European University Cyprus

# EUROPEAN UNIVERSITY OF CYPRUS

## School of Business Administration

## Master's in Business Administration

# Evolution of Public Token Sales:

# The next generation of ICOs

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## Abstract

The unregulated and highly speculative nature of Initial Coin Offerings contributed to the crypto market crash of 2018 and generated distrust and bitterness for ICOs due to significant losses for investors and rampant cases of frauds. Cryptocurrency market capitalization has quadrupled since that period and the number of conducted campaigns has skyrocketed. Despite the fact that the majority of campaigns are conducted with alternative to ICO models, they are not being distinguished or examined separately in literature. The purpose of this study was to investigate the development of alternative models of financing through public sales of cryptocurrencies, which were developed in an attempt to diminish the shortcomings of ICOs. Using nascent literature, web sources and publicly available data, we perform a cross sectional multiple case study analysis of blockchain financing models and launchpads, to develop a framework for the distinction for 2 additional models to ICOs, Initial Exchange Offerings and Initial DEX offerings. Both introduce a third counterparty into the financing transaction, which are launch platforms, named launchpads. Starting with the "DeFi summer" of 2020, developments on DeFi technologies enabled for IDOs and shifted interest from IEOs, which were the predominant model in 2019. IDO and IEO campaigns generated less initial capital in average than ICOs, where issuers assume the full responsibility of effectively signaling, marketing and conducting the public sale. Launchpads are facilitated by centralized cryptocurrency exchanges in the case of IEOs and decentralized protocols in case of IDOs. Launchpads attempt to reduce information asymmetries, reduce moral hazard for issuers, protect investors and create economic synergies. Trust is induced between counterparties whose incentives are potentially aligned leading to reduced frauds, accessibility to early-stage financing and increased innovation. IEO Launchpads achieve this, by assuming and centralizing control over the whole process. On the contrary, IDOs enable for these processes to be decentralized permissionless, transparent and immutable through complex smart contracts and DeFi mechanics. We examine the proceeds of models, campaigns and individual launchpads through the construction of datasets by publicly available data and confirm the assumption that the choice of launchpad influences the success and

performance of campaigns, as the procedures of hosting campaigns are not standardized. Further research, trusted sources and long-term studies are essential to conclusively determine the sustainability and underlying implications of each model as blockchain technology is in the adoptive stages and the cryptocurrency ecosystem is constantly evolving.

**Keywords:** Initial Coin Offering; ICO; Initial Exchange Offering; IEO; Initial DEX Offering; IDO; Blockchain; Crowdfunding, Token; Public Sales; Launchpads

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## Abbreviations - Definitions

| | |
|---|---|
| **AltFi:** | Alternative Finance |
| **AML:** | Anti-money Laundering |
| **AMM:** | Automatic Market Maker |
| **BSA**: | Bank Secrecy Act |
| **BSC:** | Binance Smart Chain |
| **CeFi:** | Centralized Finance |
| **CEX:** | Centralized Exchanges that hold custody of user funds |
| **CTF:** | Combating of Financing of Terrorism |
| **DAO:** | Decentralized Autonomous Organization |
| **DeFi:** | Decentralized Finance |
| **DEX:** | Decentralize Exchange |
| **DLT:** | Distributed Ledger Technologies |
| **ERC-20** | Ethereum network token standard |
| **FinCEN**: | Financial Crimes Enforcement Network |
| **ICO:** | Initial Coin Offering |
| **IDO:** | Initial DEX Offering |
| **IEO:** | Initial Exchange Offering |
| **IPO:** | Initial Public Offering |
| **KYC:** | Know Your Customer |
| **Minting:** | Creation of on-chain tokens or coins |
| **MVP** | Minimum viable product |
| **MSB** | Money Services Businesses |
| **POS:** | Proof of Stake consensus mechanism |
| **POW:** | Proof of Work consensus mechanism |
| **SaaS** | Software as a Service |
| **SEC:** | U.S. Securities and Exchange Commission |
| **Staking:** | The process of actively participating in transaction validation on POS consensus blockchain |
| **STO:** | Security Token Offerings |
| **TGE** | Token Generation Event |

## 1. Introduction

Traditional ways of financing used by entrepreneurs to subsidize new ventures, such as bank loans, angel investors, venture capital funds and even friends and family, are established means of raising capital in financial markets. The reluctancy of traditional banking sector, VCs and angel investors to fund newly created ventures (Crotty, 2009), given the lack of collateral and sufficient cash flows as well as constrains opposed by the financial crisis of 2008, excluded many startups from access to finance across many countries. Startups are defined as newly founded companies or ventures in the phase of development and market research. (Čalopa et al., 2014). Enabled by FinTech, electronic businesses and SaaS companies fueled a widespread expansion of online entrepreneurship. Many entrepreneurs sought funding into large online communities of consumer-investors through crowdfunding (Kuppuswamy and Bayus, 2015). While the world economies are becoming increasingly digitized, funding methods were combined with innovative process and instruments outside of the conventional financing system, to address the needs of niche markets and eventually became a relevant choice or supplementary techniques. These new financial techniques are known as Alternative Finance (AltFi) (Schueffel, 2017). Crowdfunding and equity crowdfunding were the first prominent techniques favored by the emergence of new technologies, the rise of fintech and the conditions of the financial markets. The financial industry is experiencing a significant transformation, fueled by substantial advancements in digital technologies, especially distributed ledger technologies (DLT), which is the underlying technology introduced by Bitcoin (BTC) in 2009. This rapid expansion is attributed not only on Bitcoin but also on Ethereum Network (ETH), which is the first blockchain network to deploy smart contracts, enabling complex financial services and decentralized applications. Financial applications developed on public blockchains enable decentralization, transparency and immutability while diminishing censorship, intermediation and financial exclusion.

ICOs are similar to crowdfunding in a manner that both involve minimum and maximum funding caps for the campaigns and can test the market demand for their product before launch while

allowing retail investors to participate in early-stage projects. They differ in accessibility, structure, liquidity, laws and regulation among other variables. Initial Coin Offerings name is analogous to corporate IPOs, but they differ in terms of provided asset for sale, venture maturity, investor characteristics, deal and post-deal characteristics. IPOs are used by established, revenue generating firms to acquire high volume growth, while ICOs can be deployed in any funding stage, although they are mostly launched by brand new startups. Another distinction is that IPO underwriters who serve as an intermediary set the IPO offer prices and companies are subjected to regulatory and disclosure obligations. The interplay of entrepreneurial finance, crowdfunding and blockchain lies in the need of blockchain projects to find the financial means, to develop their products or services, both within and outside of their ecosystem.

The term Initial Coin Offerings (ICO) refers to public or private sales of cryptocurrencies, usually generated from early-stage ventures, that seek funding in cryptocurrencies to develop their blockchain products. In return investors receive their newly minted (generated) tokens or coins, promising a variety of future benefits and opportunities when the product or service is operational. Initial blockchain projects that sought funding through the cryptocurrency ecosystem received individual direct BTC contributions, but as cryptocurrency ecosystem evolved, early stage blockchain ventures seeking funding started conducting public sales for their coins or tokens in return for BTC, ETH or other prominent cryptocurrencies. The hype around cryptocurrencies experienced in early 2017, caused by the rise of BTC price reinforced and popularized ICOs as a means of raising capital for blockchain enabled ventures.

The parabolic moves of the market, the speed, cost efficiency and early-stage investment nature of ICOs yielded significant gains for initial investors and a plethora of projects received millions of $ USD in funding. Ventures pre-minted the entire supply of tokens and directly sold them to investors without any regulatory supervision, bureaucratic processes or institutional intermediation. The growth in ICO activity can also be attributed to the novelty of the

mechanism, the decentralization narrative and the urge of early bitcoin investors to reinvest part of their earnings back to the cryptocurrency ecosystem. The increasing growth in use of DLT, led to increased financing needs for companies building blockchain applications which exceeded the financing capacity of existing technology VCs.

The global reach and unregulated environment of ICOs favored innovation but inadvertently abetted fraudulent activities. The highly speculative nature of ICOs and mania that cryptocurrency market experienced in 2017-2018 led to a market crash resembling the Dotcom bubble. Retail investors suffered significant losses, theft of assets and other misconducts while an immense number of projects and crypto assets ceased to exist and the number of new ICO campaigns plummeted. Nevertheless, new financial processes, platforms and products were developed, with Initial Coin Offerings being the most compelling phenomenon to emerge from the 2017-2018 cryptocurrency environment in terms of financing (H. C. Hsieh and Oppermann, 2021).

**1.1 Research rationale and context**

The aftermath of the crash of 2018 was a prolonged period of flat trading, reduced Dapp (decentralized applications) activity and interest about cryptocurrencies, that is referred as “crypto winter”. The sector and its trading platforms had seen a proliferation of frauds and misconducts leading to distrust for cryptocurrencies and ICOs, and a dramatic reduction in the number of new campaigns. In an attempt to protect investors, some regulatory authorities opposed bans on cryptocurrencies or usage restrictions for ICOs, although the global regulatory framework is still unclear. Despite the bitterness in the community and the drawbacks of ICOs, the concept was revolutionary and legitimate projects that received funding continued building successful products or services. Only a handful of new ventures conducted public campaigns while strategically trying to diminish the shortcomings of the original ICO model, which suffered from regulatory uncertainty, regulatory arbitrage, complex process and lack of integration with traditional finance. Security and privacy concerns also brought distrust in the community since

ventures conducting ICOs were holding and distributing the entire supply of pre-minted tokens without any overseeing or assurances from the perspective of blockchain technology and code, as anyone with relevant knowledge could build a website to run an ICO campaign, create an infinite supply of a new token to distribute and receive funding, but never proceed with building the product running away with investor funds and private data.

Since then, blockchain technology has continuously advanced, expanding its applications revolutionizing and disrupting many sectors, such as finance, healthcare, IOT, cybersecurity, supply chain management and governance among others. With the rise of Decentralized Finance (DeFi), the regulatory framework that developed around exchange platforms and the investments of crypto specific VCs, crypto market has regained momentum and trust of investors. Starting in 2020 with the advent of the Covid-19 pandemic, cryptocurrency market capitalization has decupled reaching $3 trillion USD in 2021, from the mean of $300 million USD of the 2018-2020 period. New blockchain technology applications and projects have increased in an exponential rate while the demand for capital to develop new projects has grown. The number of ICO campaigns has also increased but the majority of public sale campaigns are conducted with alternative fundraising models with differentiated characteristics. These campaigns differ in terms of structure, distribution, intermediation, and regulatory framework, as entrepreneurs and communities seek to correct past ICO shortcomings by learning from past mistakes in an ever-changing industry.

Ever since the phenomenon of ICO has attracted many researchers that examine it in a technological, social and financial context. Previous literature compares ICOs to crowdfunding and conventional forms of corporate finance, additionally exploring the determinants of campaign success in relation to signaling theory, as well as their correlation to cryptocurrency market sentiment and capitalization. A wide range of studies examine the dynamics of token and campaign returns in short and long term. While other researchers examine the technical characteristics, structure and strategy of different campaigns. In social context relevant studies

examine the geography of campaigns, investor and entrepreneur motives, institutional adoption, regulatory framework and implications, as well as the aspect decentralization and democratization of finance though blockchain financing campaigns. Whilst ICOs are extensively studied in literature, we identify a gap regarding the emergence, development, characteristics and performance of alternative cryptocurrency fundraising models where literature is still nascent. The concept of IEOs is introduced in published literature by Doe-Bruce (2019), where alternative finance sources instigated by the rise of Bitcoin are explored along with their implications and future expectations. Myalo (2019) conducted a comparative analysis that provides the concepts of the ICO, Decentralized Autonomous Organization Initial Coin Offering (DAOICO), IEO and STO and examines them in detail with a case study of a campaign for each model, while identifying the pros and cons of each method. Lack of relevant literature Is probably attributed to the reduced interest on blockchain crowdfunding during the "crypto winter", the novelty of the mechanisms and the likelihood that other researchers don't distinguish between different models, characterizing new campaigns as Initial Coin offerings. It's necessary to examine and evaluate them as their characteristics and differences influence the whole range of stakeholders.

**1.2 Aim and research questions**

Our aim is to thoroughly examine relevant literature and web sources to further explore the evolution of token sales market, identify and complement literature with the differences and similarities of ICO and alternatives models that are now predominantly used to raise capital for the next generation of blockchain applications. The first objective is to shed light on the effectiveness of alternative models on diminishing the drawbacks of ICOs. We attempt to develop a conceptual framework to advance understanding and investigate factors related to campaigns' success, the advantages and disadvantages of choosing each individual model for entrepreneurs and investors, as well as the development of dedicated platforms to launch token sales, named Launchpads. Secondary objective is to measure the performance of individual

fundraising models in a specific period creating a snapshot of market. Finally, we examine individual launchpads to assess the if the selection of a specific launch platform effects the success of a cryptocurrency fundraising campaign. Therefore, this thesis aims to contribute to the following research questions:

**RQ 1**: How did the cryptocurrency financing market evolved following the dusk of Initial Coin Offerings and how new alternative models minimize the shortcomings of the original model?

**RQ 2**: How do Initial Coin Offerings, Initial Exchange Offering and Initial DEX Offerings perform in relation to each other in terms of capital raised and investor returns in the period 2019-2021?

**RQ 3**: Why does the choice of a specific launch platform influence the performance of an Initial Exchange Offering or Initial DEX Offering campaign?

### 1.3 Outline of project structure

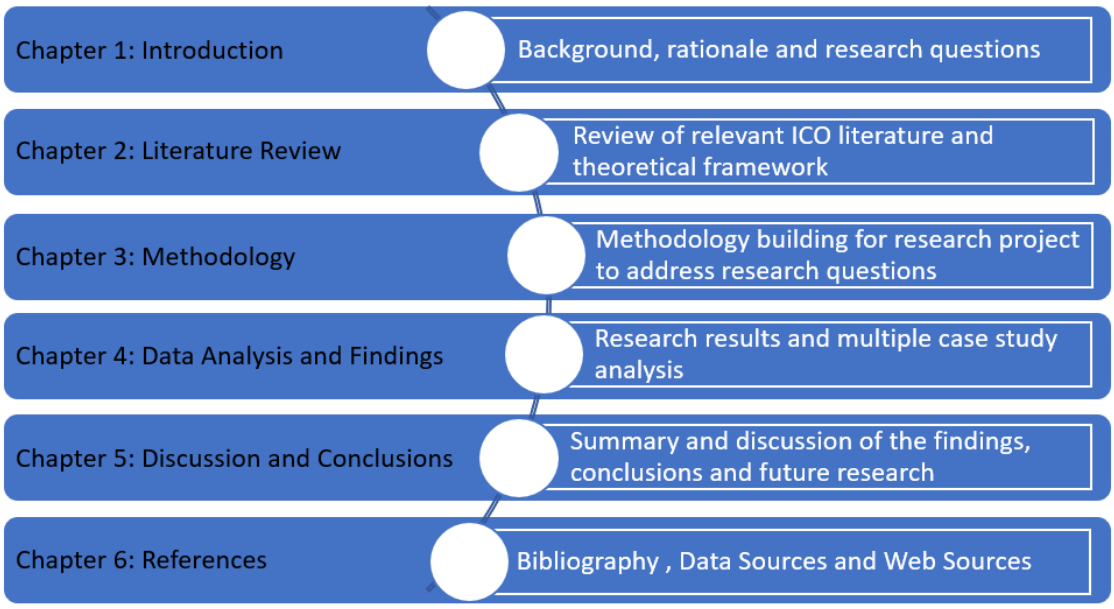


*Figure 1: Structure of the thesis*

The Chapter 1 outlines the background knowledge and introduces the subject in a top-down approach, defining the scope and develops the research questions. Chapter 2 reviews relevant literature on entrepreneurial finance and especially Initial Coin Offerings, outlining the conceptual and theoretical framework based on research questions. Chapter 3 describes the building of methodology to address research questions, data and sources collection, database creation and analysis with descriptive statistics. In Chapter 4 we present, analyze and critically evaluate the qualitative and quantitative findings. In Chapter 5 we summarize and discuss our findings and limitations, concluding with recommendations for future research and potential implications for the subject.

## 2.Literature Review

In this chapter we attempt to analyze related literature to develop a conceptual framework about the evolution of the ICO market and construct a theoretical framework to address our research questions regarding the emergence, characteristics and performance of new alternative ICO models and their respective launch platforms.

