Democratising Entrepreneurial Finance: The Impact of Crowdfunding and Initial Coin Offerings (ICOs)

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Abstract Our article sheds light on two recent phenomena in the area of entrepreneurial financing, namely, crowdfunding and Initial Coin Offerings (ICOs). We investigate the main characteristics of the two alternative forms of entrepreneurial financing, their differences and coherences, reasons leading to their occurrence, their market relevance and legal aspects. Furthermore, we provide both an overview of the different motivations backers of the two phenomena have to support campaigns as well as the success factors for the campaigns. Due to their newness, both types are not devoid of risks and limitations which are also discussed. We state that crowdfunding and ICOs have many aspects in common and that a combination of both concepts may be optimal in their future development to overcome the current inefficiencies of crowdfunding or the shortcomings of ICOs. In summary, entrepreneurial financing is positively influenced by the two phenomena leading to a democratisation of financial possibilities for both entrepreneurs and backers.

Keywords Entrepreneurial finance · Crowdfunding · Initial Coin Offering · Blockchain

1 Introduction

> ICOs are here to stay as we transition towards blockchain-based applications and a token economy. Therefore, every start-up, entrepreneur and company needs to understand the marketing, technical, legal and regulatory rules of this new funding tool.
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While an *Initial Coin Offering* (ICO)[1] may represent a component of the future entrepreneurial finance landscape, entrepreneurs already have the opportunity to make use of an alternative financing instrument that is still young but far more established. *Crowdfunding*[2] is a phenomenon that mainly appeared in the aftermath of the financial crisis when companies had to struggle to receive external financing provided via debt capital. This effect was particularly prevalent for start-ups and entrepreneurial initiatives (Bruton et al. 2015). During this time, start-up initiatives, mainly from the creative and non-profit sector, started to collect money from individual investors, the so-called crowd, to realise their projects (Agrawal et al. 2014; Ahlers et al. 2015).

This phenomenon was facilitated by the ongoing process of *crowdsourcing* and *open innovation* initiatives by established companies, a process which is mainly based on the thought that the needs and the early feedback of the crowd can be integrated into product development processes (Belleflamme et al. 2014; Kleemann et al. 2008).

While the basic idea of crowdfunding is not entirely new and relies on cooperative approaches, the development and establishment of modern crowdfunding platforms can be observed between 2006 and 2010 (Dushnitsky et al. 2016). During this time, the development of crowdfunding was significantly influenced by technological, social and financial market developments like the increasingly dynamic use of the Internet (web 2.0), the increased emergence of joint consumption and collaborative production (the sharing economy) as well as evolved customer requirements resulting in new consumer groups (digital natives) (Bruton et al. 2015).

These developments have equally influenced the emergence of entirely new technologies and concepts. By publishing *Bitcoin*[3]*: A Peer-to-Peer Electronic Cash System* in November 2008 by the pseudonym "Satoshi Nakamoto" (Nakamoto 2008), the world's first *blockchain* application for digital payment processing was made available on the Internet as open source (Meinel et al. 2018). With the increasing awareness and adaptation of *bitcoin* and the technology behind it, blockchain-based financing through an ICO could also reach new heights in 2017. At the peak, the question for blockchain entrepreneurs when raising capital was not

[1] *Initial Coin Offering* (ICO) also token sale or token generating event refers to a new form of capital raising for financing entrepreneurial activities. By combining different approaches from the fields of peer-to-peer networks, cryptography and game theory (consensus mechanisms), financiers are enabled to contribute to entrepreneurial projects on a global scale without a central entity (Boreiko and Sahdev 2018).

[2] *Crowdfunding* is a relatively new form of seed- and early-stage funding for start-ups that collect small amounts from a large group of individuals through the use of online platforms acting as intermediaries (Schwienbacher and Larralde 2010).

[3] *Bitcoin* with a capital "B" means the peer-to-peer network, the open-source software, the decentralised general ledger (*blockchain*), the software development platform and the transaction platform. The term *bitcoin* written with the lowercase letter "b" refers to the unit of the crypto asset (well known as *cryptocurrency*) (Sixt 2017).

which venture capitalists they have to address but how high they should set the funding limit in an ICO (Siegel and Gramatke 2018).

PricewaterhouseCoopers recently analysed the ICO market and concluded that almost USD 7 billion were raised globally in 2017 (Diemers et al. 2018). In contrast, the best-known crowdfunding platform Kickstarter has been able to provide about half of that capital to project initiators since its inception in 2009 (Fisch 2018).

In the first half of 2018, nearly USD 14 billion were raised through these so-called token sales. If we assume that ICOs are more like a digital IPO than crowdfunding, we find that Facebook's IPO was able to collect that amount in just 1 day. Accordingly, the still young ICO market could be considered as having a huge growth potential (Cohney et al. 2018).

In summary, the ICO market of the recent years resembles in many ways the "New Economy" and the resulting dot-com bubble (Internet bubble) around 2000 (Cohney et al. 2018). Token sales have reached a market relevance and transaction size that make further research in the context of entrepreneurial finance inevitable.

