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# Initial Coin Offering: A Taxonomy Based Approach to Explore the Field

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## Abstract

*New ventures and private investors are showing increasing interest in innovative forms of fundraising. ICO is the abbreviation of Initial Coin Offering and it represents an innovation in entrepreneurial finance (Fish, 2019; Block, Colombo, Cumming, & Vismara, 2018). However, no study has ever developed a taxonomy of academic and non-academic discourse related to this type of innovative financial tool. This paper aims to fill this gap by developing a taxonomy to investigate and categorize papers that discuss Initial Coin Offering phenomenon. This study is developed using a mixed methodology. The first stage of the research protocol regards the dataset definition and description. In the second stage we adopted the taxonomy process developed by Nickerson et al. (2012). The purpose of the present work is to develop a taxonomy with a set of dimensions each consisting of a set of characteristics that describes the objects in a specific study. We identified a set of seven dimensions: research approach, research design, data collection, philosophical view, focus, research issue, ICO phase. In the taxonomy process we assigned a single value to every dimension. In the last section, we summarize some preliminary results, providing conclusions and discussions for future research.*

**Keywords:** Initial Coin Offering, Blockchain, Cryptocurrency, Taxonomy, Token sale

## Introduction

New ventures and private investors are showing increasing interest in innovative forms fundraising. Traditional ways to fund a project can be represented by through the 3 F's (family, friends and fools): banks or financial institutes, angel investors or venture capitalists, government grants, crowdfunding.

The process involving the development of Initial Coin Offering (ICO), as we know it today, was first described in January 2012 in the white paper titled "The second Bitcoin White Paper" (Willet, 2012).

ICO stands for Initial Coin Offering and it represents an innovation in entrepreneurial finance (Fish, 2019).

The idea behind this was that the existing Bitcoin network could serve as a basic protocol to build new protocol levels with their respective rules.

The first ICO was launched by Willett in 2013 under the name Mastercoin in which raised USD 500,000 (Shin, 2017). Another important turning point in the field of ICO process is the creation of Ethereum company, which was founded by Vitalik Buterin (2013). The company introduced Ether tokens raising more than USD 18 millions of start-up capital.

ICO is defined as a poorly regulated process (method) of obtaining start-up funding for companies engaged in blockchain technology (Investopedia, 2018).

ICOs, also called token sale, allow entrepreneurs to sell a predefined number of newly generated digital tokens to the public in exchange for cryptocurrencies (Kranz et al., 2019).

The easiest way to define initial coin offerings (ICOs) is that they can be considered a financing activity that allows online projects and start-up companies to raise the required funds with the support of venture capitalists.

Since Bitcoin was first conceptualized in 2008 and implemented in 2009 (Nakamoto, 2008), the price of Bitcoin has gone from almost zero (January 2009) to more than $56,000 (March 2021). The rise of Bitcoin has brought attention not only to digital currencies but also to the underlying technology empowering digital currencies: blockchain technology (Y. Chen, 2018).

Companies adopt this revolutionary token sale process to try to avoid a more regulated process of raising capital by institutional investors in the classic public offering of shares.

An ICO is a new way to perform crowdfunding campaigns, based on blockchain technology. It allows financing startups using blockchain technology without intermediaries. The new venture will create and distribute its tokens with the aim to convince investors on the success of its innovative project. The token of the ICO can be developed through a smart contract, a computer program running on a public blockchain.

A blockchain is a distributed ledger that is usually managed by a peer-to-peer network (Buterin, 2014; Nakamoto, 2008). In the distributed ledger, transactions are organized into blocks that are linked together into a chain. In a blockchain, trans-actions are validated and recorded by distributed consensus in the peer-to-peer network, eliminating the need for a trusted central entity (Y. Chen, 2018).

Blockchain technology represents one of the greatest innovations that have occurred in recent years as this tool allows the creation and exchange of digital assets (cryptocurrencies), as well as the conclusion of contracts between customers. All this has led to the rapid introduction of a new fundraising method by startups, especially in the field of innovative technologies, known as initial Coin Offering. Before this revolutionary tool, companies raised funds for their innovative projects using traditional methods, where venture capital funds and business angels played a fundamental role.

Due to the innovations provided by the blockchain technology, the cost of the ICO process using the cryptocurrency exchange platforms is up to ten times cheaper than the costs of traditional IPO (Initial Public Offering) on the stock market (Lahajnar & Rožanec, 2018).

ICOs are a disruptive financial tool through which new ventures can generate and sell blockchain-based tokens to investors. In ICOs, entrepreneurs raise money through the issuance of blockchain based tokens. Blockchain can be defined as a decentralized, distributed ledger technology that records the provenance of a digital asset. This innovative technology facilitates peer-to- peer transactions, without the need for financial intermediaries.

