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INITIAL COIN OFFERING:
Effective instrument for companies or speculation?

Description of the phenomenon and comparison with traditional fundraising

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Abstract

The advent of Blockchain technology has led in recent years to the birth of a new form of capital raising, the Initial Coin Offering (ICO), through which startups finance themselves through the issuance of digital tokens. As of 2017, this phenomenon has exploded, both in the number of ICOs conducted and in the amount of capital raised, thus attracting the attention of many.

In this paper will be described and analysed the main aspects related to ICO, starting first of all with the technologies underlying the phenomenon, Blockchain and Distributed Ledger Technology. In this phase, a focus will be made on the cryptocurrencies and their uncertain future. Then, it will be explained its characteristics, functioning and phases, and the comparison with traditional fundraising methods: Initial Public Offering (IPO), *Crowdfunding*, Venture Capital and Business Angels. In the final part of the paper it will be analyzed the ICO market: its evolution over time, the main features in terms of concentration and an analysis of the performance.

The results of the empirical analysis carried out on a sample of 365 ended ICOs from 2014 to 2018, will reveal how the performance of this new method of raising capital are not encouraging at all, with a largely negative average return (-45%) and with 86% of the cases in which the current price of the tokens is below their listing price.

The paper will conclude by discussing the implications of the empirical results obtained, above all with respect to regulatory aspects, which still lack of a global harmonization and that will be a key point for the future of this new financing method.

Keywords

Initial Coin Offering (ICO), Blockchain, Cryptocurrency, Fundraising

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1. Behind Initial Coin Offering: Cryptocurrencies and Blockchain technology

Before going into the phenomenon of the Initial Coin Offering and understanding how it works, it is necessary to know what is the underlying technology and its applications.

1.1 Introduction to Blockchain

The two pillars on which the functioning of the cryptocurrency system and its countless applications, including Initial Coin Offerings, are based are the Blockchain and the Distributed Ledger Technology (DLT).

A distributed ledger is a network that records ownership through a shared registry. Unlike a centralised ledger, where a *clearing house* aggregates and validates information, in a distributed ledger all information are shared between all the users involved. This infrastructure is much faster than the traditional one but it is generally associated with problems of trust and security between participants, who prefer to interact through the *clearing house*.

The Blockchain technology solves this problem and for this reason it is generally applied together with DLT, resulting complementary. It is a type of database, by its nature built to be shared: "it is a decentralized digital network that enables the exchange of value or the ability to confidently share data, including financial assets and contracts, in a secure environment" (Accenture, 2017). The first Blockchain, as we know it today, was born in 2008 with the publication of the whitepaper "*Bitcoin: A Peer-to-Peer Electronic Cash System*" that allowed the creation of the famous Bitcoin cryptocurrency.

By design, Blockchain builds trust into every transaction and shared data source: all information is built in blocks and its integrity is preserved by a chain. Every time you are inserting information, you are inserting a new block, but you won't be able to do it if you don't know the combination of past information, i.e. the chain (security comes from here, you need to have access to all past information). Bigger is the chain, more difficult is to manipulate information.

The blockchain is distributed and accessible to all participants, who can control it and view it themselves without the need for a central authority. This technology brings along multiple benefits including a high level of security, faster transactions, transparency, eliminating the need for a higher authority, empowering the users and reducing operating costs.

Blockchain systems however, are not light, they use a lot of resources and are quite complex. In fact, in order for a new block to be "hooked" to the previous one, the participating nodes of the network must perform a series of activities. The people who perform these activities are called *miners*, and the activity they perform is referred to as *mining*. It consists of validating, checking and encrypting each block, through the resolution of a complex series of cryptographic puzzles, so that it can then be inserted into the blockchain. It requires considerable effort, as well as significant calculation capacity and electrical power. However, to make the mechanism work, the *miners* need to be rewarded for this effort and generally, they are rewarded with the commissions applied for each transaction approved and with cryptos.

In summary, the main properties of the Blockchain and, more generally, of DLT:

- **Secure and Reliable**: all records are individually encrypted and all network participants agree to the validity of each of the records;
- **Immutable**: transactions, or more generally information, which they form the blockchain cannot be altered, eliminated and therefore revoked in any way;
- **Transparent**: all transactions are recorded in the blockchain and all network participants have full copy of the ledger;
- **Anonymous**: the identity of participants is either pseudonymous or anonymous.

1.2 Cryptocurrencies

Although there are other areas of application that are not strictly connected to tools that allow the transfer of value, cryptocurrencies express in the best way the innovative capabilities that Blockchain technology has to offer. A cryptocurrency is a recent form of value transmission,

whose popularity has grown to a greater extent in recent years. It is a decentralized and digital currency, not issued by any central authority and based on the principles of cryptography for the validation of transactions and for the generation of the coin itself.

The entire crypto system is based on the Blockchain infrastructure: every transaction is visible on the public ledger and once the transaction is confirmed it cannot be changed. Only *miners* can confirm transactions, stamp them as legitimate and spread them across the network, making these transactions anonymous, fast, secure and not subject to any central authority.

Currently the number of cryptocurrencies is extremely high and exceeds 1000 types, but it is a growing number. The first crypto to be issued and certainly the most known, is Bitcoin (BTC), born in 2008. This is flanked by other cryptos, generically called *altcoin* (Alternative Coin) and to date the most traded include: Ether (ETH), NEO (NEO), Litecoin (LTC), Ripple (XRP) and Dash (DASH). Currently the cryptocurrency market is very dynamic, with a high volatility and rapidly growing, which makes it attractive for both investors and speculators. Crypto exchanges such as Coinbase, Poloniex, Shapeshift or Binance allow the trading of hundreds of crypto and their daily trading volumes exceed those of some European stock exchanges.

Altcoins have proved to be an innovative and efficient method to enable companies to raise capital for project financing. A large number of companies, mainly startups, are using cryptos as a means of raising capital through the issuance of tokens, avoiding high costs associated with traditional fundraising methods. The action through which a company issues tokens to collect money is called Initial Coin Offering (ICO), which will be analysed in the next chapter and will represent the main theme of this paper.