### 2.1 Related Literature

On the theoretical side, from a corporate and entrepreneurial finance perspective, several papers are concerned with the effects of blockchain technology and fintech on finance and startups (Tapscott A. and Tapscott D., 2017; OECD, 2019; Cai, 2018; Yadav and V., 2020). The use of cryptocurrencies and tokens impact the overall strategic operational and financing aspects of a company (Howell et al. 2018; Liu and Wang 2019). Further research tries to identify the benefits of ICOs for entrepreneurs (Cong et al., 2018; Li and Mann, 2017, 2018), focusing on the dynamics of platforms and crypto tokens. Catallini and Gans (2019) elaborate that ICOs enable entrepreneurs to collect information about the consumers prior to the launch, providing higher returns in comparison to equity financing. On the comparison of ICOs and traditional financing methods, Chod and Lyandres (2020) present an agency theory, involving disclosure and information asymmetries, while discussing the advantages of ICOs over venture capital

financing. Initial Coin offerings are compared to crowdfunding and traditional financing instruments by a wide range of studies (Block et al., 2021; Choi, 2020; Lipusch, 2018). Underpricing, one of the most notable characteristics of IPOs, is also prevalent in ICOs, and according to research it stems from information asymmetry and moral hazard (H. C. Hsieh and Oppermann, 2021). Entrepreneurs have to perform due diligence on their own, since they actively promote their ICO and signal its quality, engaging with potential investors through various channels including social media, dedicated websites, whitepaper and promotional ads on relevant websites. Crowdfunding campaigns include a minimum and a maximum threshold for funds raised, while most ICOs include a soft cap, a bare minimum of funds, which if not reached by the end of the campaign, the ICO will be canceled, and the funds will be returned to investors. A hard cap is sometimes present, where the campaign is closed if tokens sold exceed a certain quantity (Lyandres et al., 2018). These procedures can be coded in a smart contract and ensure their automatic implementation without the involvement of a third party. Many analysts consider reaching either funding cap as a measure of success for an ICO but since the decision is endogenous, thresholds can be purposely easy to reach. In relation to traditional methods like IPOs, ICOs are low cost, fast and keep documentation and regulation needs to a minimum. IPO and investors are offered some form of equity or security, while ICO investors are presented with different opportunities. The key differentiating characteristic of ICOs is that issued cryptocurrencies can be readily available to trade on a secondary market, enabling immediate financial speculation. ICOs offer the fastest market exit for investors compared to traditional non-crypto fundraising methods, since tokens can be immediately traded after wallet distribution and are highly liquid provided that they are listed in an exchange (CEX) or a decentralized exchange (DEX). Studies regarding ICO design and characteristics examine token types, features and valuation mechanics indicating that utility tokens and security tokens are assigned higher valuations by investors. Empirical studies reveal the dominance of utility tokens in the crypto markets, but other researchers don't find significant differences in funds raised regarding the type of the token (Fisch and Momtaz, 2019b).

Other researchers argue that fintech and especially blockchain enabled crowdfunding campaigns democratize access to finance (Bollaert et al., 2021; Chen, 2018; Fisch et al., 2020). The importance of Initial Coin offerings as a new financing mechanism , as well as the process and its structure are discussed by Adhami (2018), Fisch (2019) and Momtaz (2018). There is also a wide range of papers exploring the potential and possible effects of tokenization of non-crypto assets and how it could influence businesses in the future (Chod et al., 2019; Cong, 2021; Heines et al., 2021; Sunyaev et al., 2021). The implicit effects of tokenization of off-chain assets, render token sales and their mechanisms more relevant than ever.

### 2.1.1 Distributed Ledger Technologies and Blockchain

Blockchain is a type of distributed ledger technology. The first blockchain, Bitcoin is attributed to an unknown team or individual (Nakamoto,2008) and it's an open source, public, distributed database shared among the nodes of a computer network that stores information structured in linked blocks. The public ledger is not stored on centralized servers, instead it's stored in private computers using the network across the globe, and each computer represents a node. New blocks are verified by user run nodes, incentivized with the reward of the native protocol asset and transaction fees, enabled by a mix of cryptographic hash functions and signatures, consensus mechanisms and game theory. This enables trustless, censorship free, immutable, transparent and verifiable transactions between parties, without the need for a trusted centralized intermediary (Babich et al., 2021; Bargar, 2016; Catalini and S.Gans, 2019:Russo, 2020; Mohanta et al., 2018). Individual users create wallets which are assigned a wallet address cryptographically derived from their public key, also obtaining a private key to access the wallet, then users can start submitting transactions sending and receiving digital assets, in return for fees paid in the native network cryptocurrency. Cryptocurrency miners that validate those transactions and submit the block in the blockchain are paid in transaction fees. The native protocol asset of the blockchain is referred as coin while assets issued on top of the base (settlement) layer, inheriting the native asset characteristics are referred to as tokens. Bitcoin's consensus algorithm is Proof of Work (POW) which is the most studied and is considered to be

the most secure, but its highly dependent to computational power. There are several types of blockchains, public, private, consortium and hybrid, differentiating in access and control rights, transparency and scalability but each one serves a different purpose (Zheng et al. 2016). Ethereum is the second cryptocurrency in terms of capitalization and is also an open source, permissionless blockchain network which pioneered and popularized decentralized applications (Dapps) and smart contracts adding various new applications to the network. Smart contracts are self-executed immutable and deterministic computer programs that enable automation of execution for transactions and digital agreements under pre-determined conditions with all the inherited characteristics of the Ethereum network. Enabled by the Ethereum Virtual Machine (EVM) (Dai et al., 2021) programming interface which simplifies and speeds up the creation of any blockchain-based applications, developer communities created new financial products, services, applications and opportunities, for value creation and value capture. These decentralized financial services are referred to as Decentralized Finance (DeFi) (Chen and Bellavitis, 2020). More complex smart contracts can also provide the ability to entrepreneurs to predefine the token sale characteristics, tokenomics and distribution mechanics and vesting schemes. There is a number of new EVM and non EVM compatible blockchains with smart contracts on the market nowadays, and each one approaches the blockchain trilemma (Hafid et al., 2020, Buterin, n.d.) in a different way, aiming to offer solutions for different applications. Since 2020 DeFi has bloomed, a wide variety of decentralized financial products have been developed, enabling a P2P market with decentralized exchanges, lending and borrowing platforms, payment systems, synthetic assets, stablecoins, asset management and other applications (Stepanova and Eriņš, 2021). The importance of crowdfunding capital for projects with public sales of cryptocurrencies lies in the innovation promoted by investors cycling capital gains back to the somewhat closed cryptocurrency ecosystem, participating in disintermediated early-stage venture funding, contributing to the development and adoption of blockchain applications from around the world.

### 2.1.2 Initial Coin Offerings

Initial Coin Offerings (ICOs) is a process or event where a company, usually a startup, seeks to raise external capital by selling their new cryptocurrency to investors, which hope that the value of the coin or token will appreciate, and they will realize capital gains or are interested to purchase them and exchange them later for services and products developed by the issuing venture. Earliest ICOs used smart contracts to define a ratio in which the offered generated tokens will be automatically distributed to participants' wallets when they send funds to the ICO specific address, usually in return for ETH, BTC cryptocurrencies. From a technical perspective Initial Coin Offerings are token generation events and token sales predominantly implemented by smart contracts on Ethereum blockchain, which according to (Fisch and Momtaz, 2019a), accounted for approximately 88.1% of all ICOs until 2019. New projects often launch a ERC-20 Token to run a funding campaign on Ethereum infrastructure, and then launch their respective native protocol asset when their own blockchain is deployed (Li and Mann, 2021a). According to Fisch (2019) and Momtaz (2020), tokens issued are classified in different categories. Native assets of a specific blockchain, used as a digital currency in the respective blockchain are referred to as coins or cryptocurrencies. While tokens are issued on top of an existing blockchain and are classified as utility tokens when they represent the rights to use and redeem a product or service in their respective platform when it's deployed. Security tokens carry cashflow and ownership rights for the holders and their sales are known as Security Token Offerings (STO). They are classified as security tokens with the use of Howey Test and are subjected to securities laws enforced by the US Securities and Exchange Commission(SEC.gov, 2018) in case of US jurisdictions. Tokens can also be considered as Governance Tokens if they provide voting rights for decentralized platforms or Decentralized Autonomous Organizations (DAOs). The appropriate token for each project is related to financing needs, agency problems and platform characteristics(Cong et al., 2018). ICO investors are for the most part retail investors with financial, speculative and ideological incentives, although established crypto VCs and angel investors, are now common participants in pre-ICO, private funding rounds (Presales).

### 2.1.3 History of Initial Coin Offerings

The first token sale was conducted by Mastercoin in 2013, a protocol proposed by J.R. Willett aiming to add new features on top of the original Bitcoin network. The project raised around 4700 BTC, worth around $500,000 at that time. Rebranded and known today as OMNI which is the underlying protocol for Tether stablecoin (USDT). Ethereum, another open source, permissionless blockchain network which started from a crowd sale of its native coin in 2014 and raised 3700 BTC in the first 12 hours. Ethereum's introduction of the ERC20 standard for token creation allowed for a significantly easier ICO launch process which contributed to the growth of ICOs. Another mentionable case is the DAO in 2016, a decentralized autonomous organization which raised a record $150 million USD in a crowdsale to fund the project. The DAO was exploited leading to losses of $50 million USD worth of ETH which were taken by an unknown hacker. This divided the community of Ethereum and led to two separate blockchains (hard fork event). The original continued as Ethereum Classic (ETC) and the new separate version became Ethereum (ETH), performing a network rollback before the theft. Telegram Open Network (TON) in February 2018 and EOS blockchain in June 2018 ICOs were conducted in Cayman Islands and the British Virgin Islands and are definitely worth mentioning, since they raised extraordinary amounts of capital, $1.7 billion USD and 4.2 billion USD, respectively. A dispute with US SEC led to Telegram being fined and halting the TON blockchain operations, eventually returning $1.2 billion USD back to investors. By 2017, the vast majority of ICOs were conducted to fund blockchain infrastructure, trading and investing platforms and general finance applications followed by marketing and gaming (OECD, 2019).

ICO activity was limited from 2013 to 2017, whereas the number of campaigns increased exponentially peaking in the first quarter of 2018 with a 350% increase compared to 2017. According to Zetzsche et al. (2018) ICO volume has exceeded $25 billion USD by February 2018. The overall ICO volume in Q3 and Q4 of 2017 surpassed the total volume of all previous ICOs combined. Failed ICOs are considered those that didn’t manage to reach the predefined soft cap or didn’t raise any capital at all. Their failure rate in 2017 was exceptionally high at 45% and only

44.2% of startups survived 120 days after the campaign (Benedetti and Kostovetsky, 2018; OECD, 2019). A remarkable share of ICOs had negative ROI and there were also cases of projects abandoning development despite having raised substantial capital. Due to increased regulatory scrutiny, warnings by regulatory authorities, cases of hacks, price manipulations, cases of fraud and the total market cap of crypto crumbling with an 85% drop from its peak in January of 2018, ICO market activity and interest declined significantly by 2020, as shown by Bellavitis et al (2021).

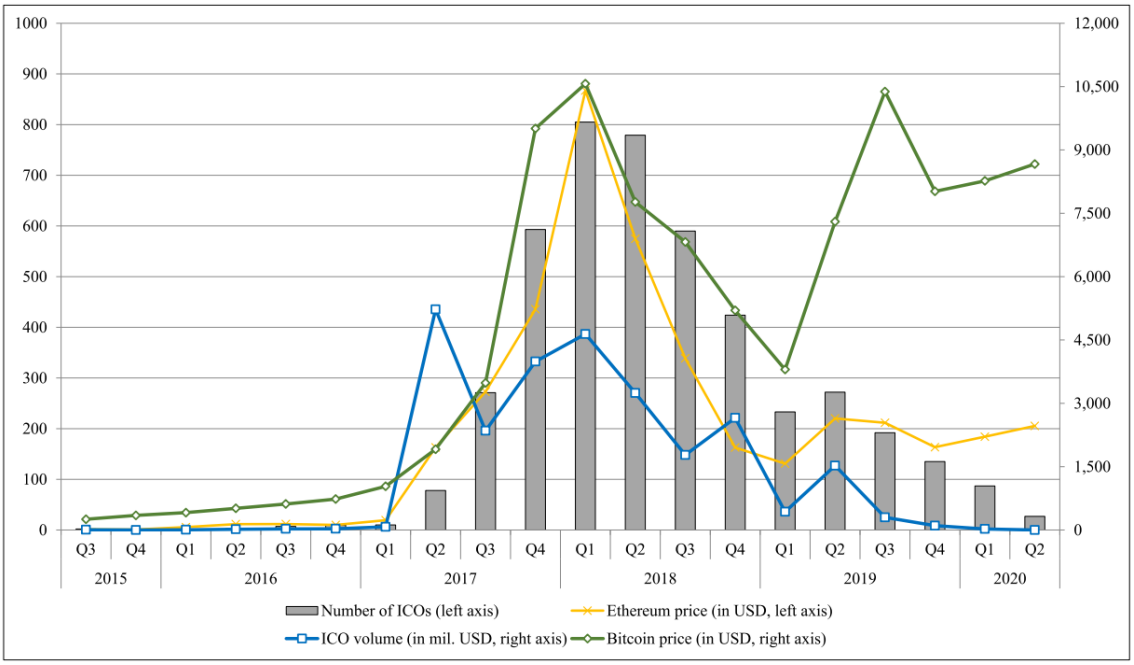


*Figure 2 :Evolution in the Number of ICOs, Volume and BTC/ETH Price 2015-2020 (Bellavitis et al., 2021)*

US Security Exchange Committees' decision in 2018 that declared that all tokens issued in ICOs are considered by default as securities, unless proven otherwise led to a change in behavior of ICO issuers, while this decision is still in effect (SEC.gov, 2021). Looking to reduce the uncertainties related to ICOs, issuers that strived for regulatory compliance, started offering security tokens, giving out equity, dividends and voting rights to investors, introducing Security Token Offerings (STO). Ventures offering utility tokens or coins avoided launching on US jurisdictions to avoid sanctions and fines opposed in the case their token offering got characterized as a security offering. Following the decline in ICO funding in 2018, traditional venture capital (VC) funding has nearly tripled reaching $4 billion USD by Q3 of 2018.

Institutional interest has increased with a number of crypto oriented VCs and angel investors entering the blockchain financing market(OECD, 2019). Additionally, as cryptocurrency exchanges were constantly searching for new ways to capitalize on the market, offering services outside of the traditional brokerage model, some exchanges have developed their own tokens, blockchains and launch platforms. The first IEO Launchpad was developed by Binance Exchange and facilitated the IEO of BitTorrent Token (BTT) on January 2019, which sold out within 15 minutes and raised over $7 million USD, while other exchanges looking to capitalize on that trend developed their own launchpads. Over the course of 2019, indications of token sales market stability have emerged, with legitimate projects focusing on avoiding the mistakes of the past and investors exhibiting more rational behaviors.

## 2.2 Theoretical Framework

### 2.2.1 Process and Structure of Initial Coin Offerings

The process of raising funds with an ICO starts with the drafting of the whitepaper which resembling an ICO prospectus and an academic proposal research grant (Li and Mann, 2021b) It becomes available by the ICO issuer and provides a detailed technical explanation of the product, the token distribution and tokenomics, project roadmap and financial information, as well as a team introduction(Barraza, 2019). Token issuers actively use said material and campaigns to advertise their public sale through various channels like social media and dedicated websites, throughout the project development in order to raise awareness and attract possible investors. Before the public sale, some projects are conducting private, strategic rounds of fundraising (presales) where selected groups of investors are given exclusive rights to purchase tokens in discounted prices, meaning that institutional investors like crypto VCs and angel investors are heavily invested in ICOs, often before the public sale. Public sales usually launch with a fixed price, but on occasions there are pre-determined price schedules. Campaigns last for specified time periods and are considered successful, only if they reach the specified soft

cap. In most cases the sale ends when it reaches a certain limit of tokens sold, known as hard cap. Projects only issue a part of the total token supply in the public sales, while issuers tend to hold a part of the supply as reserves, usually locked in smart contracts and used for future financing needs, miner and developer incentives, community growth and marketing. Lately it has become the norm for ICO issuers to require KYC/AML processes for investors in order to participate in the sales, also introducing whitelisting for eligible addresses. Following the public sale, tokens issued are eventually listed on centralized or decentralized exchanges and are actively traded in the secondary market. Investors participate through a page dedicated to the ICO or the project's website, contributing prominent cryptocurrencies like BTC, ETH and FIAT currencies, by transferring them to a specified smart contract address, which then automatically transfers the predetermined amount of tokens to investors' wallets.

### 2.2.2 Determinants of Success

In respect to signaling theory in corporate finance literature, potential investors tend to invest in ventures that signal their quality, since they are more prone to succeed, thus reducing investment risk (Ahlers et al., 2015; Fisch, 2018). Determinants of financing success for ICOs are similar to funding campaigns in traditional capital markets, including characteristics of human capital, quality of the business model, project design, social media activity and community creation. It's crucial for those ventures to signal their quality and technological capabilities, to reduce information asymmetries, attract investors and higher amounts of funding(Chen, 2019; Chod and Lyandres, 2018). A number of studies uses amount raised as a proxy to measure success (Adhami et al., 2018; Amsden and Schweizer, 2018; Liebau and Schueffel, 2019; Zetzsche et al., 2017).

Approaching ICOs with the use of signaling theory Fisch and Momtaz (2019) claim that the amount of capital raised is determined by the existence of high quality code , technically impeccable whitepapers , higher total supply and launching an ERC-20 token. According to Momtaz (2021), venture quality is signaled by CEO loyalty and is positively associated with ICO

success , arguing that loyalty might reduce problems correlated to information asymmetry. Adhami et al., (2018) conclude that ICO success in terms of capital raised depends on a range of factors including open-source code, presale funding rounds and the rights provided by issued tokens such as access to a service or a share in profits. The participation of institutional investors like VCs in presales of a project can signal its quality, attracting more retail investors, potentially increasing campaign success (Hackober and Bock, 2021; Schaefer and Strese, 2021). Howell et al. (2020) highlight the importance of disclosing information and the existence of a whitepaper, while documenting that liquidity and trade volume of tokens is higher when issuers disclose more information about the project. Although Momtaz (2021b) argues that issuers might be prone to moral hazard while signaling the quality of their venture, due to the lack of authorities that audit or impose fines in case of biased signals.

Regarding human capital, research shows the importance of project team, quality of management, team experience in blockchain applications, behavior and transparency, reputation and size, in attracting investors (Amsden and Schweizer, 2018; Ante et al., 2018; Liu and Wang, 2019). Also, dynamics of community creation through the issuance of tokens to developers and investors increase the success for the campaign. Vesting periods for reserves, as well as the percentage of held tokens by the project organization, signal team's commitment to the project (Amsden and Schweizer, 2018; Howell et al., 2020).