An ICO provides a new way for entrepreneurs to raise money for a startup by selling their own cryptocurrency to investors. This is similar to crowdfunding in two aspects: both require a minimum funding threshold to be reached; and both are in a way engaged in testing the market demand for their product.

This is similar to crowdfunding in two aspects: both require a minimum funding threshold to be reached; and both are in a way engaged in testing the market demand for their product (Cerezo Sanchez, 2017) (H.-C. Hsieh & Oppermann, 2020).

Only one study carried out a systematic literature review concerning this phenomenon (Bruckner et al. 2020) at Americas Conference on Information Systems. Current literature provides contributions on investor decisions to fund ICOs as well as on investee decision to obtain funds for their innovative projects, other studies provide an overview on ICO characteristics that influence the investors-investee relationship. Their research provides a systematic literature review revealing clusters of ICO characteristics that influence an investor's decision-making process.

G.Fridgen, F.Regner, A. Schweizer and N.Urbach developed a general taxonomy of empirically validated ICO design parameters, but the manuscript is dated (2018) and their classification consider only technical aspects regarding three thematic categories: token, issuer and sales term.

However, no study has ever developed a taxonomy of academic and non-academic discourse related to this type of innovative financial tool considering Research Dimensions. This paper aims to fill this gap by developing a taxonomy to investigate and categorize papers, that discuss Initial Coin Offering phenomenon, in seven dimensions and 32 values.

The present work is structured as follows: the next paragraph provides a description of the theoretical background concerning the ICO phenomenon. In the third paragraph we illustrate the methodology adopted to develop the taxonomy. Afterwards, we provide a description of the taxonomy development process classifying the dimensions and their values. In the last section, we summarize some preliminary results, providing conclusions and discussions for future research.

## Theoretical background

The literature related to ICOs is still quite limited. Most of the works refer to what the success factors of ICOs are and link success to the amount of money raised. Adhami, Giudici, and Martinazzi (2018) examined the specific characteristics of an ICO that determine success. They found that the probability of an ICO's success is higher if the code source is available, when a token presale is organized, and when tokens allow contributors to access a specific service.

Fisch (2019) analyzed the factors that determine the amount raised. The results explored by Fisch showed that technical white papers and high-quality source codes increase the amount raised, while patents are not associated with increased amounts of funding. Fisch, Masiak, Vismara and Block (2019) identified and categorized the motivations to invest in ICOs using factor analysis. They found that investors are driven by ideological, technological, and financial motives. Moreover, Fisch and Momtaz (2020) examined the role of institutional investors in ICOs. They argued that institutional investors' superior screening and coaching abilities enable them to overcome the information asymmetry of the ICO context. They found that institutional investor backing is associated with higher post-ICO performance.

Roosenboom, van der Kolk,and de Jong (2020) found evidence that ICOs are more successful in raising funding when they disclose more information to investors, have a higher quality rating by cryptocurrency experts, organise a presale, have shorter planned token sale durations and have a larger project team.

Some studies focused on aspects of the venture such as raising funds, others investigated the characteristics of the investor or investee or both. Hsieh and Oppermann (2020) investigated how ICO characteristics, cryptocurrency markets, the jurisdictions, the ICO industry and conventional financial markets affect the initial returns of ICOs.

Momtaz (2020) focused on asymmetric information between investor-investee. He found that loyal CEOs have to offer lower financial incentives to attract investors and are still able to raise more proceeds and are less likely to fail.

An, Duan, Hou, and Xu (2019) examined the effects of founders' characteristics on firm's success in ICOs. They discovered that the disclosure of founders' personal information is associated with larger amount of funds raised in ICOs.

Hsieh and Oppermann (2020) analyzed the initial returns of ICOs and showed that ICO under-pricing is very high. Moreover, they discovered that having a short offering phase, not holding a presale, an accurately written whitepaper, and the creation of an independent blockchain all have a positive impact on ICOs' initial returns.

Another mainstream of study analyses ICOs in relation to IPO (Initial Public Offering) and crowdfunding phenomena.

An, Duan, Hou, and Xu (2019) studied the effects of founders' characteristics on firm's success in ICOs, drawing parallels between ICOs,crowdfunding and venture capital, where a large literature examines the relationship between founder characteristics and firm performance.

Huang, Meoli and Vismara (2020) demonstrated that the availability of investment-based crowdfunding platforms is positively associated with the growth of the number of ICOs, while debt and private equity markets do not provide similar effects.

Block, Groh, Hornuf, Vanacker, and Vismara (2020) drew a comparison between crowdfunding and ICO. Their study demonstrated that although the two market segments initially appear to be similar, relevant differences exist between them. Their comparison focused on the stakeholders, microstructures, regulatory environments, and development of the markets.