1.3 Value or bubble? Controversies and possible future of cryptos

Before closing this first introductory chapter on the main technologies underlying ICO, it is necessary to illustrate the controversies surrounding cryptocurrencies.

First, cryptos are not coins, therefore they do not have a legal course but are a digital representation of value not issued by a central bank or other credit institutions.

Legal tender currencies are usually recognized as unit of account, store of value and means of exchange. Can a cryptocurrency perform the same functions? The high volatility of them certainly does not allow for the proper function of "unit of account": it is highly inefficient, not to say impossible, to price goods and services in crypto units. As regards the value reserve function, it must be considered that the more they are used for the payment of goods and services, the more they will increase in value. This is because the number of cryptocurrency units that can be produced, for most of the crypto types, is limited. They could, however, gradually carry out an exchange function in the near future.

The idea that most of cryptos are pure speculation and that we are faced with a bubble is widespread and the most commonly analyzed example is that of Bitcoin.

Around it, there has been a true viral effect that can be attributed mainly to 4 reasons:

1. **Anti-system / Anti-banking roots:** the origin of Bitcoin took place in 2008, in the midst of the global economic crisis. One of the main intentions was to create a parallel system that cannot be traced back to traditional regulators and could escape from capital control: an independent, decentralized, traceable currency that was outside the circle of traditional financial intermediaries, considered among the architects of the crisis. These basic principles attracted the interest of many.
2. **Prohibition reverse effect:** regulators have begun to address the challenges that cryptos have introduced with a variety of different approaches. The attitude of regulators was generally quite negative, especially considering that it is a difficult area to discipline, falling within the competence of different public subjects at national level and operating, at the same time, on a global scale. However, the authorities' lack of openness towards cryptos has increased the curiosity of many towards this world, fuelling its viral effect.
3. **Easy money idea:** when the Bitcoin was born, the use of normal home computers was sufficient to validate transactions and obtain the reward; over the years, however, the enormous expansion of Bitcoin has led many people to venture into the world of virtual

currencies and today *miners* must have special high-performance processors, cooling systems and huge amounts of electricity. It is therefore much more difficult to get Bitcoins as a reward for the *mining* activity.

4. **Finite quantity:** by its nature, Bitcoin has a finite quantity (21mln). This helped to create a "mania" around this asset and to explain its exponential success.

The price of Bitcoin and other cryptos, which at the first exchange on the markets had a value of approximately zero, in the following years recorded an exponential increase, mainly due to an excess of demand, which in turn contributed to feeding a speculative bubble. Currently cryptos are an emerging market and its size is still relatively small compared to the stock market, that of fiat currencies or commodities. This makes cryptocurrencies value highly volatile, subject to sudden and consistent changes following small events and speculative activities. A fundamental role is played by the announcements of the states regarding the choices they intend to implement towards the system (regulation, taxation, etc.).

Another point of debate and that could play an unfavourable role in the future of cryptos is their degree of acceptance and their negative perception: the relatively anonymous nature of digital currencies has made them very attractive to criminals, who could use them for money laundering, frauds and other illegal activities. The absence of a precise legal framework makes it impossible to implement effective legal protection of the users, which can therefore be exposed to having to incur huge economic losses, for example in the event of fraudulent conduct, bankruptcy or cessation of activity of the online exchange platforms where personal digital wallets (the so-called *e-wallets*) are kept.

In this context, the exchange platforms are also exposed to high operational and security risks: unlike authorized intermediaries, they are not required to guarantee the quality of the service, nor must they comply with capital requirements or internal control and risk management procedures, resulting in a high probability of fraud and exposure to cybercrime.

At this point it is logical to ask what the future of cryptos is. Also in this area, a strong debate is underway and there are several predictions about their fate. Some are extremely positive and believe that in the near future cryptocurrencies will dominate the global economic and financial landscape, thanks to the advantages of the Blockchain technology.

According to the most expert observers, however, while recognizing the advantages of the technology, the future of cryptos is not so rosy and is still completely uncertain. As mentioned above, the idea that this phenomenon is only a big bubble and that it derives from a strong speculation causes scepticism and opposition by governments, banks and monetary authorities. For many, the vast majority of *altcoins* will disappear and their price will drop to zero, leaving space eventually for Bitcoin, being the first and most famous crypto or, alternatively, to a new global crypto that will be understood by the world, immune to extreme volatility and not linked to spending dynamics related to *mining*, electricity or similar.

2. Initial Coin Offering

2.1 Definition, Features and Brief History

The Initial Coin Offering (ICO) - also called *Initial Token Offering* or *Token Sale* - is a new way of raising capital used especially by startups that, in order to raise capital, propose a project to the public by issuing digital tokens that can be purchased through the use of cash (USD, EUR etc.) or, more often, via cryptocurrencies (mainly Bitcoin and Ethereum).

Tokens are a representation of a particular resource or utility in digital form. So anything that has a value can be represented as a token. This value may be intrinsic or derived / linked to other sources, for example the right to receive a dividend, the right to vote, a license, a property right, the right to participate in future performance or to take advantage of future services.

The creation, issuance and transfer of tokens takes place thanks to the already examined Distributed Ledger Technology (DLT) and via the Ethereum platform ("mother" of the already mentioned Ether crypto), whose novel elements have allowed the creation of most of the ICOs. Ethereum, like Bitcoin, uses Blockchain technology for the transmission of virtual money; in addiction it introduces the possibility of creating the so-called *smart contracts*, i.e. IT protocols that automate and verify the negotiation and the execution of a contract without the intrusion of third parties.

Tokens are smart contracts that the owner - in our case the company that wants to realize an ICO - distributes to investors. The latter purchase tokens by paying them generally with cryptocurrencies and subsequently, tokens can be sold, traded or converted into fiat currency in the same way as exchanges or conversions with bitcoins take place.

There are mainly 3 types of tokens that can be issued through an ICO:

- **Currency tokens:** born as a digital currency, they are payment instrument for the purchase of goods and services and that can be exchanged with other tokens or with currency having a legal value based on a value defined by the market. These tokens do not grant rights towards the issuer and are not linked to other features or projects.
- **Investment tokens:** they give to the holders a number of rights and they may include dividends, interest payments, shares of a company or including membership rights, such as the right to vote. Therefore, these tokens can be subject to regulation as in many countries they are assimilated to financial instruments as well as shares or bonds.
- **Utility tokens:** are tokens through which it is possible to purchase goods or access to particular products / services provided by the issuer. Unlike currency tokens, which are used as a generic payment instrument for any good or service, utility tokens can only be used for the purchase of a specific good and service provided by the issuing company.