The decentralized nature of cryptocurrencies, along with their anonymity, increases the risk of money laundering and fraud (Hornuf et al., 2021), therefore know your customer (KYC) policies are necessary and more frequent for ICOs nowadays. According to Lyandres et al. (2019), the presence of whitelist or KYC/AML requirements is positively associated with the success of an ICO, signaling legitimacy and quality for the project. Investor restrictions like KYC and whitelisting can also create long term relationships between issuers and investors, discouraging and preventing speculators from participating. However, Lee et al. (2021) disagrees, claiming that the KYC policies is an insignificant indicator. Blaseg (2018) states that KYC policies can

reduce the number of potential investors thus the capital raised, considering the additional cost and time needed to implement them.

Social media serve as an important marketing and communication channel for announcing ICOs and distributing information about the underlying tokens and project development progress resulting in reducing the information asymmetry and uncertainty around the project(Chen, 2019; Ofir and Sadeh, 2019). Social media platforms can be strategically used by ventures to influence investors behavior and promote relationships and community creation. Market sentiment and market liquidity are strongly linked to exchange listing and social media activity, implying that issuers have an incentive to creative positive sentiment for investors through social media (Momtaz, 2018). Literature is not yet conclusive to the importance of social media on the success of a campaign but activity on Github, Telegram, Reddit, Twitter and Discord , attribute to the reduction of information asymmetries in the market (Albrecht et al., 2020). Thus, this kind of information disclosure promotes relations between stakeholders and possibly contributes to the success of the campaign.

Amsden and Schweizer (2018) claim that a measure of punctual success is given by the total value raised but argue that long-term success is ICO's strongest measure of success. According to their research long term success is achieved when the issued token is listed on an exchange platform where it's traded with considerable volume. Lyandes et al. (2019) and Momtaz, (2020) also conclude that listing after an ICO campaign is an important indicator for success and a critical milestone for every cryptocurrency project, since it provides liquidity attracting new investors. Lyandres et al. (2019) finds that a higher number of exchanges that list the token is a positive indicator for the success of the project. Benedetti (2019) studies token cross-listings and find significant that trading volume, liquidity, and financial returns increase around cross-listings in different exchanges. Ante and Meyer (2021) supplement these findings by finding abnormal returns on listing day and over the first week after listing, also highlighting those individual

exchanges from their sample, yield higher returns compared to others where listing effects are negligible.

ICO returns differ between different phases of the cryptocurrency market as confirmed by Aslan et al. (2021), Hsieh and Oppermann (2021) and Masiak et al.(2020). Since cryptocurrency and ICO market is extremely volatile and complex, market and investor sentiment are closely correlated to the success of ICO campaigns, with negative investor sentiment generating negative returns in the short term. Performance and capital raised is highly correlated to the performance of cryptocurrency market and especially the performance of BTC and ETH (Hu et al., 2018; Masiakf et al., 2020; Thies et al., 2021). Considering that most ICOs offer their tokens in exchange for these currencies, instead of FIAT currencies, the amount raised is more substantial in hot market conditions.

### 2.2.3 Advantages and Challenges of Initial Coin Offerings

Opportunities and challenges emerge when leveraging blockchain technology and cryptocurrencies to raise capital for new ventures. Challenges are related to the integration of cryptocurrencies in modern finance and include the lack of regulatory standards, the risk of criminal activity, regulatory bans and usage restrictions, security and privacy concerns, and the high volatility of the cryptocurrencies market. Implications are different for each stakeholder and are presented individually in this section.

**Entrepreneurial Perspective**

A range of researchers outline the benefits of choosing Initial Coin Offering campaign to raise capital for a blockchain enabled venture (Andrieu and Sannajust, 2021; Hashemi Joo et al., 2019; Momtaz, 2020; OECD, 2019). The exchange of value facilitated on the blockchain though an ICO can benefit entrepreneurs by:

- Efficiency gains due to disintermediation, reduced cost, absence of institutional supervision and regulatory requirements
- Direct access to a global pool of investors, excluding banned jurisdictions
- Network effects created by involvement of early adopters
- Enabling evaluation of consumer demand at early stages
- Possible alignment of entrepreneur, developer and investor incentives without relinquishing venture control, depending on structure and token type

Challengers emerge for entrepreneurs who choose to launch an ICO due to:

- Regulatory uncertainty can increase future costs and risk due to possible fines or imposed restrictions
- Cryptocurrencies and especially ICOs are highly volatile investments attracting speculators
- Companies that rely on ICOs may face constraint raising follow up capital (Catalini and Gans, 2018)
- Tax inefficiency, due to ICO revenue being subjected to taxation contrary to equity financing. (Heath, 2017)
- Increased communication effort, risk and moral hazard due to entrepreneurs assuming responsibility for due diligence, ICO structure, token distribution and pricing as well as KYC/AML procedures and marketing
- Complexity of blockchain technologies and limited integration to traditional finance can exclude inexperienced investors from participating.
- Decentralized governance can cause conflicts of interest between token holders and the venture (OECD,2019)
- The combination of threat of cybercrime and immutable nature of blockchains

**Investor Perspective**

The high-risk nature of investing of ICOs envelops significant returns but also increased risk for participants. Investors can be benefited by:

- Potential rapid capital growth and rapid exit options by the secondary market
- Increased financial inclusion by allowing retail investors to directly participate in early-stage venture financing.
- Transparency, immutability, security and decentralization of public blockchains allows for reduced counterparty risk and self-custody of funds.
- Controlled exposure and reduced risk due to token fungibility and fractionality
- Redistribution of platform gains and offered utility of tokens in platforms and services.

Despite the advantages, participating in ICOs exposes inexperienced retail investors to unidentified and undocumented risks such as:

- Lack of framework for ICO regulation and consumer protection increases risk of fraud
- Immutability of blockchain transactions can potentially cause the irretrievability of embezzled funds
- Occurrence of “Gas wars” on public blockchains like Ethereum, were participants can overrun the transactions of others by paying higher transaction fees, gaining priority in public sales.
- Insider trading or exaggerated claims of ventures along with the high volatility of crypto assets can expose investors to significant loses from price depreciation

### 2.2.4 Global Legal Aspects

Huang et al. (2020) state that USA, Singapore and Hong Kong are among the main countries in terms of number of campaigns throughout 2018 and 2019, while in Europe, Switzerland and UK lead in number of offers, followed by Estonia and Lithuania. Regulators and the industry are

debating token classification and taxonomy in an effort to figure out what regulations should apply to them without constraining innovation. Tokens could be considered financial instruments, securities, commodities, non-cash payment facilities or managed investment schemes, depending on their characteristics. Disintermediation and flexibility offered by ICOs is a major challenge for regulators aiming to maintain financial stability and investors' trust. Kaal (2018) shows that legislators have adopted very diverse approaches, from total bans to more minimalist regulations.

In China, Egypt , Indonesia and South Korea among others ,ICOs are considered fraudulent and have been banned in an effort to protect investors (Bellavitis et al., 2021). In United States, the SEC has warned investors about ICOs and enforced campaigns to comply to SEC regulations, introducing Security token offerings (STO). Russia has restricted ICOs to accredited investors while EU countries, Japan and Australia have warned investors about the dangers related to ICOs with the regulatory framework being unclear. Although regulations already and increasingly apply to MSBs (Money Services Businesses) like digital exchanges and payment systems which facilitate token trading, clearing and settlement.

### 2.2.5 Alternative ICO Models

Despite the benefits that the ICO can provide to both investors and companies, there are still obstacles to overcome for token sales to gain widespread acceptance and become a reliable investment option as well as a trustworthy way of raising funds. According to ICObench.com (2021) in 2017, more than 950 ICO were launched, and more than $7.4 billion USD were raised. Performance and volume peaked at $ 4.64 billion USD (approx. 440000 BTC) in the first quarter of 2018, gradually declining after the peak with only $ 31 million USD in Q1 2020. Alternative to ICO models have been developed to diminish the drawbacks of the original.

**Security Token offerings (STO)** was the first alternative ICO model that was developed, in an effort to comply especially with US SEC regulations, as a solution to the major problems of ICOs,

lack of legal framework and ownership rights to tangible assets. Tokens sold on STOs are exclusively classified and regulated as securities (investment contracts) in USA, and are determined as such by the Howey Test, created by US Supreme Court(SEC.gov, 2018). Security tokens are investment driven and their purpose is to provide holders with rights comparable to investment securities. Ventures issuing security tokens are obliged to provide financial reports and risk disclosures in order to be legally and regulatory compliant to US financial authorities. STO campaigns are defined as a regulated security sale restricted to accredited investors, filled to the regulators of a specified jurisdiction but the securities are issued on-chain embedding the characteristic of blockchain assets. Conclusively STOs are not very different to ICOs and could be characterized as regulated and private ICO campaigns for tokenized securities.

**Initial Exchange Offerings (IEO)**. Initial Exchange Offerings are predominantly token sales to raise capital for blockchain startups, facilitated on dedicated launch platforms developed by centralized cryptocurrency exchanges, named IEO Launchpads. IEOs offer flexibility as an interim solution addressing issues of ICOs and STOs, therefore have gained popularity among blockchain startups aiming to avoid using the ICO or STO model. They are designed to mitigate risk, ensure secondary-market liquidity and minimize delay in the listing process for tokens, while the exchange servers the role of the underwriter. Issuers are benefiting from the infrastructure and expertise of the launchpad, as well as the exchange's client base and reputation, sharing the effort and cost of pre-fundraising processes such as listing, KYC and marketing. Exchanges are benefited with increased trading fees, increased traffic, percentages of proceeds and exclusive listings. Although issuers reportedly pay expensive fees on exchanges for those services while relinquishing part of the control over the project. Investors are benefited by simplified access, guaranteed listing and a form of trust induced by the enforced regulatory compliance on cryptocurrency exchanges and the alignment of interests. In countries with developed financial markets like the US, exchanges are strictly regulated, falling under the regulatory scope of Bank

Secrecy Act (BSA) and Financial Crimes Enforcement Network (FinCEN) while being obliged to comply with AML/KYC/CTF guidelines. Regulated exchanges facilitate crypto to FIAT trading and depositing via credit card services, bank deposits and wire transfers, enabling more investors to onboard the cryptocurrency ecosystem. Moreover, blockchain transaction fees do not apply on IEO campaigns since sales are conducted on the cryptocurrency exchange platform instead of on-chain. Nevertheless, investors relinquish the custody of their funds, the security and transparency offered by blockchain infrastructure, going against the decentralization ethos of public blockchains. Exchanges are also subjected to cyber-attacks and thefts since their centralize nature creates single points of failure, contrary to public blockchains. IEOs deal with the same regulatory and legal compliance issues with ICOs and are still unregulated and unapproved by US SEC (SEC.gov, 2020), resulting to US residents being restricted from participating.

**Decentralized Autonomous Initial Coin Offering (DAICO),** is a model originally conceptualized by Vitalik Buterin in early 2018 (Buterin, 2018) and it's an improvement on the ICO fundraising model, that incorporates certain aspects of Decentralized autonomous organizations. It is enabled by processes relying on smart contracts and governance tokens where investors vote on proposals regarding the allocation of funds raised by the funding campaign towards the development of a project. This model induces transparency, decentralized governance and accountability to the developers since the counterparty is the protocol controlled by investor's vote. It's very complex model to implement especially for startups with no experience, requires sophisticated and experienced investors that will participate in decision making. Simultaneously investor participation in decision making constrains the freedom of the venture and the listing process of the token for trading in the secondary market is not guaranteed contrary to IEOs.

### 2.2.6 Information Asymmetry, Signaling Theory and Underpricing

As previously discussed, the quality of a project, technological innovations, accessibility, social networks, investor expertise and motivations are the main factors that determine the

success/failure of a cryptocurrency fundraising campaign and eventually of the project. Aside from those factors, information asymmetry is the fundamental concern of ICOs and other alternative financing structures. The concept of information asymmetry was introduced by Akerlof (1970) and arises when one party is unaware or partially informed of the characteristics of its counterparty, or when one party is concerned about its counterparty behavior or intentions (Courtney et al., 2017; Rui Chen and Chen, 2020; Zhao et al., 2019). Potential investors are unsure about the quality of the project and the teams' credibility, and they can't only depend on issuer promises or rating websites that might be biased. On the other hand, issuing startups usually lack sufficient knowledge of the market and investors. In line with the crowdfunding financing literature, information asymmetry presents several challenges for platform design and governance in terms of the moral hazard problem. Additionally, adverse selection and moral hazard problems are key challenges associated with asymmetric information for means of financing or investments (Darrough and Stoughton, 1986; Zhao et al., 2019). As a result, asymmetric information is one of the major factors causing investor uncertainty, and could potentially impact on the success of traditional crowdfunding campaigns (Ahlers et al., 2015; Belleflamme et al., 2015; Rui Chen and Chen, 2020) and token sale campaigns. Underpricing is used in some studies as a proxy for success and occurs as a result of the large information asymmetry between the ICO issuers and investors (Benedetti and Kostovestky, 2021; Momtaz, 2020; Hsieh and Oppermann, 2021). Meaning that the venture issues the token at price below the fair value, but then adjusts to a market price during the listing phase in the secondary market. Aslan et al. (2021) shows that underpricing can be explained by offering price, market sentiment, capital raised, low trading volume prior to listing and the duration of the campaign

In tandem with information asymmetry, signaling theory can contribute to conceptualizing token sales (Aslan et al., 2021; Ofir and Sadeh, 2019), as the objective of signaling theory is to reduce information asymmetry between counterparties with the use of signals (Connelly et al., 2011; Spence, 1973; Vismara, 2018). Therefore, we are enabled to use signaling theory to

investigate the determinants of success mentioned above for ICOs and for new alternative token sale models.

### 2.3 Conclusions

Cryptocurrencies offer businesses and individuals lower transaction costs, higher efficiencies, increased security and privacy, meaningful diversification benefits, alternative financing solutions, and financial inclusion. Token sales market is dynamic, fast-paced and volatile, meaning that the process of raising capital with public ICO campaigns for blockchain enabled ventures, especially for startups, is currently unsustainable practice due to the lack of regulatory clarity and extensive moral hazard and information asymmetries, attributed to disintermediation, lack of issuer obligations and supervision, and investor protection. Considering that these ventures are in early stages of development, ICOs are considered to be risky investments. High risk is induced by limited access to information, technological expertise needed to participate and as mentioned above, lack of institutional supervision. Except for STOs, the regulatory environment is still uncertain in most jurisdictions. While the cryptocurrency market gradually matures big players like VCs and cryptocurrency exchanges sought to develop solutions to revive the token sales market and finance the next generation of blockchain projects. The developments on smart contract technology and DeFi have also provided mechanisms to improve the structure of token sales and reinvent decentralized token sales. Since blockchain technology is constantly evolving and adoption is surging, the cryptocurrency market has recently reached unprecedent highs in capitalization. Initial Exchange Offerings and Launchpad platforms are now an established centralized alternative to raise capital, but the implications of stakeholders as well as their performance are not extensively covered by researchers. New decentralized financing models that have recently emerged are claiming a big share of the market once hold by ICOs and recently by IEOS and are not yet examined in published literature as a separate model, contrary to the cryptocurrency ecosystem where they are distinctly differentiated from ICOs. Moving forward we present the methodology used, in an

attempt to complement existing literature, by reviewing the evolution of the token sales market and stakeholder implications, as well as the development and performance of decentralized campaigns and launch platforms in relation to their centralized counterparts.

## 3. Methodology

### 3.1 Introduction

In this section, we provide the research methodology that was applied in an effort to address our research questions. The conceptual framework drawn upon the theoretical framework is used to develop the methodology to understand the complex process and market of Initial Coin offerings and interpret how the determinants of success apply to alternative models. Simultaneously explore the development and returns of new models and dedicated launch platforms for these campaigns, as well as their implications and influence on campaign performance.

