trend, in this timeframe clearly reflected the trend of the overall crypto market, even if part of the increase in price might be partially explained also by the release of the second beta version of the EOS software in December of that year.

In the following months the price started to progressively decrease, until the mid of 2018 (i.e. May/June 2018), when the EOS tokens reached their historical maximum of \$21,54. In this case the pattern faced by EOS was not clearly correlated with the overall crypto market, even though by carefully observing, a relatively similar pattern can be spotted in the Ethereum graph in *Figure 21*, but with a much smaller intensity. An explanation for a such important price growth, might be explained mainly by the announcements regarding the release of the first version of the EOS.IO platform, which is for sure the most important milestone in the whole project development. However, given that the peak was, actually, reached before the official launch of the platform on the 2nd of June 2018, another possible explanation might be that part of the very huge price increase come from an excessive exuberance on the secondary market, with lot of interested investors willing to buy the EOS tokens, before the conclusion of the ICO.

Finally, from June 2018 the EOS price progressively decreased, until the end of 2018, when the trend inverted and it started to progressively raise up to June 2019, with the tokens reaching a value of \$8,51. After that maximum relative peak, the EOS's price decreased and, at the time of writing, its value oscillates between \$3 and \$4. This relative bounce in price in the first half of 2019 is partially correlated with the overall crypto market, in fact, a similar trend can be spotted both in *Figure 21* (i.e. Ethereum) and *Figure 22* (i.e. Bitcoin). However, on the 1st of June 2019, the block.one team made a very important announcements in a conference in Washington DC, and the day after the price dropped of 8%, then continuing the decreasing trend thereafter after stabilizing between \$3 and \$4 at the time of writing. Specifically, on that day they announced the second and upgraded version of the EOS.IO platform, which, in any case, is not expected to have been the cause of this price drop since the newer version is a huge improvement from the first one. However, on the same day, they also announced the launch of a blockchain based social media platform, named Voice, based on the EOS.IO platform, which could partially explain the price drop. In fact, with this announcement the Block.one team *clearly positioned itself against the main tech giants Facebooks, Google by stating that "Voice will be public, allowing for transparency to be a core part of the experience. Everyone – the user, to contributor, the platform – plays by the same rules. No hidden algorithms, no invisible interests"* (Block.one, 1st Jun. 2019).

This decision of committing money in this very hard challenge to mainstream the blockchain technology and compete against giants with billions of daily active users, might have been perceived by EOS token holders as too challenging and possibly negative for the future development of the EOS.IO platform. Furthermore, by carefully thinking this move is the right opposite of what are making these tech giants, which are entering the blockchain world with their own tokens (i.e. Facebook with Libra), but the key difference is that they ideally will be able to be much faster than Voice in the worldwide diffusion of the blockchain technology given their huge pool of daily active users. Therefore, a combination of these consideration might be the explanation of the price drop faced by EOS in the last few months.

Figure 23 – Daily returns of equally weighted investments in EOS, ETH and BTC



Source: own elaboration using data from CoinMarketCap

Another insight relatively to the performance of EOS with respect to the one of the overall crypto market, is reported in Figure 23. In particular, the above exposed figure, depicts the daily return of equally weighted investments in EOS, Ethereum and Bitcoin, starting from the first day of EOS tokens trading, to the 31st of August 2019.

As it is possible to observe, from the summary results reported in Figure 23, the average output of the one dollar invested in EOS, would have been more than double with respect the same dollar invested in Bitcoin, and fourfold with respect Ethereum. The other side of the coin is that EOS resulted to be much more volatile with respect the other two coins, as it is possible to observe by the comparison of the three standard deviations. In fact, the

cumulative return of the one dollar invested in EOS interchanged extremely high absolute values, with low ones very frequently, instead, the dollars invested in Ethereum and Bitcoin, faced a much more regular trend, therefore not an ideal solution for a common rational investor. Volatility is obviously a very important aspect to keep into consideration when investing in a financial instrument, because even if potentially a volatile instrument is able to provide very huge returns, actually it leads to the downside of being very difficult to evaluate the right exit moment.

Table 5 – EOS short- and long-term returns

ICO price N/A		Underpricing N/A	
Short-term returns			
First day return *	N/A	First day return	-1,94%
			One-week returns 126,73%
Long-term returns			
One-month returns	76,24%	Three-months returns	-29,92%
One-year returns	704,95%	Two-year returns °	229,70%
			Six-months returns 775%
* computed without excluding the ICO underpricing			
° precisely it is two years and 2 months (i.e.1 st July 2017 - 31 st August 2019)			

Source: own elaboration using data from CoinMarketCap

Finally, the last part of the EOS's returns analysis will investigate the *Underpricing, Short- and Long- term returns* faced by the company, which are displayed in Table 5 and, then, will be compared them with the average results exposed in Chapter 4, in order to understand whether EOS shared similarities with the average returns observed by the literature. Obviously, these returns have to be analysed in the light of what has already been observed when investigating the historical trend of the EOS tokens prices.

Differently both from Ionomi, and from the literature's studies analysed in Chapter 4, EOS did not face *Underpricing*, because of the peculiar ICO structure chosen by the founding team, especially for what concern the tokens pricing. The fact that no fixed price was set for the token's sale, but rather, that different prices were set on the different ICOs rounds, based on the investors willingness to pay, made it possible for Block.one to not leave money on the table. An example of how this mechanism concretely worked, was reported

in the Tokens Purchase Agreement:

“As an example:

1. 20 EOS Tokens are available during a period.
2. Bob contributes 4 ETH and Alice contributes 1 ETH during the period. The period ends.
3. As a total of 5 ETH were contributed for 20 EOS Tokens during the period, 1 EOS Token will be distributed for every 0.25 ETH contributed. Therefore, Bob receives 16 EOS Tokens and Alice receives 4 EOS Tokens” (Block.one, 4th Sep. 2017). This process was carried out for each round of the whole ICO, the first being after five days of token sale, and thereafter every day until the end of the whole fundraising campaign.

The effect of the absence of ICO’s underpricing can be clearly observed also from the result obtained for the *First-day return* displayed in *Table 5*. In fact, in the first day of trading of the EOS tokens the price remained substantially unchanged, opening at 1,03 and closing at 1,01, thus yielding a -1,98%, which can be considered null. This result is very different from both the one observed in the Iconomi’s analysis (i.e. very negative first day return), and the median results found by previous literatures’ studies, reported in Chapter 4. A very likely explanation for this difference might be that, the absence of a huge underpricing, did not tempt initial EOS investors to immediately sell their tokens in order to monetize the huge initial return.

The first days of trading after the initial listing of the EOS tokens, went very well, as it was previously pointed out when analysing the historical trend of the tokens price, in fact the *One-week return*, reported in *Table 5*, was extremely positive and equal to 126,73%. However, in the subsequent months, the EOS performance worsen, with *Three-months returns* being equal to 76,24% and *Six-months returns* becoming negative and equal to -29,92%. This is an unexpected pattern with respect to the average results obtained in previous literature’s studies reported in Chapter 4, which, instead, showed an increasing trend over time, however, the fact that the tokens were progressively listed and tradable when the fundraising campaign was still ongoing, surely had an effect on market price of that tokens, even if actually the proportions of this effect are very difficult to be extrapolated. As already said during the EOS historical price analysis, actually in the first three months the Block.one founding team worked hard to release the first prototype for the creation of the EOS.IO platform and no major negative event seemed to be happened which could be possibly explaining this important decrease in price faced by EOS during

this timeframe, when the overall crypto market was actually slowly increasing.

The trend strongly inverted thereafter, with extremely high *Six-months returns* and *One-year return*, respectively equal to 775% and 705%, as it is possible to observe from *Table 5*. In this case the massive returns after six months is largely explained by the overall huge hype around the crypto market, which reached the peak in January 2018, even though a partial reason might also very likely be explained by the release of the first beta version of the EOS.IO platform. As far as the longest one-year return, here the very huge price increase is mainly explained by the announcements and release of the first version of the EOS.IO platform, which coincided with the end of the ICO campaign and with the transformation of the EOS ERC-20 tokens into EOS tokens based on the new proprietary blockchain protocol created.

Finally, the EOS performance after *two years* of trading is 230%, which is still a good result, but it has actually decreased a lot from the previous returns reported in *Table 5*. As it has already been previously said when analysing the historical price trend, a partial explanation is an overall de-hype of the crypto market, observable both in *Figure 21* (i.e. Ethereum) and *Figure 22* (i.e. Bitcoin). However, a partial explanation might come, also, from the announcement made by Block.one in June 2019, to launch a new social media platform, named Voice, based on the EOS.IO software, with the clear aim to mainstream the blockchain technology and compete against the tech giants like Google or Facebook.

5.3 TaTaTu (2018)

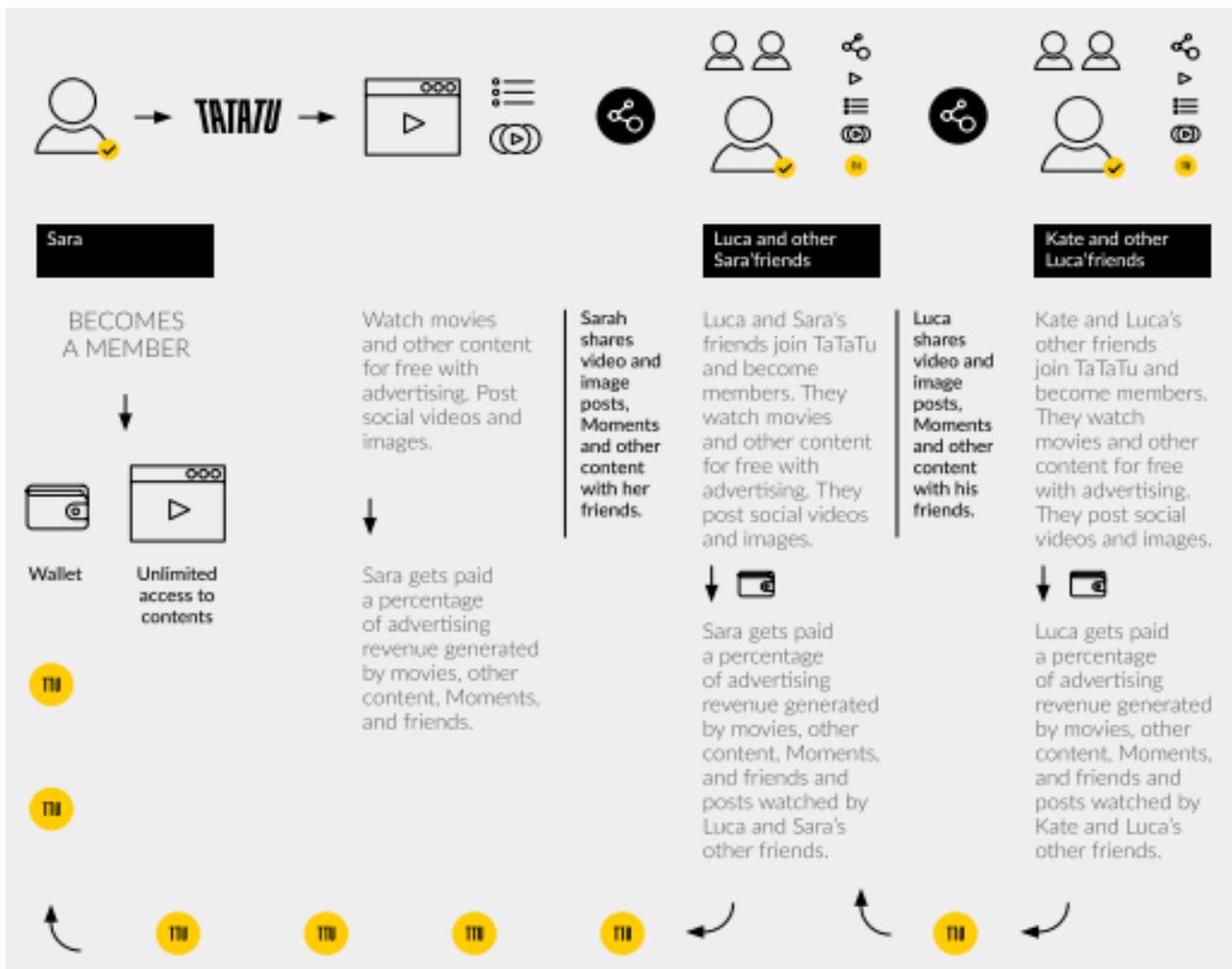
The last ICO remaining to be analysed is TaTaTu, an ICO launched in the Cayman Islands, between May and June 2018, which never entered the public sale, because the management team reached the pre-targeted hard cap during private investments rounds. It was the largest ICO of 2018 and the third most successful ICO of the history in terms of funds raised, collecting \$575 million.

