

INITIAL COIN OFFERINGS (ICOs): A COMPREHENSIVE REVIEW on START-UP FIRMS

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Abstract

In this study, the theoretical framework of the ICO concept, which is one of the newest and most discussed topics in the financial world, is examined. ICO meaning, basic characteristics of the ICO, the ICO process, ICO participants, its advantages and disadvantages, the determinant factors of success of the ICOs performed up to date, the risks waiting for the investors and the differences between IPO and ICO are comprehensively analyzed. All ICOs realized are examined comparatively and critical success factors are tried to be determined. The aim of this study is to make this subject better understood by market participants and to give insights to other following studies in the academic world.

Keywords: Initial Coin Offerings, Cryptocurrencies, Crowd-based Funding, Fintech, Crowdsale, Token Offering Blockchain, Distributed Ledger, Technology, Entrepreneur, Start-up, Risk Factors, Artificial Intelligence.

İLK KRİPTOPARA ARZLARI (ICOs): START-UP FİRMALARI ÜZERİNE KAPSAMLI BİR İNCELEME

ÖZ

Bu çalışmada, finans dünyasındaki en yeni ve en çok tartışılan konulardan biri olan ICO kavramının teorik çerçevesi incelenmiştir. ICO anlamı, ICO'nun temel özellikleri, ICO süreci, ICO katılımcıları, avantajları ve dezavantajları, bugüne kadar gerçekleştirilen ICO'ların başarısının belirleyici faktörleri, yatırımcıları bekleyen riskler ve halka arz ile ICO arasındaki farklar kapsamlı bir şekilde analiz edilmektedir. Gerçekleştirilen tüm ICO'lar karşılaştırmalı olarak incelenmekte ve kritik başarı faktörleri belirlenmeye çalışılmaktadır. Bu çalışmanın amacı, bu konunun piyasa katılımcıları tarafından daha iyi anlaşılmasını sağlamak ve akademik dünyadaki diğer çalışmalara bilgi vermektir.

Anahtar Kelimeler: ICO, Kripto para, Kitlesel Fon Toplama, Fintech, Kitlesel Satış, Token Arzı, Blockchain, Dağıtık Defterler, Teknoloji, Girişim firmaları, Start-up, Risk Faktörleri, Yapay Zeka.

Jel Codes: E42, G10, G11, G15, L26, M13

1. Introduction

We experience a period when new digital developments emerge every day. If we look at the subject chronologically, first watches and photographs were digitized and then televisions. The digitization process has expanded over time, including marketing methods. Perhaps the most loud part of digitization was the digitization of currencies that began with the birth of Bitcoin. Cryptocurrencies led to revolutionary new developments in the financial sector, and stocks eventually joined this process.

Initial Coin Offerings (ICOs) are a new type of crowdfunding that is unregulated unlike IPOs and raises funds with a blockchain through selling tokens associated with ventures in exchange for cryptocurrencies (Amsden and Schweizer, 2019). ICOs are welcomed by the Blockchain startups since it is serving as tool to raise early capital

(Conley, 2017). ICOs are used by open-source blockchain-type start-ups as a new type of fundraising and it is conducted over the web (Lipusch, 2018). Transaction costs are minimized thanks to ICOs and they democratize finance while removing banks' intermediary function (Kaal and Dell'Erba, 2018).

Compared to existing mechanisms in early stage finance, tokens have a comparative advantage to potentially serve investors with rapid opportunities via the liquid trading platforms (Momtaz, 2020). Since 2017, number of ICOs and the amount of fund raised have increased remarkably (Fish, 2019).

As everyone knows, ICO (it is also called as First Token Supply), which is very similar to IPO (Initial Public Offering), differs from IPO by two differences:

- It is not possible to have a share in the company in the future.
- Somehow the system must be connected to the blockchain.

Despite of big loud created by the ICOs and grabbed investors' attention significantly academic studies has been still weak and needs more interest on this subject. (Lipusch, 2018).

In this study, the conceptual framework, advantages and disadvantages of ICOs, which are very newly introduced to the finance literature, will be discussed and the ICO success of the enterprises will be analyzed. In the second part of the study, ICOs will be examined in detail, and in the third part, the current literature on the subject will be reviewed, and in the last part, the success of ICOs and their price performance after ICO will be analyzed.