With this in mind, this article is intended to illustrate current developments concerning the ICO phenomenon and to relate them to crowdfunding as a contemporary and comparable form of entrepreneurial financing. Using selected comparison criteria, it should be clarified in which points both overlap and to what extent this can lead to displacement effects. Since ICO research is still in its infancy stage, the comparisons made between crowdfunding and ICO concerning different aspects are by no means conclusive but rather follow the intention to provide an overview and to be useful for further research impulses.

2 Appearance and Characteristics

Crowdfunding has its origin in crowdsourcing where entrepreneurial initiatives and established firms try to collect early feedback from the crowd on product ideas and developments in order to adapt the products to the users' needs and interests (Belleflamme et al. 2014; Kleemann et al. 2008). In the case of crowdfunding, the crowd typically provides money for product ideas or entrepreneurial initiatives via Internet-based crowdfunding platforms acting as intermediaries (Agrawal et al. 2014; Ahlers et al. 2015).

The oldest and most popular type of crowdfunding is *reward-based crowdfunding* (Cholakova and Clarysse 2015). In this type, the crowd gives money for projects or entrepreneurial initiatives and receives the product or another form of reward in return (Xu et al. 2014). Hence, the crowdfunding backers in this type can be considered as first customers, product testers or providers of feedback that help to improve and establish the crowdfunding project. Projects seeking reward-based crowdfunding are often in a pre-commercialisation stage and use the money raised via crowdfunding to develop the product or to establish their initiative (Antonenko et al. 2014).

Another type is *donation-based crowdfunding*, in which backers provide financial means for interesting product developments or projects without expecting something in return. It is therefore rather similar to certain arts and humanitarian projects as it can be characterised as a classical charitable donation.

Lending-based crowdfunding is a third type. Projects using lending-based crowdfunding collect money from crowdfunding backers through debt-like instruments, i.e. they typically offer a repayment of the invested amount after a specified time with a typically fixed interest payment on top (Koch and Cheng 2016).

Equity-based crowdfunding is the fourth type, often also referred to as *crowdinvesting* as it typically grants backer's stakes or bond-like shares in the equity of the crowdfunded project (Ahlers et al. 2015). Hornuf and Neuenkirch (2016) state, however, that most equity-based crowdfunding projects do not offer common shares due to legal obligations and rather use structures like profit participating loans, cooperative certificates or silent partnerships.

The type of crowdfunding chosen has implications on firms' governance issues. The distribution of rewards for campaign backers does not affect governance since no ownership rights are associated with it. The same applies to donation-based crowdfunding. Most forms of lending-based crowdfunding offer subordinated short-term debt instruments so that the influence on firms' governance is as well limited. If equity crowdfunding is used, however, and the instrument is structured in a way that voting rights are distributed to the crowd, a large group of new equity holders may affect the firms' governance structures (Bruton et al. 2015). Some campaigns therefore try to use equity-like financial instruments restricting voting rights to circumvent this issue. Drover and Busenitz (2017) state that the advantage of equity crowdfunding versus traditional venture capital funding is that firms using crowdfunding have a large group of dispersed shareholders which can be easier to govern than a few venture capitalists getting very involved in the strategy. Often, the type of crowdfunding elements also occur in a mixed form so that, e.g. equity crowdfunding is used along with rewards granted but excluding voting rights (Belleflamme et al. 2014).

If we now take a look at the ICO phenomenon (also token sale, *token generating event*), we can distinguish between two main forms. In contrast to crowdfunding, financiers do not receive a product, equity share or interest payment in return for their support but a *digital unit* in form of a *token* (similar to a voucher, coupon) or a digital unit commonly referred to as a *cryptocurrency* or *coin* (also *payment token*, currency token).

While a token is based on an existing blockchain such as Ethereum (Siegel and Gramatke 2018), the issuing of a cryptocurrency creates an independent blockchain ecosystem of various stakeholders (including, for instance, developers, nodes, users, miners). Both digital units can be structured differently and may include, for example, participation in decision-making, a right to profit-sharing/dividend distribution and the use of a product/service or no claim at all (Aschenbeck and Drefke 2018).

Considering the dynamic developments within the ICO market, a clear distinction between different types of tokens is neither binding nor conclusive.[4] The frequent existence of hybrid models due to the functionality of a token also makes a regulatory classification difficult (Weitnauer 2018). However, over time, the following four main types can be observed.

A *utility token* is typically a form of voucher for accessing a blockchain-based platform (Mironov and Campbell 2018). Once the project to be financed has been implemented, it enables, for example, the use of storage space on a decentralised storage service; it is a means of payment for digital services on the platform or simply grants discounts. Quite often, the non-subscribed tokens are made useless (*burning*) after the completion of an ICO to cause an artificial shortage, which can ultimately lead to rising prices without any functionality of the token.