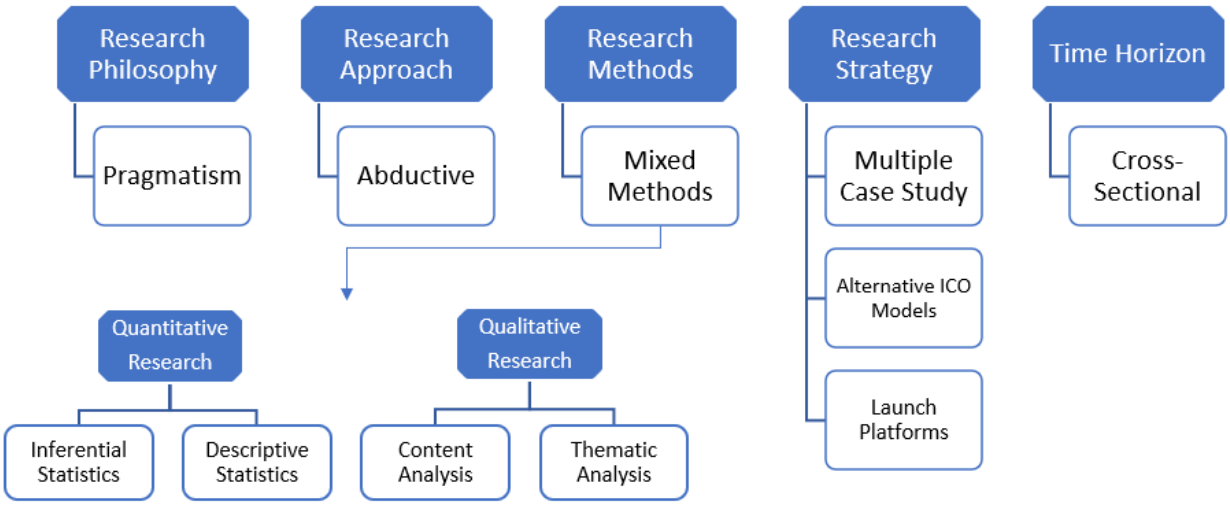


*Figure 3: Structure of methodology*

### 3.2 Research Philosophy

Research philosophy refers to the system of assumptions and beliefs regarding the development of knowledge (Saunders et al., 2019). These assumptions include the ontological assumptions

(regarding nature of reality), epistemological assumptions (regarding human knowledge) and axiological assumptions (regarding the role and value of ethics)(Holden and Lynch, 2004; Hopper and Powell, 1985). These assumptions shape all aspects of the research process and design (Feilzer, 2010). Since our assumptions don't fit under a specific framework in the duality of objectivism-subjectivism paradigms, we choose pragmatism as the research paradigm of this thesis. Pragmatism is particularly relevant in finance research because it addresses truth, rejecting the dichotomy of fact/value present in other philosophies, considering the existence of multiple realities that overlap and can be interpreted differently. Pragmatism strives to reconcile both objectivism and subjectivism, facts and values, accurate and rigorous knowledge and different contextualized experiences by considering theories, concepts, ideas, hypotheses and research findings not in an abstract form, but in terms of the roles they play as instruments of thought and action, and in terms of their practical consequences in specific context. Truth is conceived as a product of collective agreement and is structured as the result of processes and interactions between humans and natural factors (Almeder, 2015; Powell, 2002). The purpose of pragmatism-based research is to provide a practical outcome, which is achieved by having a direct application in the real world (Creswell and Clark, 2007). Blockchain technology applications can affect a variety of sectors and change fundamental realities of how social constructs work in finance, governance and fundraising by incorporating transparency, democratization and disintermediation. Therefore, we assume that blockchain technology and blockchain crowdfunding models do not have one reality while they are still developing and could be interpreted differently in different contexts, although absolute reality exists on the code that governs the networks. Technical aspects need to be evaluated accurately but they might have direct or indirect social, organizational and financial implications. Since we study an emerging phenomenon that allows for a variety of interpretations we choose a pragmatists philosophy, thus our research approach can be chosen depending on what is appropriate for the specific research (Feilzer, 2010), we proceed with an abductive approach and a mixed methods design of quantitative and qualitative research as described below.

### 3.3 Research Approach

Research reasoning usually involves testing or developing a theory and it is often depicted with two contradicting approaches of deductive or inductive reasoning. Deductive reasoning is when a conclusion is logically derived from a series of theoretical assumptions, with the conclusion being true if all of the assumptions are true. Contrary to inductive reasoning where a logic gap is observed between the conclusion and the assumptions, with the conclusion being examined in order to be supported by the observations made. (Ketokivi and Mantere 2010; Saunders et al., 2019). In our case we collect data to explore a phenomenon, identifying themes and explaining patterns, in an attempt to generate or modify an existing theory that will be tested through additional data collection and analysis. Instead of moving from theory to data (deduction) or data to theory (induction), we adopt an abductive approach which alternates between deduction and abduction, effectively combining them (Lawrence and Suddaby, 2006; Saunders et al., 2019). Abduction begins with the discovery of a "surprising fact," followed by the development of a plausible theory as to how it could have occurred. Some plausible theories can account for what is observed better than others (Van Maanen et al.,2007), and these theories that will help uncover more "surprising facts" while arguing that deduction and induction are complementary to abduction as logics for testing plausible theories.

### 3.4 Research Design and Strategy

Pragmatism is a commitment to uncertainty, an acknowledgement that any knowledge ‘‘produced’’ through research is relative and not absolute, that even if there are causal relationships they are ‘‘transitory and hard to identify’’ (Feilzer, 2010; Ferasso, 2020). Pragmatism dismisses the quantitative/qualitative dispute and concludes the paradigm war by arguing that the most important question is whether the research has helped ‘‘to find out what [the researcher] want[s] to know’’ (Hanson, 2008). Our aim was to uncover the reason for subsequent actions of stakeholders in the token sales market, understand the reason for

phenomena and to measure what predicts their occurrence to some extent as a result of processes and interaction between human beings and technology. Mixed methods design is an approach to tie together several steps in an evaluation process and involves collecting, analyzing and integrating qualitative and quantitative research in single study, to provide a better understanding of a research problem.

A multiple case study design fits our aim of updating the literature on the evolution of the token sales market, in consequence of the abandonment of the ICO model, the emergence of centralized and lately new decentralized alternative models and their implications with stakeholders and the ecosystem. Ridder (2017) defines a case study as "a systematic study of a real-life phenomenon in-depth and within its environmental context", while Yin (2014) argues that the difficulty lies in deciding a specific case study, but a well define purpose of the research can help establishing selection criteria. A case study investigates and analyzes one or more phenomena in depth, either over time or in comparison to other cases. The exploratory designed is used to address the "how" questions, the explanatory to design is used to answer "why" questions while the descriptive is used to investigate relevance (De Massis and Kotlar, 2014). The argument supported by Yin (2014) that a single case study might be inadequate in addressing the research question and struggle producing generalizable results led us to choosing the multiple case study design. The most significant advantage of multiple case studies is the facilitation the of comparison of findings (Yin, 2014), which makes them a good choice for developing theories from examples and findings by allowing for comparative analysis, going beyond a particular setting. Despite the limitations, in order to increase credibility and validity of our research we choose to perform a multiple case study of alternative ICO models parallel to a case study of launch platforms. Launch platforms are interconnected to alternative models so their involvement in this study is crucial to be able to effectively evaluate their differences. The review of empirical ICO research and an exploratory study of determinants of success of ICOs led us to recognizing how IEO characteristics diminish the shortcomings of ICOs and how they affected the development of launch platforms and new decentralized alternatives.

Consistent to the pragmatism philosophy where truth is conceived as product of collective agreement and is structured as a result of processes and interactions between humans and other factors, we make some assumptions consistent with the collective reality of the cryptocurrency and public blockchain ecosystem. Taking that into consideration we develop a framework to classify different ICO models. We classify them in three categories as Initial Coin Offerings (ICO), Initial Exchange Offerings (IEO) and Initial DEX Offerings (IDO), dismissing STOs as they are regulated and restricted for retail investors therefore are not public sales.

### 3.4.2 Qualitative and Quantitative objectives

Qualitative data which are principally derived from words and images, are believed to be "more varied, elastic and complex" (Saunders et al.,2019). Qualitative research tends to provide rich and contextualized information, centered on live experiences (Miles and Huberman, 1994). We perform qualitative research to identify in literature the factors and characteristics of Initial Coin Offerings that determine the success of an ICO campaign and simultaneously the factors that led to the abandonment of the model as the primary model of raising capital for blockchain technology ventures, a premise which is supported by quantitative data about ICO performance. We extract information from the nascent literature and web sources to examine the development of alternative ICO models that have now claimed the biggest share of the token sales market. We perform thematic analysis to search for themes or patterns that occur and identify the differentiating technical or structural characteristics of the alternative models compared to the original ICO model and present them while trying to highlight how these differences can influence the returns and performance of new campaigns, considering the emergence of launch platforms and the implications of all stakeholders (Entrepreneurs, Platforms, Investors). Followed by content analysis to examine the relationship between variables and analyze these data with a qualitative approach. Proceeding by quantitatively comparing the returns of alternative models in the created dataset. Concluding we bring the approaches together to explain the quantitative findings about their performance and the performance of launch platforms, supplementing the analysis with the qualitative findings. As

proposed by Leech and Onwuegbuzie (2007) we attempt with this research, through personal interpretation of the meanings, to establish a holistic picture to fully understand the phenomenon, the future of cryptocurrency funding and the implications for investors, entrepreneurs and the public blockchain ecosystem.

**3.5 Data collection preparation and analysis**

To develop the conceptual framework to categorize the alternative public campaign models based on their characteristics, dynamics and determinants of success, in relation to ICO, crowdfunding and IPO literature as mentioned in the theoretical framework (2.2), we conducted systematic searches of keywords carried out in October 2021 without a specific time horizon on scientific databases and web sources (webpages, online communities and online media). Scientific databases include Science Direct, JSTOR, SSRN, Research Gate, Springer and the academic search engine Google Scholar, using a variety of combinations of terms such as *Blockchain, *Crowdfunding, *ICO and *Initial Coin Offering, *Initial Exchange Offering, *IEO, *smart contracts, *DeFi etc. By deploying the backward snowballing technique, we identified and examined additional relevant literature, through the process of the research, as our objectives became apparent. Due to infancy of the subject a wide variety of web sources were used, but their validity is supported from cross referencing information on different sources. The observation method is widely used for the systematic observation, recording, description and interpretation of people's behaviors (Saunders et al., 2019), while internet-mediated observation involves collecting data while observing or participating in online communities, taking into consideration the internal and external validity of internet-based research, (Mathy et al., 2003). Despite personal involvement with the cryptocurrency ecosystem, the author has not participated in any of these projects other than reading available material, while we strive to avoid observation, sample-collection and confirmation biases. According to Hox and Boeije (2005) and Salkind (2010) primary data sources refer to an original data source in which the author collects the data first-hand, for a specific study or project objective, whereas secondary

data is characterized as the opposite of primary data, referring to material that has previously been obtained for other purposes. Since our study collects publicly available data from Cryptorank.io (CryptoRank.io,2021) ICO listing website, but supplements and cross-checks them with a variety of other listing websites and web sources such as dedicated campaign web pages, exchange and launch platform information manually, using the aforementioned definition our data can be considered primary data.

### 3.5.1 Sampling

Time horizon for our research is considered to be cross sectional as the study takes place in a specific point in time [Nov. – Dec. 2021] creating a snapshot of a particular market in time, prompting for further research. To ensure validity of the research while addressing the research questions sampling and boundaries of the study must be determined carefully. In order to achieve the research objectives and answer research questions with the author's judgment, a purposive sample method is utilized (Saunders et al., 2019). We choose to examine only successful (reached soft cap) public sales of ICOs, IEOs and IDOs as categorized by Cryptorank.io and supported by the developed framework. The initial dataset and tables were constructed in Excel [Microsoft Office 365], by publicly available data collected from the webpage Cryptorank.io, the only listing website offering clear distinction between different types of token offerings. This database was supplemented and cross checked manually with data from other ICO tracking websites such as ICObench.com, Coincodex.com, ICOdrops.com, ICOholder.com, Coinmarketcap.com and dedicated websites, then merged and cleansed to construct the final data sets and the references for data web sources are included at the Data References section. Our dataset includes the outcomes of Public Sales for 467 ICOs ranging from 2017 to end of 2021, 357 IEOs and 1245 IDOs ranging from 2019 to the end of 2021, where some projects conducted both types of sales (sample #1). Comparative analysis is performed for entries in the period 2019 to 2021, since ICO returns for that period are extensively covered by published empirical research, although we use ICO data from 2017-2018 to provide visual representation of the evolution of the market. **Sample #1** is used to examine the amounts of capital raised for

funding campaigns of all types (ICO, IEO, IDO) and the capital raised by individual launch platforms for IEOs and IDOs, while the availability of data allows us to present a timeline of blockchain sectors that receive funding through time. Sample #1 includes six variables that are used to formulate our findings, which are presented below:

1. Project name
2. Capital raised
3. Campaign launch Platform (for IEOs and IDOs)
4. Type of campaign
5. Sector
6. Campaign end date

The amount of capital raised is commonly used as a measure of performance for ICO campaigns but also on crowdfunding and IPO campaigns as mentioned in literature review chapter (Adhami et al., 2018; Amsden and Schweizer, 2018; Liebau and Schueffel, 2019; Zetzsche et al., 2017).

Underpricing is a phenomenon of high occurrence to financing literature and ICO literature as mentioned in the theoretical framework (Benedetti and Kostovestky, 2021; Momtaz, 2020; Hsieh and Oppermann, 2021; Ljungqvist, 2007; Loughran and Ritter, 2004; Salerno et al., 2021), although unavailability of data to calculate 1$^{st}$ day Initial returns for campaigns due to lack of established sources or free APIs and the complexity involved, we cannot calculate underpricing for ICO IDO and IEO campaigns in our sample. Considering that issuing projects don't sell the entire generated supply of the token and a part of it is kept by the team or distributed to different parts of the venture for future development, marketing etc., assuming it can possibly be sold in higher prices in the future. Hence return on investment is not only relevant for investors to assess the performance of a fundraising campaign, launchpad or financing model, it is also relevant for issuers. Since information for tokens or coins purchased at the date of publics sales was publicly available in the listing websites, we extracted data regarding the returns at All time high prices for each public sale and the returns at a specific date of sampling.

This sample (**Sample #2**) enables us to depict the potential returns for issuers and investors the peak of the cryptocurrency market capitalization today, at almost $3 Trillion USD [04 November 2021] (Coinmarketcap.com,2021). The constructed second sample includes seven variables, presented below:

1. Project name
2. Sale rice
3. All-Time-High (ATH) price
4. Current price (4th November 2021)
5. Campaign launch platform (for IEOs and IDOs)
6. Type of campaign
7. Campaign end date

Using these variables, after cleaning the data for inaccuracies and incomplete information, the detailed data available for analysis purposes in the resulting Sample #2 was 128 ICOs, 872 IDOS and 332 IEOs that concluded their campaigns from the start of 2019 to the 4th of November 2021, when we collected the price feed data. The modified smaller sample was constructed, due to the sheer number of IDO campaigns conducted in December of 2021 and inconsistencies found in listings of recently completed campaigns on ICO aggregator websites. Public sale entries with inadequate information and limited listings on these websites were dismissed from the dataset.

Following the construction of final datasets we calculated the Mean, Median, Standard Deviation(σ) values and Range (min, max) for the capital raised and returns variables. Descriptive statistics are generally used to describe variables and focus on two aspects: the central tendency, and the dispersion (Saunders et al.,2019), quantitatively explaining the patterns and trends of the dataset and giving a summary of the data in numerical values. For additional validity we performed calculations in 'R" programming environment [version R-4.1.3] to exam

normality of distribution in dataset and subsets and proceeded with inferential statistics. The findings are then presented and interpreted eventually linking quantitative and qualitative findings in the conclusions section.

### 3.5.2 Data Limitations

Our data and research findings are subjected to several limitations due to the infancy of the market, sample size, and possible inaccuracies in retrieved data, due to the lack of established sources. It's impossible to manually access reliable data for campaigns that didn't reach the predefined soft cap and returned funds back to investors, thus failed. The data set constructed is compiled exclusively with successful campaigns that reached the soft cap, from different ICO aggregator websites, since there is no standardized or universal data source for token offerings. Bourveau et al. (2018) highlights the importance of ICO rating websites on reducing information asymmetry, although potential bias concerns arise with these websites, given the pay to list model and the different approaches to retrieving and listing information. The number of ICO tracking websites is limited and due to fluctuations of interest and the market, some websites used on previous research are not updated or have been suspended. Limitations also appear due to the unclear overlap and differences between different ICO listing websites, so results can be interpreted locally for campaigns contained in our final dataset.

## 4. Findings and Data Analysis

As developers and entrepreneurs tried to distance themselves from the infamy of ICOs, alternative to IEO and ICO models have been introduced with different definitions and functions such as the aforementioned DAICO and IGO ("Initial Game Offering (IGO) | CoinMarketCap," n.d.) which refers to sales of tokens to fund blockchain gaming projects. We develop a classification framework for public sale campaign models categorizing them in three distinct categories based on their characteristics and the industry narrative.

### 4.1 Model Specification

#### 4.1.1 Initial Coin Offerings

ICOs are characterized as the direct sales of digital assets, facilitated on centrally controlled by the issuer project site or dedicated ICO website, where investors contribute FIAT currencies through an interface or send cryptocurrencies through their blockchain wallet to a specified smart contract address that transfers the predetermined amount of pre-minted coins or tokens to their wallets. Issuers control the entire supply of the token and distribute it directly to investors without any supervision or assurance regarding fund distribution and the creation of additional token supply. Decentralization is only present in ICOs in terms of the self-custody of distributed tokens and on chain transaction immutability and transparency. Issuers could possibly generate additional tokens or coins, sell them in the secondary market if the token or coin is listed on a cryptocurrency exchange, devaluating the initial investment of participants. Investors have to rely on entrepreneurs to commit to their obligation of proceeding with developing the project or returning the funds if the campaign fails to reach the specified soft cap, in case it is not coded to the smart contract. In recent events Initial Coin offerings are successfully conducted by teams with extensive experience on building blockchain applications, as they require the project to assume the responsibility of pricing their token or coin, structuring the sale, KYC/AML and possible legal requirements, marketing campaigns and stakeholder relations, vesting schemes and distribution of supply through development. ICOs campaigns can rapidly raise substantial amount of capital in the expense of increased risk, cost and effort for issuers.

#### 4.1.2 Initial Exchange Offerings

IEOs are characterized as the public sales of digital assets facilitated on dedicated centralized launch platforms, developed by cryptocurrency exchanges. Tokens are minted before the public sale and instead of processing on-chain transactions across blockchains and wallets, utility tokens or coins are sold to investors through the exchange platform. Launching an IEO on an

exchange launchpad guarantees the listing of the token on the exchange ensuring immediate secondary market liquidity.