2. ICO Concept

ICO is a funding and donation mechanism used by ventures through Bitcoin and Ether to fund new and structured venture projects. ICO can be considered as a type of crowdfunding that is conducted via the cryptocurrencies in order to raise capital required to initiate new business. Roughly ICO is a form of stock market inspired by Bitcoin. In other words, instead of buying Apple or Intel shares, in ICO model investments are performed in entrepreneurs with many different and innovative business models. When it is thought that investors don't have share in start-up that they invested, what may be motivator factors for ICO model.

The reason that leads investors to buy ICO tokens is expectation of obtaining some financial benefits in the future according to smart contract rules. Also, token prices may increase rapidly that creates opportunity for investors to invest. This section is similar to traditional stock market. Advantages and also some risk issues will be analyzed in detail in the subsequent parts.

2.1 A Brief History of ICO

The first cryptocurrency offered by ICO is Ripple. At the beginning of 2013, Ripple Labs started to develop the Ripple payment system and created approximately 100 billion XRP tokens. The company sold these tokens to fund the development of the Ripple platform. Later in 2013, Mastercoin promised to create a layer above Bitcoin to execute smart contracts and symbolize Bitcoin transactions. The developer sold several million Mastercoin tokens against Bitcoin and received about 1 million euros.

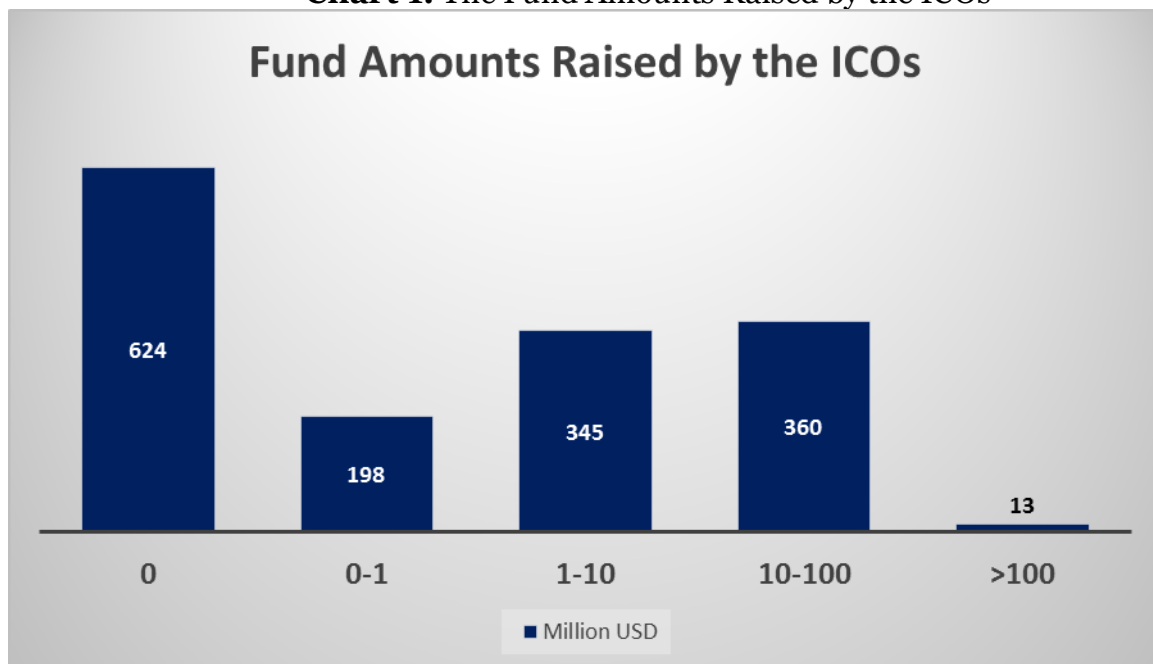
The most stunning ICOs in the past is given in Table 1 below:

Table 1. Successful ICOs Made in the Past

ICO	Explanation
Ripple	Because you have to pay your network fees in Ripple Labs XRP, the payment network has created 100 billion XRP tokens that serve as an anti-spam mechanism in Ripple. XRP is sold by Ripple Labs, and the trend is downward, while its values don't move in a clear direction. It started with 5,000 Satoshi, sometimes appreciated below 1,000 Satoshi, tested 7,000 Satoshi and was balanced at 3700, its final value.
Next	Next was a new general encryption made in 2013. Initially, 1 billion tokens were sold to early traders. With ICO, developers only have two digits of Bitcoin. Today, the NXT token is much more valuable, and Next has become a relatively successful and stable cryptocurrency.
Mastercoin	In 2013, Mastercoin announced that they were building a layer on top of Bitcoin and sold Mastercoin-token to investors. The developers received about 10,000 Bitcoin, which was worth \$ 1 million at the time. The current value of these bitcoins is \$ 45,000,000. Mastercoin tokens appreciated a month later, while investors made huge gains. Later, Mastercoin merged with Counterparty and Omni.
Ethereum	The biggest ICO was made by Ethereum ever. With a pre-sale of approximately 60 million ETH, the Ethereum Foundation obtained 31,500 Bitcoin. This event has become the beginning of the biggest cross-linking ever made and a wildly successful cryptocurrency. Investors of ETH pre-sales have continued their lives profitably.
Lisk	Lisk, based on BitShares, is a blockchain written in JavaScript, which enables smart contracts on side chains. Lisk sold coins on Bitcoin and made about \$ 5 million proceeds.

Source: <https://kriptokoin.com/>

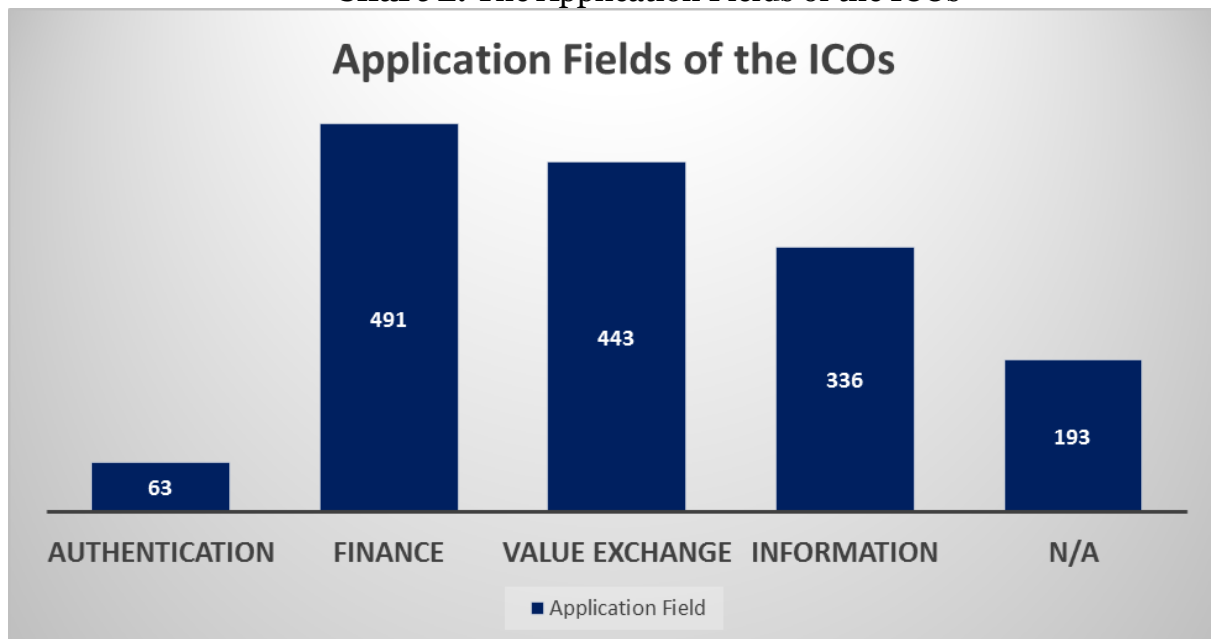
The fund amounts raised by the ICOs are shown in Chart 1 below.

Chart 1. The Fund Amounts Raised by the ICOs

Source: Tong (2017).

The application fields of the ICOs are given in Chart 2 below.

Chart 2. The Application Fields of the ICOs



Source: Tong (2017).

2.2 ICO Process

ICO process has been performed between issuer start-up firms and investors. In other words, participants of ICO process is composed of only firms and investors. Simply, in basic ICO models, firms are selling services & products associated with crypto product. Therefore, they are offering a new idea which is connected with blockchain to the investors. These developers initiate new marketing campaign to invite investors to purchase their tokens. ICO tokens represent investment in a start-up. There is a positive relationship between money invested and amount of token purchased. Mentality underlines in investment of ICO is that investors can buy start-up firm's future services based on purchased tokens or they can have capital gain by selling token by higher price level than purchasing price if the business model of start-up become successful and firm value increases.