5.3.1 – Business idea analysis & Business model

They TaTaTu's founding team introduced the project in the Whitepaper as follows: "*TaTaTu will be a fair and transparent social media and entertainment platform. People will be rewarded for both creating or providing content and for watching it*" (TaTaTu, 2018). As

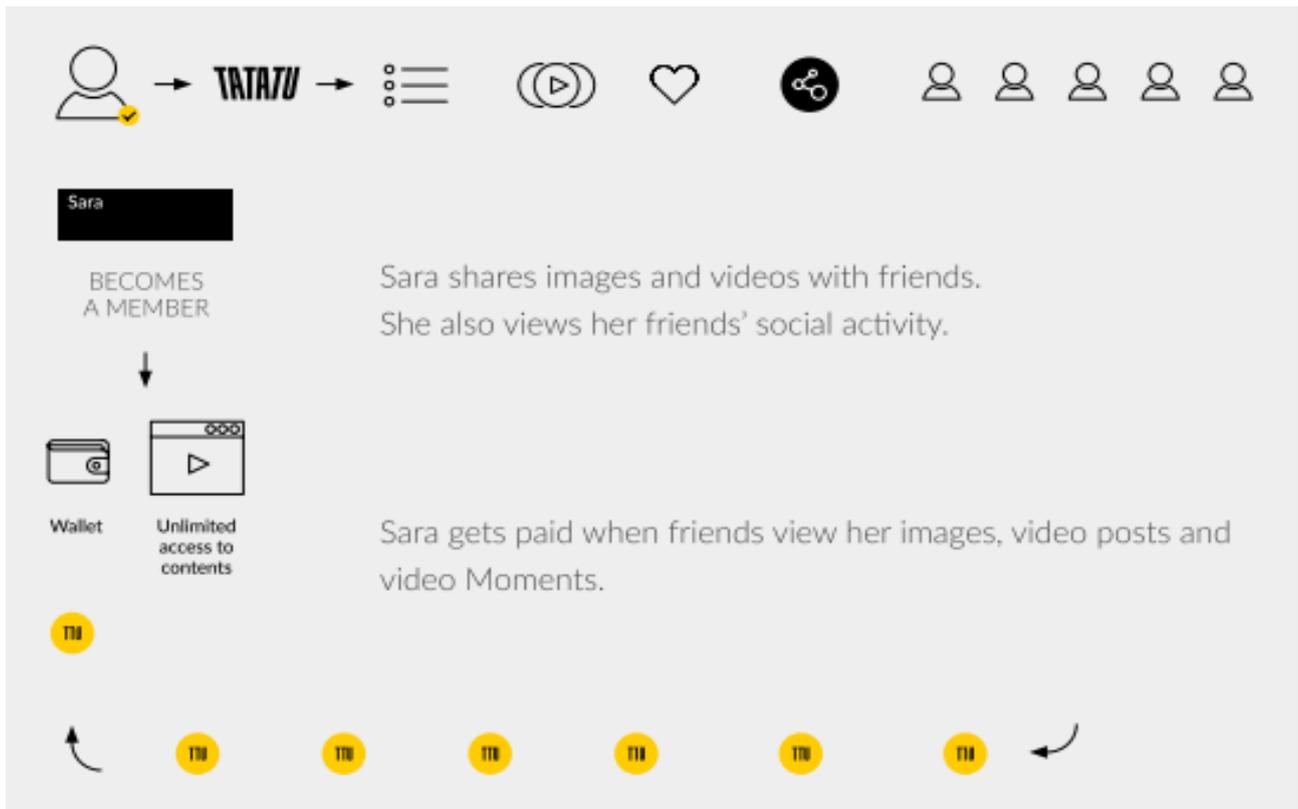
clearly highlighted within the same document, the idea of this ICO come out because the management team realized that content providers, in the modern age, struggle to manage the rights of their content and fully realise the profits of their creative work. In fact, people are used to free online content, the problem is that when high quality contents are not paid, it means that whoever made them is not fairly rewarded for their work and creative efforts. TaTaTu believes that an ad-based distribution model is the only viable solution. In exchange for free content, people need to provide something in return to the content creator, and that usually ends up being their attention and their data. The user becomes the product (TaTaTu, 2018).

Figure 24 – Process of earning TTU tokens rewards based on watching TaTaTu contents



Source: TaTaTu Whitepaper – 2018

Figure 25 - Process of earning TTU tokens rewards based on Users' content creation



Source: TaTaTu Whitepaper – 2018

On that platform “anybody using the platform openly accepts a relationship with advertisers and gets rewarded for it”, in fact people will be rewarded through the TaTaTu tokens (TTU), for both creating contents and for watching them (TaTaTu, 2018):

- Users collect tokens every time they watch content on TaTaTu and also earn tokens if their friends view content, as displayed in the above reported *Figure 24*.
- Anyone who creates or provides content for the platform will be rewarded in tokens and will earn tokens on content views, as displayed in the above reported *Figure 25*.

Therefore, the TaTaTu business model is completely different with respect to the ones of traditional entertainment industry, which are either based on subscriptions, or on advertising. The difference is that while traditional platforms keeps most of the revenue for themselves, TaTaTu is able to reward people who add content to the online platform and those who consume it. Transactions are recorded on a shared ledger provided by the blockchain to create a trusted ecosystem among all users of the platform (TaTaTu, 2018).

Furthermore, the TaTaTu platform is also a powerful tool for content producers who have access to a sophisticated digital management tool (DRM) to help locate all the rights to their movies (i.e. which is one of the main problems), in order to allow them to better concentrate in the production of better content. Therefore, the platform connects movie producers and other content providers directly with their audience and all of these users earn TTU tokens for participating. Producers can use any tokens they earn from viewing or providing content to use the DRM (TaTaTu, 2018).

5.3.2 – Project implementation

The roadmap planned by the founding team and disclosed in the Whitepaper was to “roll out the entertainment platform over the course of 12 months. This will start with a Minimum Viable Product (MVP) to include user registration, simple Video On Demand (VOD) features, inviting friends, a simple token wallet, simple social media profile, and ad booking for brands” (TaTaTu, 2018). As reported in the same document, after the MVP, they planned to introduce three further product interactions:

- *Release 2*, in which they would have introduced the advertising through Advertising Video On Demand (AVOD) on the platform and they would have also developed the “ad server”, in order to make it possible to correctly split the revenues coming from advertising, between the content owner, the viewer, and TaTaTu itself.
- *Release 3*, which would have provided an enhanced social experience, allowing users to create premium User Generated Content (UGC) for the whole platform. Thus enabling that part of the TaTaTu platform more similar to YouTube.
- *Release 4*, finally, would have been provided full social functionality along with social and financial insights whilst enabling platform users to redeem their TTU tokens.

Specifically, on the 31st of May 2018 the TaTaTu management team launched the first Alfa version of the platform to 500 test users and, as reported by the CEO Andrea Iervolino, “We reached that number in few seconds as well as over 200,000 subscribers to our waiting list in little over two hours” (Iervolino, 12th Jun. 2018).

At the beginning of July 2018, the eight to be precise, the management team as planned within the Whitepaper, released with a post on their Facebook and Twitter pages, the first Beta version of the TaTaTu platform in US, UK, Canada, Australia, New Zealand. The team perfectly respected the roadmap shown in the Whitepaper, which foreseen to reach such

milestone in the second quarter of 2018. The mobile platform was initially delivered to Android users and in the subsequent days to iOS users.

Together with the announcement just reported, they also declared that new countries would have been added in the last quarter of 2018. The same timing was contained also in the Whitepaper's roadmap, which foreseen, by the end of 2018, the availability of the platform also in the whole European Union, South Korea, Japan, Russia, Brazil, Mexico and India. However, differently from what originally planned, the TaTaTu team widen the platform only to Italy and much later than what promised, the 7th March 2019. To the time of writing no more countries have been supported by the TaTaTu platform.

From the analysis of the TaTaTu platform it appears that the management team over time implemented the whole business model explained at the beginning of the section, even though there has not been the official release of a final version of the platform. In particular, they introduced the possibility for the users to be rewarded both for enjoying the platform contents (i.e. Film, Sport events, Games and Celebrities moments), which was at the heart of the whole project, and for bringing friends within the platform. In particular, in the website they state: *"You can earn approximately 12 TTU coins for each movie you watch. You also earn approximately 12 TTU coins for each movie watched by friends of yours. The calculation is based on 100-minute movie"* (TaTaTu Website).

Furthermore, they also included in a section of the platform the possibility in which each one can create contents, such as photos and videos, similarly to YouTube, but rewarding creators with TTU coins based on the views and on the community interaction through likes, comment or sharing.

Obviously, all this system of free rewards distributed for enjoying the content available on the platform, works because the founding team implemented the possibility for companies to advertise their products on the platform, paying the advertisement spaces with TTU coins, which then are distributed between the content creator, the platform's users and TaTaTu itself.

Finally, the management team also opened an e-commerce selling TaTaTu merchandising which the users can buy if they wish, with the TTU coins they gained by using the platform or through initial marketing programs.

Starting from the release of the first Alfa version of the TaTaTu platform the management team seemed to be quite active in setting up partnership with many important actors in order to produce new proprietary movies/contents, similarly to Netflix. Among the most important celebrities involved it is possible to mention: John Travolta, Jim Caviezel, Mark Rylance, Andrea Bocelli, Antonio Banderas and Johnny Depp. Furthermore, they also set partnership with other producers in order to have the right to stream their films on the TaTaTu platform, thus increasing the overall library available to the users.

5.3.3 – Tokens analysis and subsequent transformation

The first and most important consideration to make is that, for the initial sale of the TTU tokens, the management team did not have a proprietary blockchain, but rather used an ERC-20 architecture for its tokens, as it was clearly reported within the Whitepaper “*The blockchain is made up of ERC-20 tokens*” (TaTaTu, 2018). The previous analysis (i.e. Ionomi and EOS) suggested us that this initial blockchain structure, give the possibility to benefit of the well-functioning Ethereum ecosystem, making the whole ICO much simpler, without the need of huge initial investment for the building-up a new blockchain protocol.

As it has already been said at the beginning of the ICO analysis, the TaTaTu public tokens’ sale never took place, because on the 12th of June 2018, the CEO Andrea Iervolino announced on the Medium blog and in all the other social media channels, that all the tokens which were allocated to be distributed during the ICO were already all been sold in private presales. In particular, the announcement was the following: “*Today we are extremely proud and honoured to announce that our token has been sold out with the sole support of our partners...To them goes my second big THANK YOU, for believing in us, for believing that a different online entertainment industry really is possible...We have come to the decision that running a public sale in the current regulatory environment would have exposed the project to too many risks, both for us and for everyone buying our token. Therefore, we will not be making the token available on general sale. We know that many will be disappointed, but we feel this is the right approach...We won’t be asking for financial support where none is needed. TaTaTu is about giving and rewarding rather than taking*” (Iervolino, 12th Jun. 2018). Among the private investors who believed in the TaTaTu project there were very important people, such as Lady Monika Bacardi, of the famous liquor family and the Prince Felix of Luxemborg, as they declared on the Telegram

channel, but also important crypto investment funds like Lvna Capital and BlockTower Capital (Dale, Jun. 2018).

The TTU tokens started to be officially listed on various crypto exchanges from the 2nd of July 2018, as reported by CoinMarketCap. Over time TTU tokens have been listed also by other crypto exchanges, among which one of the most important was Ethfinex, in September 2018. However, starting from February 2019, the TTU tokens have been progressively delisted by all the exchanges, until becoming totally inactive precisely from the 27th of that month.

Even if no specific and transparent information were provided by the management team, by deeply investigating what happened to the TaTaTu platform at the beginning of 2019, it was possible to evince that they decided to move away from the Ethereum blockchain, by setting up a their own blockchain, called TAT01. In fact, they wrote a Memorandum of Understanding in their website, in which they say that: *““TTU” means cryptographically secured digital tokens generated by software code in the form of in the form of TAT01 a blockchain technology which has been developed and/or executed by Tatatu”* (TaTaTu Website). The new tokens TTU TAT01 will not be listed on a major crypto exchanges, but rather, they will be transferable only within the TaTaTu wallet platform, thus basically transforming the TTU tokens from being public listed tokens (i.e. ERC-20) to be private tokens (i.e. TAT01). As the same management team declared in their website, the reason behind this decision, was *“to eliminate the risk of price fluctuation that is affecting the crypto market, TaTaTu has launched an international memorandum of understanding to establish a fixed rate of exchange for the TTU Token of 0.25 USD”* (TaTaTu Website). Obviously, this choice will have an important effect in term of liquidity, volatility and return, which however will be analysed further in the last section of the chapter.