Prominent launchpads do not only provide a platform for startups to launch their tokens, as they serve the roles of business accelerators and incubators for ventures looking to conduct and IEO and the roles of an underwriter and a counterparty between entrepreneurs and investors (HackerNoon.com, 2021; Cointelegraph.com,2021). Established launchpads perform due diligence to confirm the credibility of the venture and project team, while assessing the unique selling points, tokenomics, MVP and development as well as the trajectory for the project. Additionally, they provide expertise related to technical requirements, smart contract construction, marketing, offering structure, listing process, research and marketing material while handling KYC/AML procedures through the exchange platform ensuring regulatory compliance. Investors interested to participate in the sale need to create an exchange account and go through Know Your Customer (KYC) and Anti-Money Laundering (AML) procedures before gaining full access. Vesting schemes, token distribution, whitelisting, participation and allocation limits for participants are handled by the exchange off-chain and are usually determined by the amount of exchange token holdings of each participant (Binance.com, 2021).

#### 4.1.3 Initial DEX Offerings

The common variable in these alternative ICO campaigns is the devotion to the principles of decentralization, openness and transparency that accompany blockchain technology, which were present in ICOs only in the matter of custody of funds and means of transacting (on-chain).

IDO campaigns were enabled by innovations on DeFi and decentralized protocols on Ethereum network, where through complex smart contracts and interoperability between decentralized protocols, complex financial structures and services can be deployed. Leveraging decentralized cryptocurrency exchanges, projects seeking capital could autonomously launch their token by creating a liquidity pool of the issued digital asset versus a prominent cryptocurrency or

stablecoin. Participants are prompted to contribute their currencies to the pool in advance and receive their new tokens upon the Token Generation Event (TGE), thus avoiding the issuance of pre-minted tokens that favors issuers over the investors. Initial DEX Offerings provide frictionless liquidity, immediate trading, and significantly lower listing costs without restricting user or issuer access, as tokens can be immediately traded on the DEX after initial distribution, while participants are additionally incentivized to provide liquidity on the DEX's pools. Since the process was conducted on chain Gas wars and frontrunning have resurfaced, while the AMM formula powering DEXs, dynamically adjusting the price on the pool, led to significant appreciation from the initial sale price before the end of the campaign.

Probably influenced by IEOs, developer communities have advanced IDOS by creating decentralized launchpad platforms that are dedicated to facilitating IDOs, leveraging DEX mechanics and pools while addressing the issues of ICOs and offerings conducted on decentralized exchanges. Launchpads offer on their platforms a wide range of services, including smart contract construction, liquidity pools, structuring the sale and vesting mechanics along with KYC and governance procedures, offering support, visibility and growth for new projects, either by integrating services of other Dapps or developing by their own. Launchpads provide a range of sale and auction mechanics, such as fixed price pools and Dutch auctions, while some offer multi-chain support. Launchpad users are prompted to use DeFi mechanics such as staking and liquidity providing with the launchpad token. Users who hold the token and utilized those services are becoming eligible to participate in IDOs hosted on the platform by contributing and locking cryptocurrencies until the token generation event. Participation limits and allocations are usually analogous to token holdings, while in some cases these launchpads are also DAOs, where an IDO is hosted if it's voted and supported by decentralized governance procedures. Following the IDO, tokens are listed on the launchpad's DEX and is usually followed by frictionless and censorship free listing on other DEXs. Investors retain the self-custody of their funds, while all procedures are governed by transparent, immutable and verifiable smart contracts.

### 4.2 Launchpad Implications

The introduction of launchpads indicates the need for a trusted counterparty when conducting financing campaigns with public sales of tokens or coins, considering the regulatory uncertainty in the cryptocurrency environment. How those platforms reduce uncertainty and risk around campaigns is different between IEOs and IDOs in terms of disintermediation, censorship, transparency, decentralization and revenue model. The common denominator is that those platforms contribute to reducing information asymmetry between entrepreneurs and investors, increasing transparency and trust between counterparties, potentially leading to creation of value. Launch platforms serve the role of a third participating counterparty in these campaigns. They help ventures signal their quality to investors while simultaneously informing them about the project, providing channels for communication and community building. Launchpads promote innovation by providing the platform and infrastructure to conduct a campaign, reducing moral hazard, risk and communication effort for issuers, while they can exclusively focus on developing and optimizing their product or service. The implications for stakeholders and determinants of success for centralized and decentralized launchpads are presented below.

#### 4.2.1 Centralized Launchpads

Determinants of success for a project that is launching through an IEO launchpad are comparable to determinants of success for ICOS as mentioned in literature, but performance is influenced by additional factors. The most significant difference is that exchange listing is not a determinant for success for an IEO, as tokens or coins are guaranteed to be listed on the exchange. IEOs and launchpads address the shortcomings of ICOs by amassing and centralizing control over the campaign, providing a seamless experience off-chain, implementing individual participation limits and providing assurances to investors through their credibility and regulated nature, but in cost of decentralization, disintermediation, loss of control for the project and access to finance due to potential censorship. Since a framework or a standardized process of scrutinizing, hosting and co-promoting an IEO campaign does not exist, performance of a

campaign is not only correlated to aforementioned factors like market sentiment and signaling of the projects and team's qualities, but it is also highly correlated to the exchange's user-base, volume and reach as well as reputation and procedures followed by the exchange-launchpad. Implications for each counterparty are presented below:

- **Exchange Launchpads** are additionally benefited by attracting new users, increasing awareness for their services, increased demand and price appreciation for the exchange's token. Although launchpads might be prompted to disclose information, exaggerate signals or recklessly audit the projects to increase revenue, resulting in increased moral hazard for the exchanges.
- **Investors** are getting access to innovative early-stage investments, on a platform that research and community portals with key details about the project, developments, activity overview, social and community channels which contribute to reducing information asymmetry, leading to rational choices and successful investments, and additionally offers guaranteed listing and secondary market liquidity for fast exit. Although investors that are motivated by the self-custody, transparency, disintermediation, pseudonymity and security characteristics of public blockchains are ideologically deterred from participating. Additionally extreme price appreciation of prominent launchpad tokens can exclude retail investors that are not early adopters of the launchpad.
- **Issuers** are benefiting from the shared marketing effort, risk distribution and leveraging of launchpad's expertise on sale structure and valuating tokens, payment channels and userbase to attract a diverse and more experienced pool of investors. Communication effort is reduced for issuers as well as moral hazard since launchpads assume the role of underwriting and managing funds.

Conclusively, the success of a campaign conducted on a launchpad is determined by the fundamental qualities of the venture and their application, but it is also correlated to the

reputation and procedures followed by each launchpad. Performing meticulous auditing on teams, assessing the quality and viability of the project and business model as well as support and guidance offered by the launchpad can accelerate the success of a venture and simultaneously create value for the exchange. Investors still have to perform due diligence before investing on those projects but launchpads induce additional trust by reducing information asymmetry, improving transparency, and aligning their motives with investors'. Considering the lack of regulatory and operational framework, these procedures are not an industry standard and are dependent to the culture and intentions of each launchpad.

#### 4.2.2 Decentralized Launchpads

IDOs can be characterized as the successor of the ICO model. Advancement in smart contracts and DeFi technologies have enabled IDO campaigns to offer the decentralized, intermediated, accessible and fair funding that ICOs have committed to offering. As issuers had to fully assume the responsibility of constructing and conducting the sale, KYC compliance, distribution and communication to shareholders, as well as the moral hazard of signaling, marketing and promoting their token or coin, ICOs involved significant expertise, risk, effort and cost for the issuers. IDOs alleviate the deficiencies of ICOs by delegating some responsibilities of issuers, or exchanges in the case of IEOs, to decentralized blockchain protocols. Token distribution, allocations, supply releases, liquidity and identification are handled by the blockchain, and smart contract services developed by the launchpad or are integrated on their platform. Considering that smart contracts are governed by open-source code, these processes are transparent, immutable and verifiable, resulting in increasing trust between counterparties. Information asymmetries are reduced as launchpads provide visibility and information for upcoming projects as well as research portals and gamified quests to learn about them in some cases. The procedures encoded in smart contracts can also verified on blockchain explorers. Moral hazard is reduced for all counterparties due to decentralized, permissionless, immutable and self-custody nature of IDOs while stakeholders' motives are aligned. No party has direct control as they confer their trust on the blockchain and occasionally investors are prompted to participate

in decision making for launchpads or projects although this can potentially create conflict of interests in same cases.

Despite the decentralized nature, fairness and increased accessibility, most launchpads have priority, lottery and tier systems, promoting their utility and governance tokens, creating barriers for small investors, since allocations are not guaranteed and lately their tokens have significantly appreciated in price, but possibly limiting participation to experienced investors.

Decentralized services are more complex than their centralized counterparts, deterring participants that lack of technological expertise on DeFi applications reducing overall participation compared to IEOs. Listing on a decentralized exchange may provide immediate liquidity for a token but doesn't signal the success for a campaign since there are not any requirements, contrary to established centralized exchanges or decentralized launchpads that perform extensive scrutinization and assessment for projects.

Different launchpads are comprised of different communities of investors and specialize on certain niches like gaming, blockchain research and DeFi or services such complex sale structures, constructing decentralized governance structures, Dapp deployment or have the form of DAOs. In parallel with established centralized launchpads some provide validity, guidance, community building and technological expertise to accepted projects, while on other cases new projects can deploy sales without any supervision or vetting by the launchpad, resulting in the choice of launchpad influencing the performance of the campaign. The procedures, community and promotion of the specific launchpad actively influence the amount of capital raised and returns for conducted campaigns. Although due to reduced cost and decentralized nature of IDO launchpads, projects can choose to launch simultaneously on different launchpads to increase their reach and diversify the pool of investors.

The development of launchpads indicate that complete decentralization of early-stage token financing might be unattainable and ineffective. The developments on blockchain technology have allowed for the creation of IDOs which is a model that reduces frauds, uncertainty and risk

for all parties without deviating from the decentralization ethos. Due to aforementioned implications, vesting periods for private investors and small individual allocations on public sales, the IDO funding and issuance model tends to favor the building of platform economies as well as a more sustainable and healthy market that promotes innovation and fair access to financing. The native blockchain that hosts the launchpad or a campaign is also a factor that influences the potential of campaigns due to lack of interoperability between public blockchains or possibly depends on the amount of available capital in each blockchain ecosystem as ETH based ICOs and launchpads' tend to perform better in terms of raised capital. A notable example of an alternative model of decentralized blockchain financing is developed on Polkadot's ecosystem, for parachain auctions. Polkadot addresses scalability issues with the development of chains parallel to the Polkadot Relay Chain, which are able to parallelize transaction processing and achieve scalability. Parachain slots are auctioned on crowdloan campaigns. Parachains crowdloans allow a project to bid a number of Polkadot's native token DOT to the auction and then crowdsource contributions from project supporters to reward them later with their respective token or coin. It is up to individual parachain teams to decide if and how they want to reward participants who forgo staking and choose to lock their Polkadot (DOT) in support of the parachain's campaign (Polkadot Wiki, 2021).

### 4.3 Quantitative Results and Analysis

In this section we present the findings of sample analysis regarding the performance of ICOs, IDOs and IEOs, as well as the performance of individual launchpads. We also depict the growth of financing for new blockchain sectors through campaign data. Private, Seed and Strategic rounds of investments are not included in calculations but our data reports that 645 projects have conducted private sales, received institutional, VC or angel funding before their public sale.

### 4.3.1 Performance of Models

- **Capital Raised**

Figure 4 reveals the decrease of ICO campaigns and the emergence of IEOs in 2019 with an explosive increase of IDO campaigns, due to their ease of deployment, reporting a 41.47% increase in the total number of campaigns in Q4 of 2021. Table 1 presents the findings of analyzing Sample#1 for the capital raised by each model in the period 2017 to 2021 for ICOs and for the period 2019-2021 for IEOs and IDOs. Data were checked for normality using the Shapiro-Wilk Test which none of the data had. Since the data were not normally distributed (even when log-transformed; confirmed by the Shapiro-Wilk test.

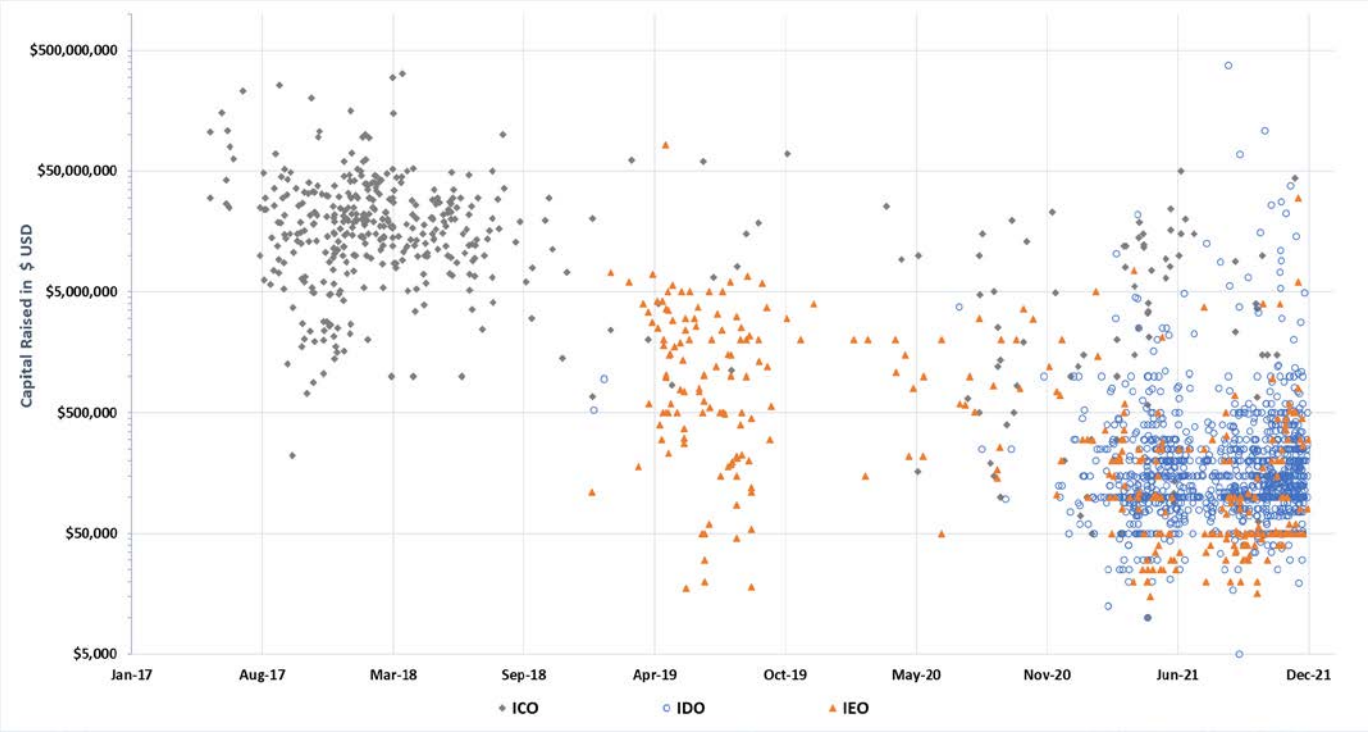


*Figure 4:Capital raised in $ USD by each type of campaign, excluding EOS (4.2 billion $USD) and Telegram (1.7 billion $USD) ICOs, ranging from the Jan-2017 to the Dec-2021. [#Sample 1]*


*Figure 5: Cryptocurrency Total Market Capitalization 2017-2021 [Coinmarketcap.com, 2021]*

**ICO**

| Year | Campaigns | Sum | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|---|
| **2017** | 161 | $4,279,963,970 | $26,583,627 | $15,960,000 | $220,800 | $257,000,000 | $37,932,706 |
| **2018** | 203 | $11,075,389,450 | $54,558,569 | $19,220,000 | $679,450 | $4,200,000,000 | $316,968,594 |
| **2019** | 12 | $250,560,000 | $20,880,000 | $7,345,000 | $850,000 | $69,490,000 | $26,623,777 |
| **2020** | 31 | $168,909,730 | $5,448,701 | $1,350,000 | $100,000 | $25,660,000 | $7,274,313 |
| **2021** | 60 | $414,903,300 | $6,915,055 | $3,370,000 | $10,000 | $50,000,000 | $9,651,948 |
| **Total** | 467 | $16,189,726,450 | $34,667,508 | $14,870,000 | $10,000 | $4,200,000,000 | $210,783,639 |

**IEO**

| Year | Campaigns | Sum | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|---|
| **2019** | 109 | $275,561,410 | $2,528,086 | $1,020,000 | $17,500 | $83,000,000 | $7,992,815 |
| Q1 | 6 | $21,380,000 | $3,563,333 | - | $180,000 | $7,200,000 | $2,814,546 |
| Q2 | 55 | $181,426,880 | $3,298,671 | - | $17,500 | $83,000,000 | $11,082,837 |
| Q3 | 45 | $63,754,530 | $1,416,767 | - | $18,000 | $6,700,000 | $1,717,999 |
| Q4 | 3 | $9,000,000 | $3,000,000 | - | $2,000,000 | $4,000,000 | $1,000,000 |
| **2020** | 36 | $37,312,230 | $1,036,451 | $774,960 | $50,000 | $3,600,000 | $949,686 |
| Q1 | 3 | $4,150,000 | $1,383,333 | - | $150,000 | $2,000,000 | $1,068,098 |
| Q2 | 9 | $8,869,920 | $985,547 | - | $50,000 | $2,000,000 | $742,786 |
| Q3 | 11 | $9,617,310 | $874,301 | - | $143,480 | $3,000,000 | $873,811 |
| Q4 | 13 | $14,675,000 | $1,128,846 | - | $50,000 | $3,600,000 | $1,170,865 |
| **2021** | 211 | $97,777,970 | $463,403 | $75,000 | $15,000 | $30,070,000 | $2,256,370 |
| Q1 | 28 | $17,777,980 | $634,928 | - | $50,000 | $5,600,000 | $1,346,536 |
| Q2 | 46 | $14,123,610 | $307,035 | - | $15,000 | $7,500,000 | $1,128,226 |
| Q3 | 59 | $9,305,570 | $157,722 | - | $20,000 | $3,750,000 | $492,741 |
| Q4 | 78 | $56,570,810 | $725,267 | - | $16,000 | $30,070,000 | $3,486,571 |
| **Total** | 356 | $410,651,610 | $1,153,516 | $200,000 | $15,000 | $83,000,000 | $4,837,425 |