There is a big constraint for the promoters and issuers since investors don't have share in this start-up firm. Therefore, somehow they should convince investors and invite them to invest in. For this purpose they offer some financial rights to the investor in smart contract that is established between firms and investors. These contracts are computer protocols and they automate value determination between issuer and investors (Momtaz, 2020). This is an official contract in other words codes that works if some conditions are realized. Today, most smart contracts work on Ethereum (Kaal and Dell'Erba, 2018). The first smart contract was created by Vitalik Buterin, who is also the developer of the Ethereum platform. However, there are other alternatives such as Confideal, ChainLink, BlockCAT and so on. Of course, every smart contract system has its advantages and disadvantages.

2.3 ICO Advantages and Disadvantages

Although it is seem very new, and from some aspects traditional IPO method provide more confidence, ICO still provides some unique advantages as follows:

- Compared to IPOs they provide cost saving since IPOs are expensive and their cost is around %7 of raised fund (Conley, 2017).

- Promoters and developers of ICOs don't have to give their equity for a project to raise a capital (Kaal and Dell'Erba, 2018). Thanks to this, start-up firms will not have to share management control. In this way, the company is not shared with an investor, only a future service is sold to investors. This is perhaps the biggest difference of ICO from IPO. Thus, start-up companies both have required funds for business development and can still manage their own business.

- Another advantage that ICO provides to the investors is after-market liquidity means token exchange platform will be 24/7 during 3 months following ICO implementation (Momtaz, 2020).

- While companies have to visit funds to find investors in traditional methods, funding can be collected from any country in the world thanks to the globalization advantage offered by ICO.

- This is an unregulated process that firms are not suffering heavy procedures that take a long time.

Although ICOs have the above mentioned advantages, they also have some disadvantages. In ICOs are made during 2012-2017 period, firms raised cryptocurrencies through token sales without protecting investors with some conditions, landmark requirements and security measurement (Kaal and Dell'Erba, 2018). Investors who give cryptocurrency for purchasing token to have a right to use platform related crypto product don't have a right to supervise to find out how these funds are allocated by the promoters. Therefore, particularly in traditional ICO process, issuers and promoters can use ICO proceeds as they wish.

2.4 ICO vs. IPO

IPO is generally ideal for companies that have been operating in the sector for a long time and have reached a certain economic size. However, ICO is suitable for startups with higher risk levels. Differences between ICO and IPO can be shown in Table 2 as follows:

Table 2. Basic Differences between ICO and IPO

CRITERIA	IPO	ICO
Legal Requirements	There are some conditions in IPO process required by the regulatory institution called Capital Market Board (CMB). Before the IPO, the company must apply for a IPO and prepared necessary documents and should confirm that it fulfills these conditions. There are many procedures that CMB requires in the IPO process such as the financial statements of the firm for the last 3 years should be audited in accordance with IFRS rules, the prospectus that informs investors about the firm and public offering, signing a public offering intermediary framework agreement with the investment bank,	Since ICOs do not require adherence to any regulatory framework or legal protocol and do not even require a majority commercial record. Entrepreneurs prepare a technical document called white paper in order to identify the projects themselves and their business model. Compared to IPO, ICO process is completed in a much shorter time. Just like the prospectus used in IPO, ICO projects have a whitepaper, but unlike the prospectus, there is no requirement to be prepared within the framework of predefined rules.

	registration to the Stock Exchange and other regulatory institutions, etc.	Even in some countries, whitepaper documents are not accepted as legal documents. Only the programmer team and the internet are needed to implement an ICO.
Investor perspective	Investors can directly participate in an IPO in their country of citizenship, but they will need some additional procedures to invest in IPOs realized in other countries.	The only thing needed to invest in ICO is internet access. Any token of any company can be purchased from any country. The only exception to this is some US projects that are defined as securities. These projects are not valid for US citizens. In order for such projects to collect investments within the country, they should make IPO-like reporting.
Returns	Shares obtained through public offering represent claiming the company's future earnings. The company distributes dividends annually to shareholders based on its earnings during the year (Dividend Yield). Another way to make money is to invest in the company at an early stage and sell the stock when its value increases (Capital Gain).	The most important thing to know is that the tokens do not provide ownership in the project. Those who invest in ICO projects can earn income in different ways depending on how the tokens are structured. Start-ups can give a fixed price where investors can buy or sell tokens and they can distribute them to their investors if they earn more than the predetermined amount. Whatever the investor's earnings will be, these details are written down in the project's whitepaper document.