Collomb, De Filippi, and Sok (2019) compared Initial Public Offerings (IPOs) and equity crowdfunding with ICOs and explored the corresponding risks and limitations of these different fundraising practice. They discovered that many ICOs share lots of similarities with traditional IPOs and equity crowdfunding, they so they should be regulated in a similar manner.

Hashemi Joo, Nishikawa and Dandapani (2019) recognized the benefits of ICO as a way of raising funds and presented a comparison between the ICO and the initial public offering to realize the future possibilities of this innovative funding method. ICOs structure is much more elastic and it represents a faster and less costly way of raising capital than IPOs.

Other academics also consider it essential to argue about Blockchain when analyzing the phenomenon of ICO.

Kher, Terjesen, and Liu (2020) systematically reviewed 152 articles concerning blockchain and its applications and synthesized five topics: computer science, economics, entrepreneurship, and law and governance.

According Boreiko, Ferrarini and Giudici (2019), ICOs are a new way for blockchain startups to finance project development by issuing coins or tokens in exchange for fiat money or Bitcoin or other cryptocurrencies. They compared the European and American regulation, highlighting the great differences between Europe and the US which make Europe less friendly to blockchain startups.

According Yan Chen (2018) blockchain tokens may democratize entrepreneurship by giving entrepreneurs new ways to raise funds and engage stakeholders, and can give to innovators a new way to develop decentralized applications.

(Lo & Medda, 2020) examined venture related blockchain tokens, and developed the analysis through a stepwise testing of four hypotheses using panel ordinary least squares with cluster-robust standard errors. They found that token functions are statistically significant in relation to token prices.

Mangano (2018) illustrated advantages and drawbacks concerning the use of blockchain technology in finance. The issuance of blockchain securities is creating a divisoon between the world where securities are issued, offered and sold, and the world where law is enforceable. Albrecht, Lutz, & Neumann (2020) investigated whether blockchain ventures can reduce information asymmetries between investor/investee by utilizing signaling mechanisms on Twitter and how the resulting effects differ from those in conventional market environments.

## Methodology

In conducting our review, we followed the approach used by Za et al. (2018) which comprises four major steps: 1) material collection, 2) analysis collection, 3) taxonomy development (selecting structural dimensions and categories based on well-established theory, 4) preliminary evaluation and interpretation.

Although we adhered to this process, we gathered the first two steps so that our study comprises three major steps as described in fig. 1.

This study is developed using a mixed methodology. In the first step we selected bibliographic sources using Scopus database since academics and practitioners consider this tool a comprehensive, expertly curated abstract and citation database.

The first stage of the research protocol regards the dataset definition and description. We chose the searching terms using Scopus, then we applied a practical and methodological screening giving a description of the dataset, eventually a refining selection.

In the second stage we used the taxonomy process developed by Nickerson et al. (2012). The purpose is to develop a taxonomy with a set of dimensions each consisting of a set of characteristics that describes the objects in a specific study. It consists of iterating empirical-to-conceptual and conceptual-to-empirical

approaches in the analysis of the papers gathered in the dataset. The iterating process should be run until values and attributes of theoretical dimensions appear clear (Za et al. 2020). Our purpose is to identify a set of dimensions and their values to better categorize papers of the dataset.

We adopt a "useful taxonomy" in agreement with the definition by Nickerson et al. (2012): the dimensions and values should be concise, robust, comprehensive and extendible. Finally, in our research each paper has one value for each dimension, so we did not assign two or more values to one dimension.

In the third section, we report the findings from a preliminary interpretation of studies regarding ICOs phenomenon. As part of this analysis, we consider ICOs' theoretical background to understand how research type and topics are related to this innovative finance tool. From the preliminary analysis we report for every value the number of papers involved distinguishing seven dimensions concerning research type and topics (research approach, research design, data collection, philosophy view, focus, research issue, ICO phase).