**IDO**

| Year | Campaigns | Sum | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|---|
| **2019** | 1 | $950,000 | $950,000 | - | $950,000 | $950,000 | - |
| **2020** | 10 | $5,821,000 | $582,100 | $125,000 | $50,000 | $3,750,000 | $1,147,833 |
| Q3 | 3 | $4,096,000 | $1,365,333 | - | $96,000 | $3,750,000 | $2,066,617 |
| Q4 | 7 | $1,725,000 | $246,429 | - | $50,000 | $1,000,000 | $338,326 |
| **2021** | 1278 | $1,097,077,460 | $858,433 | $105,000 | $3,000 | $379,260,000 | $11,361,978 |
| Q1 | 100 | $32,782,090 | $327,821 | - | $12,500 | $10,330,000 | $1,069,820 |
| Q2 | 316 | $109,404,130 | $346,216 | - | $10,000 | $21,900,000 | $1,331,631 |
| Q3 | 239 | $528,090,370 | $2,209,583 | - | $5,000 | $379,260,000 | $24,920,375 |
| Q4 | 623 | $426,800,870 | $685,074 | - | $3,000 | $108,850,000 | $5,041,913 |
| **Total** | 1289 | $1,103,848,460 | $856,360 | $125,000 | $3,000 | $379,260,000 | $11,313,790 |

*Table 1: Descriptive statistics for the capital raised by ICOs, IEOs and IDOs campaigns in the period 2017-2021 [#Sample 1]*

Our findings confirm the correlation of number of campaigns to market sentiment since campaigns are increasing in correlation to crypto market capitalization (Table 1; Figure 5). We observe an increase in all types of campaigns following the growth of market capitalization in 2020. Number of ICOs has significantly deceased following 2018 but we discern a slight increase along with market capitalization. 2019 was the year of IEOs as the majority of campaigns conducted in that period (109), were conducted on centralized launchpads and raised approximately $275 million USD, although in the same period only 12 ICO campaigns managed to amass more than $250 million USD. Standard deviation indicates significant differences in performance between different ICO campaigns. Findings confirm that advancements in DeFi in 2020 shifted interest again on decentralized financing campaigns, as along with market capitalization the number of IDO campaigns skyrocketed in 2021 (1278 campaigns). Although some projects simultaneously conducted campaigns on multiple launchpads, increasing the total number of campaigns. In a period where all types of campaigns were available for issuers and investors (2019-2021) IDOs continuously increased their market share, while capital raised amounts to approximately 1.1 billion USD with the majority of capital raised and campaigns conducted in 2021. ICO proceeds in the same period have raised approximately $834 million USD which represent 36% of capital raised, while IEOs 17% and IDOs 47% of the grand total.

Even recently ICOs seem to provide for the highest amount of capital for issuers, but due to increased effort, cost and risk the majority of projects choose to launch through decentralized launchpads where proceeds might be lesser but other implications such as costs, failed campaigns, frauds and diversity of investors and teams are undocumented. Nevertheless, findings imply that IDOs potentially increase access to finance for a wider spectrum of projects, as the number of different projects that received funding is significantly larger than ICOs, indicating a more sustainable and healthier market. Proceeds of IDO are not conclusive to their performance as the majority of campaigns were conducted on a period of positive sentiment in the market and the examined timeframe is limited compared to ICOs and IEOs.

Amidst the crypto winter projects building blockchain infrastructure, exchanges and financial services monopolized the token sales market, and as blockchain technology progressed through 2020, DeFi, decentralized protocols and on-chain data services were developed. Blockchain adoption and applications are continuously expanding especially In DeFi sector which dominated the token sales market in terms of capital raised in 2021. In sum, from 2019 to 2021, DeFi sector applications are leading with approximately $800 million USD raised, followed by blockchain infrastructure with $593 million USD and blockchain gaming sector with $323 million USD. An explosive increase in capital raised, amounting to more than $300 million USD, solely in 2021 (Figure 6).

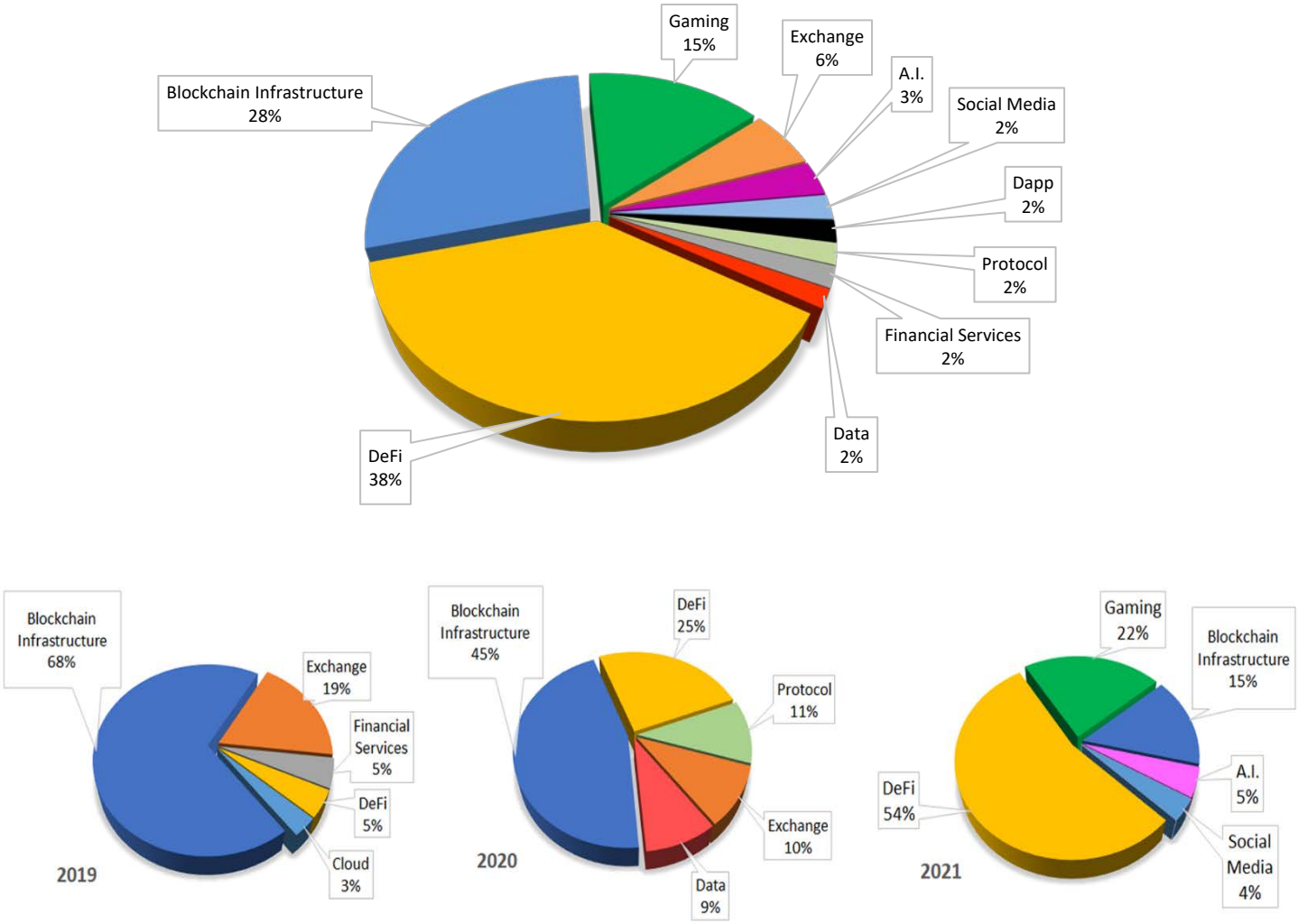


*Figure 6:Top 10 Blockchain Sectors in terms of Capital Raised 2019- 2021 and Top 5 sectors per year. [Sample# 1]*

- **Return on Investment**

Return on investment is examined as a means of estimating the returns for investors and follow up capital that ventures can potentially earn by selling the reserved supply for their financing needs. It can also indicate the percentage of ventures that kept developing their applications, delivering on their promises and effectively communicating with investors, as their tokens keep trading above their public sale price. Sample #2 is used due to recency and the sheer number of IDO campaigns conducted in December 2021, and despite the fact that we used a modified smaller sample, the findings IDOs are not conclusive, considering that we examine short term volatile returns for tokens during a markup phase of the market.

Returns calculated with the current price can provide information and a snapshot of the token returns in a period of highly positive sentiment and expectations from investors, while the ROI calculated at ATH prices for each token shows us approximately, the highest potential gains the team or initial investors could realize by selling their cryptocurrencies at that price. We use this information to make logical inferences regarding the potential returns and implications of each financing model. The percentage of tokens trading with returns less than 100% during the time of sampling, means that these projects do not trade above their initial sale price in hot market conditions. This indicates that delivery and progress in these projects has probably stopped or slowed down significantly along with investors interest, or that team doesn't effectively signals their qualities and ineffectively markets their product or service to increase visibility. In the case of ATH ROI%, tokens that have been trading below the public sale price (<100% returns) at their all-time-high price have never yielded any returns for early adopters even after being traded for as long as 3 years (2019-2021).

Table 2 presents, for each model, the current average returns for initial investors in the day of sampling and at the all-time-high price for each token that launched in the aforementioned period.

## ICO

**Current ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 20 | 918% | 70% | 0% | 5489% | 1458% |
| **2020** | 36 | 4800% | 285% | 6% | 102405% | 17202% |
| **2021** | 72 | 821% | 378% | 0% | 5413% | 1065% |
| Total | 128 | 1955% | 361% | 0% | 102405% | 9257% |

**ATH ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 20 | 2479% | 1320% | 33% | 10638% | 3031% |
| **2020** | 36 | 10852% | 1280% | 115% | 118096% | 23009% |
| **2021** | 72 | 8629% | 1575% | 163% | 135939% | 25926% |
| Total | 128 | 8293% | 1346% | 33% | 135939% | 23028% |

## IEO

**Current ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 113 | 1748% | 52% | 0% | 60002% | 7881% |
| **2020** | 37 | 6908% | 732% | 27% | 133198% | 22382% |
| **2021** | 182 | 990% | 278% | 2% | 10815% | 1872% |
| Total | 332 | 1907% | 181% | 0% | 133198% | 8982% |

**ATH ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 113 | 3404% | 499% | 14% | 100308% | 12281% |
| **2020** | 37 | 11580% | 2216% | 148% | 164599% | 27776% |
| **2021** | 182 | 2313% | 1168% | 43% | 24109% | 3511% |
| Total | 332 | 3717% | 873% | 14% | 164599% | 12236% |

## IDO

**Current ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 1 | 2272% | - | - | - | - |
| **2020** | 9 | 1102% | 111% | 32% | 7442% | 2408% |
| **2021** | 862 | 1259% | 306% | 1% | 33194% | 3336% |
| Total | 872 | 1258% | 306% | 1% | 33194% | 3325% |

**ATH ROI%**

| Year | Campaigns | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|
| **2019** | 1 | 3003% | - | - | - | - |
| **2020** | 9 | 5789% | 2715% | 386% | 29374% | 9145% |
| **2021** | 862 | 3624% | 1206% | 3% | 75253% | 8108% |
| Total | 872 | 3646% | 1209% | 3% | 75253% | 8112% |

*Table 2: Descriptive statistics for Current and All-Time-High price Return on Investment % for ICO, IEO and IDO campaigns in the period 2019-2021 [Sample #2]*

In ICOs and IEOs the mean returns in the examined period are approximately at 1900% at average, meaning that initial investors could have yielded returns x19 times their initial investment. As for IDOs the returns average at about 1250% but with almost twice as much the number of campaigns of ICOs and IEOs combined and IDOs have been conducted mainly in 2021. In the case of ATH price analysis ICO average returns amount to 8293% while for IEOs and IDOs returns average at 3600%. Our findings indicate the ICO model offers the highest proceeds for issuers and investors in average but the amount of ICO campaigns conducted is proportionally lesser than other models and compared to ICO history, probably due to high uncertainty and risk involved in issuers directly interacting with investors.

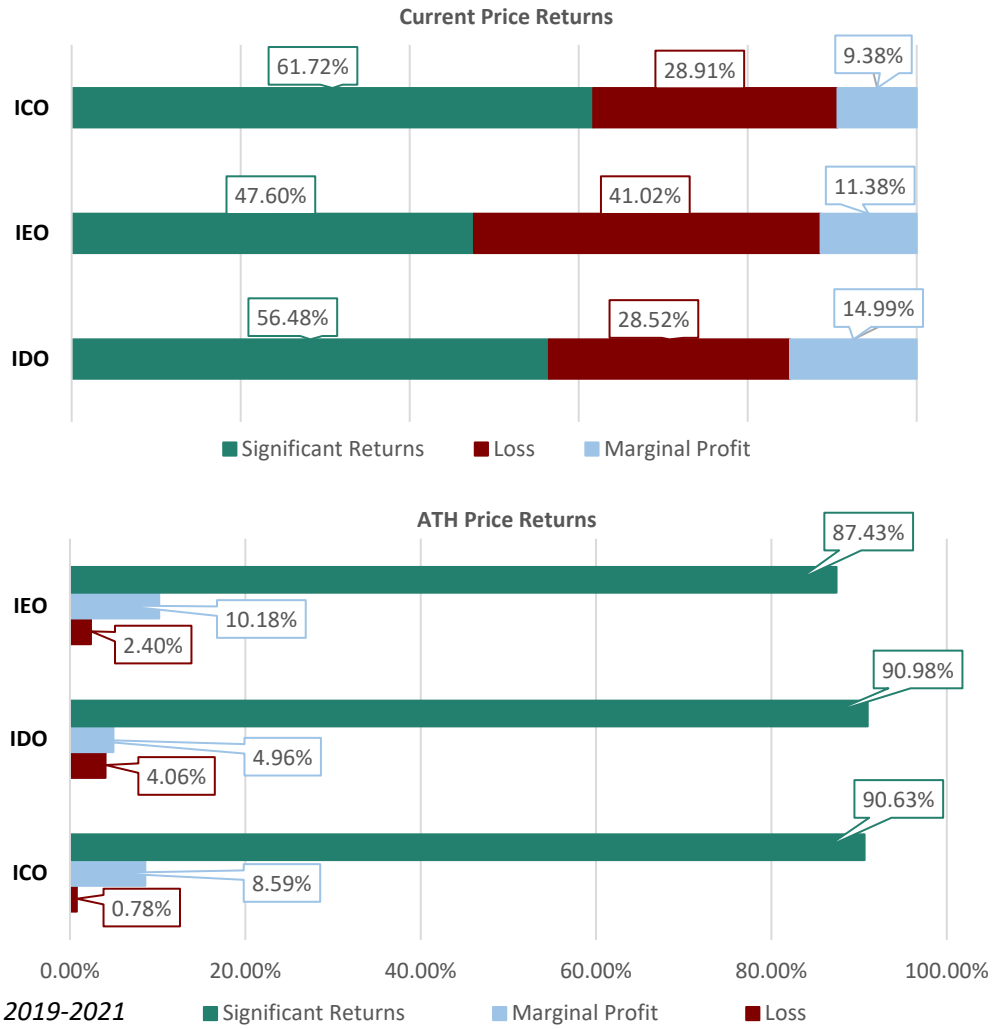


*Figure 7: Percentage of tokens trading with a loss (<100% ROI), marginal profit (101% to 200%) and significant returns (>201%) calculated using Current and ATH price for each token, for each type of campaign. [Sample #2]*

As presented in figure 7, examination of average current price shows that IEOs have the highest percentage of tokens trading on a loss (41%), meaning that these tokens are struggling to generate follow up interest and demand, trading below the initial public sale price in a time of positive sentiment in the market. Projects trading with marginal profits are still yielding returns for initial investors, but they are struggling to follow the market narrative, due to ineffective communication with investors or lack of activity and new developments, which lead to decreased demand. In terms of ATH price, IDOs have the highest percentage of tokens trading with a loss, but can be attributed to their recency and unrestricted deployment of projects. The increase in ICO tokens trading positively translates to increase in successful ICOs compared to past market cycles. A possible explanation is that only established, and VC supported teams, choose to launch ICO campaigns aiming for higher amounts of capital raised but solely managing their marketing campaigns, sale structure and distribution, KYC/AML regulatory compliance and procedures, launch and listing costs, thus increasing risk and moral hazard.

The share of IEOs that are trading with marginal profits is probably attributed to launching on launchpads that do not generate high proceeds and visibility for campaigns, and the shift of investors to decentralized alternatives. Results indicate reduced gradually reduced proceeds or potentially underpricing for IEOs campaigns due to more accurate token pricing, estimation of venture financial needs, but lower average amounts of capital raised compared to ICOs. In IDOs significant initial returns are mitigated by the distribution through DeFi applications and DEXs that offer issuers complex mechanics for pricing, allocations and distribution of tokens, potentially creating a more stable financing environment.