The last aspect about the TTU tokens remaining to be analysed is their classification and the functions attached to them. Within the Whitepaper, the TaTaTu tokens were clearly labelled as utility tokens: *“Tokens is a utility token. Tokens are digital utility tokens that afford Tokens holders to [access the Platform] and/or execute certain functions on the Token Smart Contract in accordance with the terms of an open-source license agreement. Tokens do not represent a loan to Token Generator nor do they provide Purchaser with any ownership or other interest in or to Token Generator”* (TaTaTu, 2018). In particular, in a further section of the Whitepaper they clearly stated that *“The sale of Tokens and*

Tokens themselves are not securities, commodities, swaps on either securities or commodities, or a financial instrument of any kind... Purchaser acknowledges and agrees that Purchaser is not purchasing Tokens for purposes of investment, speculation, as some type of arbitrage strategy, for immediate resale or other financial purposes. Tokens are not designed for investment purposes and should not be considered as a type of investment”.

In particular, the utility of the TTU tokens come from the fact that:

- They are the only method for companies to purchase advertising within the platform. In order to become an advertiser, a token holder has to first be approved by the TaTaTu governance community (TaTaTu, 2018).
- TaTaTu users receive TTU tokens for watching and sharing content on the platform and no other form of reward is allowed. The TTU token are designed to encourage adoption of the platform but also ongoing loyalty, which is directly related to the quality of the platform’s contents (TaTaTu, 2018).
- The TTU token can be used to purchase gadgets in the TaTaTu e-commerce store. This will stock general merchandising items related to TaTaTu, like stickers or clothing accessories, as well as merchandise that relates directly to contents, such as a movie and/or the actors (TaTaTu, 2018).

It is worth highlighting, that all the function attached to the TTU tokens remained the same also after the transformation of the tokens from ERC-20 to TAT01. Therefore, the management team changed only the form of the tokens, but not their substance and functions.

5.3.4 – ICOs’ design analysis

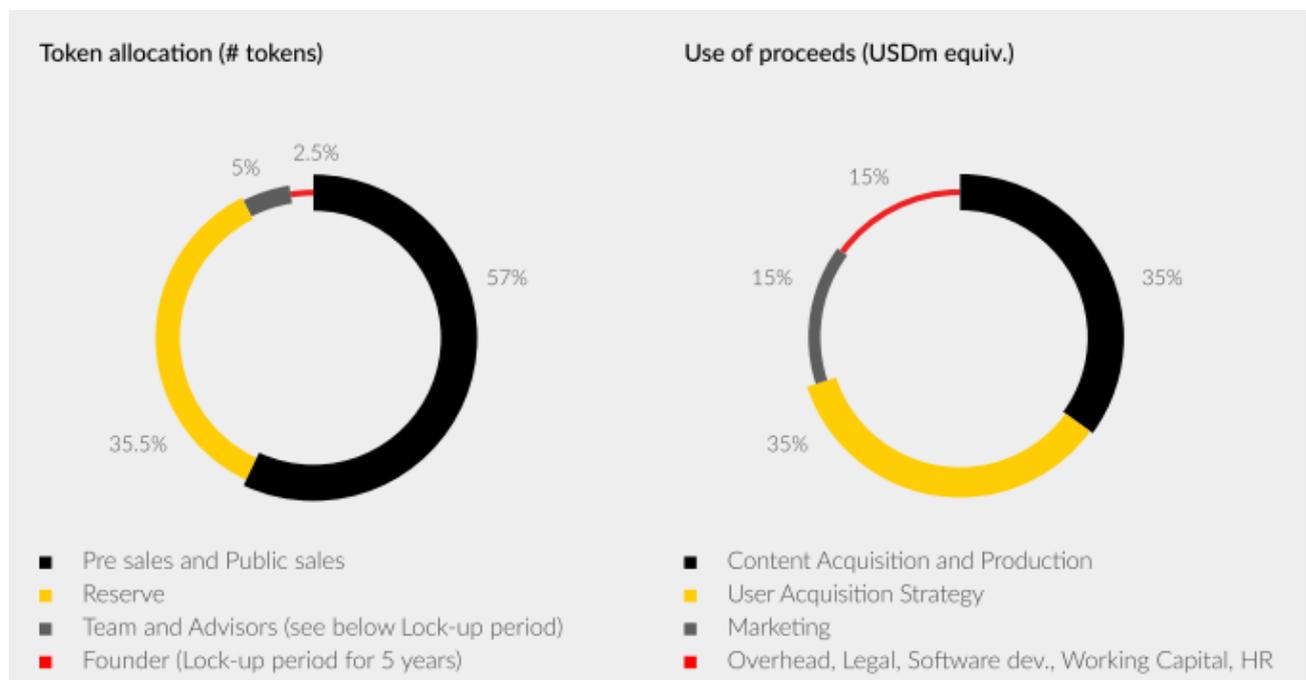
ICO Structure

Many information about the ICO were not available neither on the Whitepaper, nor on the corporate website/blog articles, therefore, differently from the other analysis (i.e. Iconomi and EOS), this section will be analysed as a whole and not each aspect of the ICO structure separately.

In particular, the only information contained within the Whitepaper about the ICO structure they chose, were about the *token distribution*, described as follows: *“In a bid to enhance the long-term success of the project, only 57% of the total amount of tokens created will be available during an Initial Coin Offering (ICO) event. 35.5% of the tokens will be assigned*

to an internal reserve fund at TaTaTu. This creates a deposit of pledged tokens” (TaTaTu, 2018). In the same section of the ICO Whitepaper, there was also the planned use of proceeds they would have made, with a 70% equally divided between the acquisition of new users and the production of proprietary contents and the acquisition of already existing ones. The other 30% was equally split between marketing and all other expenses (i.e. Overhead, Legal, Software development, Working capital, HR). A visual representation of these information can be found in the below reported *Figure 26*, captured by the same Whitepaper.

Figure 26 – Token allocation & Use of proceeds



Source: TaTaTu Whitepaper – 2018

As in the previous two analysis (i.e. Iconomi and EOS) not the whole 100% of token created was decided to be distributed, but only the 57%, which is a much smaller portion with respect the one distributed in the other two ICOs analysed. However, very little information were provided about the remaining 43% of tokens, which were kept out from the ICO. The only information were the one gatherable from the above reported *Figure 26* in which it is possible to see that only the 7,5% was actually reserved to the founders and advisors, in order to align their interest with the ones of the ICO investors. The most considerable part of the tokens not available for the sale (i.e. 35,5%) were reported to be kept at reserve, the problem is that no further information about what these tokens were

blocked for and where they are physically stored was provided to potential interested investors if not that “35.5% of the tokens will be assigned to an internal reserve fund at TaTaTu. This creates a deposit of pledged tokens” (TaTaTu, 2018).

The most warning thing about this ICO, however, is that within the Whitepaper, and in their social media channels was not reported the period in which the ICO should have took place. Information providers report for the TaTaTu ICO different dates, in particular ICO Bench and ICO rating report that it was conducted between the 11th and the 30th June 2018, instead, Etherscan reports it was carried out between the 24th of May 2018 and the 30th of June of the same year. Given that the announcement that there would have not been any public sale of the TTU tokens, because they already reached the hard-cap in the private rounds, was given by the CEO Andrea Iervolino on the 12th of June 2018, the truth might be in the middle, with the pre-ICO being carried out from the 24th of May to the 11th of June 2018, while the actual ICO was programmed between the 11th and the 30th of June 2018. However, these are assumption since in no one of the official documents were reported the ICO's dates.

A possible explanation for this very important lack of information might depend on the fact that they were originally reported in the corporate website and then removed when the public ICO was cancelled. However, the fact that these information completely lacked from the most important ICO document (i.e. Whitepaper), is quite warning.

Other fundamental information which were lacking from the TaTaTu's Whitepaper, were the *total token supply*, the *price* at which the tokens would have been sold, the presence of any *soft/hard-cap* and the *currencies accepted* during the tokens' sale. As before, all these information have been found elsewhere, in particular CoinMarketCap reported an overall *token supply* of 10 billion tokens, while the main information providers ICO Bench, ICO rating and Etherscan, reported that the TaTaTu ICO had a *soft-* and *hard-cap* respectively equal to \$250 and \$575 million, and an *ICO price* equal to \$0,25, with Ethereum as unique accepted *means of payment* in the tokens' sale.

Confirms about the ICO price can be found in the website of the TaTaTu platform, since \$0,25 is also the fixed value they set for the TTU TAT01 tokens after the tokens' transformation at the beginning of 2019, as they stated in their Memorandum of Understanding: “*Seller will accept TTUs at a fixed rate of \$0.25 per one (1) TTU, and to the extent Buyer will accept this fixed rate in the relevant agreement*” (TaTaTu, 2019).

Therefore this price very likely reflect also the token value the management team decided for the original TTU ERC-20 tokens, before the launch of the ICO.

Overall the TaTaTu ICO structure followed the main trend already observed in the literature review. In particular, the team set the ICO price very low and a huge tokens supply, in order to capture the preference of investors for lottery-type investments (Fisch, 2018), characterized by cheap prices and a large number of instruments offered. Furthermore, they correctly set soft- and hard-caps, which were found to be, in general, highly correlated to ICO success, since they are able to make the venture more credible at the eyes of investors.

However, the fact that the actual public ICO never took place, makes it impossible to really know what was the real ICO price charged to the private investors, or the overall percentage of tokens sold during the pre-ICO, therefore all the consideration made so far about the ICO structure, are based on the planned ICO structure, rather than on actual tokens sale.

Finally, differently from both Ionomi and EOS, TaTaTu carried out a very successful *pre-ICO*, which even allowed them to not carry out the actual ICO and it was the only one of the three having had this particular path. However, the mere fact that only one over three ICOs analysed conducted a presale, has not to be interpreted that they are a doubtful tool for carrying out successful ICO campaigns. Rather, there are different ways to carry out a successful fundraising campaign and having a presale, surely, is one of them being TaTaTu the third most successful ICO of the history.

As pointed out in Chapter 3, carrying out a presale, with important investors taking part, as it was the case for TaTaTu, which had the privilege of receiving investments from very important people (i.e. Monika Bacardi, the Prince Felix of Luxemborg, Luna Capital and BlockTower Capital), is a very important boost of credibility and prestige able to benefit the company also during the subsequent project implementation.

Marketing activities

Considering that all the tokens available for the sale have been immediately sold in private investments rounds, actually, all the marketing activities carried out by the management team, both through marketing programs and in the social media channels, were oriented to the expansion of the TaTaTu platform, rather than for the promotion of the tokens sale.

This feature, is intrinsic of the TaTaTu token sale, given that the promotion activities adopted by all the other ICOs so far analysed, were mainly aimed to promote their ICOs.

The main *marketing program* adopted by the TaTaTu's management team, was an Airdrop which started with the release of the TaTaTu platform Beta version in July 2018 and it is still in place at the time of writing. It consists of providing to each new subscriber 50 TTU tokens for free, in order to incentivize the use of the platform and reach a minimum critical mass able to make the platform self-sufficient. This promotion activity was not clearly explained within the Whitepaper, however, in the description of the use of proceeds they reported their willingness to reserve the 30% of the funds raised to implement an "*users acquisition strategy*", therefore, they actually behaved consistently with what declared.

In order to avoid the risk of providing TTU tokens for free, which could be immediately sold in the secondary market by the initial subscribers for making a profit, the management team set a minimum of 200 TTU needed to be able to withdraw the TTU tokens from the account (Wisteria, Aug. 2018). The main aim of this decision, was to reduce the possibility that random people benefitted this free tokens with the only purpose of gaining money, therefore incentivizing each new subscriber to enjoy the platform's contents and invite friends, in order to gain TTU also on the content watched by the latter.