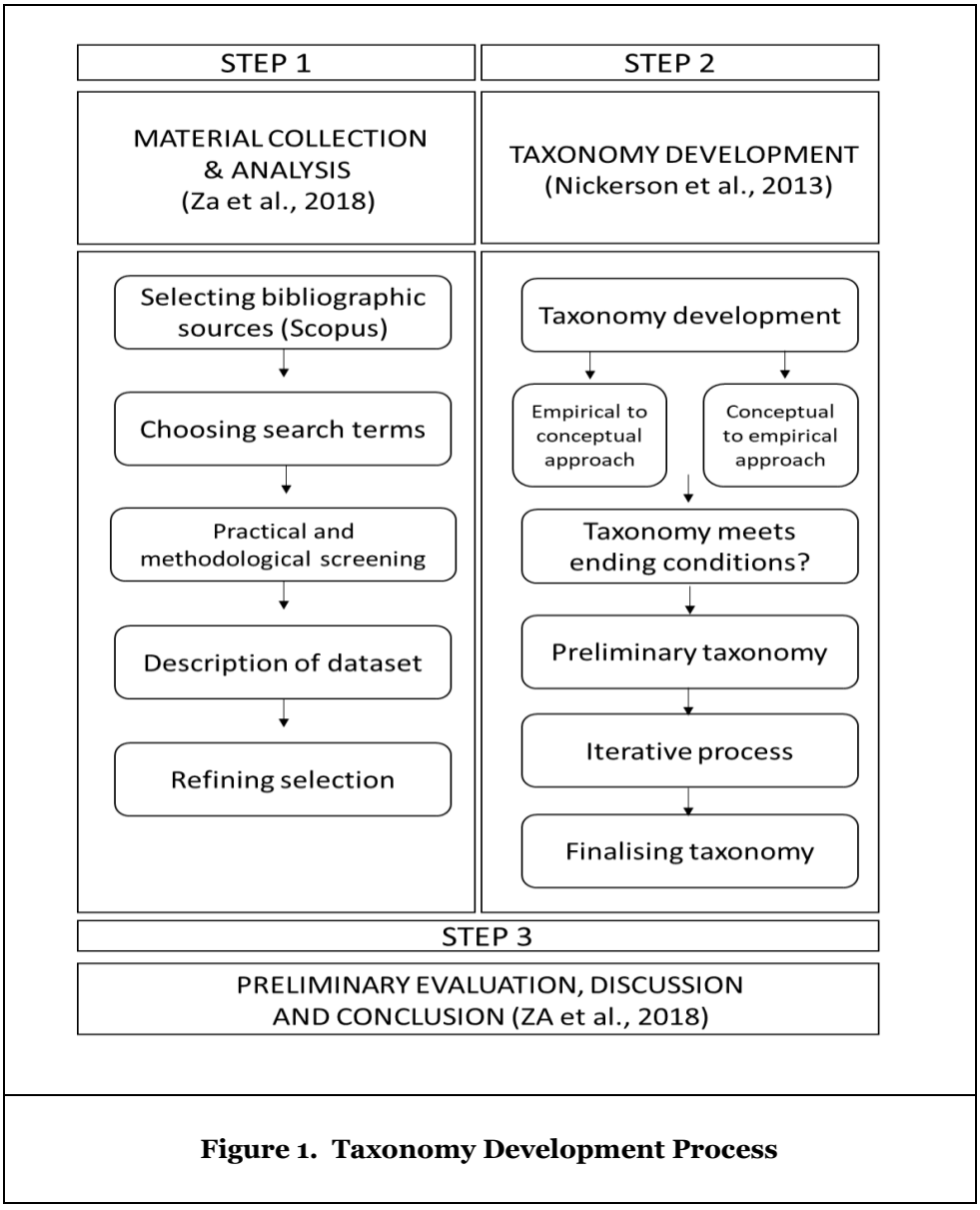


**Figure 1. Taxonomy Development Process**

## Material collection and sample description

In a literature review research, academics select different kinds of criteria to collect documents. To cover all studies regarding ICOs' phenomenon, we conduct our search using Scopus database, since this platform is widely used by academics and researchers in the field of social studies (Za et al. 2020). The first stage of our work involved data collection so that a congruous source of academic literature can be identified. We used Scopus database to gather relevant studies related to the ICOs phenomenon. To perform the search, we specified a query on Scopus to find documents which contain the string "Initial Coin Offering*" in the article title, abstract or keywords without any temporal restriction. We used wildcards to also include plural words, grammatical and spelling variations.

The first query returned 226 papers published between 2017 and 2021. A growing interest regarding this innovative finance tool can be noticed. Articles represented 63% of the works, followed by conference papers which constituted 20% of the total. Prevalent keywords used are Initial Coin Offering (130), Blockchain (108) and Cryptocurrency (67). The major publication outlets included Small Business Economics, Economist United Kingdom, Journal of Alternative Investments, European Business Organization Law Review, Journal of Corporate Finance.

We restricted our dataset by selecting only journals and conference proceedings document types, to develop a rigorous taxonomy. We also included only English studies and excluded the publisher Economist United Kingdom since it represents a newspaper. The first refined dataset included 133 contributions.

We analyzed all abstracts to refine our dataset further, in order to include only works consistent with ICOs phenomenon. The final refinement led to 99 relevant papers for our purpose.