#### 4.3.2 Performance of Launchpads

The success of a blockchain funding campaign, amount of capital raised and token performance after public sale concludes, is highly correlated to the selection of launch platform for IDO and

IEO campaigns and we attempt to confirm this assumption by analyzing capital raised and returns for campaigns and tokens in individual launchpads.

- **IEO Launchpads**

Gate.io launchpad is leading in terms of total capital raised, amounting to approximately $141 million USD, although it has launched proportionally more campaigns compared to other launchpads (Table 3; Figure 8). Average capital raised for Gate.io IEOs amounts to approximately $980 thousand USD, while the median is merely $50 thousand USD. Gate.io is the predominant launchpad used by projects up to date, that want to launch an IEO campaign parallel to their IDO to increase their reach. Exchanges that have the majority of users and trading volume like Binance, FTX, Kucoin, OKEx and Huobi and others, are leveraging their popularity and marketing channels, but are conducting far less IEOs with proceeds that are significantly higher for issuers, investors and the launchpad.

**IEO**

| Platform | Campaigns | Sum | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|---|
| Gate.io | 143 | $141,059,880 | $986,433 | $50,000 | $15,000 | $83,000,000 | $7,361,025 |
| Binance | 26 | $104,320,000 | $4,405,217 | $4,000,000 | $1,500,000 | $7,500,000 | $1,685,793 |
| OKEx | 13 | $30,400,000 | $2,338,462 | $2,000,000 | $1,000,000 | $5,040,000 | $1,089,915 |
| Huobi Global | 19 | $24,183,500 | $1,272,816 | $600,000 | $45,000 | $4,200,000 | $1,263,130 |
| Kucoin | 20 | $21,860,000 | $1,150,526 | $300,000 | $40,000 | $5,600,000 | $1,562,219 |
| Bittrex | 4 | $15,790,000 | $3,947,500 | $4,020,000 | $750,000 | $7,000,000 | $2,875,243 |
| AscendEX | 17 | $7,747,310 | $455,724 | $200,000 | $16,000 | $2,000,000 | $534,637 |
| Bitfinex | 3 | $7,050,000 | $1,025,000 | $470,000 | $50,000 | $2,000,000 | $1,378,858 |
| Bitforex | 10 | $6,381,500 | $638,150 | $612,000 | $17,500 | $1,510,000 | $385,620 |
| Probit | 15 | $5,732,980 | $409,499 | $297,980 | $50,000 | $1,200,000 | $314,443 |
| MEXC Global | 31 | $4,906,740 | $158,282 | $120,000 | $18,000 | $500,000 | $119,307 |
| FTX | 10 | $4,060,000 | $406,000 | $400,000 | $200,000 | $840,000 | $202,056 |
| DigiFinex | 4 | $3,410,000 | $852,500 | $660,000 | $200,000 | $1,890,000 | $782,192 |
| bibox | 4 | $2,640,000 | $660,000 | $745,000 | $150,000 | $1,000,000 | $412,391 |
| Bybit | 6 | $2,420,000 | $403,333 | $450,000 | $200,000 | $520,000 | $125,963 |
| BitMart | 7 | $2,330,400 | $332,914 | $50,400 | $30,000 | $1,750,000 | $631,812 |
| ZB.COM | 2 | $650,000 | $325,000 | | $50,000 | $600,000 | $388,909 |

*Table 3: Descriptive statistics for the capital raised by IEO Launchpads, ranked by Sum of capital raised 2019-2021 [Sample#1]*

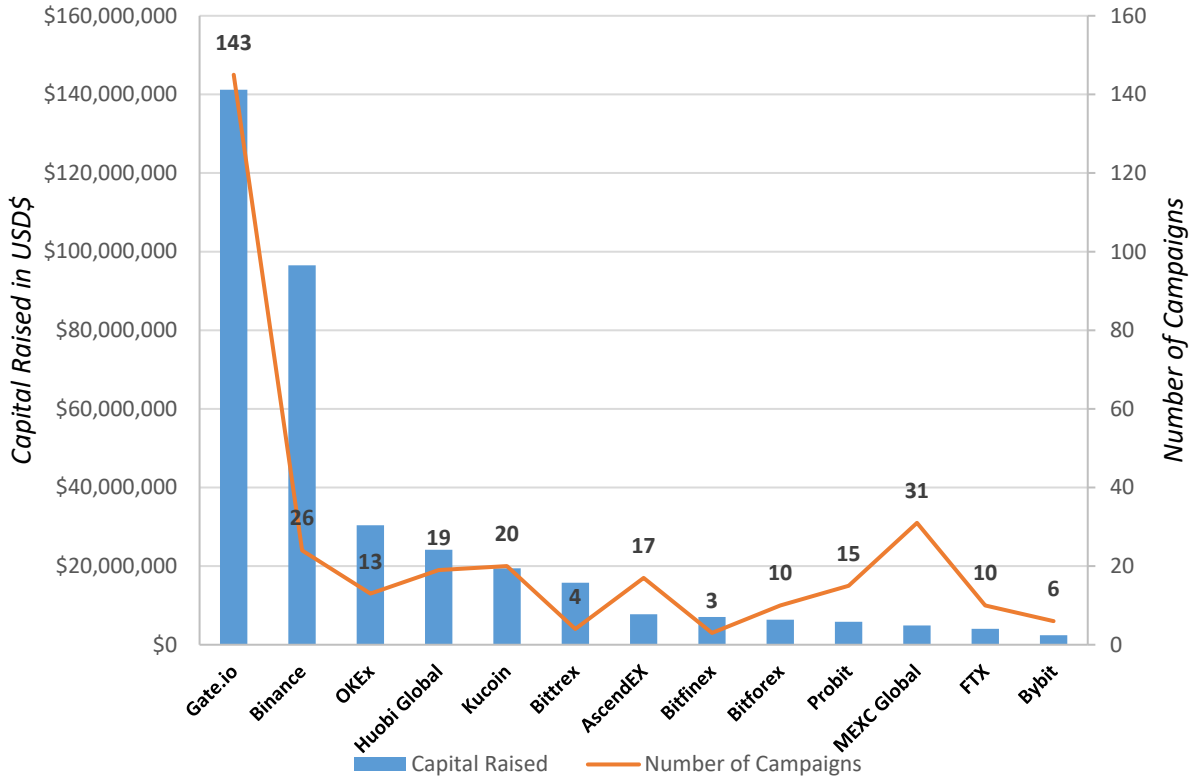


*Figure 8: Graphical representation of the Top IEO launchpads, ranked by sum of capital raised 2019-2021 [Sample #1]*

Binance launchpad which pioneered in the adoption of IEOs has raised more than $104 million USD with only 26 campaigns launched (Figure 9). These findings indicate that projects scrutinized and supported by Binance Exchange are set for a successful fundraising campaign. This also applies to other major exchanges, such as FTX, Kucoin, Huobi and OKEx although the procedures followed by each exchange to evaluate, supervise and support projects are not specifically determined. IEO campaign success is influenced by the individual launchpad if its procedures of scrutinizing and supporting the project as well as the joint marketing initiatives are reducing information asymmetries between entrepreneurs and investors. Previous successful campaigns attract even more investors to participate to the launchpad, contributing to the success of future campaigns. Exchange user base, region and reach are also potential factors that influence the performance of campaigns, as retail investor capital is limited, and they have to decide which exchange token will hold to gain eligibility for IEOs. Launchpads that effectively signal the quality and technical capabilities of an upcoming project, while inducing

trust between counterparties through their reputation and scrutinization procedures, are reducing information asymmetries, which leads to attracting more investors and higher amounts of funding.

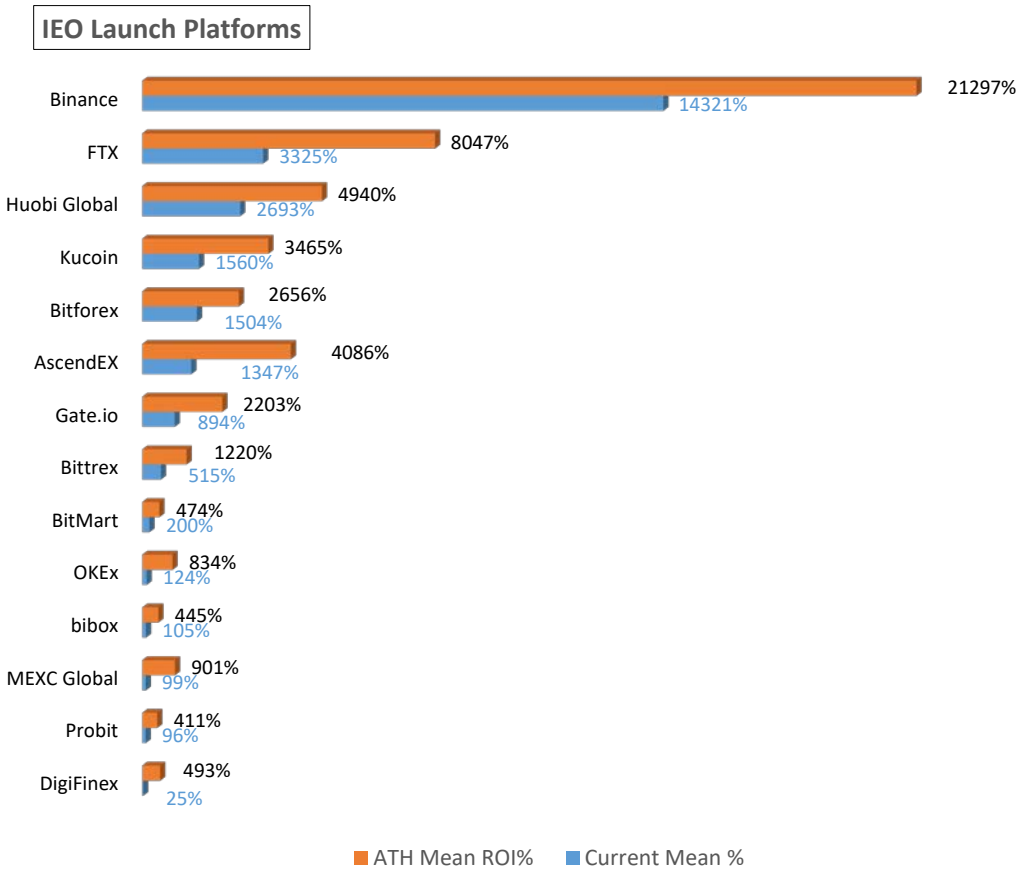


*Figure 9: Mean Current and Mean All-Time-High returns for IEO launchpads, for tokens purchased at public sale price in the period 2019-2021, ranked by ATH Mean ROI% [Sample#2]*

As shown in Figure 9, launchpads that accumulate the majority of capital raised are on the top in terms of returns, with the exception of Gate.io where average returns are still significantly high. Return on investment is shown to be correlated to the trading volume and popularity of the exchange hosting the launchpad, as the highest returns are on the exchanges leading in terms of trading volume in the cryptocurrency ecosystem like Binance and FTX. Binance is the leading launchpad in terms of average returns for investors, although its token BNB used for eligibility and calculation of allocations for IEO participants, has significantly appreciated compared to other exchange tokens, increasing the barriers for retail investor participation.

Regarding the percentage of tokens trading on a loss (<100% Current ROI) or significant returns (>200%), successful launchpads are easily distinguished as Binance, FTX and Kucoin. Where correspondingly 95.65%, 90% and 83.33% of tokens are trading with significant returns for initial investors, in a positive market sentiment, close to the highest market capitalization to date. Probit, MEXC Global, OKEX and Bitforex exchanges are characterized by negative returns for tokens launched on their platforms, with more than 60% of tokens trading negatively compared to the sale price, on the given time period of our sample (Sample #2).

- **IDO Launchpads**

Performance of decentralized launchpad varies as each launchpad is facilitated to address the need of different niches or for different applications. Certain projects launch on many platforms simultaneously to reach a wider and more diverse pool of investors, but the performance of a campaign is correlated to the choice of launch platform. Campaigns raise significantly more capital in launchpads that have previously conducted successful campaigns. In Table 4 Dedicated DEXs refers to campaigns launched pools to fund the development of new DEXs or new launchpads, which structured and facilitated the funding campaigns on their dedicated platforms. MISO (instantmiso.com) is the launch platform developed by the established Sushiswap DEX on Ethereum network, its leading in terms of capital raised due to the launch of BitDAO (bitdao.io), a decentralized autonomous organization that functions as an investing fund, through individual contributions and is governed by decentralized governance procedures. As Ethereum network is the leading blockchain in terms of protocol TVL (Total Value Locked), IDOs and launchpads launching on Ethereum tend to accumulate the highest amount of capital. Although we observe an increase in launchpads dedicated to specific blockchains or development of blockchain agnostic launchpads like Polkastarter (Polkastarter.com). If the services, DeFi mechanics, research platforms, marketing and potentially governance structures of a launchpad benefit participants they attract investors to hold the launchpad token to receive eligibility for hosted IDOs. The economic synergies, community building, and research portals

align counterparties' motives, inducing trust between parties, reduce information asymmetries and lead to launch of successful projects. Campaign success is not influenced only by the aforementioned determinants of success but is additionally affected by the individual blockchain the launchpad is built upon, the niche that the launchpad specializes and the market narrative. With additional interpretation of findings, we form the assumption that IDO campaigns conducted on launchpads facilitated by established DEXs, will leverage the popularity and volume of DEXs resulting in potentially higher accumulation of capital than individual launchpads.

Polkastarter is the leading decentralized launchpad in terms of capital raised and conducted IDO campaigns as depicted in Figure 10. Polkastarter's 81 IDOs have raised more than $24 million USD, by DAO maker with 64 campaigns and capital raised adding up to 20.85 million USD. Descriptive statistics in Table 4, show that the capital raised by individual launchpads is somewhat analogous to the number of campaigns conducted and the median values indicate an even distribution of capital between new projects, with some extreme exceptions of projects that require significant operational capital like investing DAOs or Layer 1 protocols.

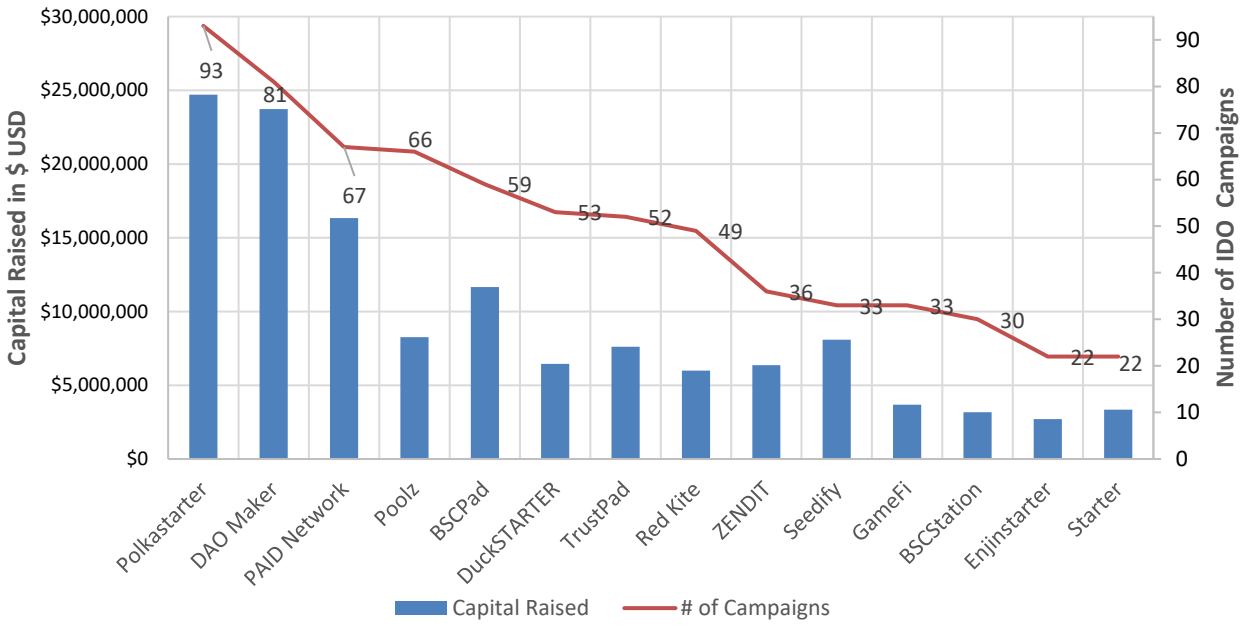


*Figure 10 : Graphical representation of the Top IDO launchpads, ranked by number of conducted campaigns 2019-2021 [Sample #1]*