To these 3 categories of tokens a fourth should be added, represented by **hybrid tokens** which have characteristics of 2 or more types of tokens and are very frequent.

Given this diversity of tokens, it is possible to identify mainly two groups of ICOs:

- **Currency ICO:** concerning the creation of a new cryptocurrency through the issuance of currency tokens. The most famous case of this type of ICO was that of Ether crypto.
- **Project ICO:** when the tokens issued are investment or utility ones. By purchasing them, certain rights or the possibility of using services offered by the company will be acquired.

Although Initial Coin Offerings have reached their maximum use in 2017 and continue to be widely used even today, they have existed since 2013. The first ICOs were launched to raise funds for new cryptos, while later the main purpose became to directly finance business ideas.

The birth of the ICO is attributed to J.R. Willett, a Seattle engineer who in early 2012 published a paper entitled *"The second Bitcoin White paper"* in which he argued that the protocol used for Bitcoin could have great potential and that it could also be used for a new operation.

This idea was then put into practice in July 2013, through the launch of the digital coin and platform called Mastercoin (MSC). Through the ICO the project was able to collect 5.000 Bitcoins for a total value of about $500.000 at that time.

2.2 Phases of an ICO

Generally, an Initial Coin Offering consists of 4 main stages: first, the project is developed and subsequently distributed among investors, then the pre-sale and sale phases of tokens, and finally the listing of tokens on the market.

In the first exposure phase, the issuer announces its intention to develop a specific project, in order to publicize it and arouse curiosity among the interested parties. In an IPO, one of the key moments is the *roadshow* event, that is the marketing strategy by which a company that intends to go public on the markets, spreads its vision through conferences and events. In the Initial Coin Offerings, the concept of *roadshow* undergoes considerable changes as the face-to-face

interaction with potential customers leaves space for more modern forms of communication, including the use of dynamic websites and social media with the aim of increasing investor interest. After that, the most important document of the operation, the *whitepaper*, is created and distributed. It has the function of communicating the corporate strategy, as well as detailed information on the project and the so-called *token economics* that it includes: the methods of issuing tokens, the maximum and minimum number of tokens that can be purchased (*hard cap* and *soft cap*) and which services can be purchased with them.

A *roadmap* is also submitted, which shows the dates by which the set objectives will be achieved, allowing the activities to be structured more efficiently and making investors understand what the company intend to accomplish with the operation.

After the tokens sales conditions have been communicated and the project has been presented, the issuing phase opens. Tokens are offered for a limited period of time and generally in two tranches: the first called pre-sale and the second, which represents the real token sale. In the pre-sale, also called *pre*-ICO, tokens are sold at a more advantageous price to encourage potential investors and this phase is performed in order to benefit from covering advertising costs for the next stage and reducing the typical IPO underpricing phenomenon, being able to more accurately predict tokens demand during the sales phase.

After the pre-sale, the actual Initial Coin Offering starts: the issuing company creates a digital address containing the total tokens, which will then be distributed among the investors. Subsequently the investors will pay the funds in fiat currency or, more often, in cryptos to the company address and finally will receive an amount of tokens equivalent to the sum paid.

Once the tokens are issued, the ICO ends with the listing phase that guarantees the possibility of trading them in secondary markets, thus providing a source of liquidity for investors.

2.3 Token evaluation

It is necessary at this point to illustrate how the tokens are evaluated. However, there is no single

and irrefutable method for the determination of their value because i) in most cases it is determined by purely speculative mechanisms or qualitative elements that cannot be measured in a standard way; ii) the determination of the value is further complicated by the presence of different types of tokens whose characteristics deviate significantly from the usual instruments. Traditionally used methods in corporate finance for investment valuation, first and foremost the *Discounted Cash Flow* (DCF), are hardly applied in the case of tokens: first of all, there are different types of tokens other than investment ones and tokens could not give the right to receive a cash flow, but could include other types of rights.

For this reason, the value attributed to a token by the investor is the translation of a series of predominantly qualitative elements, in conjunction - if possible - with quantitative elements extrapolated using typical indices of corporate finance adapted to cryptoassets.

Qualitative Elements

To qualitative elements associated with the evaluation of a token is usually assigned a score. These are expressed by industry experts and published on specific platforms that handle with the ICOs rating. Hereinafter, the main qualitative factor used in the evaluation of tokens: i) the **team**, its composition and experience are crucial. Subjects who have the right skills and who are able to conduct business in a structured way increase the ICO rating and therefore the token value; ii) the **community**, so if the ICO is popular on the web, if it is the subject of studies or articles and what are the feedbacks from the major sites, if it is followed in social networks, or if it is reported by subjects with a good reputation in the industry. The more an ICO is known, well considered, and cited by community users, the more its reputation and, consequently, the value of the tokens, will increase; iii) the **product** and the **market**. The originality of the product, as well as on the existence of a potential market. Provide the solution to an existing market problem and differentiate it from its competitors; iv) the **technology**. The value of a token is also influenced by the technological structure of the platform; v) the **offer** and its

description: token distribution, the maximum number of purchasable token (*hard cap*), the use of the capital raised and the rights that belongs to each token owner.

Quantitative elements

Once the ICO is started, it's possible to add to the above mentioned qualitative elements, some of a quantitative nature, if available, to determine the value of the tokens.

It is essential to note however, that it will be extremely difficult that the results obtained will reflect the true value of the token because of the scarcity of all the necessary information and because of the complexity and the arbitrariness to combine quantitative and qualitative data.

Quantitative factors can be divided into 3 groups: those that show the historical trend, those that show the current one and those that try to predict the future trend.