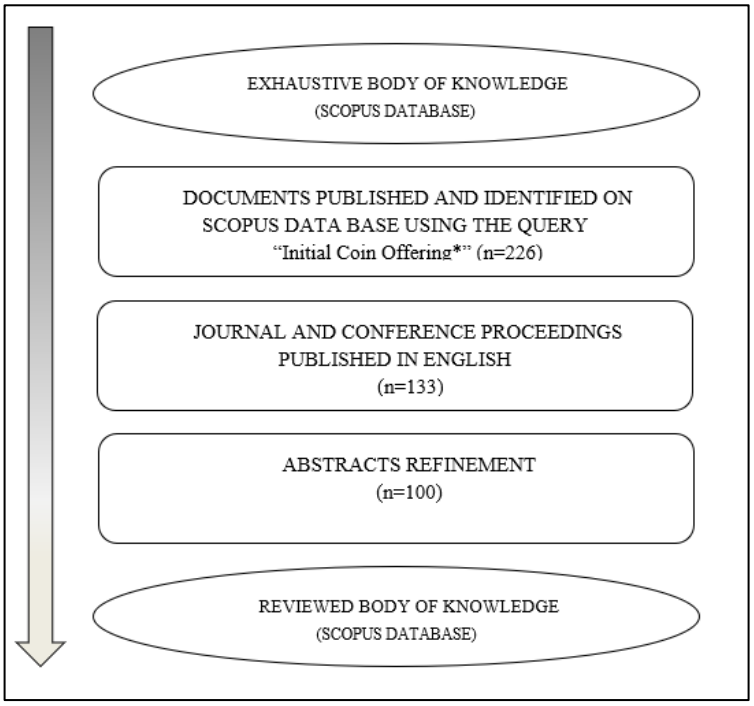


**Figure 2. Systematic Selection of Bibliographic Sources on Scopus**

## Taxonomy description

In this study, we developed a taxonomy to better understand and describe the emerging phenomenon of ICOs. A taxonomy is the result of a design science research approach ; it consists of dimensions containing characteristics that are "mutually exclusive and collectively exhaustive" (Nickerson et al., 2009).

Our purpose is to synthesize the literature regarding ICOs phenomenon exploring which kind of research academics apply and which topics are investigated.

We identified a set of seven dimensions: research approach, research design, data collection, philosophical view, focus, research issue, ICO phase. In the taxonomy process we assigned a single value to every dimension.

### *Dimensions' description*

*Research approach*. Following Creswell (2014) we distinguished four main approaches: qualitative, quantitative, mixed methods and design science research (DSR). Qualitative research is an approach for exploring social or human issue and the researcher makes interpretations of the meaning of the data. Quantitative research is "an approach for testing objective theories by examining the relationship among variables" (Creswell, 2014). Mixed methods involve both quantitative and qualitative data, using different designs that can involve philosophical assumptions and theoretical frameworks. DSR is a research approach that has to be differentiated from mixed-methods (Kutzner, Schoormann, & Knackstedt, 2018), it consists in a problem-solving paradigm that seeks to enhance human knowledge via the creation of innovative artifacts (Brocke, Jan Vom & Hevner, Alan & Maedche, Alexander, 2020).

*Research design*. Re-viewing the selected literature of ICOs, we identified several strategies used by researcher: Empirical, literature search, grounded theory, longitudinal study, case study, survey design, content analysis, field research. "Empirical research is research that is based on observation and measurement of phenomena, as directly experienced by the researcher" (Emerald publishing). The data generally are compared against a theory or hypothesis, but the results are related to real life. The main purpose of literature search is to provide the background to and justification for the research undertaken (Bruce, 1994, p. 218). The two preeminent style of literature review are traditional or narrative and systematic. Grounded theory aims to build the theory from the data, obtained and analysed using a comparative analysis (Glaser et al., 1967). Longitudinal study is considered a research design that involves repeated observations of the same variables over short or long periods of time. The benefit of a longitudinal study is that researchers can find out changes in the characteristics of the target population regarding a specific field of study. According to Creswell (2014) case studies are a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals. Survey research is defined as "the collection of information from a sample of individuals through their responses to questions" (Check & Schutt, 2012, p. 160). Survey research involves acquiring information about one or more groups of people (exploring e.g., characteristics, opinions, attitudes) by asking them questions and tabulating their answers. According Stemler (2001) content analysis is a systematic, replicable data reduction technique, compressing many words of text into content categories based on explicit rules of coding. A field research is defined as a study that takes place in the natural environment of the subject of the study rather than in a laboratory environment; it involves observations, experiments, and interactions with participant.

*Data collection*. Data can be classified using five main tools: observations, documents and records, questionnaire, interview, focus groups. "Observation is a way of gathering data by watching behaviour, events, or noting physical characteristics in their natural setting". Observations can be overt (everyone knows they are being observed) or covert (no one knows they are being observed and the observer is concealed) (Taylor-Powell et al., 1996). Document and records data collection involves systematic data collection from existing records. This method of data collection involves analysis of content from written documents in order to make deductions based on the study parameters Questionnaires are designed to collect data from a group. A questionnaire is a research instrument consisting of a series of questions for

the purpose of gathering information from respondents. They can be carried out face to face, by tele-phone, computer or post (www.simplypsychology.org). Interviews are used to collect data from a small group of subjects on a broad range of topics. Interviews can be conducted either in person or over the telephone. Surveys are standardized written instruments that can be assigned by mail, email, or in person. An interview may use the same instrument created for a written survey, although interviewing generally gives the possibility to explore questions more deeply. The purpose of a focus group is to add a collective element to individual data collection. This data collection method uses collective interviews of typically six to eight participants from similar backgrounds, similar demographic characteristics, or both. In focus groups participants can discuss the questions and share their opinions, people can influence one another in the process, stimulating a debate on an issue.