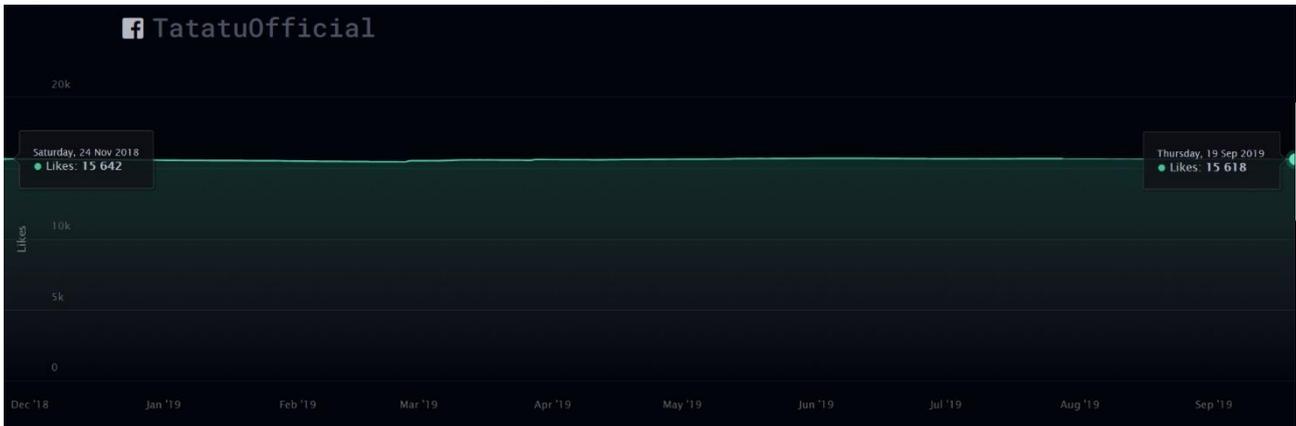
Differently from the previous two ICOs analysed, here the management team decided to implement an Airdrop (i.e. free tokens to whoever), rather than a more thought Bounty program (i.e. free tokens in exchange for something benefitting the platform). However, this choice is somehow consistent with the objective of increasing the sooner possible the critical mass, fundamental for making companies willing to advertise their products on the TaTaTu platform, which is the most important revenue stream able to keep the whole project alive.

As far as the *social media activity* is concerned, here the main channels used by the founding team are Facebook and Twitter. In fact, even if TaTaTu has also an opened account on the Medium blog, actually, it has never been very used as the previous ICOs analysed. However, differently from the latter, TaTaTu was more active on communication platforms, such as Telegram, in which they had a very explosive start.

For consistency with the other two analysis, in *Figures 27 – 28 – 29* will be displayed the TaTaTu users' growth on the main social media channels Twitter, Facebook and Telegram, gathered from CoinMarketSocial. As in the previous ICOs analysis,

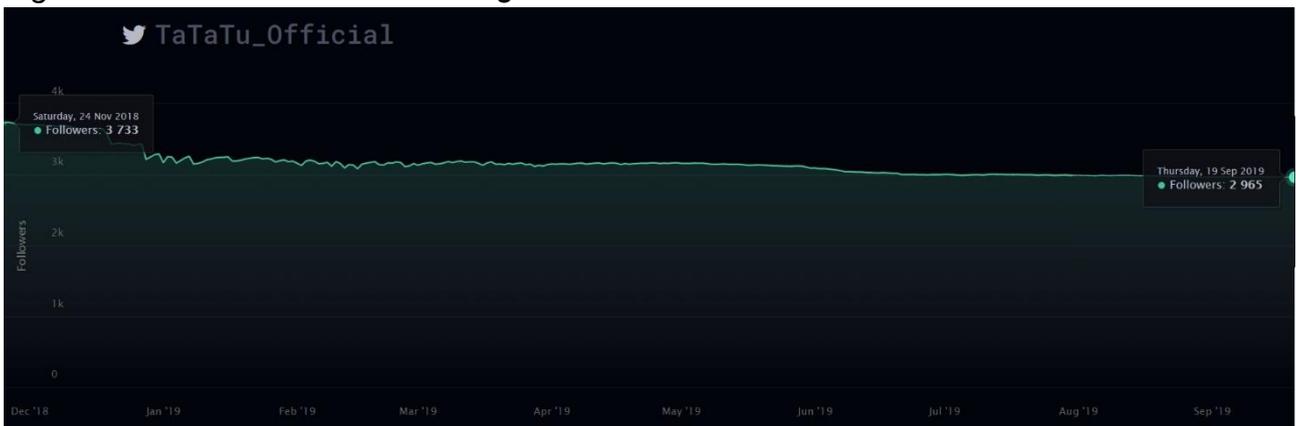
CoinMarketSocial did not capture the users' growth on the various channels from the very beginning when the account were created (i.e. March 2018), but only from December 2018 and this makes much more difficult the evaluation of the users' growth on the different channels, especially on Facebook, which is the most important one for TaTaTu.

Figure 27 – TaTaTu's Facebook user growth



Source: CoinMarketSocial

Figure 28 – TaTaTu's Twitter user growth



Source: CoinMarketSocial

Figure 29 – TaTaTu's Telegram user growth



Source: CoinMarketSocial

Figure 27 depicts the historical path of Facebook users' growth, which is by far the platform in which the management team was more active since the very beginning and, also, the one with the highest number of subscribers, 15K to be precise. From December 2018, its users remained more or less unchanged, even though it is very likely to expect that the account had a sharp users' growth until July 2018 when the management team released the beta version of the TaTaTu platform.

Far more interesting are the paths observable in *Figure 28* and *29*, respectively representing Twitter and Telegram. In both case it can be observed a decreasing trend, but while in the first case it is only slightly decreasing (i.e. shifting from 3.7K to 2.9K), in the second case there is a very steep fall (i.e. from 8.7K to 3.6K). In particular, being Telegram the most direct means of contact between the platform's users and the employees of the platform, a possible explanation for this important drop of the Telegram's users, might reflect a progressive loss of interest of the TaTaTu community on the project after perceiving the management team as either non-professional or unable to continue to properly implement the project and make it grow over time.

Information disclosure analysis

In many previous section, in particular when analysing the ICO structure, it has already been discussed about the information content of the TaTaTu's *Whitepaper*, which was very different with respect to the ones of the other two ICO's analysed (i.e. Iconomi and EOS). The main differences regarded mainly the form factor, in fact, the TaTaTu Whitepaper was much longer (i.e. about 50 pages) and with a much better and more professional visual impact. Specifically, as it has been possible to observe from the many schemes previously reported when presenting the TaTaTu's project and its development, the Whitepaper was surrounded by many graphics and pictures which helped to better understand the overall project and the way it works. Furthermore, while the Iconomi's Whitepaper was mainly descriptive and the EOS's one was more technical, the TaTaTu Whitepaper actually mixed both these two features, together with a marketing oriented visual presentation.

Another way in which the TaTaTu Whitepaper differentiates from the previous ones, is that it contained very important information about the use of proceeds, the road map both in terms of timing and in terms of countries, the founding team and, finally, a good corporate disclaimer indicating the risks and limitation attached to the tokens sale. Many of these aspects, in the previous analysis, were either not present at all, or reported in different

documents and blog's articles and this was a very positive aspect of the TaTaTu's information disclosure.

What, however, is very strange is the complete lack within the Whitepaper of information regarding the ICO structure: period of the ICO, number of token issued, ICO price, soft- and hard-caps and the currencies accepted during the tokens' sale. These information are fundamental and there is no exceptions to not include them on the main ICO document. As it was previously reported when analysing the ICO structure, some of these information have been gathered by information providers websites, like ICO Bench, ICO rating and Etherscan probably meaning that somewhere the management team disclosed those information, either in a section of the website and then removed once communicated that tokens were all sold during the presale, or that they were included in another document, which, however, was not be possible to obtain.

Another difference in the TaTaTu information disclosure policy with the previous ICOs analysed, is that the management team did not used very actively their Medium *blog* in order to provide relevant information to the community. This was a very important downside for anyone who wanted to deeply inform about the TaTaTu project and ICO, because basically no other information, if not the one reported in the Website and in the Whitepaper, were possible to be gathered. This approach can be fine if all the relevant information are included within the Whitepaper, however, it was not the case, in fact, the lack of additional information able to implement the one already included within the Whitepaper, was one of the main problem we faced when analysing this ICO, with respect the other two (i.e. Iconomi and EOS).

Finally, for what concerns the disclosure of the *Source Code*, the TaTaTu team neither disclosed their code, nor opened a GitHub account, similarly to what was done by Iconomi. As a consequence, the final effect of the disclosure of the source code in terms of ICO success remains doubtful. It might very likely be that the relevance of the source code disclosure highly depends on the project behind the ICO and the technical knowledge of people to which the project is oriented. In fact, it could be very important when building a new ecosystem in which developers and companies have to build something on top of that project, such as in the case of the EOS.IO platform, while for project more oriented to the general public, which does not have a sound technical know-how, such as in the case of Iconomi and TaTaTu, the disclosure of the source code might be irrelevant.

Founding team presentation

The TaTaTu Whitepaper, differently from the ones of the previous ICOs analysed, contained a satisfactory explanation of the management team, which was composed by the following 9 members:

- The *founder and CEO* Andrea Iervolino - He was for sure the most important member of the whole team, both for his vision and for his contact with the Film industry. Within the Whitepaper he was described as follows: “*Launching a tech business at the age of 13, Andrea produced a film just two years later and his first films at 15. Today, at the age of 30, he finances and distributes over 500 films... Andrea was nominated Best Producer at the Venice Film Festival, along with James Franco and Al Pacino, and has been named a Producer to Watch by Variety*” (TaTaTu, 2018).
- The *CTO* Jonathan Pullinger - He was the more technical member of the team and was described as “*one of the early pioneers of Bitcoin and Litecoin, he first developed mining rigs in 2012. Over the years, he has been immersed in several Blockchain projects, including writing Ethereum smart contracts for ERC-20 tokens and other solidity-based solutions, Hyperledger, Fabric, Waves Platform and lightning nodes*” (Mari, May 2018).
- The *Head of Platform* Ed McCulloch – He previously was Product Leader and Project Consultant for AKQA, Hype, Starcom MediaVest, Momentum Worldwide, TMW and the BBC. His main clients included Microsoft/Xbox, Sony Mobile, Nissan, Diageo, HSBC, Lloyds of London and Unilever (Mari, May 2018).
- The *Head of PR* Marcello Mari – He was a former head of PR for SingularityNET and a contributor for Wired Italy, The Guardian and Techcrunch (TaTaTu, 2018).
- The *Head of Marketing* James Aufenast – He was “*Former Head of Editorial at TMW, managing Unilever, Sony, Vodafone, Diageo and Nissan (Europe) among many other clients in content, social and customer acquisition programmes*” (Mari, May 2018).
- The *Head of Partnerships* Anthony McGuire – He previously was Global Partner at Facebook and worked in the Logistics at Singularity University (TaTaTu, 2018).
- The *Head of Content* Hans Hagman – He mainly had to deal with increasing the platform contents’ offering and his expertise comes from being “*the former Programme Director for Viasat Film channels and VP Music Programming for MTV Networks International*” (Mari, May 2018).

- The *Head of Financial strategy and Blockchain* Mario Alberto Casiraghi – He formerly worked at Bank of America Merrill Lynch and Cairn Capital among others and is specialised in corporate finance and fundraising. Furthermore he had an established presence in the blockchain ecosystem, by being ICO advisor (TaTaTu, 2018).
- The *Head of Business Development* Daniel Santos – He was the CEO of Token Advisors in Singapore and focussed on developing the token economy and ecosystem in the region. Previously he spent 15 years working in other major companies such as Morgan Stanley, Deutsche Bank, Citigroup in London and Renaissance Capital in Moscow (TaTaTu, 2018).

By analysing the LinkedIn profiles of each of the team members, it was found consistency with what TaTaTu disclosed in the Whitepaper and the general opinion is that once again the composition of such a good team, made of people with relevant experience in their respective field of interest, had a great impact on the success the private ICO rounds.

Interestingly, by deepening the analysis, it has been found that the majority of the team members left TaTaTu starting from July, either for creating their own consultancies companies or to work in other companies related to the entertainment industry. In particular, *Jonathan Pullinger*, the CTO, left in July 2018 founding an information consultancy company; *Marcello Mari*, head of PR, left in July 2018 for a similar position at MovieCoin; *Mario Alberto Casiraghi*, head of the financial strategy and blockchain, left in June 2018. Among other roles, he is now CFO at Xfinite Global, a digital entertainment platform; *Anthony McGuire*, responsible for advertising and partnerships, left in September 2018; *Ed McCulloch*, Head of Platform, left in August 2018 and *James Aufenast*, head of marketing, left in December 2018 creating his own consultancy company.

From the LinkedIn profile of TaTaTu it has been possible to observe that they replaced all the vacant position and the team is still composed by nine people. However the fact that many original team member left is not a good sign and might be partially explained by an overall disagreement in the further development of the project, specifically for what concern the delisting and conversion of the public TTU ERC-20 tokens into TTU TAT01 private tokens. No specific information about all of that was, in any case, provided by TaTaTu, neither on the website, nor in the various social media channels.