Regarding the first group, one of the tools that can be used is the ***Sharpe Ratio*** (1), normally used for asset portfolios but in this case it is adapted to the single token. The *Sharpe ratio* is a risk-adjusted return indicator and is calculated as follows:

$$(1)\ Sharpe\ ratio = \frac{R_T - R_f}{\sigma_T}$$

Where R_T is the expected token return measurable with any frequency, R_f the expected return of a risk-free asset and σ_T is the standard deviation of the token, that represents its volatility. The higher the *Sharpe ratio*, the more it is to consider a positive element for the evaluation of the token, as it means that the subject is adequately rewarded with respect to the risk incurred.

When considering the current trend instead, is it possible to use a sort of ***Price-to-Earnings ratio***, typically used for shares. In this case, dividing the price of the utility token by the utility value, ie the intrinsic value of the product / service to which the token gives access. In this case, lower is the ratio better is for the evaluation of the token.

Regarding future trends finally, they are difficult to predict and calculate but is it possible to include the market share and the percentage of future revenues, the possible evolution of the product offer, the potential of the company and the ability to expand in the future.

3. ICO vs. Conventional Fundraising methods

3.1 ICO vs. IPO

The comparison most often analyzed when talking about ICOs is that with IPOs, given the basic similarities between the two methods of capital raising. Various and significant are however, the differences between these two mechanisms.

The IPO, Initial Public Offering, is the operation through which a company decides to offer its shares to the market for the first time. Shares are sold - which give a part of the ownership of the company to the purchaser - to a wider public of investors, in exchange for a compensation aimed at financing the entrepreneurial activity.

It must follow a specific procedure and provide a series of documentation; it is a strictly regulated operation supervised by supervisory authorities, such as the Security and Exchange Commission (SEC) in the U.S., and it involves the intervention of underwriters and law firms.

Even the Initial Coin Offering can be defined as a procedure by which a company finances itself, this time by selling its tokens against a cryptocurrency payment. Unlike IPOs, that requires prospects whose structure and content are highly controlled, in a token sale the content of the whitepaper is not precisely regulated. Moreover, in most cases, those who participate in a ICO does not participate in the equity capital: as previously analyzed in the description of the different types of tokens that can be issued, often those who join a token sale acquire a right on a specific project or, in other cases, they only acquire the possibility of using a specific service or product offered by the company itself. It should be noted, however, that starting from 2018 an evolution of the concept of Initial Coin Offering is emerging: the ETO, *Equity Token Offering*. This is new method, currently used mainly by startups, which offer the purchase of tokens representing part of the ownership of an asset, a debt or share capital, similar to the already descripted *investment tokens*. What limits their adoption is the regulation applied to them, since it can be traced back to that of IPOs, unsustainable for some small, unstructured

companies. Phenomenon of recent years, especially following the *dot.com* crash, is in fact the gradual decrease in the number of Initial Public Offerings. Protagonists of this fact are, above all, small / mid companies. From the need for additional capital, IPOs are now mainly the response of companies to exit strategies and branding events.

The reasons for this shift are various and it is not the objective of this research to analyze them, however these include: the increased access to capital with new attractive forms of fundraising and new entrants in the market, influx of private capital, more frequent rounds of capital especially in late stages and the regulatory environment that makes more expensive and time-consuming to go and remain public.

It is precisely the lack of a specific regulatory framework in fact, the main element that led to the exponential growth of ICOs worldwide in 2017, ensuring to its promoters to avoid the high costs associated with a conventional Initial Public Offering: the operation itself can be completed within a few weeks, without the obligation to submit bureaucratic requirements that prolong the time required to complete the project.

However, the lack of regulation implies little protection against investors: an ICO could prove to be a scam at the expense of the project's supporters, who at that point could no longer be protected as in more conventional operations. This happens in the ICOs especially as the reference target of the operations is represented by unqualified investors with little preparation in the field, who do not have the tools necessary to evaluate when a project is to be considered concretely impossible. Only a few investors indeed, have sufficient knowledge and information to make informed decisions and understand the uniqueness of the technology and analyze the token at the base of the project. Many of them are attracted by the popularity that has been created around the words “blockchain” and “cryptocurrency” and invest in an inaccurate way in any project that is related in one way or another to this technology. Since there is no regulation, at least not yet specific and not in all countries, it is arduous to safeguard the weak.

Lastly, in an IPO there are different pricing mechanisms including: Fixed price, Dutch auctions and Bookbuilding, the most common. In a token sale, price comes from the issuer and therefore it's quite subjective.

3.2 ICO vs. *Crowdfunding*

The method of capital raising that perhaps most closely approaches the Initial Coin Offering is crowdfunding although, as it will be examined, there are differences also in this case.

Literally "financing by the crowd", crowdfunding is a type of capital raising used by companies when they intend to propose a project or an innovative idea and it is realized by exposing the project in specifically dedicated online platforms. Among the best known we find: Kickstarter, Indiegogo, CircleUp and others.

The startup looking for funding must register on the platform that best meets its needs, providing all the documents requested. Being able to create a community around the project, as in the ICOs, becomes crucial: through a video the company presents its own product and explains the business idea, activities aimed at motivating the public are important, also through an active advertising campaign on social media. Investors, in turn, by consulting the appropriate platforms, choose the ideas that they consider most interesting, useful and successful and contribute financially to them during the collection period.

The main advantage of this method of financing is the possibility of reaching a very large number of investors, without having the obligation to submit to the costs of bureaucratic and documentation constraints required by an Initial Public Offering.

There are 4 main types of crowdfunding:

- ***Equity crowdfunding***: investors buy shares in exchange for money, thus participating in the company's share capital;
- ***Donation crowdfunding***: real charitable collections, where project supporters pay a sum of money and expect nothing in return;

- ***Reward crowdfunding***: the supporters of the project expect to receive products and services offered by the company as a preview or discounted;
- ***Lending crowdfunding***: *peer-to-peer* loans, in which the company borrows money at a subsidized rate from several people, who then become creditors over the company;

Initial Coin Offering and crowdfunding are similar with regards to the use of the web for the collection of capital and for the target audience, individuals who want to contribute to the creation and development of a project that has not yet been launched by obtaining early access to the product / service, thus becoming *early adopters*. However, ICO investors rarely make donations as they do in *donation crowdfunding*: most of the times they expect a financial return given by the possession and subsequent sale of the tokens or, in the case of a Project ICO connected to *utility tokens*, the possibility of accessing the product / service offered by the platform, similarly to what happens in *Reward crowdfundings*.