**IDO**

| Platform | Campaigns | Sum | Mean | Median | Min | Max | σ |
|---|---|---|---|---|---|---|---|
| MISO | 11 | $461,911,170 | $41,991,925 | $7,230,000 | $130,650 | $379,260,000 | $112,386,674 |
| Dedicated DEX | 142 | $359,571,320 | $2,532,192 | $150,000 | $5,000 | $108,850,000 | $11,452,047 |
| Polkastarter | 93 | $24,706,330 | $265,659 | $216,000 | $25,000 | $1,170,000 | $179,259 |
| DAO Maker | 81 | $23,732,850 | $292,998 | $152,000 | $60,000 | $3,750,000 | $464,130 |
| PancakeSwap | 15 | $19,762,500 | $1,317,500 | $1,000,000 | $437,500 | $3,000,000 | $844,729 |
| PAID Network | 67 | $16,339,050 | $243,866 | $200,000 | $75,000 | $2,000,000 | $263,003 |
| BSCPad | 59 | $11,657,180 | $197,579 | $125,000 | $50,000 | $1,000,000 | $198,844 |
| Poolz | 66 | $8,265,060 | $125,228 | $100,000 | $50,000 | $300,000 | $61,046 |
| Seedify | 33 | $8,090,000 | $245,152 | $250,000 | $100,000 | $600,000 | $88,496 |
| Avalaunch | 10 | $7,621,140 | $762,114 | $570,910 | $250,000 | $2,000,000 | $513,623 |
| TrustPad | 52 | $7,609,090 | $146,329 | $100,000 | $50,000 | $500,000 | $96,776 |
| AcceleRaytor | 13 | $6,870,800 | $528,523 | $400,000 | $100,000 | $1,050,000 | $362,273 |
| DuckSTARTER | 53 | $6,454,380 | $121,781 | $100,000 | $34,130 | $400,000 | $64,661 |
| ZENDIT | 36 | $6,364,250 | $176,785 | $100,000 | $25,000 | $1,600,000 | $265,942 |
| OccamRazer | 20 | $6,201,470 | $310,074 | $303,715 | $79,750 | $600,000 | $170,678 |
| Red Kite | 49 | $5,991,360 | $122,273 | $110,000 | $50,000 | $250,000 | $37,382 |
| CyberFi | 21 | $5,182,310 | $246,777 | $108,000 | $40,000 | $1,100,000 | $309,861 |
| Launchpool | 12 | $5,045,000 | $420,417 | $250,000 | $100,000 | $2,170,000 | $565,366 |
| Solanium | 16 | $4,690,000 | $293,125 | $225,000 | $40,000 | $1,000,000 | $239,380 |
| Lightning | 11 | $4,543,760 | $413,069 | $450,000 | $150,000 | $808,200 | $205,970 |
| Oxbull.Tech | 17 | $4,528,500 | $266,382 | $250,000 | $80,000 | $598,500 | $161,553 |
| CardStarter | 12 | $4,096,060 | $341,338 | $277,115 | $144,000 | $765,590 | $173,510 |
| GameFi | 33 | $3,682,900 | $111,603 | $110,000 | $3,000 | $250,000 | $45,892 |
| Starter | 22 | $3,341,390 | $151,881 | $111,965 | $50,000 | $636,200 | $129,642 |
| BSCStation | 30 | $3,172,500 | $105,750 | $100,000 | $50,000 | $200,000 | $37,411 |
| Enjinstarter | 22 | $2,710,000 | $123,182 | $102,500 | $70,000 | $200,000 | $36,205 |
| LaunchZone | 13 | $2,640,040 | $203,080 | $170,000 | $70,000 | $450,000 | $120,948 |
| Synapse Network | 13 | $2,575,000 | $198,077 | $150,000 | $50,000 | $500,000 | $128,493 |
| Gamestarter | 12 | $2,370,180 | $197,515 | $155,000 | $42,500 | $497,700 | $136,133 |
| ZeeDO | 20 | $1,940,500 | $97,025 | $82,500 | $25,000 | $200,000 | $47,400 |
| ChainBoost | 16 | $1,940,000 | $121,250 | $112,500 | $50,000 | $205,000 | $46,886 |
| BullPerks | 14 | $1,799,000 | $128,500 | $125,000 | $50,000 | $200,000 | $45,741 |
| BinStarter | 10 | $1,422,000 | $142,200 | $140,000 | $70,000 | $200,000 | $46,231 |
| BSClaunch | 11 | $1,373,500 | $124,864 | $150,000 | $49,000 | $200,000 | $52,684 |
| TruePNL | 17 | $1,302,500 | $76,618 | $62,500 | $25,000 | $200,000 | $44,449 |
| MoonStarter | 14 | $1,238,000 | $88,429 | $75,000 | $35,000 | $170,000 | $40,067 |
| A2DAO | 12 | $1,092,500 | $91,042 | $76,250 | $20,000 | $200,000 | $59,976 |
| Bounce | 14 | $757,500 | $54,107 | $50,000 | $10,000 | $120,000 | $33,507 |

*Table 4: Descriptive statistics for the capital raised by IDO Launchpads, ranked by Sum of capital raised 2019-2021 [Sample#1]*

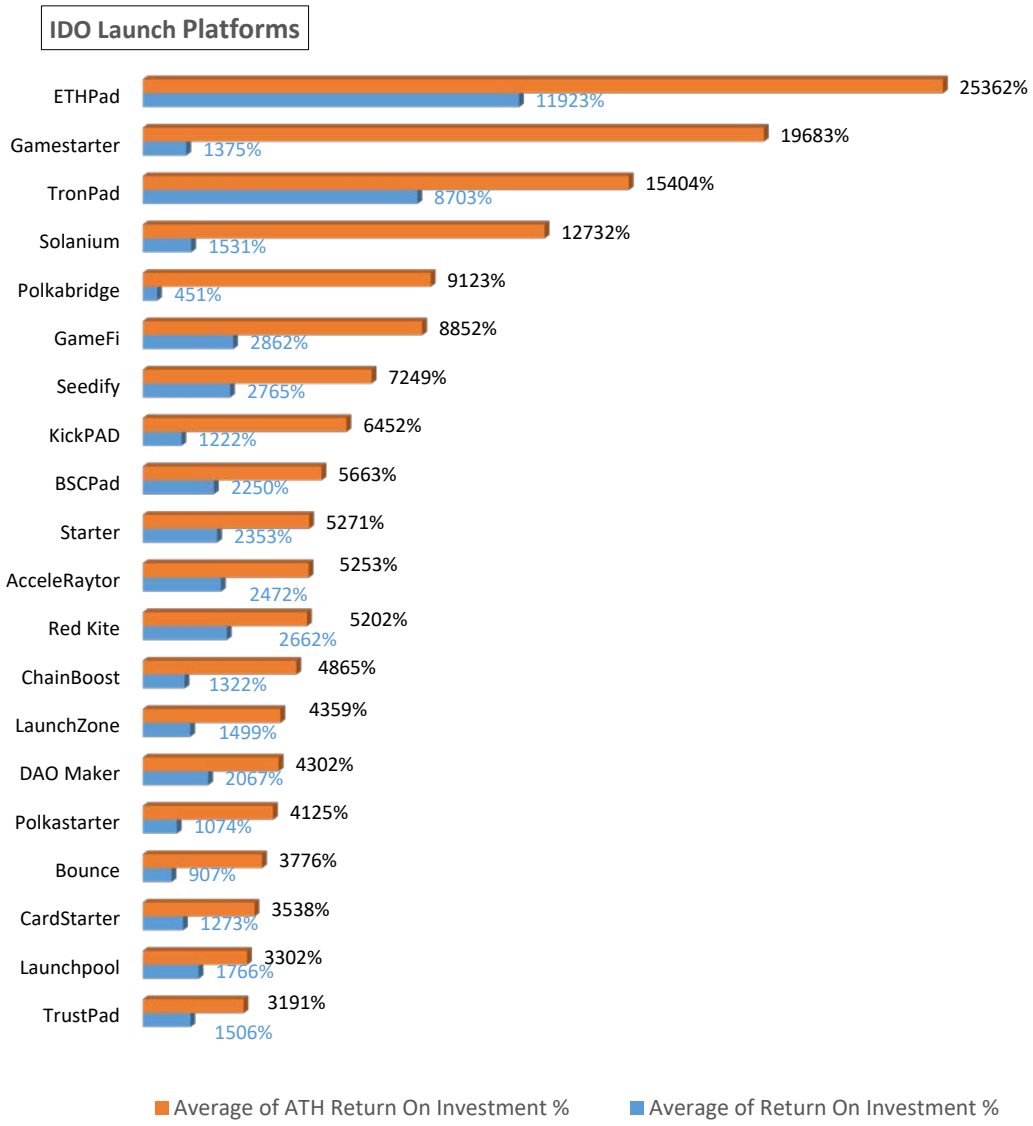


*Figure 11:Top 20 IDO launchpads in terms of Mean Current and Mean All-Time-High returns, for tokens purchased at public sale price in the period 2019-2021, ranked by Mean ATH Mean ROI% [Sample#2]*

As for IDO launchpads, the returns for tokens are difficult to be calculated accurately due to distribution with DeFi mechanics like staking instead of entirely direct sales like ICOs and IEOs. Regarding token returns for initial investors, the majority of tokens launched on IDOs were trading with significant returns (>200%) at their all-time high price and only 4.13% were trading at a loss. This indicates that the majority of investors could potentially yield significant returns if they sold close to ATH price, although vesting schemes are predominantly implemented on IDOs. Considering that the majority of IDOs were conducted in 2021, returns calculated are short term

and the average token performance for different launchpads reported is not conclusive. For returns calculated at Current price (November 4th of 2021), the entirety of tokens launched on certain launchpads such as Solanum, AcceleRaytor and Game Starter were trading for significant returns, while for others results differ substantially. We include Figure 11 with the probable but hypothetical returns for Current and ATH price for investors or project teams, if they sold their initial allocations at these prices, but these returns are not accurate due to extreme volatility, short term returns and the inability to factor vesting schemes in results.

For reference, calculating with Current price, 76.54% of tokens launched on Polkastarter were trading for significant returns (>201% ROI) and 16% were trading for a loss (<100%) compared to their public sale price. For RedKite, significant returns amount to 82.35% while 11.76% were trading negatively. As for DAO Maker returns were 78.56% and 15.63% correspondingly. The majority of tokens launched on dubious or fairly unknown launchpads were reported to be trading for a loss. In short, only 56% of IDOs were trading with significant returns, 14.17% were trading with marginal profits and 14.79% was trading on a loss in Current prices.

## 5. Discussion and Conclusions

This study complements the growing academic literature on blockchain crowdfunding campaigns or public token sales. We examine the ICO market following its 2018 crisis and explore the development of new types or models of ICOs that emerged to mitigate the shortcomings of the original model. We examine relevant ICO and crowdfunding literature, looking for the determinants of success and the technical differences to provide a framework to compare ICOs to IEOs and IDOs. In 2019 and 2020, Initial Exchange offerings regained trust of investors for public token sales by reducing information asymmetry and moral hazard for issuers by allowing them to launch campaigns through their regulated but centralized platforms. Exchanges acted as intermediaries between investors and issuers, scrutinizing projects and offering their tokens on their off-chain platform and user base, in return for trading fees, increased traffic and exclusive listings. Benefiting investors with simplified access, guaranteed

listing and a form of trust and transparency induced by their regulatory compliance and common interests. The cases of frauds were significantly reduced but IEOs are critiqued for going against the decentralization ethos of cryptocurrencies and blockchain technologies. The rise of DeFi in 2020 enabled decentralized protocols like DEXs and launchpads to provide platforms for conducting token sales, without users offering the custody of their funds while the ease and low cost of deployment, and increased funding needs for new decentralized applications led to an explosive increase in IDO campaigns in 2021. IDOs are considered to be a successor to ICOs with a more sensible approach. IDOs to do not limit the participation for any project looking to raise funds but complex distribution, allocation and vesting mechanics enabled by smart contracts, reduce centralization, moral hazard and counterparty risk, while decentralized launchpads are benefited by the fees and increased demand for their token. Public token sales offer access and significant returns to retail investors, but they are required to perform extensive research and due diligence before participating due the risks of unregulated early-stage investments. Price appreciation of token or launchpad platforms during the heated market period for cryptocurrency markets that we examine, increases the barriers to new retail investors and participation is limited to early adopters and investors with significant capital. Participation, particularly for IDOs, requires the use of on-chain wallets and DeFi services, which introduces complexity and necessitates a certain level of technological knowledge for new investors.

Average capital raised is considerably less for IDOs and IEOs compared to ICOs because ICOs provide the means to directly exchange value between entrepreneurs and investors, but the risk and effort are considerably higher for both parties. Conducting a campaign with the ICO model is probably more suitable for ventures issuing coins, meaning that they are developing their respective Layer 1 blockchain network, because it's usually experienced teams in building blockchain applications, with marketing expertise and have already received substantial amount of funding from VCs or accredited investors, which provides support and accountability to the project, even before the public sale. IEOs may have laid the foundation for token sales to regain investors' trust, but the lack of a shared framework for hosting IEOs in different launchpads, led

to concentration of capital and control in top tier exchanges. Smart contract developments have again shifted interest on IDOs, which have claimed the biggest share of the financing market in terms of campaigns conducted and total capital in 2021, providing for increased accessibility to finance, reduced counterparty risk due to disintermediation, transparency and permissionless nature, creating a more diverse and stable market for token sales. The IDO model encourages innovation, as frauds and pump and dump schemes seem to have decreased while the number of funded projects has exponentially increased. Vesting schemes, whitelisting and participation limits ensure organic price discovery and a wider pool of investors.

As an innovative technology blockchain and its applications are constantly evolving, creating new opportunities for value creation and value capture but regulation cannot keep up with this momentum. In an ecosystem tormented by regulatory uncertainty and arbitrage, the development of launchpads confirms the need for trusted entities, to facilitate the platforms for financing and development of innovation. Adoption of tokenization for real world assets will inevitably lead to creation of new intermediaries for all nonnative assets, such as token generators, token issuers, token custodians, exchange service provider etc. As blockchain technology and its adoption are still in its infancy, some centralized solutions are undeniably relevant and inseparable to blockchain adoption, an assumption confirmed by the interoperability between blockchains, and traditional finance introduced through the use of centralized cryptocurrency exchanges. Although future developments on decentralized protocols and applications can potentially minimize the need for centralized control, and provide the means for global and democratized economies and platforms. Launchpads reduce information asymmetries between counterparties, reduce moral hazard for issuers, inducing trust, transparency and attracting more investors, creating online communities and economic synergies, but moral hazard is increased for the launchpad, especially for centralized exchanges conducting IEOs. The performance of a campaign is correlated to determinants of success coequal to ICOs and traditional finance, with the exception of listing on a centralized exchange is considered as a determinant for success for ICOs, while it’s guaranteed for successful IEOs,

although success is also influenced by the volume of the specific exchange. This is not the case for IDOs where tokens are listed on DEXs with a permissionless process. Performance is also significantly influenced by the choice of the specific launch platform. Proceeds are disproportionate due to the different procedures followed by launchpads, expertise and specialization, offered support and marketing, user base, campaign record and volume, as these factors reduce information asymmetries and signal project and launchpad qualities. Proceeds for IDOs and IEOs are also correlated to market sentiment, market narrative and especially for IDOs, the popularity and capabilities of the specific blockchain that facilitates the launchpad and issued token.

Returns for IEO tokens is easier to measure since exchanges provide detailed information and data about projects deployed on their platforms while the number of campaigns is limited due to exchange supervision, exchange regulation and listing costs. Established exchanges like Binance, FTX and Kucoin are reported to yield the highest returns for investors and majority of projects launched on their platforms have raised significant capital, while a fair share of tokens still trades positively on the day of our sampling in November of 2021. Following the listing after their launch the majority of tokens launched on IEOs are being traded with significant returns but after the initial hype prices fluctuate remarkably depending on the launch platforms and the fundamentals of each project. As for IDO returns, their infancy, recent development and explosive growth, complex distribution and allocation mechanics, and lack of established data sources, makes it difficult to measure their performance accurately. Our database reports that certain niches like DeFi and blockchain Gaming yield significant returns to investors, especially if those sales are conducted on established launchpads. Polkastarter, MISO, Seedify, RedKite, DAO Maker Pad, AcceleRaytor and PAID Network seem to lead the launchpad ecosystem in terms of campaigns conducted, capital raised and returns for their projects, although many new DeFi protocols have raised capital on their dedicated platforms by deploying their own liquidity pools. Since the majority of tokens of early-stage projects have been launched in 2021 where the cryptocurrency market is at an all-time peak, short term returns are not conclusive to

accessing their performance. Further research is required regarding the underlying mechanisms behind IDO campaigns outcomes. With the exception of STOs, token sales are for the most part unregulated and the involvement of centralized or decentralized intermediaries has proven to positively impact the token sales market meaning that regulation and supervision, that doesn't hinder the progress and development of cryptocurrencies will greatly benefit investors and adoption of blockchain technology. Future research should focus on exploring the performance of IDOs and IEOs on different cycles of the cryptocurrency market while also considering the potential risks and effects of regulatory enforcement and bans on the token sales market. Especially for IDOs and decentralized launch platforms its crucial to measure their mid and long-term performance, while factoring more variables such as sale structure, distribution mechanics, allocation limits and vesting periods. Established and trusted data sources for token sales data are also imperative in order to define the amount of unsuccessful campaigns as well as calculate their 1$^{st}$ day initial returns and underpricing accurately. Future research can also investigate the implications of non-blockchain companies using and integrating tokens to finance their new ventures, as well as the societal impact, potential scaling and optimal structure for these campaigns when more data becomes available. Digitalization of financial services and capital markets, tokenization of real-world assets, remote employment, development of DAOs, on-chain decentralized economies, platforms and governance, as well as the increasing adoption of blockchain technologies, render token sales a highly relevant subject for the finance industry and future academic research. As the blockchain industry matures, applications will expand in additional sectors, adoption will surge as well as capital inflow through tokenization, and decentralized economies, employment and governance, models and platforms will scale globally but also develop locally. Financing these ventures or any initiatives through tokens and coins on public blockchains will instigate transparency and disintermediation, democratizing finance and revolutionizing how economies work, in the premise that the impending establishment of regulatory frameworks will not hinder innovation and decentralization.

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