Legal framework

TaTaTu decided to set up the same corporate structure of Block.one (the founder of EOS), in fact the company is based on the Cayman Islands as they clearly stated within the Whitepaper: “*Tatatu Token Ltd, an exempted company incorporated with limited liability under the laws of Cayman Islands*” (TaTaTu, 2018). This is the second among the ICOs analysed that carried out the fundraising campaign in the Cayman Island, therefore confirming the results obtained by Momtaz et al. (2019) reported in the first chapter. The reasons for this choice might be multiple, even if very likely a lot depends on the specific cryptocurrency regulation applied in the country and on its peculiar tax regime.

For what concerns *investor restrictions*, similarly to the previous ICO analysed, also TaTaTu limited the investor base to US and Chinese citizen, as they reported in the Whitepaper: “*Any person or entity, including anyone acting on its behalf, being based, being a citizen or resident, domiciled, located or incorporated where applicable laws prohibit or restrict distribution or dissemination of Token Generator’s materials, acquiring Tokens or accessing the Platform including, but not limited to, the United States of America and any of its lands, People’s Republic of China, or any other country that prohibits the sale of Tokens shall not use the Platform or acquire Tokens, otherwise this person assumes all the responsibility arising from the continued use of the Platform and/or Tokens*” (TaTaTu, 2018). They did not explain the reason for this choice, however, certainly this choice reflected an overall fear to fall into the regulatory attention of SEC and the Chinese government.

As it was possible to observe, the same decision of restricting the investor base was made both by TaTaTu and by EOS, differently from Ionomi which, instead, did not set any limitation for its tokens. This difference clearly reflects the different period in which the three ICOs were carried out. In fact, TaTaTu and EOS, were launched in during a hot crypto market from a regulatory standpoint, while Ionomi was launched at the very beginning when there was not any kind of regulatory concern.

Ratings provided

The overall ICO Bench TaTaTu’s rate was 3.3/5, which is overall a good rate, composed by a 3.4/5 (i.e. weighted 55%) resulting from the objective evaluation carried out by the ICO Bench’s algorithm and the remaining 45% resulting from independent experts’ reviews (ICO Bench).

For what concerns the objective evaluation part, the ICO Bench algorithm valued negatively the TaTaTu's social media presence, consistently with what emerged also from our previous analysis. All the other informative areas (team, ICO structure, product presentation) have been valued positively by the algorithm and, in this sense, there is a divergence with our analysis, since we were not able to find many important information regarding the ICO structure, while ICO Bench reports them. As it has already been pointed out, this divergence might be explained by the fact that these information were provided either in other documents, or in the original website and now are no more accessible.

As far as the subjective evaluation part of the ICO Bench rate is concerned, only two experts evaluated TaTaTu, and differently from the previous ICOs analysed, in which the subjective rates were higher than the objective ones, here it is the opposite. In fact the two assessments provided by the experts were quite critical about this ICO, especially for what concerns the choices about cancelling the public ICO phase. The overall assessment provided by these two experts in the three areas under examination were the following: 3.5/5 for the *Team*, 3/5 for the *Vision* and 3/5 for the *Product* (ICO Bench).

Differently from Iconomi and EOS, in this case the overall rating provided to TaTaTu is not fairly representative of the reality, in the sense that the quality of the product and the vision behind this project should have been valued more within the overall rating. However, the overall assessment was highly influenced by the way in which the management team decided to carry out the ICO campaign, by selling all the tokens during private rounds, instead of using them only for "market tasting" useful to be able to carry out a much better public sale thereafter.

Industry and Minimum Viable Product (MVP)

The TaTaTu project pertains to the *entertainment industry*, which is the eighth most popular industry for number of ICOs carried out in the study by Momtaz et al. (2019). The idea behind the TaTaTu was for sure very innovative and it is one of the reason why it has been so successful in terms of funds raised, concluding the ICO during the private presales. However, even if TaTaTu was very visionary and with lot of Hollywood's connections, actually it had to compete in the highly challenging film industry, made of both traditional movie houses and newly emergent online platforms such as Netflix, Prime video and TV+. Furthermore, actors and film directors, when producing movies, mainly care to be on top of the lists for proceeds raised, because it is from there that all the

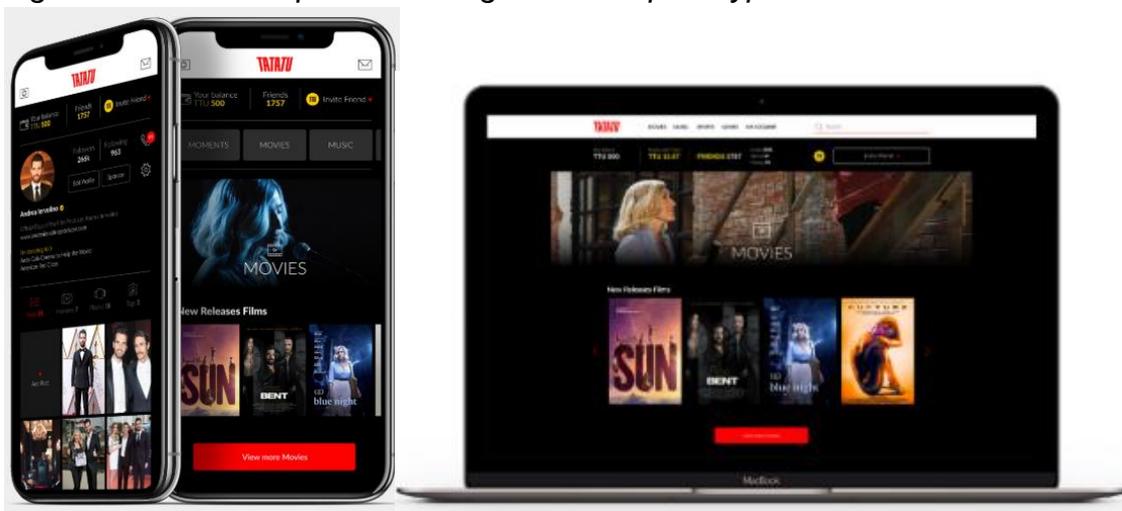
awards like Oscar come from.

Not less important has to be considered the budget that needs to be allocated for creating a wide library of film to be added to the platform. Tech giants like Amazon (Prime Video), Apple (TV+) and Netflix are currently investing billions of dollars for the creation of their On-Demand Platforms, therefore, competing with them will be very challenging for TaTaTu, even considering the successful ICO campaign they carried out. Furthermore, it has to be considered that the blockchain technology is not yet mainstream, therefore, the general public might still be reluctant to enjoy the TaTaTu platform with respect the platforms offered by “traditional companies”.

As far *MVP* is concerned, since the launch of the first Alpha version of the TaTaTu platform in May 2018, the management team delivered a very good user interface with a discrete number of contents which the testers could use for helping with the development of the platform. Over time, the management team progressively introduced new contents, both proprietary and in licencing, in order to expand the overall platform offering and implemented, also, all the functionalities initially disclosed in the Whitepaper.

The below reported *Figure 30*, shows the MVP presentation within the Whitepaper, which clearly depicts the high quality of the work done by the management team, especially in the very early stages. In fact, the fact that an operative TaTaTu platform, as the one reported in *Figure 30*, was available since the very first Alpha version, highlight the professionalism and commitment of the management team in the implementation of the whole project.

Figure 30 – TaTaTu platform design and first prototype

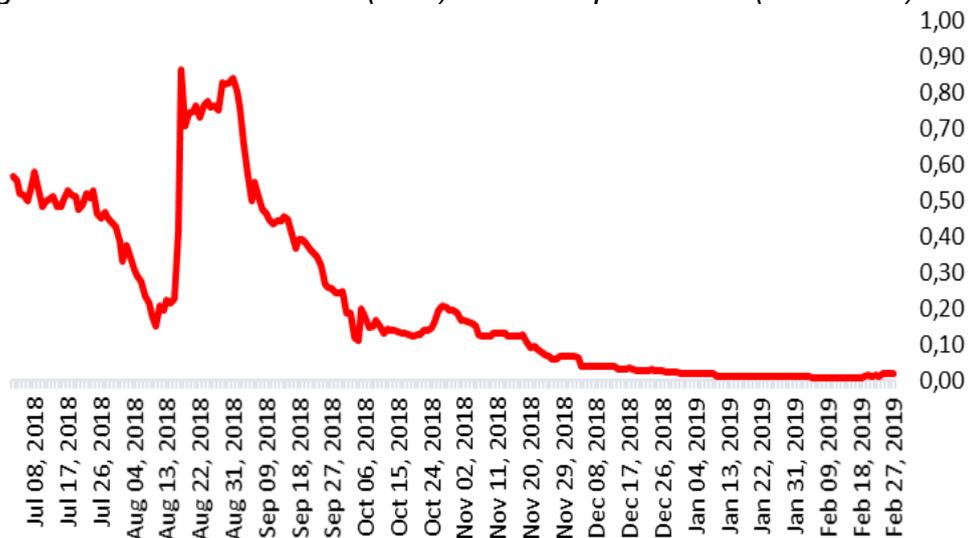


Source: *TaTaTu Whitepaper – 2018*

5.3.5 – Returns analysis

Differently from the previous analysis, in this case being less than one year the timeframe in which the TTU tokens could be traded, the analysis is much harder, because it will be more difficult to distinguish if a certain pattern derives from the overall trend of crypto market, or if it is due to a specific event happened to the venture. The shorter the timeframe, in fact, the lower the possibility of identifying clear trends in the analysis of historical prices/returns.

Figure 31 – TaTaTu tokens (TTU) historical price chart (TTU-USD)



Source: own elaboration using data from CoinMarketCap

Figure 32 – Ethereum tokens (ETH) historical price chart (ETH-USD)



Source: own elaboration using data from CoinMarketCap

Figure 33 – Bitcoin tokens (BTC) historical price chart (BTC-USD)



Source: own elaboration using data from CoinMarketCap

By comparing the historical price charts of TaTaTu, Ethereum and Bitcoin, respectively reported in the above *Figure 31 – 32 – 33*, it is possible to observe in all of the three cases a decreasing overall trend, even though it is more pronounced for TaTaTu (i.e. *Figure 31*) and Ethereum (i.e. *Figure 32*), while it is much less steep in the case of Bitcoin (i.e. *Figure 33*). This overall trend is consistent with what observed both in all the previous ICOs analysed, and in the literature review, which pointed out an overall de-hype of the crypto market starting from the second half of 2018, to the time of writing.

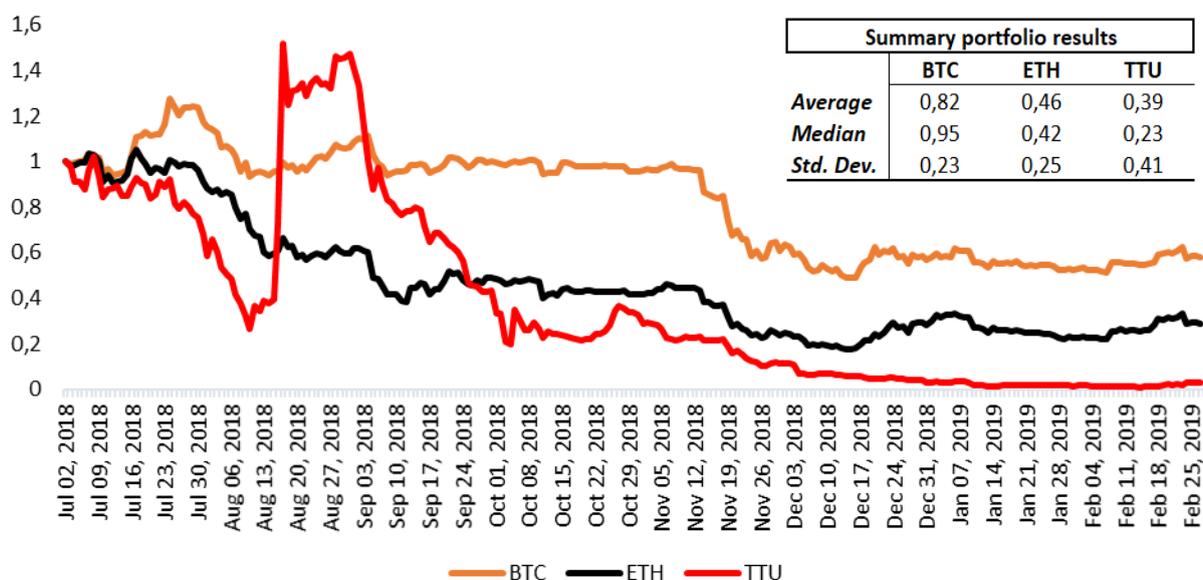
However, in *Figure 31* (i.e. TaTaTu), it is possible to observe a considerable abnormal price movement with respect the overall macro trend. In particular, on the 17th of August 2018, the TTU price shifted from \$0,41 to \$0,86 in a single day (i.e. +109,75%), even though by investigating the corporate announcement on their social media pages, it was not possible to observe any relevant information coming out able to influence the price in that way. The TTU price stayed around the maximum for nearly 15 days and, then, started dropping very quickly until the end of the year in which the tokens were valued basically nothing (i.e. \$0,02).