The point of connection between the two methods is the similarity between the already mentioned Equity Token Offering (ETO) and the *Equity crowdfunding*, both interconnected by the possibility for the investor to take part in the share capital.

Other common elements are the fairly high risk borne by investors given that, as mentioned, the projects subject to capital raising have yet to be launched, and the need of the promoter companies to create a network around the project able to attract as many investors as possible.

A distinction between the two operations is the fact that ICOs take place on decentralized platforms while crowdfunding is based on those that require the presence of third-party intermediaries. From this also derives the fact that while crowdfunding projects are limited to a specific country or region, ICOs have a global reach. This explains why the regulation of crowdfunding operations is already quite well-defined while for what concerns the ICO, as has already been described, a punctual regulation does not exist.

3.3 ICO vs. Venture Capital and Business Angels

Finally, a comparison between the Initial Coin Offering and the methods of raising capital through Venture Capital and Business Angels.

Venture Capital (VC) is a high-risk form of investment in which investors put money in return for equity stakes of startups and companies that by their nature have a high failure rate. VCs always focus on startup projects with solid teams, broad markets, products or services that already have consolidated and scalable metrics and when they decide to invest, they also make available skills at an operational level: managerial, technical, public relations and so on, with the objective to have large returns at exit ($ 1 B+), in the event of an IPO or when the business gets acquired by some other company.

A first and substantial difference is the investment "resistance": as already descripted in the comparison between ICO and IPO, buying tokens is much less complicated than buying equity, mainly because the regulatory environment that, in case of ICOs, is definitely less defined and leaves more room for the free initiative of companies and investors. In a token sale, startup existing shareholders do not suffer the classic dilution effect of capital increases, they do not lose the shares of the company and therefore they keep control over company affairs, having the possibility of operating in a more independent manner. At the same time, rules and protections designed to protect investors don't apply.

In addiction, given the success that they are experiencing and since there are no particular requirements to submit or hard selection processes to pass, raising money through an Initial Coin Offering is relatively faster and easier compared to VC; just think that in 2017, ICOs have delivered over 3.5 times more capital for Blockchain-based startups than traditional venture capital rounds (CrunchBase, 2018).

The process of persuading investors is also different: an ICO is essentially a B2C ("business-to-consumer") sale, with efforts mainly focused on marketing so as to make the business idea known as much as possible and intrigue investors.

A VC funding is instead, a B2B ("business-to-business") sale, where the startup will, first of all, have to make sure of the goodness of its accounts and pass the obstacle of the due diligence.

Another element that deeply differentiates ICOs from VC is monitoring and control. Venture capitalist are experienced and professional individuals, providing companies with scalability, business guidelines and advice with the objective of having a large exit afterwards. Multiple are the tools available to reduce the existing information asymmetries between founders / existing investors and new investors, to select the best investment opportunities (due diligence, staged investments, control rights, syndication), to monitor performance and company activities through, for example, frequent interactions, board representation, voting rights and to align those that are the different interests existing between founders and venture capitalists themselves (choice of security, pro-rata rights, anti-dilution protection, exit incentives, vesting, non-compete agreements, stock options). Moreover, they also provide a network that is essential to improve the adoption of new business by established companies.

ICO investors, conversely, rarely offer anything other than their investment above all because basically anyone, experts or not, with an internet connection and in possession of cryptos can invest in an Initial Coin Offering. Consequently, most of them aren't sophisticated enough to provide meaningful oversight to the company. They look mainly for a great idea that they find interesting, hoping that tokens will appreciate over time allowing them to make profits.

Given venture capitalists intense monitoring and efforts, their participation in the company is associated with a greater signalling effect compared to an ICO: raising funds from VC is in itself a positive indicator of the goodness of the project, due to the vast expertise of VC investors and the control that is involved. Venture capitalists invest in the project because, following in-depth analysis, they believe it will be of value. Obviously, this strong signalling effect will act negatively in the event that the VC will not follow-on.

ICOs are, by their nature, a global phenomenon, with zero geographical limit, unlike VCs that generally prefer companies from the same country / area, knowing better the market.

While VC funds collect the capital at their disposal mainly from retail and institutional funds (foundations, pension funds, fund of funds, sovereign wealth funds, insurance companies, banks), the so-called *business angels*, instead, are private investors who provide their financial resources mainly in startups in order to help them grow, in return, also in this case, for an equity stake. The reasons that lead a business angel to invest in a given project are different: they believe in the project, they have an interest in a particular idea / technology, they perceive a business opportunity and the chance of potential returns, although, unlike VCs, this is not their main target and they are ok even with small exits ($10-20 mln) given their low level of monitoring and control and their limited capital contribution. To them is associated, therefore, a lower signalling effect and a higher funding risk, because their lack of capacity to follow-on.

4. ICO Market and Trends

4.1 Evolution, Features and Performance of the market

As previously mentioned, the first Initial Coin Offering took place in 2013 with the issue of Mastercoin, now known as Omni, followed in 2014 with the launch of Ethereum. After it, the vast majority of subsequent ICOs took place on the homonymous blockchain platform, given its novelty related to smart contracts, indispensable for every transaction.

After the very first embryonic years in which only very few technology companies have conducted ICOs, mostly for the launch of different types of cryptocurrencies, the phenomenon of Initial Coin Offerings has begun to arouse the interest of investors in the early months of 2017, i.e. when the value of Bitcoin has started to grow exponentially.

Currently hundreds of startups have already attracted investments in this way and the overall volumes collected are high. More and more investors want to invest in ICOs, thus helping innovative technological projects and almost anyone can participate in an ICO. This opens the

doors of financial markets even to smaller investors, who wish to invest in new projects but cannot do so with traditional methods, as already analyzed.

Below are the main data relating to the ICO market carried out since 2013. It is important to warn, however, that these figures are not to be considered as unique and definitive for various reasons: the ICO market is unregulated, there is no single source of ICO data, reporting standards or generally accepted methodology. For these and other reasons, there could be variances, even significant ones, between the data in the following tables and those given by other public sources and by transactional data available on the public blockchain. This research paper is based on project websites, the most popular crypto exchanges, ICO trackers, data aggregators and field studies.