Source: <https://tr.cointelegraph.com/>

Based on the comparison between ICO and IPO made in Table 1, pros and cons of both methods can be outlined in Table 3 as follows:

Table 3. Pros and Cons of ICO and IPO

	Reliability	Legal Scope	Official company registration	Quick / Fast Investment	Small Investment Amount	Ease of access to international markets
IPO	+	+	+	-	-	-
ICO	-	-	-	+	+	+

Source: <https://tr.cointelegraph.com/>

2.5 Risk Factors and Issues that Investors Should Consider in an ICO Investment

The first thing investors should look for is experience degree of the team that create and develop the projects and whether projects have a flexible and clear business model. Ethereum founder Vitalik Buterin made the following statement on how to protect against ICOs that could be fraudulent: "First of all, I look at how the coin will be used. If Ethereum was used instead of coins, the project would go worse. If our answer is no, ICO is not required."

In the literature, there is a model that is composed of 4 T includes Team, Technology, Theme and Token. The properties that investors should look for in each part of the model are summarized in Table 4 below.

Table 4. 4 T Models in ICO Selection

4 T	Explanation
Team	The project team should be experienced and there should be members who complement each other in the project. Previous successful entrepreneurship experiences have grown tremendously. Therefore, team members' inexperience in the professional field is a red flag that should be avoided.
Technology	The technology to be used in the project should be clear, understandable and easy to explain. Most importantly, the project should serve a specific purpose and be functional.
Theme	The theme describes the general business model and how sustainable this business model is. It shows competitors and customers in the market and prospects for the future. Expectations are very important, but investing only in expectations may cause wrong decision.
Token	The legal status of the token should be considered. This is important for the country where it will be released. China has banned ICOs and many countries have taken a similar stance. If investing in an ICO without any legal status, investors can only get their money back at best.

Source: <https://kriptokoin.com/>

There are also timing methods for evaluating, such as octave based evaluation. Some parameters are selected and specific levels of risk are determined based on experience from many former ICOs with fraud. These parameters should contain plus and minus values. For example, if there is no information about the founders of the project on social media or LinkedIn, this should be considered as negative, such as minus 10 points. The founders of the project took part in previous startups and if these projects are launched, this is a positive indication about the target project it should be evaluated positively like 10 points plus. Finally, a certain score will be obtained, and if this score range between 0 and 33 percent, this indicates that the project is a fraud. Values range between 33 and 66 indicate that the project should be examined in more detail. Values between 66 and 100 mean that investments can be made in the project.

One of the more popular methods involves a scientific language analysis. This method gives more successful results against tricking investors (frauds), especially in the last 5-10 years, by filling in the information parts of the projects with fashionable words. In general, it is to try to catch the attention of investors by using words that contain many interesting sales statements. It is possible to evaluate the real value of the project by doing some analytical analysis and reading how the company defines its projects. It should also be taken into account the company address, the quality of the website, or whether the company has previously participated in any industrial events. However, sometimes a very well designed website and international office addresses may not be an indicator that this company is investable.

3. Literature Review

Li and Mann (2020), established a new model that rationalize economic value of digital tokens to be launched in P2P platforms. They built model to define potential coordination failure. Based on this model, they also showed avoiding this failure by introducing of token distributed before platform start to work. In their model they defined an entrepreneur who has ability to start P2P platform that permits its users either to use service or provide other users. They described 2 potential users called as A and B respectively. They assumed that among the demand providing service each users rotate. User A creates surplus by obtaining the service in each odd period and it provides service for a c cost in each even period. On the other hand, because of opposite

timing, user B creates surplus from service in each even periods. They claimed that case by case analysis will create its own problems. Absence of certain rules may bring additional risk to start-up firms, investors who are already facing risky early stage investment. They analyzed economic value created by tokens and offered rule-based regulatory framework to ensure its development in the future.

Amsden and Schweizer (2019), examined ICO success and described tradability of token as base measure. They also analyzed relationship among venture uncertainty, venture quality, and investor opportunity set. For this purpose, they built sample consists of 1.009 ICOs performed during 2015 – March 2018. Based on the findings, they found out that venture uncertainty has a negative correlation with ICO success while higher venture quality has positive correlation. They concluded that in providing hard cap in pre-ICO period is useful for investors to determine ICO success in pre-sale stage.