The reason for such drastic drop in price might be partially explained by the huge giveaway of \$50 million in TTU tokens to the new subscribers, which was mainly aimed at increasing the platform’s users. The management team cleverly set some limitation in order to avoid that all the users benefitting from that free tokens decided to immediately sell the tokens for profit, however it probably was not enough. In particular, they allowed

the users to withdraw the tokens from their account to trade them, only starting from October 2018, and only if the account amounted at least to 200 TTU, therefore, the early users needed to demonstrate to believe in the project by watching the contents already available on the platform and, most importantly, by inviting friends to do the same, since in this way they would have been rewarded also for the content watched by the latter. Consistently to that, the graph in *Figure 31*, shows that starting from October 2018, the TTU price stayed constantly under the ICO price of \$0,25, confirming that even if setting limitation, actually many users decided to sell their tokens, making consequently the price dropping.

Reasoning in numbers, an airdrop of \$50 million in TTU tokens, translate into an overall free distribution of around 200.000.000 tokens (i.e. if each token was valued by the management team \$0,25, as the price they set for the ICO). Given that the circulating supply provided by CoinMarketCap was nearly 96 million tokens, it means that basically the 50% of the users who received these free tokens, decided to sell them on the market. Obviously, this might not be the unique reason, in fact, as it has been possible to observe from *Figure 32 – 33* (i.e. ETH and BTC respectively), also the overall crypto market faced a decreasing trend over the same timeframe, thus the final cause for the TaTaTu price might have been a combination of effects.

Figure 34 – Daily returns of equally weighted investments in TTU, ETH and BTC

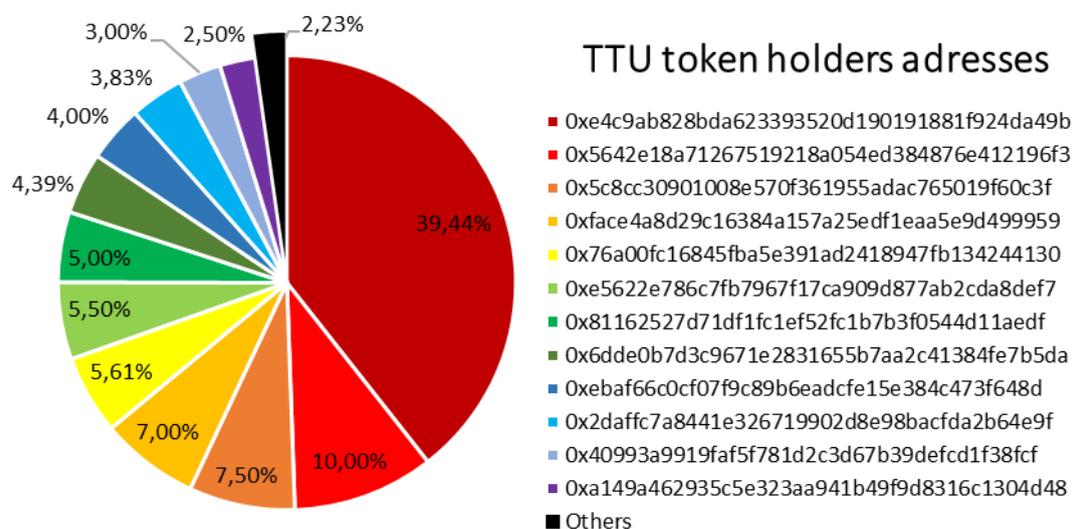


Source: own elaboration using data from CoinMarketCap

Also by analysing *Figure 34*, that represent the returns which could have been obtained by equally investing \$1 in each of the three cryptocurrencies (i.e. TTU, ETH and BTC), during the entire lifetime of the TaTaTu tokens, it is possible to observe an overall correlation between the instruments, a part from the same abnormal peak, already observed in *Figure 31*, that the TTU tokens had in the second half of August 2018.

The comparison of TTU, ETH and BTC in terms of summary results highlight that TTU tokens underperformed the overall market (i.e. ETH and BTC), both in terms of average and median returns, showing at the same time a higher standard deviation, therefore an higher returns' volatility, very likely due to the abnormal peak we were referring before. These results further confirm that the TTU tokens should not have been considered as an investment opportunity for the platform's users, at least until it would have built up the minimum critical mass able to enable the whole business model the management team initially thought.

Figure 35 – Analysis of TTU ownership



Source: own elaboration using data from Etherscan

The last aspect remaining to be analysed are the returns obtained by TaTaTu over the short- and long-term. However, the analysis of the returns, in this case, is much less meaningful with respect to the other two ICOs analysed, because no “common investor” bought the TTU tokens in the primary market, but rather, they were bought by wealthy investors, which very likely had not the aim of investing for making short-term profits. This can be understood also by the analysis of the percentage of token circulation (i.e. before the delisting and the conversion of the tokens), with respect the overall token supply

provided by CoinMarketCap. Specifically, the overall TTU token supply is 10 billion tokens, while the tokens in circulation are nearly 96 million, therefore, only the 0,97%. This result is even more supported by the analysis of the TTU token holders, which highlight that of 2.677 TTU token holder addresses reported by Etherscan, the first 12 own the 97,77% of the overall tokens supply, as it is possible to see from the above reported *Figure 35*.

Going to the actual analysis, of the TaTaTu's returns reported below in *Table 6*, it is possible to observe relatively high *Underpricing* and *First-day return*^o, comparable to the average results obtained by Lee et al. (2018), Dittmar et al. (2019) and Benedetti et al. (2018), reported in Chapter 4. However, all the other subsequent returns (i.e. from *One week-return* to *Eight-months returns*), show a clear sharp decreasing trend consistent with what already observed when analysing the historical TTU prices (i.e. *Figure 31*) in comparison with the overall crypto market (i.e. ETH and BTC).

Table 6 – TaTaTu short- and long-term returns

ICO price*	0,25	Underpricing	138,27%
Short-term returns			
First day return °	127,70%	First day return	-4,44%
		One-week returns	2,13%
Long-term returns			
One-month returns	-34,32%	Three-months returns	-67,04%
Six-months returns		Six-months returns	-96,78%
Eight-months returns^	-96,87%		
* as reported by ICO Bench and ICO rating			
° underpricing including also the whole first day of trading (i.e. up to the first day closing price)			
^ nearly eight-months returns from the 2 nd of July 2018 to the 27 th of February 2019			

Source: own elaboration using data from CoinMarketCap

As it has already been explained in the analysis of the TTU historical prices in *Figure 31*, the explanation for the very low returns faced by TaTaTu during its lifetime is very likely a combination of effects: an overall de-hype of the crypto market and a massive Airdrop program, which ultimately lead more than 50% of those who benefited to sell the tokens for making a profit, the sooner they had the possibility to do that.

In the light of the analysis of the TaTaTu returns, the choice of the management team to

convert the TTU public ERC-20 tokens into TTU private TAT01 tokens and the fact that their value was set to be fixed at \$0,25 was fundamental to keep the whole project survive, otherwise it would have been impossible to buy advertising and merchandising with a value of the TTU token equal to -96,78% with respect the first day of trading. However, it has not to be interpreted as a 0% return over time (i.e. since ICO price = to fixed token value), because the TTU tokens are currently no more tradable and they can be used only to buy merchandising in their e-commerce.

Finally, the last consideration worth to be made about the TaTaTu ICO is that, even if the way in which the project was managed and transformed over time might have lead some people to think of being in front of a scam ICO, actually, the fact that the tokens were not sold to the public, but to private conscious investors and all the tokens in the hand of the general public were gained by the latter for free, after having enjoyed the platform's content, leads to the final conclusion that there is not any potential risk for the platform users.

5.4 Final considerations

The aim of this last section is to discuss all the main findings emerged by the analysis of Iconomi, EOS and TaTaTu, both in terms of similarities/differences shared by the three ICOs, given the fact that they were carried out of different timeframes, and in terms of consistency with the theoretical concepts exposed in the first chapters.

The first and most noticeable similarity between the ICOs analysed, is that during their development all of them faced some sort of *transformation of their underlying blockchain*. In particular, all three the ICOs selected at the beginning were Ethereum based and the tokens issued during the ICOs were ERC-20, but over time all of them, in different ways and for different reasons, transformed their nature:

- *Iconomi*, changed the initial ICN ERC-20 tokens, into what they defined e-ICN tokens, which however have still not been tokenized. Currently, they are simply traditional “Genussschein” securities, issued in Lichtenstein, and the stated intention of the Iconomi's management team is to tokenize these securities and list them, as soon as there is a stable regulatory approach for security tokens. The reality is that, currently, they are non-blockchain-based securities.

- *EOS*, once concluded the one-year long ICO, transformed the EOS ERC-20 tokens into new EOS tokens, based on their new blockchain protocol EOS.IO. Differently from *Iconomi*, however, the management team made this transition smoothly, by freezing the previous tokens and changing them with the new ones. Therefore, the newly created EOS tokens continued to remain listed in all the crypto exchanges in which were listed the previous EOS ERC-20 tokens.
- *TaTaTu*, after that the TTU tokens basically lost all their value, transformed that TTU ERC-20 based tokens, into the TTU TAT01 tokens at the exchange rate 1:1, the latter running on a new blockchain protocol (i.e. TAT01) developed by the *TaTaTu*'s management team. Furthermore, while the TTU ERC-20 tokens were listed, tradable and their value derived from the market, the new TTU TAT01 tokens are private, non-tradable and their value had been set to be fixed by the management team.

Even though a sample of three ICOs is absolutely not representative of the overall ICOs' population, the fact that all these three successful ICOs faced relevant transformations in their blockchain's structure, might still be considered an important signal about what seems to be their development process after the conclusion of the ICO.

Another common denominator in the three ICOs analysed is a completely *imperfect information disclosure* regarding many important aspects of the fundraising campaign the ventures carried out. As it has been highlighted in the first chapter, the main document through which ventures should communicate to potential investors all the characteristics of the ICO's project and its structure, is the *Whitepaper* which, however, in all the three ICOs analysed, did not provide exhaustive information. In fact, during the whole analysis there was a constant need to implement the information contained in the *Whitepaper*, with something else, which could be found either on the corporate blog/social media pages, or on ICOs' information providers websites, such as *ICO Bench*, *ICO rating*, *Etherscan* or *CoinMarketCap*.

As it has already been reported in the different analysis, an explanation for this lack of information might be that part of them, during the ICO, were included on an appropriate section of the corporate website, then deleted once the ICO was concluded. However, this problem should be carefully evaluated and addressed by regulators by imposing ventures to disclose every ICO's information in a unique document, like an "IPO's Prospectus". Furthermore, any subsequent relevant event faced by the venture during the project implementation, rather than being disclosed by the management team through articles

written on the corporate blog, should be disclosed through interim/yearly financial reports similarly to the ones of traditional listed companies.

All these improvements will be able to make the crypto world much more trustable and comparable to the traditional one, thus eliminating all the shadows created by this huge level of information asymmetry.

Relatively the problem of information asymmetry intrinsic of the crypto market, it is worth highlighting that the mitigation role provided by the main information intermediaries such as ICO Bench, ICO rating or ICO drops through the issuance of *ICOs' ratings*, is still not comparable to the one provided by traditional rating agencies, such as Standard & Poor's, Fitch and Moody's.

In particular, in all the three analysis (i.e. Iconomi, EOS and TaTaTu), the choice of reviewing only the rating provided by ICO Bench was due to the fact that it was perceived the better among all the other ICO rating providers, because it interestingly conciliated both an objective evaluation part made by an algorithm, and a subjective evaluation composed by crypto-experts reviews weighted based on their experience and credibility. Even though the construction of the overall rating seemed to be very powerful, actually, by deepening these ratings, especially the ones provided by crypto-experts, the impression was that they were very informal and not professional as the one that would have been provided by traditional rating agencies. As a consequence, these features decreased the whole credibility of the rating analysed, making them less useful in mitigating the information asymmetry problem intrinsic of the crypto market, by providing investors an additional source of information, from a third independent party.

For what concerns the *most important ICOs' elements needed for carrying out a successful fundraising campaign*, the first, a most important, thing worth to be mentioned, is that the real difference is made by the quality of the project underlying the ICO, rather than by specific elements in the ICO structure or process. If the ICO project is really visionary, possibly in an unexplored field, with a well thought MVP and roadmap, then the odds of carrying out a successful ICO campaign are very high.