*Philosophical view*. The philosophical idea behind a research project is represented by the philosophy view. A postpositivist view regards deductive proceedings starting with selected theories, while a "constructivist view aims at generating or inductively developing a theory or pattern of meaning" (Creswell, 2014).

*Focus*. We mean the main aspects discussed in our data set: Technological, Organizational, Individual, Social, Geopolitical and Legal aspects.

*Research issue*. This dimension refers to the kind of aspects every paper wants to explore, every work covers literature gap in a particular field and their purpose is to analyse: Technical aspects, Token market, Information asymmetry (investor-investee) and Ideological aspects (Entrepreneur behaviour, Investor's risk tolerance).

*ICO phase*. Generally, every ICO can be divided in three phases: Pre ICO, ICO launch and post ICO. Every work can be associated to a particular ICO phase. Pre ICO refers to ICO planning and marketing services. ICO phase refers to the actual launch and development process. Once the ICO launch and development process is completed, it is then opened for ICO token sale and exchange (Post ICO).

| **DIMENSIONS DESCRIPTION** | | |
|---|---|---|
| ***DIMENSION*** | ***VALUES*** | ***DISTINGUISHING ATTRIBUTES*** |
| **Research approach** | Quantitative | Quantitative research is "an approach for testing objective theories by examining the relationship among variables" (Creswell, 2014). |
| | Qualitative | Qualitative research is an approach for exploring social or human issue and the researcher makes interpretations of the meaning of the data. |
| | Mixed | Mixed methods involve both quantitative and qualitative data. |
| | DSR | DSR is a research approach that has to be differentiated from mixed-methods (Kutzner, Schoormann, & Knackstedt, 2018), it consists in a problem-solving paradigm that seeks to enhance human knowledge via the creation of innovative artifacts (Brocke, Jan vom & Hevner, Alan & Maedche, Alexander, 2020). |
| **Research design** | Empirical | Empirical research is research that is based on observation and measurement of phenomena, as directly experienced by the researcher" (Emerald publishing). |
| | Literature research | The main purpose of literature search is to provide the background and justification for the research undertaken (Bruce, 1994, p. 218) |
| | Longitudinal study | Longitudinal study is considered a research design that involves repeated observations of the same variables over short or long periods of time. |
| | Grounded theory | Grounded theory aims to build the theory from the data, obtained and analysed using a comparative analysis (Glaser et al., 1967). |
| | Case study | Case studies are a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals (Creswell, 2014). |
| | Survey design | Survey research is defined as "the collection of information from a sample of individuals through their responses to questions" (Check & Schutt, 2012, p. 160) |
| | Content analysis | Content analysis is a systematic, replicable data re-duction technique, compressing many words of text into content categories based on explicit rules of coding (Stemler, 2001). |
| | Field research | A field research is defined as a study that takes place in the natural environment of the subject of the study rather than in a laboratory environment; it involves observations, experiments, and interactions with participant. |

| | | |
|---|---|---|
| **Data collection** | Observation | Observation is way of gathering data by watching behaviour, events, or noting physical characteristics in their natural setting (Taylor-Powell et al.,1996) |
| | Documents & Records | Document and records data collection involves systematic data collection from existing records |
| | Questionnaire | A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents |
| | Interviews | Interviews are used to collect data from a small group of subjects on a broad range of topics. |
| | Focus groups | This data collection method use collective interviews of typically six to eight participants from similar backgrounds, similar demographic characteristics, or both. |
| **Philosophical View** | Postpositivist view | A postpositivist view regards deductive proceedings starting with selected theories (Creswell, 2014) |
| | Constructivist view | A constructivist view aims at generating or inductively developing a theory or pattern of meaning (Creswell, 2014) |
| **Focus** | Technological | Papers that explore technical aspects related to the ICO: innovative tools, bonus, soft and hard cap, platform. |
| | Organizational | Papers that point out organizational structure of companies: functional, divisional, matrix, flat. |
| | Individual | Documents that consider more aspects related to the psychology of the individuals involved. |
| | Social | Documents that explore social projects. Socially responsible ICOs aim to improve public wellbeing in education, environment, health and poverty. |
| | Geopolitical | Documents that explore geopolitical issue related to ICOs: how governments can affect the development of new ICOs. |
| | Legal | Documents that explores legal issues: how ICOs face different legal issues in different countries. |
| **Research Issue** | Information Asymmetry | Documents that explore investor-investee relationship. |
| | Ideological aspects | Documents that explore ideological aspects (entrepreneur behaviour, investor's risk tolerance). |
| | Technical aspects | Documents that cover literature gap in technical aspects: platforms, smart contracts, token price. |
| | Token market | Documents that give an overview of token market. |
| **Ico phase** | Pre ICO | It refers to a sale of a limited number of Tokens or Coins before the actual ICO (Initial Coin Offering) takes place. |

