

Start-up Financing through Initial Coin Offering: Technology Risks, Data Protection and Regulatory Frameworks in the European Market

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1 Introduction

„Diese Technologie bietet solches Potenzial und das wird wahrscheinlich größer als das Internet.“ (Interviewee C 2020, p. 142)

As the above quote illustrates, few phenomena have attracted as much attention in recent years, not only in expert circles but also among the international public through frequent mentions in the media, as cryptocurrencies and the underlying blockchain technology (Fahlenbrach and Frattaroli 2019). Blockchain is currently the most widespread form of the distributed ledger technology (DLT) and it first appeared in 2009 with the successful cryptocurrency Bitcoin, which has been followed by many other cryptocurrencies to this day (Beck et al. 2017; Nakamoto 2008). For several years now, the use of blockchain technology has been tested in numerous other areas (BSI 2019). New business models have been established that require an innovative start-up form and form of corporate financing. The so-called initial coin offerings (ICOs) marked an important trend in the financing of new cryptocurrencies and blockchain-based companies in the early stage venture phase from 2013 onwards. Experts compare this innovative form of financing with traditional financing measures such as initial public offerings (IPO) or venture capital (VC) (Fahlenbrach and Frattaroli 2019). In total, ICOs raised more than 31 billion US dollars (USD) between January 2016 and August 2019 (CoinSchedule 2019a). Especially in 2017 and early 2018, a boom took place in which ICOs experienced exponential growth, and for the first time, in 2017, collected more capital than all VCs combined in the blockchain sector (Chohan 2017).

Within the framework of an ICO, companies emit specially created tokens or coins via a blockchain, which are then issued via a so-called intelligent contract. The tokens can be designed in different ways by the issuer and equipped with different rights. As a rule, however, the tokens are emitted as a pure means of payment or as a right of use for the products or services of the issuing company. Cryptocurrencies or fiat money can be exchanged by potential investors (Howell et al. 2019).

At the beginning of 2018, in addition to blockchain-based start-ups, an increasing number of established crypto foreign companies such as Kodak or Telegram carried out an ICO to benefit from the advantages of this financing method (Diemers et al. 2018). In contrast to traditional risk investments, an ICO provides rapid liquidity in the early stages of a company's formation due to its earlier tradability in secondary markets, whereas traditional equity-based or reward-based contracts are essentially illiquid (Adhami et al. 2018). The issuing company also benefits from the properties of the blockchain technology. ICOs enable start-ups to raise enormous funds in a short period of time with a minimum of effort, while avoiding costs and time spent on transactions and regulatory compliance (Kaal and Dell'Erba 2018; Pilkington 2016).

The enormous growth and financing success of initial coin offerings pose massive challenges for financial researchers, investors, companies and financial market authorities around the world. This is because in an ICO companies collect capital from small investors far removed from any regulations, such as the obligation to publish a prospectus or investor protection (Adhami et al. 2018). At the same time, the number of cases of fraud and cyberattacks in ICOs has risen so rapidly that, in addition to unclear regulation and the collapse of the crypto market at the beginning of 2018, a radical turnaround in the ICO market has resulted. Within a few months, both the number and the sum of the collected capital of ICOs decreased to a record low (CoinSchedule 2019a; Dowlat and Hodapp 2018).

1.1 Problem and Objective

Initial coin offerings have recently developed a significant impact as a financing mechanism, but due to their novelty, little is known about the dynamics and interrelationships of ICOs (Fisch 2019). States and regulatory authorities around the world have so far been searching for appropriate approaches to evaluate and embed ICOs in their regulatory framework (Kaal and Dell'Erba 2018). This is because ICOs are largely neglected by research in the field of information systems (IS), although the interest of institutional and private investors in this form of financing is steadily increasing (Chanson et al. 2018; Lochmahr 2019). Due to the increasing relevance of the blockchain technology, the subject of ICOs must be a topic of IS research.

Initial coin offerings involve a large number of different kinds of risks. The intention of this thesis is to identify these risks that fall under the keywords *technology*, *data protection* and *regulatory framework* in the European Union (EU) and classify them within a risk taxonomy. From this task the first research question (RQ1) arises.

RQ1: What are the key risks with regard to technology, privacy and regulation of initial coin offerings and how can these risks be classified?

In a second step, this thesis attempts to derive appropriate measures and recommendations for action from the results of the first research question in order to establish initial coin offerings as an accepted form of corporate financing in the EU. This objective is reflected in the second research question (RQ2), which will be answered in the framework of the thesis.

RQ2: How can capital financing through Initial Coin Offerings be integrated under the aspect of data protection, IT security and regulation, in order to be established as a transparent, secure and efficient form of corporate and start-up financing in the European Union?