Once having made this premise, in the light of the empirical examination carried out, it is possible to make some considerations about the many successful elements analysed by the literature and reported in Chapter 3. First of all, it seems that having a very experienced *management team*, possibly with previous crypto experience, is really

important for carrying out a successful ICO campaign, and this is a common denominator in all the three ICOs analysed. For what concern, instead, the *ICO structure*, it has been found positive confirms about both the investors' preference for ICOs issuing a huge number of tokens at a very low price, and for ICOs retaining a portion of the token supply for aligning the interests of the founding team/advisors, with the investors' ones.

No certain answer was found for what concerns *Pre-ICOs* and *Marketing programs*, since in the three ICOs analysed only TaTaTu carried out the presale and for what concerns marketing programs they were used only by Ionomi and TaTaTu (i.e. Ionomi a Bounty program, while TaTaTu an Airdrop), with different outcomes. As it has already been highlighted in the different analysis, more than the simple positive/negative effect of these instruments on the ICOs success, it is far more important the way in which these instruments are implemented by the management team. As an example, a marketing program based on a bounty program, if well implemented, can be much more powerful than a simple airdrop, since it is able to engage only really interested people, while than everyone randomly. The risk with airdrops, in fact, is to provide free tokens to speculators, whom only aim is to sell the tokens received as soon as they have the possibility, in order to generate a profit. This is exactly the difference between the successful bounty program implemented by Ionomi and the unsuccessful airdrop implemented by TaTaTu.

Furthermore, far more important than the efficacy of carrying out a presale, is the way in which the whole token sale is arranged by the management team, since there are different ways for carrying out a successful ICO campaign. An example of that is the difference between the EOS and TaTaTu ICO process: the former carried out the most successful ICO of the history without a pre-ICO, thanks to the construction of a very innovative ICO structure, while the latter, which is still one of the most successful fundraising campaigns of all the time, raised all the funds needed through private investments rounds.

Another aim of this empirical analysis was to understand how the legal framework applied by each ICO selected, changed as the crypto regulatory approach evolved over time, especially starting by the end of 2017, when worldwide governments began to approach ICOs very strictly (especially the SEC and the Chinese government). The main finding was that Ionomi, which was the ICO selected for 2016, as expected, did not restrict its investor base, while both EOS and TaTaTu, carried out respectively in 2017 and 2018, prohibited their tokens to US and Chinese investors. However, it is worth highlighting that also Ionomi's decision to transform its ICN tokens into eICN tokens in 2018, was mainly a

reaction to the increasing regulatory attention about security tokens, considering that the original ICN tokens were by all means similar to traditional securities.

All these choices clearly highlight how crypto companies are afraid of facing the most stringent crypto regulations, which, even if more cumbersome in terms of disclosure and reporting, are potentially able to reduce the information asymmetry intrinsic of the crypto market. Rather, they prefer to escape by prohibiting certain investors to obtain their tokens, but until the behaviour of crypto companies remains the same, the blockchain technology will never become mainstream, because of the main problem of information asymmetry highlighted many times during this work. In this sense, only a strong position by worldwide regulators can address the whole problem, by aligning the crypto market with traditional ones and making it appealing for the general society.

Finally, as far as the analysis of the ICOs' returns is concerned, the most noticeable thing in all the three ICOs analysed was an overall comparable trend with the two main cryptocurrencies Bitcoin and Ethereum. Abnormal peaks not explained by the overall crypto market were clearly explained by specific facts happened to the different ventures, during their development. However, when comparing the performance of equally weighted investments in ICOs' tokens (i.e. ICN, EOS or TTU), Ethereum and Bitcoin, the result was that newly created venture faced, on average, higher returns with respect to the two main cryptocurrencies, even though they showed, also, higher levels of volatility. This aspect should be carefully evaluated by people interested to invest in the ICO market mainly attracted by the explosive performance of newly created ventures, because together with a high performance, they are associated also with a high risk levels, being these tokens more volatile than consolidated instruments, even within the same crypto market.

Conclusions

The aim of this work was to deeply analyse the emerging phenomenon of the Initial Coin Offerings, which became very popular in the last years, attracting lot of attention both by potential interested investors and by regulators worldwide.

In the *first chapter* it has been investigated more theoretically the broader framework which allows ICO to take place (i.e. the blockchain technology), the evolution of the ICO phenomenon over the years, the main advantages and disadvantages intrinsic of the ICOs and a comparison with the main alternative source of funding: Crowdfunding, IPOs and Venture Capital investments. Furthermore, in the *following chapter* it has been analysed the ICO process, the different types of tokens that could be issued and the worldwide ICOs' regulatory scenario. *Chapter 3* and *Chapter 4*, instead, overviewed the literature's studies, in order to understand the main determinants respectively of the fundraising campaign success and of the ICOs' short- and long-term returns. This theoretical chapters were fundamental for gathering an overall understanding of the ICO phenomenon, which is extremely new, innovative and in continuous evolution.

The *last chapter*, instead, focussed on the empirical examination of three different ICOs (i.e. Iconomi, EOS and TaTaTu), carried out over different timeframes, respectively 2016, 2017, 2018, in order to test and verify the theoretical knowledge gathered in the previous chapters. In particular, for each ICO it has been analysed the business idea explained within the Whitepaper, the way in which the project was development after the conclusion of the ICO and the features of tokens issued, with particular attention to the functions attached. The central part of the analysis concentrated in the actual ICO campaign, by analysing many different aspects: the ICO structure, the marketing activities, the information disclosure, the founding team, the ratings provided, the legal framework adopted and the presence of any Minimum Viable Products at the time the ICO was carried out. Finally, it has been provided both an analysis of the historical tokens' prices in comparison with the two main cryptocurrencies Bitcoin and Ethereum, and an analysis of the ICOs' returns both short- and long-term.

The last chapter resulted to be very important for gathering a different level of understanding about the ICO phenomenon, because differently from the theoretical notions and the results coming out from literature's studies, it allowed to concretely touch many different ICOs' aspects.

In the end, what emerged through this work is that the potential of the blockchain technology is huge, with Initial Coin Offerings being the most outstanding implementation from a Corporate Finance standpoint, allowing companies to build up interesting new corporate structures, while at the same time providing consumers new ways for accessing the corporate product/services. However, in order to see this technology applied at a mainstream level, both in terms of industries and people participating to the fundraising campaigns, there is still lot of work to do. In particular, there is the need of a clear regulatory scenario, which forces companies to behave consistently to how they should behave if they were operating in the traditional economy. In this way, the general public will be much more willing to enter the crypto market, because perceived as a real alternative to traditional ones, rather than as a potential scam.

Bibliography

S. Adhami, G. Giudici, S. Materazzi (2018). Why do businesses go crypto? An empirical analysis of initial coin offerings. *Journal of Economics and Business*, Vol. 100, p. 64-75.

R. Amsden, D. Schweizer (2018). Are Blockchain Crowdsales the New “Gold Rush”? Success Determinants of Initial coin Offerings. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3163849>.

J. An, W. Hou, X. Liu (2017). Initial Coin Offerings: Investor Protection and Disclosure. Presented at FMA San Diego 2018. University of Edinburgh Business School.

Y. Bakos, H. Halaburda (2018). The Role of Cryptographic Tokens and ICOs in Fostering Platform Adoption. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3207777>.

H. Benedetti, L. Kostovetsky (2018). Digital Tulips? Returns to Investors in Initial Coin Offerings. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3182169>.

B. Beers (2018). Over-the-counter Derivative. Investopedia [online]. Available at: <https://www.investopedia.com>.

Binance Academy (12th Sep. 2019). Delegated Proof of Stake Explained. Available at: <https://www.binance.vision>.

N. Bond (26th Apr. 2019). The current state of the IEO market. ICO Bench. Available at: <https://icobench.com/thebench>, p.11.

D. Boreiko, N.Sahdev (2018). To ICO or not to ICO – Empirical analysis of Initial Coin Offerings and Token Sales. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3209180>.

T. Bourveau, E.T. De George, A. Ellahie, D. Macciocchi (2018). Initial Coin Offerings: Early evidence on the role of disclosure in the unregulated crypto market. Presented at Conference on Emerging Technologies in Accounting and Financial Economics (CETAFE) 2019. University of Southern California Marshall School of Business.

C. Catalini, J. S. Gans (2018). Initial Coin Offerings and the Value of Crypto Tokens. MIT Sloan School of Management, Working Paper 5347-18.

C. Chiang (3rd Dec. 2018). The growing popularity and worth of the initial exchange offering. ICO Bench. Available at: <https://icobench.com/thebench>, p.19.

U.W. Chohan (2017). Initial Coin Offerings (ICOs): Risks, Regulation, and Accountability. University of New South Wales, School of Business and Economics. Discussion Paper Series: Notes on the 21th Century. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3080098>.

Coindesk (2018a). Coindesk ICO tracker. Available at: <https://www.coindesk.com/ico-tracker>.

Coindesk (2018b). Blockchain Venture Capital. Available at: <https://www.coindesk.com/bitcoin-venture-capital>.

S. Cohny, D. A. Hoffman, J. Sklaroff, D. Wishnick (2019). Coin-Operated Capitalism. Columbia Law Review, Vol. 119, p. 591; U of Penn, Inst for Law & Econ Research Paper No. 18-37.

L. Cong, Y. Li and N. Wang (2019). Tokenomics: Dynamic Adoption and Valuation. Becker Friedman Institute for Research in Economics Working Paper No. 2018-49; Fisher College of Business Working Paper No. 2018-03-015; Charles A. Dice Center Working Paper No. 2018-15; Columbia Business School Research Paper No. 18-62.

J. P. Conley (2017). Blockchain and the Economies of Crypto-tokens and Initial Coin Offerings. Vanderbilt University Department of Economics, Working Paper 17-00008.

R. F. Dittmar, D. Wu (2019). Initial Coin Offerings Hyped and Dehyped: An Empirical Examination. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3259182>.

Ernst & Young (2017). Initial Coin Offerings. EY research: initial coin offerings. Available at: <https://www.ey.com>.

Ernst & Young (2018a). Initial Coin Offerings – The Class of 2017 one year later. EY research: initial coin offerings. Available at: <https://www.ey.com>.

Ernst & Young (2018b). Big vs agile? Global IPO trends: Q4 2018. EY quarterly Global IPO trends reports. Available at: https://www.ey.com/en_gl/ipo.

Financial Conduct Authority (last update Feb. 2019). Initial Coin Offerings. Technical document. Available at: <https://www.fca.org.uk>.

C. Fisch (2018). Initial coin offerings (ICOs) to finance new ventures. *Journal of Business Venturing*. Vol. 34, No. 1, p.1-22.

D. Florysiak, A. Schandlbauer (2019). The Information Content of ICO White Papers. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3265007>.

P. Hacker, C. Thomale (2017). Crypto-Security regulation: ICOs, Token sales and Cryptocurrencies under EU Financial Law. *15 European Company and Financial Law Review* 645-696 (2018).

S. T. Howell, M. Niessner, D. Yermack (Jul. 2018). Initial Coin Offerings: Financing Growth with Cryptocurrency Token Sale. European Corporate Governance Institute (ECGI) - Finance Working Paper No. 564/2018.

W. Huang, M. Meoli, S. Vismara (2019). The geography in Initial Coin Offerings. *Small Business Economics* <https://doi.org/10.1007/s11187-019-00135-y> (Online first).

W. Kaal, M. Dell'Erba (2017). Initial Coin Offerings: Emerging practices, risk factors and red flags. Forthcoming, *Fintech Handbook*, Florian Möslin & Sebastian Omlor eds., Verlag C.H. Beck (2018); U of St. Thomas (Minnesota) Legal Studies Research Paper No. 17-18.

W. Kaal, (2018). Initial Coin offerings: The top 25 jurisdictions and their comparative regulatory responses. *CodeX Stanford Journal of Blockchain Law & Policy* (2018); U of St. Thomas (Minnesota) Legal Studies Research Paper No. 18-07.

KPMG (2016). Venture Pulse Q4 2018, Global analysis of venture funding. KPMG quarterly VC reports. Available at: <https://home.kpmg/xx/en/home.html>.

KPMG (2018). Venture Pulse Q4 2018, Global analysis of venture funding. KPMG quarterly VC reports. Available at: <https://home.kpmg/xx/en/home.html>.

J. Lee, T. Li, D. Shin (Jul. 2018). The Wisdom of Crowds and Information Cascades in Fintech: Evidence from Initial Coin Offerings. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3195877>.

J. Li, W. Mann (2018). Initial Coin Offerings and Platform Building. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3088726>.