Token Offering Development

Year	⌀ Duration (d)	⌀ USD mln	Total #	Total volume (USD mln)
2013	41	0,4	2	0,8
2014	68	3,8	8	30,5
2015	32	1,0	10	9,9
2016	39	5,1	49	252,0
2017	29	12,8	552	7043,3
2018	58*	12,3*	1132	19689,3
2019 (until 31.05.2019)	84	13,1	250	3263,0

Table 1 *– Token Offering Development (Source: Strategy&\|PwC, 2019), *not considering Telegram and EOS.*
Calculations based on currency exchange rates on end date of ICO. As Ether and Bitcoin exchange rates are highly volatile, actual and current market capitalization of the companies today may differ significantly from figures shown in the table. ICO funding amount until 31.05.2019 considered

From the data of May 31st 2019 on the ICOs shown in *Table 1*, it can be seen that over the years the quantity of token sale projects and the volumes of capital raised have progressively increased over time. 2017 is the year in which there was a real boom, going from about 50 to over 500 token sales and with companies, mainly startups, that decided to use cryptos to raise capital through the issuance of tokens, avoiding the high typical costs of an IPO or to undergo meticulous phases of DD by VC funds and suffer the expected capital dilution. The strong growth trend continued in 2018, with important transactions such as that of EOS and Telegram, and today, even if the cryptocurrency market has gone through a phase of correction and less euphoric ("crypto winter"), as evidence of the effectiveness of the ICO for raising capital.

Another interesting fact that can be noticed from *Table 1* is that the average duration of an ICO is increasing, going from about one month in 2017, the year of the explosion of the ICO phenomenon, to almost 2 months in 2018, with the upward trend in the early months of 2019 (over 80 days). This a sign that companies need more time to achieve the fundraising campaign goal and that the ICO process is starting to be taken more seriously, with the tendency to involve more advisors during the procedure, becoming thus more costly.

Actually, the performance of ICOs did little to inspire confidence for a series of reasons that will be briefly explained. The number of projects conducted in these years has been much greater but not all have ended satisfactorily. Numerous are, in fact, the projects started but not completed due to multiple causes including the failure of achieve the minimum amount of capital required to be considered successful (*soft cap*) and also the illegitimacy of the transaction, that is if during the fundraising misleading behaviours were identified.

In 2018 approximately 60% of ended ICOs did not raise capital (ICObench, 2019) and in 2017 of the top 141 ICOs represented 87% ICO funding in 2017, 30% lost substantially all their value. A portfolio consisting of this top class ICOs, in one year (Jan-Sep 2018) would have lost 66%, with top 10 projects returning -56% and the other 131 ICOs returning -77% (EY, 2018). In 2018 instead, among the top 10 ICOs by funds raised, 6 have a very negative ROI (on average -85%) and of the remaining 4 their tokens are not even listed on exchanges (ICObench, 2019).

In confirmation of these non-encouraging data, now it will be explained the results of the empirical analysis carried out to study the historical performance of tokens. The data for this report, taken from *TokenData* platform (tokendata.io), which lists and provides all the data on current, past and upcoming token sales, were used to form a sample of 365 ended ICOs, which occurred over the 2014-2018 time horizon and with complete information available on current and listing prices (see summary statistics in the Appendix). This is a non-exhaustive list and it is necessary to remember again that there may be inconsistencies between the data in this study and those in other analyses, due to the lack of a single source of ICO data, reporting standards

or generally accepted methodology. The data available for each token sale was the capital collected, the listing price at the time of the ICO and the current token price (on Dec. 2019).

From these, have been derived first the returns for each single token, dividing the current price with the ICO price, and subsequently the average return of the tokens issued in the ICOs, weighted by the amount of capital raised by each company.

The results obtained confirm what has been previously described in other sector researches: the performance of the ICOs completed so far are not positive at all. It was obtained in fact, an average token ROI of 0.55x, resulting in a -45% return.

On the 365 token sample object of the analysis, 315 are below their listing price. In other words, in 86% of cases, investors who have financed companies via Initial Coin Offerings by buying their tokens are making losses. This is a remarkable figure and that does not justify the impressive growth that this method of capital raising is generating among investors.

Moreover, a year after raising capital, only a small portion of ICO-funded startups have progressed towards working product offerings, passing from 5% in 2017 to 13% in 2018 (EY, 2018); it is important to notice that 71% have no offering in the market at all (*Figure 1*).

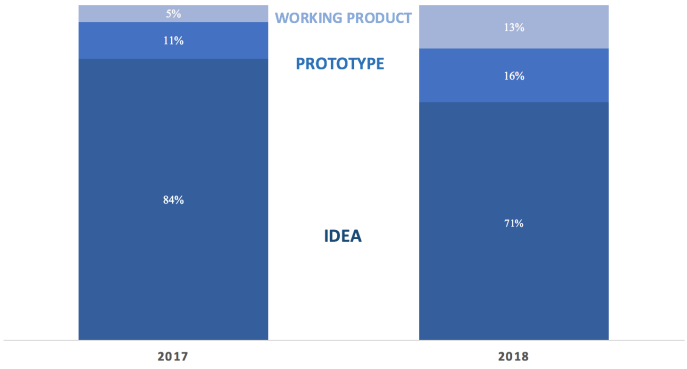

Figure 1 *– Offerings one year after the ICO (Source: EY research, 2018)*

EY analysis of 86 projects based on their public sites and 2017 whitepapers

Typically, within one year of a traditional venture-backed software startup, there is a significantly higher percentage of the companies with a functional early stage product.

Another important feature worthy of being described is the high concentration of the ICO market in terms of funds raised, gains, platform used for transactions and geographically. Among the

141 ICOs sample already mentioned above, top 10 ICOs raised 52% of the total claimed funds in 2018 (EY, 2018). The two main operations have been carried out by Telegram and EOS which have collected through their token sale $1.7 and over $4 billion US dollars respectively.

With regards to profits, the concentration is even more accentuated, with top 10 gainers bringing 99% of net gain (84% of gross gain), mostly in the blockchain sector which proves to be the most profitable and important segment along with fintech, and with the almost exclusive use of the Etherum as the preferred platform for the execution of ICO transactions. (EY, 2018).