| | | |
|---|---|---|
| | ICO | It refers to the launch of ICO. |
| | Post ICO | It refers to post ICO performance. |

**Table 1. Research Dimensions**

## Preliminary Evaluation, Discussion and Conclusion

From a preliminary analysis of our dataset, we identified several findings. First, papers use qualitative (38) and quantitative (37) research approach in equal measure; second, documents apply empirical (41) and field research (19) methodology. Nine literature research studies explore ICOs phenomenon adopting mixed (5) and qualitative (4) research approach.

Several features and aims discussed in our dataset documents can be explored by combining two or more dimensions. We proposed a preliminary analysis of ICOs literature using a subset of 3 dimensions in two different combinations:

- In the first analysis we considered the following dimensions: research approach, research design, focus (Fig. 3).
- In the second analysis we considered the following dimensions: research approach, research design, research issue (Fig. 4).

This analysis can provide some insight into the discussion on ICOs phenomenon in the contributions focused on main aspects of the object of study, and on what kind of research issue documents aim to explore.

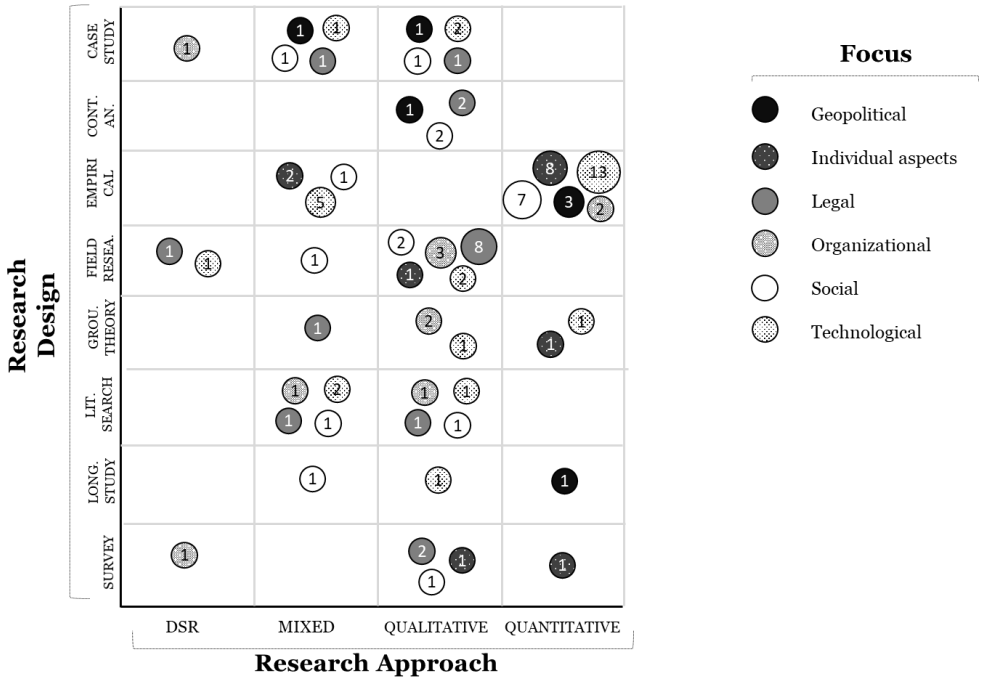


**Figure 3. Number and distribution of contributions discussing ICO phenomenon in relation to the Focus considering Research Design and Research Approach Dimensions**

Figure 3 shows the resulting diagram combining three specific dimensions: Research Design (survey, longitudinal study, literature search, grounded theory, field research, empirical, content analysis, case study), Research approach (DSR, Mixed, Qualitative, Quantitative) and Focus (technological, social, organizational, legal, individual, and geopolitical aspects). Looking at the diagram, it appears that most documents are focused on technological aspects (30) and are mainly empirical studies (18). Social studies (19) are mainly empirical (8) while legal documents (18) are involved mainly in field research (9). Quantitative studies are involved in technological aspects while qualitative works explore legal issues.