J. Metke (2017). Marketing behind ICO part I. Marketing Science & Inspirations, vol. 12 Issue 4, p51-56.

D. Mitra (2012). The role of crowdfunding in entrepreneurial fiancé. Delhi Business Review, vol.13, Issue 2, p. 67-72.

P. P. Momtaz (2018a). Initial Coin Offerings. HFRC Working Paper Series N° 31.

P.P. Momtaz (2018b). Initial Coin Offerings, Asymmetric Information, and Loyal CEOs. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3167061>.

P.P. Momtaz (2018c). The Pricing and Performance of Cryptocurrency. The European Journal of Finance, Forthcoming. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3169682>.

P.P. Momtaz, K. Rennertseder, H. Schröder (2019). Token Offerings: A Revolution in Corporate Finance? Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3346964>.

Monetary Authority of Singapore (Apr. 2019). A guide to digital token offerings. Technical document. Available at: <https://www.mas.gov.sg/>.

OECD (2019). Initial Coin Offerings (ICOs) for SME Financing. Technical document. Available at: <http://www.oecd.org/finance/>.

M. Ofir, I. Sadeh (2019). ICO vs IPO: Empirical Findings, Information Asymmetry and the Appropriate Regulatory Framework. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3338067>.

L. Rhue (2018). Trust is All You Need: An Empirical Exploration of Initial Coin Offerings (ICOs) and ICO Reputation Scores. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3179723>.

State Duma of the Federal Assembly of the Russian Federation (Mag. 2018). A draft law on digital financial assets was passed in the first reading. Available at: <http://duma.gov.ru/en/>.

M. Swan (2015). Blockchain, Blueprint for a New Economy. O'Reilly.

Swiss financial Market supervisory Authority (Apr. 2017). FINMA Guidance 04/2017. Technical document. Available at: <https://www.finma.ch/en>.

Swiss financial Market supervisory Authority (Feb. 2018). Guidelines for enquiries regarding the regulatory framework for initial coin offerings (ICOs). Technical document. Available at: <https://www.finma.ch/en>.

The People's Bank of China (Set. 2017). ICOs' ban communication. Available at: <http://www.pbc.gov.cn>.

U.S. Security and Exchange Commission (1946). SEC v. W. J. Howey Co., 328 U.S. 293. Available at: <https://www.loc.gov>.

U.S. Security and Exchange Commission (Dec. 2017). Release No. 10445 / December 11, 2017 – Munchee Inc. Available at: <https://www.sec.gov/litigation/admin.shtml>.

U.S. Security and Exchange Commission (Jul. 2017). Release No. 81207 / July 25, 2017 - Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO. Available at: <https://www.sec.gov/litigation/investreports.shtml>.

U.S. Security and Exchange Commission (Last update, Apr. 2019). Spotlight on Initial Coin Offerings. Available at: <https://www.sec.gov/ICO>.

K. Wu, S. Wheatley, D. Sornette (2018). Classification of cryptocurrency coins and tokens by the dynamics of their market capitalisations. Royal Society Open Science (online first) <https://doi.org/10.1098/rsos.180381>.

D. A. Zetsche, R.P. Buckley, D. W. Arner, L. Föhr (2017). The ICO Gold Rush: It's a scam, it's a bubble, it's a super challenge for regulators. University of Luxembourg Law Working Paper No. 11/2017; UNSW Law Research Paper No. 17-83; University of Hong Kong Faculty of Law Research Paper No. 2017/035; European Banking Institute Working Paper Series 18/2018; Harvard International Law Journal, Vol. 63, No. 2., 2019.

Iconomi

<https://www.iconomi.com/>

<https://www.cashila.com/>

<https://icobench.com/ico/iconomi>

<https://coinmarketcap.com/currencies/iconomi/>

<https://coinmarketsocial.com/assets/iconomi>

<https://twitter.com/iconominet>

<https://www.facebook.com/iconomicom/>

<https://medium.com/iconominet>

Iconomi (10th Oct. 2018). eICN Frequently Asked Questions, Part I. Medium [online]. Available at: <https://medium.com/iconominet>.

Iconomi (12th Oct. 2018). Restructuring Pinta and BLX. Medium [online]. Available at: <https://medium.com/iconominet>.

Iconomi (30th Oct. 2018). eICN Frequently Asked Questions, Part II. Medium [online]. Available at: <https://medium.com/iconominet>.

Iconomi (7th Dec. 2018). eICN Frequently Asked Questions, Part III. Medium [online]. Available at: <https://medium.com/iconominet>.

Iconomi (24th Jun. 2019). Prospectus for the offering of ICONOMI AG Securities. Available at: <https://www.iconomi.com/investors>.

G. Kobal (6th Mar. 218). New Supported Countries for Tier 2 Verification. Medium [online]. Available at: <https://medium.com/iconominet>.

J. Mele (24th Sep. 2016). ICONOMI.INDEX – the first cryptocurrency index investment fund. Medium [online]. Available at: <https://medium.com/iconominet>.

T. Tolj (7th Dec. 2017). New Digital Assets on the Block: Ten New Digital Assets for DAA to choose from. Medium [online]. Available at: <https://medium.com/iconominet>.

T. Tolj (14th Dec. 2017). New Digital Assets on the Block: Five New Digital Assets for DAA to choose from. Medium [online]. Available at: <https://medium.com/iconominet>.

T. Tolj (4th Jan. 2018). New Digital Assets on the Block: Starting 2018 with Five New Digital Assets. Medium [online]. Available at: <https://medium.com/iconominet>.

T. Tolj (9th Jan. 2018). More supported countries & Higher Tier 1 limits. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (31st Jan. 2018). ICONOMI financial report – Q4 2017. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (14th Mar. 2018). Introducing Fees Payable in ICN. Medium [online]. Available at <https://medium.com/iconominet>.

M. Tomazin (26th Apr. 2018). ICONOMI financial report – Q1 2018. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (30th Jul. 2018). ICONOMI financial report – Q2 2018. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (27th Sep. 2018). The technical and Legal Side of ICONOMI's Transformation. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (30th Oct. 2018). ICONOMI financial report – Q3 2018. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (31st Jan. 2019). ICONOMI financial report – Q4 2018. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (26th Apr. 2019). ICONOMI financial report – Q1 2019. Medium [online]. Available at: <https://medium.com/iconominet>.

M. Tomazin (30th Jul. 2019). ICONOMI financial report – Q2 2019. Medium [online]. Available at: <https://medium.com/iconominet>.

E. K. Ursic (1st Mar. 2017). ICONOMI platform development completes major milestone. Medium [online]. Available at: <https://medium.com/iconominet>.

E. K. Ursic (25th May. 2017). Introducing the ICONOMI iOS app. Medium [online]. Available at: <https://medium.com/iconominet>.

E. K. Ursic (28th Jul. 2017). ICONOMI financial report – Q2 2017. Medium [online]. Available at: <https://medium.com/iconominet>.

E. K. Ursic (17th Oct. 2017). Introducing the ICONOMI Android app. Medium [online]. Available at: <https://medium.com/iconominet>.

E. K. Ursic (30th Oct. 2017). ICONOMI financial report – Q3 2017. Medium [online]. Available at: <https://medium.com/iconominet>.

J. Valjavec (18th Aug. 2016). ICO bounties. Medium [online]. Available at: <https://medium.com/iconominet>.

J. Valjavec (10th Oct. 2016). ICONOMI ICO bounty distribution. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar, J. Valjavec, Z. Batagelj, E. U. Kovac, A. Lekse (July 2016). ICONOMI, Open Fund Management Platform to disrupt the investment industry. Whitepaperdatabase [online]. Available at: <https://whitepaperdatabase.com>.

T. M. Zagar (10th Aug. 2016). Introducing New Financial Instruments for a Decentralised Economy. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (25th Aug. 2016). ICONOMI ICO IS NOW OPEN. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (31st Aug. 2016). ICONOMI ICO minimum initial capital reached – in just 6 days! Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (2nd Sep. 2016). ICONOMI: more ambitious goals and a 21.000 BTC cap after a successful ICO start. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (13th Nov. 2016). ICONOMI.performance funds is launched with the first investment. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (19th Dec. 2016). ICONOMI.index fund and Open Fund Management Platform outline will be realised on 28 December. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (28th Mar. 2017). ICONOMI introduces Repayment Program. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (28th Apr. 2017). ICONOMI financial report – Q1 2017. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (1st Aug. 2017). ICONOMI platform is now open for registration. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (11th Aug. 2017). Introducing Columbus Capital ICONOMI's First Asset Management Partner. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (21th Dec. 2017). Announcing New Executive Team Members. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (20th Apr. 2018). Digital Assets Verified by Deloitte. Medium [online]. Available at: <https://medium.com/iconominet>.

T. M. Zagar (27th Sep. 2018). A New Chapter for ICONOMI: Transformation of Corporate Governance and Issuance of Equity Tokens. Medium [online]. Available at: <https://medium.com/iconominet>.

EOS

<https://eos.io/>

<https://block.one/>

<https://vc.eos.io/>

<https://icobench.com/ico/eos>

<https://coinmarketcap.com/it/currencies/eos/>

<https://coinmarketsocial.com/assets/eos>

<https://www.facebook.com/blockoneofficial>

https://twitter.com/block_one

<https://medium.com/eosio>

<https://steemit.com/@eosio>

Block.one (1st Jun. 2019). Block.one Introduces “Voice” to Bring Alignment and Transparency to Social Media. [online]. Available at: <https://block.one/>.

Block.one (9th Jun. 2017). Draft EOS token sale Smart Contract. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (22th Jun. 2017). Logically consistent principles for token distribution. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (27th Jun. 2017). EOS.IO software roadmap. GitHub [online]. Available at: <https://github.com/EOSIO>.

Block.one (3rd Sep. 2017). The Dawn of EOS.IO. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (4th Sep. 2017). EOS Token Purchase Agreement. [online]. Available at: <https://github.com/EOSIO>.

Block.one (15th Sep. 2017). Dawn 1.0 release. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (4th Dec. 2017). EOS.IO Dawn 2.0 released & development update. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (26th Jan. 2018). Dawn 3.0 alpha announcement. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (13th Feb. 2018). The EOS.IO blog has moved. Steemit [online]. Available at: <https://steemit.com/@eosio>.

Block.one (16th Mar. 2018). EOS.IO Technical White Paper v2. GitHub [online]. Available at: <https://github.com/EOSIO>.

Block.one (28th May 2018). Important Notice for EOS Token Holders on Ethereum Address Registration. Medium [online]. Available at: <https://medium.com/eosio>.

Block.one (31st May 2018). Calling all Devs: The EOSIO Bug Bounty Program is Live. Medium [online]. Available at: <https://medium.com/eosio>.

Block.one (2nd Jun. 2018). EOSIO 1.0 release. Medium [online]. Available at: <https://medium.com/eosio>.

Block.one (3rd Apr. 2019). Introducing EOSIO Labs™: a place for open innovation. Medium [online]. Available at: <https://medium.com/eosio>.

Block.one (8th Jul. 2019). Introducing the EOSIO Webinar series. Medium [online]. Available at: <https://medium.com/eosio>.

TM Lee (29th May 2018). Step-by-Step Guide: EOS Mainnet Token Swap with MyCrypto. CoinGeko [online]. Available at: <https://www.coingecko.com>.

TaTaTu

<https://tatatutoken.io/>

<https://www.tatatu.com/>

<https://icobench.com/ico/tatatu>

<https://coinmarketcap.com/currencies/tatatu/>

<https://coinmarketsocial.com/assets/tatatu>

https://twitter.com/TaTaTu_Official

<https://www.facebook.com/TatatuOfficial/>

<https://medium.com/tatatu>

B. Dale (Jun. 2018). This \$575 Million ICO With Royal Backing Is So Crazy, It Might Be Real. Coindesk [online]. Available at: <https://www.coindesk.com>.

A. Iervolino (12th June 2018). Thank you! Medium [online]. Available at: <https://medium.com/tatatu>.

M. Mari (May. 2018). Introducing our World Class Team. Medium [online]. Available at: <https://medium.com/tatatu>.

TaTaTu (2018). TaTaTu Whitepaper – The first social entertainment platform to reward its users for sharing and watching movies, music videos, sports content & more. Whitepaperdatabase [online]. Available at: <https://whitepaperdatabase.com>.

TaTaTu (2019). TaTaTu International Tatatu Memorandum of Understanding. Available at: <https://tatatutoken.io/terms-of-service>.

Wisteria (Aug. 2018). The Biggest Crypto Giveaway: \$50 Million for Users Who Join. Medium [online]. Available at: <https://medium.com/tatatu>.