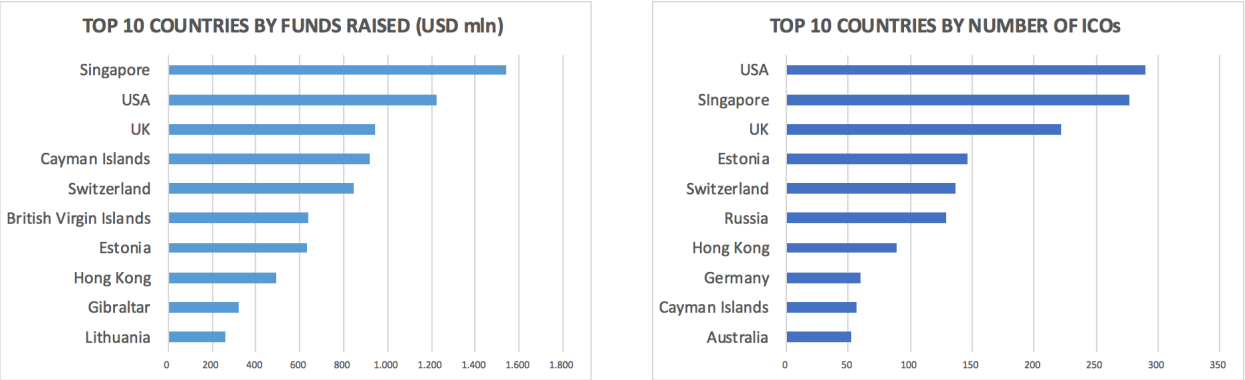

Figure 2 *– Top 10 countries by Funds Raised and by number of ICO, 2018 (Source: ICObench, 2019)*

In 2018 the trend of companies choosing as headquarter of their ICOs one among the few countries that have always been at the centre of this type of transaction, continues. At the end of the year, Singapore, USA and UK confirmed themselves as leading countries both in terms of the number of funds raised and the number of ICOs hosted (*Figure 2*). Overall, top 10 countries account for about 70% of the total capital gathered and about 60% of the total number of ICOs conducted in 2018 (ICObench, 2019).

These values in past years were even higher, indicating that ICOs are becoming slightly more widespread worldwide, thanks to the evolution of regulations. The rise of countries like Estonia and Lithuania confirms the dynamism of Eastern Europe in terms of technological innovation and digital economy, taking advantage of the so-called "regulatory arbitrage" phenomenon. In Asia, leaving aside the already mentioned leading position of Singapore, China loses its position in the top 10 compensated by the rise of Hong Kong as an important centre for both funds raised

and number of ICOs in 2018. Finally, present in this ranking Caribbean tax havens Cayman Islands and British Virgin Islands, confirming the importance for ICOs on matters such as regulations and taxes.

4.2 What's the future? Regulation and Final Conclusions

In this last part of the research it will discussed what will be the destiny of the ICO instrument, describing possible scenarios that will be created in the coming months and years, and thus reaching the final conclusions.

Certainly the most important aspect to evaluate and that will be crucial for the survival of token sales is the regulation which, as often said during this paper, is still an obfuscated chapter, despite the business volume of this market it is continuing to grow. The choices of policy makers around the world regarding ICOs and all the tools connected to them, first and foremost cryptocurrencies, will mark their destiny unavoidably.

The Initial Coin Offering is a completely different financing method from the existing ones, therefore it is not possible to apply the traditional legislation. The attention points for the supervisory authorities of the financial markets raised by ICOs are manifold, as well as are numerous and different the approaches followed so far to provide a first regulatory response to the instrument: many states have tried to tackle the problem simply by assimilating tokens into financial instruments, while others have basically ignored or banned the phenomenon.

It is precisely the lack of an organic and harmonized regulation the origin of the strong geographical concentration that was described in the last paragraph, with few countries that thanks to their less stringent regulations have been able to attract more ICO events, and will be the biggest problem to face in the near future.

The most complicated junction is given by the fact that there are different categories of tokens (currency, utility, investment or hybrid) each with its particularities and functions.

In general, it is possible to observe 4 main guidelines regarding the regulation of tokens sales around the world (Guerrea-Martínez & Remolina León, 2018):

1. **Contractual approach**, in which tokens are excluded from the scope of securities regulation. Under this approach, each token issue is regulated exclusively by the law of contracts and specifically by the whitepaper published by the company, reducing the regulatory costs of ICOs and thus making them more attractive. However, several problems could arise under this type of regulation. First, a regulatory imbalance would be created between functionally similar products, with those subject to the securities laws most affected by the regulatory burden. Second, in the absence of mandatory disclosure, investors would be subjected to high risks, unable to compare and adequately select best projects and rely on the protection of the securities supervisor. Finally, for token issuers it would be easier to omit or obscure terms and important information, to the detriment of tokenholders.
2. **Prohibition**; in this case, bans can take different forms and levels. In the maximum degree, the legislators decide to prohibit in any way Initial Coin Offerings, as happened in China and South Korea. The reasons that push policy makers to implement these bans are many and include the adverse effects of token sales that could cause for the economic and monetary policies of a country or when they perceive that the risks associated with ICOs exceed the benefits. The scepticism of regulators with respect to this source of financing on the one hand is plausible, especially given the high percentage of scams, but on the other hand it limits the innovation and development of SMEs. Therefore, if the regulators' main concern regards the stability of the financial system and the protection of investors, it would be more appropriate to limit the prohibition until the regulator has fully understood the potential risks associated with ICOs or, even better, adopt other types of limitations, along with warnings and education campaigns on ICO risks.

   For example, the legislator could establish the maximum number of tokens that can be purchased by a single investor, as is already happening in Russia. However, even if this model limits both the exposure of savers and the negative externalities potentially associated with the failure of the issuer, it does not offer effective protection for investors.

Another limitation is to restrict the sale of tokens to certain categories of subjects. For example, the regulator could exclude retail investors from buying tokens, to protect them from the purchase of an instrument they are unable to completely understand, and commercial banks, due to the fact that they manage savers' money and funds retirement. Finally, another type of prohibition could limit certain categories of companies that want to implement an ICO, imposing barriers to entry in the form of licenses and minimum capital requirements.