Conley (2017), stated that crypto-tokens which are offered in ICOs are tried to implement various roles and function on different platforms. Author separated tokens into 3 types according to their similarity to currencies and securities and observed that some tokens are like currencies while others are similar to securities and last are completely different from first 2 groups. He described a successful token that considers some important aspects of monetary theory, financial economics and game theory. He claimed that failing to follow above mentioned aspects of economic disciplines may endanger succession of any given project. He also examined assessment economic value of token offered, structuring ICOs by start-up firms what effects of assigning several roles to token on a platform.

Lipusch (2018), aimed to provide basic information about ICOs by collecting and analyzing available data. He compared ICOs to traditional crowdfunding approaches like IPOs and Venture Capitals underlined differences and common points between them. Author also examined working mechanism of ICOs and business models that are related to this kind of fundraising and discussed broader effects of ICOs.

Kaal and Dell'Erba (2018), contributed existing literature by providing fundamental information about ICOs, market structure and market conditions, basic risk factors for investors. They also highlighted red flags of ICO practices that should be improved by the regulatory intervention.

Momtaz (2020), analyzed ICO market. He point out that marketability and liquidity of the tokens is contributing start-up finance. His first findings is investors are earning %8,2 on average in first day of trading but %40 of all ICOs reduce investor's value on the first day. He also analyzed determinants of trading results and found out that management quality and ICO profile have a positive correlation with funding amount and returns however he explored that visionary projects have negative effects. He added that highly visionary projects are more subject to be failed. Finally he examined sensitivity of the ICO to developments occurred in the sector like China's ban of ICOs and hack of leading ledgers. His findings is that ICO is so sensitive these environmental adverse events that is resulted as big losses for the investors.

Fisch (2019), studied determinant factors of amount of funds raised through 423 ICOs. He used technical white papers, source code quality, token supply and Ethereum-standard as independent variable that are expected to affect ICO. From aspects of signaling theory, he describes importance of technologic background of the ventures in ICOs. Based on the findings of the analysis, he observed that technical white paper and high quality source codes increase amount of fund raised. He couldn't see relationship between patents and raised fund amount. He stated that results of detailed determinant factor analysis in ICOs are similar to existing literature related to start-up finance while others are completely unique to the ICO.

Adhami, Giudici and Martinazzi (2018), analyzed determinant factors of success of ICOs based on a sample with 253 offerings. They concluded that ICOs are more likely expected to be successful when code course is provided, when a token presale is organized and when tokens ensure investors to reach specific services.

4. Conclusions and Discussions

ICOs are defined as a fundraising mechanism in which new projects sell basic cryptocurrencies in exchange for Bitcoin and Ether. From some aspects, it is argued that ICOs are similar to the IPO which investors purchase the company shares. ICOs are a relatively new phenomenon, but are quickly becoming the main topic of controversy in the blockchain community. While many consider the ICO as a non-regulated securities enabling founders to make unfair capital increases, some argue that there is an innovation in the traditional venture funding model. According to the U.S. Security Exchange Commission (SEC)'s decision on ICOs published in 2019, the quality of a token will be determined by whether it pass the Howey test.

If the test is passed, the token should be treated as a security and should be subject to certain restrictions and regulations applied by the SEC.

Regardless it is a security or not, according to market participants it is accepted a new crowdfunding method. Compared to IPO, it has some both advantages and disadvantages. The most important disadvantage of ICOs are their legal status that makes them less secure options than IPOs. On other hand, its most significant benefit for developers is non-requirement to share project with investors in other words developers don't have to transfer ownership and management rights of their start-up firms. Moreover crucial benefits of ICOs for the investors can be outlined as less document requirements, minimized cost transactions and easier access to international markets.

In this study, the conceptual framework of ICOs, which is accepted as the new method of crowdfunding, is explained. Information regarding on the definition, legal status, history, ICO process, participants, ICOs' advantages and disadvantage advantages, differences with IPO and risk factors on ICOs are provided on related chapters. In addition, summary statistics about ICOs are shared.

The aim of the study is to increase the awareness about ICOs by contributing to the existing literature on ICOs. It is hoped that the study will be an summary guide for those who will conduct research on ICOs.

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