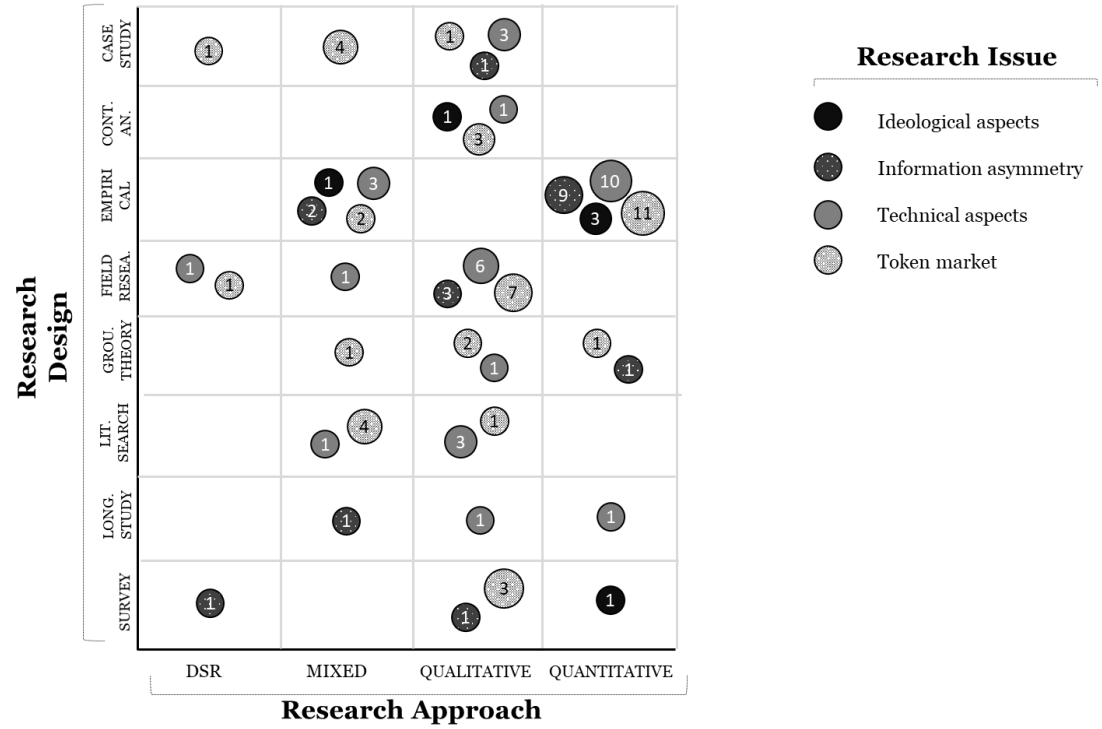


**Figure 4. Number and distribution of contributions discussing ICO phenomenon in relation to the Research Issue considering Research Design and Research Approach dimensions.**

Figure 4 shows the resulting diagram combining three specific dimensions (the first two are the same of the first diagram): Research Design (survey, longitudinal study, literature search, grounded theory, field research, empirical, content analysis, case study), Research approach (DSR, Mixed, Qualitative, Quantitative) and Research Issue (Ideological aspects, Information asymmetry, Technical aspects, Token market). Looking at the diagram, it appears that scholars focus attention first on Token market (42), second on technical aspects (32), third on information asymmetry (19). Both qualitative and quantitative studies explore mainly the token market (17, 12).

The proposed taxonomy could be useful for practitioners as well as for academics. These findings offer several theoretical contributions to ICOs phenomenon. First previous studies did not develop a taxonomy of academic and non-academic discourse related to ICO's Research Dimensions. Second, this study contributes to the innovation research by identifying seven dimensions in research topic, which combined in an appropriate way can disclose any gaps in literature or can identify the most explored topics. Third, the study contributes to pointing out the emerging research issue regarding information asymmetry and investor/investee relationships. The findings of this study also have implication for investor and investee to achieve more awareness about this finance tool, as well as some policies implications for countries where this phenomenon is unregulated.

Although the present work narrows some of the gaps in ICOs literature review, it also has several limitations that provide opportunities for future research. First, the dimensions of research relate to a personal

interpretation of the present authors, so dimensions may differ significantly from those of other researchers. Second, the dataset is limited to 99 documents and the growing interest on ICOs phenomenon can determine a larger dataset. Third, a second set of dimensions could be explored regarding research type (research approach, research design, data collection). Therefore, a further literature review process is recommended in order to enrich research topics dimensions as well as the dataset number of contributions. Future works could also explore a new set of dimensions regarding research approach and research design adopted by researchers. Fourth, the dataset doesn't consider empirical data from real world ICO cases, thus future research might use the present taxonomy as a starting point to build an updated taxonomy including ICO cases. Finally, it could be useful to use the present taxonomy to explore other innovative financial tools such as Initial Exchange Offering and Security Token Offering.(Za, Spagnoletti, Winter, & Mettler, 2018).

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