3. **Security Token Registration**, adopted for example by U.S., Singapore and Switzerland, consists of the application of securities laws exclusively for security tokens. Thus, non-security tokens can be freely issued without any type of control by the securities regulator and will be subject only to the law of contracts. This is certainly a better regulation method because, unlike the Contractual approach, it submits functionally similar instruments to the same regulation, also guaranteeing better protection for investors, however there are still some loose ends. It is not clear indeed, if security laws are enough to guarantee an adequate protection for security tokenholders and if an adequate protection is also guaranteed to non-security tokenholders, who seem to be less safeguarded by policy makers. Finally, there could be the risk that non-security tokens, are classified as security tokens, and *vice versa*.
4. **Comprehensive Token Registration**, implemented by other countries, such as Mexico, involves a total *ex ante* control over each token issue, recording it, authorizing it and subjecting it to the regulatory regime appropriate to the type of token issued. This model, while solving some problems typical of the one analyzed above, has the disadvantage of being highly costly both for issuers and regulators.

The just described are only the 4 main standards that can be identified globally, although actually there are many more approaches followed by each country, all with their own individualities and objectives to pursue. It is precisely this inhomogeneity of regulations the reason why only

a few countries are able to attract more ICO projects and for which token sales are still not a phenomenon that is totally recognized and globally accepted.

Probably the cause of the doubtfulness of some regulators regarding Initial Coin Offerings is given by the figure of the tokens which, as has already been said in this paper, can be of different types and it is not always so immediate to associate them with a category of securities, but above all it is caused by the scepticism linked to the phenomenon of cryptocurrencies, which are often automatically associated with ICOs.

The mistrust of cryptos could be understandable given their characteristics which, as analyzed at the beginning of this research, to date suggest a large speculative bubble. However, it would not be correct to directly link cryptos to Initial Coin Offerings because, while sharing the same basic technology, the Blockchain, and although they can interact with each other through the token-crypto exchange, they are two different instrument.

Provide a full review of this innovative form of fundraising is not possible to date, given its novelty and the impossibility of finding enough data to form a comprehensive perspective on the risk and return mix. However, as descripted in the previous paragraph following the analyses conducted, although ICOs are enjoying great success, with an increasing number of projects and capital raised, their performance in terms of returns are not encouraging, especially compared with traditional forms of raising capital that, although associated with more severe regulations, are restricted to accredited investors and involve heavy due diligence and monitoring, certainly offer significantly higher performances together with investor protection and reduction of information asymmetries. ICO-backed companies, look like they offer more risk for investors not compensated by high returns but, on the contrary, the percentages of failures following the collection of capital are very high and early returns are negative also for the best projects.

Most likely these performances will improve in future months and years, when the market will stabilize and the destiny of ICOs will be less uncertain.

Going forward, more forms of fundraising through tokens will be created, plausibly using a mix between tokens and equity, offering investors tokens associated with rights. This could favour both investors, for example VC funds, who could become minority shareholders through the purchase of tokens, and entrepreneurs who would retain control of the companies while being able to benefit from the added value offered by VCs. Some of these innovations are already a reality, such as RATEs ("Real Agreement for Tokens and Equity") in which the company issue two tokens, one as equity, issued in accordance with securities laws, and the other as a perk, a sort of utility token. Another similar instrument under that is being developed is the DATE ("Debt Agreement for Tokens and Equity"), where a convertible note or straight debt token and a utility token are offered.

Now, the lack of organic regulation, the extreme volatility of prices and the plausible risk of losing the invested capital or, even worse, participating in the fundraising of an illegal project, significantly compromise the development of Initial Coin Offerings.

It is, therefore, essential to have a uniform intervention by regulators, which aims to monitor tokens emissions, without, however, adopting drastic measures that would lead to centralization of the network. By their nature ICOs are a global phenomenon, based on decentralized infrastructures and technologies and for this reason they cannot prescind from an organic and harmonized regulation. In other words, a global phenomenon needs a global response.

In addiction, Initial Coin Offerings should have, at least in the near future, a development that seeks to be as less dependent as possible on digital currencies, so far unreliable due to their extreme volatility, so as to be able to become a brilliant and innovative tool for raising capital, regardless the uncertain destiny of cryptos.

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Appendix

Summary statistics on the analysis conducted on a sample of 365 ended ICOs from 2014 to 2018.

ENDED ICOs SAMPLE	365

	TOTAL	AVERAGE	STD. DEV.	10th PERCENTILE	90th PERCENTILE
USD RAISED	$ 9.043.368.047,82	$ 24.776.350,82	$ 44.343.831,52	$ 1.981.605,78	$ 45.000.000,00
TOKEN SALE PRICE	-	$ 0,58	$ 1,95	$ 0,01	$ 1,06
CURRENT TOKEN PRICE	-	$ 0,32	$ 1,54	$ 0,001	$ 0,44
TOKEN SALE PRINCE − CURRENT PRICE	-	$ 0,26	-	-	-

	No. CASES	%
TOKEN SALE PRICE > CURRENT PRICE	315 / 365	86%
TOKEN SALE PRICE < CURRENT PRICE	50 / 365	14%

WEIGHTED AVERAGE TOKEN RETURN	0,55 x
RATE OF RETURN	-45%

N.B. *EOS*' ICO, the biggest ICO to date in terms of capital raised ($ 4.2bn) was not considered in the analysis due to the multiple doubts it is arousing about the lawfulness of the operation. The SEC, on Sep. 30, 2019: "*The Securities and Exchange Commission today announced settled charges against blockchain technology company Block.one for conducting an unregistered initial coin offering of digital tokens (ICO) that raised the equivalent of several billion dollars over approximately one year. The company agreed to settle the charges by paying a $24 million civil penalty. [...]Block.one did not register its ICO as a securities offering pursuant to the federal securities laws, nor did it qualify for or seek an exemption from the registration requirements*." (more details on: https://www.sec.gov/news/press-release/2019-202).

If this operation had been included in the analysis conducted, given its great weight in terms of capital raised compared to the other ICOs analyzed, the weighted average token return would have changed from the current 0.55x to 1.2x.