1.2 Approach and Methodology

To answer the above-mentioned research questions, this study is divided into eleven chapters. The introduction is followed by Chapter 2, in which the terminology necessary for the thematic discussion is given. The first subchapter deals with the technical foundation, in which the terms

DLT, blockchain, digital token and smart contract are introduced in detail. Building on this, the actual concept of initial coin offerings is explained in the second subchapter and is differentiated from traditional forms of financing. In addition, the chapter provides a historical and current market overview and further illuminates a special form of ICOs, the so-called security token offerings. Building on this basis, the main part of the study follows. Chapter 3 introduces and examines the current status quo of the data protection, IT security as well as regulatory framework in relation to the financing of start-ups through initial coin offerings in the European Union. Furthermore, Chapter 4 presents the gap in the literature of the topic and derives the two research questions accordingly. Chapter 5 is dedicated to the research methodology and is divided into research design, data collection and data analysis. The resulting findings of the previous chapter are presented in Chapter 6 and answer the question why ICOs were successful and why they ultimately failed. In a same step the key strengths and weaknesses are also highlighted. In Chapter 7, the actual classification of risks within the framework of a taxonomy is then carried out in the context of technology, privacy and regulation, and the first research question is answered. Chapter 8 provides a critical appraisal and a discussion of the results, while a limitation shows the restrictions that constrain the research on the topic. Chapter 9 is devoted to the second research question, in which meaningful recommendations for action are derived based on the results of Chapter 7. Scientific and practical implications are highlighted in Chapter 10. The last chapter then contains a final analysis, which includes important contents and findings as well as a personal assessment with reference to the research questions. A short outlook concludes the work.

2 Theoretical Foundations

2.1 Technical Background

To understand and discuss the topic of initial coin offerings, it is necessary to provide the reader with a certain level of technical understanding and knowledge about distributed ledger technology, blockchain, virtual token and smart contract. Due to the high level of technological complexity, only basic knowledge and concepts of the above-mentioned topics are discussed in this section. In the further course of the theoretical foundations, the ICOs themselves will be explained and the current market development will be examined more closely.

2.1.1 Distributed Ledger Technology and Blockchain

Distributed ledger technology describes a special form of electronic data processing and storage and forms the basis of the blockchain technology (Metzger 2018). The starting point of DLT is a decentralized database, the so-called ledgers, which are distributed to different and independent members of the network. The main purpose of the ledgers is to document agreements on various transactions between parties within the network and to conclude these without

decisive role in reducing the existing uncertainty and lack of acceptance of this newly developing financial sector.

11 Conclusion and Outlook

The research results thoroughly presented and discussed in the course of this thesis can help to broaden the current picture of ICOs and their role for the financial sector. Both the technically as well as theoretically sound fundamentals and their status quo with regard to the concepts important for the discussion and, above all, the specific consideration of the risks and corresponding recommendations for action of the initial coin offerings lead to revealing results.

In this thesis, the first research question was to investigate how the risks of an ICO can be meaningfully classified in a risk taxonomy, taking into account technology, privacy and regulation. Prior to this, the status quo of the underlying terms data protection, IT security as well as regulatory framework was examined in order to create a starting point for further discussion of the topic. Due to the lack of research status and the current dynamics of this topic, semi-structural interviews were conducted in order to enable a more in-depth and practice-oriented analysis. Subsequently, the reasons and factors that led to the enormous success and failure of the ICOs in 2018 were analyzed. In a next step, based on the findings so far and taking into account the second research question, recommendations for practical action were derived accordingly.

First of all, it should be emphasized that initial coin offerings are a new and innovative form of blockchain-based corporate financing, which can certainly be attributed a disruptive character. Regarding the first research question *“What are the key risks with regard to technology, privacy and regulation of initial coin offerings and how can these risks be classified?”* it is stated that the key risks presented in Chapter 7 can be classified both on the level of blockchains and on the level of ICOs. Furthermore, the risks regarding technology and privacy are classified according to the actors involved: issuer, digital currency exchange and investor. The risks of the enormous number of fraud cases and scams, the persistent uncertainties due to insufficient regulation as well as the lack of awareness in dealing with privacy and IT security should be emphasized. In addition, the absence of a real business model behind the majority of ICOs, along with the previous abuses, led to the failure of the ICOs in 2018. This development directs attention to the security token offerings. They are able to fill the gaps that ICOs have opened up. The findings of this thesis have shown that the principle of blockchain-based start-up and corporate financing should be considered separately as a well thought-out and revolutionary financing construct that benefits in addition from the advantages of the DLT. However, it does not succeed in the context of implementation by the ICOs.

For the time being, ICOs will tend to play a subordinate role in blockchain-based start-up and corporate financing. In chapter 9, under consideration of the second research question *"How can capital financing through Initial Coin Offerings be integrated under the aspect of data protection, IT security and regulation, in order to be established as a transparent, secure and efficient form of corporate and start-up financing in the European Union?"*, comprehensive recommendations for action based on the findings of this thesis are formulated to be considered in practice. In particular, they include a standardized, EU-wide consistent regulation for ICOs, a comprehensive sensitization for privacy and IT security as well as the establishment of regulated ICO platforms and exchanges.

Based on the results presented, the future tracking of the changing role of blockchain-based corporate financing in the financial market represents a continuously interesting point of reference due to rapid progress in information technologies and the expansion of legal regulations. STOs in particular are still in an early stage, so that at this point in time no clear assessment can be made as to the extent to which they will prevail in competition with traditional shares or venture capital. In theory, they have enormous potential, especially in the financing of SMEs and real estate, and could revolutionize the traditional financial market. The new EU Growth Prospectus, the Blockchain Strategy of the German federal government, the Blockchain Act as well as the numerous regulated digital exchanges such as SDX or BSDEX also show clear signals that the European Union is increasingly opening up to the crypto market. With regard to the ICOs, the next few years will reveal the role they will ultimately play in the future in start-up and corporate financing.