A *payment token* (also cryptocurrency, coin or currency token) is generally used as a money substitute in decentralised networks for the payment of goods and services without any further functionality. The term cryptocurrency is ubiquitous but misleading in so far as its suitability as a (legal) means of payment fails due to its stability of value and representativeness.

A *security token* (also equity token or investment token) represents assets and can be structured both as debt or equity capital. This type of token sale often takes place for entrepreneurial financing in the blockchain sector and is often referred to as *Security Token Offering* (STO)[5] for demarcation purposes. These tokens may include a liability-based claim against the token issuer on future earnings or an equity-based membership right in the form of participation in decision-making processes (Aschenbeck and Drefke 2018; Nyffenegger and Schär 2018).

An *asset-backed token* (also *stable coin*) is linked to an underlying asset and represents a claim to the particular asset (e.g. commodities like gold or real estate) (Hahn and Wons 2018). The connection of a physical good and a token is described as *tokenisation* or *unitisation* and increases liquidity in previously less liquid markets (Frank 2018). As a result, assets not previously represented in the banking system (non-bankable assets) can be integrated into the financial system. Table 1 gives an overview of the different types of crowdfunding and their main characteristics in comparing the types of tokens which can be issued during an ICO.

[4]In order to support regulators, entrepreneurs, investors and researchers, the International Token Standardization Association (ITSA) is working on a framework for classifying cryptographic tokens and increased market transparency. The framework allows to correctly identify (International Token Identification Number, ITIN), classify (International Token Classification, ITC) and analyse (International Token Database, TOKENBASE) every major token that exists on the market (International Token Standardization Association 2018).

[5]The term *Security Token Offering* (STO) has been used increasingly since 2018 and is often referred to as the follow-up to the ICO (Blockchainwelt 2018). An STO could help the entire market to become more stable and mature but does not necessarily have to follow blockchain-based business models. In theory, company shares could also be issued independently of the business model on the basis of a blockchain through an STO.

Table 1 Overview of the different types of crowdfunding and tokens in terms of backers' motivation

Crowdfunding	Purpose	Motivation	Token type	Purpose
Equity-based	Finance in exchange for ownership stake	**Return on investment**	Security Token	Ownership stake, co-determination rights
Lending-based	Finance in exchange for interest rate and principal repayment		Asset-backed Token	Ownership of asset
Reward-based	Finance in exchange for goods or services	**Lead users**	Utility Token	Access to platform (services), protocol
Donation-based	Finance in exchange for the "cause" (good feeling)	**Realisation of an idea**	Payment Token	Payment of goods and services within decentralised networks

Own illustration

Appearance and Characteristics: Strong Overlaps

Both alternative forms of financing occur mainly in four types, while tokens often take hybrid forms. Hybrid models can occasionally be observed in crowdfunding (e.g. combination of donation- and reward-based crowdfunding). Basically, tokens are a kind of reward for the contribution.

3 Market Relevance

The importance of crowdfunding and ICOs in the area of entrepreneurial financing in terms of market volumes is substantial. Crowdfunding can be considered as a global phenomenon since regulatory conditions largely allow it to be pursued worldwide, with the exception of equity crowdfunding (Bruton et al. 2015). It is of growing importance referring to market volumes with an increase of funds invested globally of about USD 5.24 billion in 2015 and USD 14.61 billion in 2017 (reward- and equity-based crowdfunding, Fig. 1). Furthermore, there are no particular borders prevalent so that those interested can often contribute to any crowdfunding project they wish to through Internet-based crowdfunding platforms, without being restricted to national borders if they meet the platform's regulatory requirements for registration.

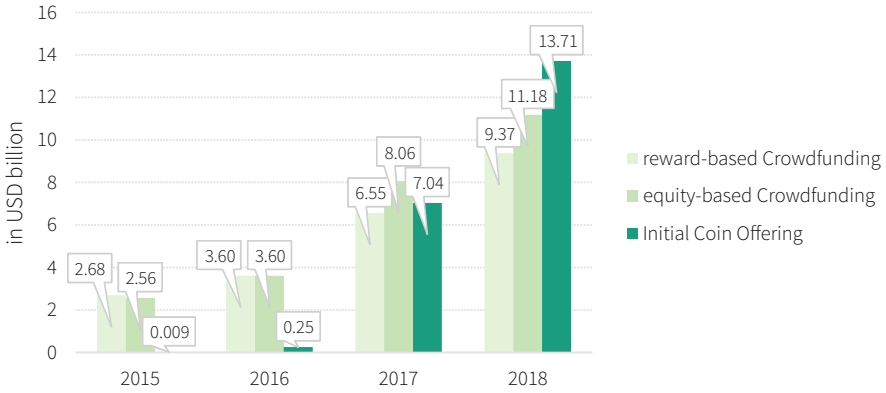

Fig. 1 Global ICO market compared to developments in crowdfunding market since 2015 in billion USD (Own illustration based on Diemers et al. 2018; Statista 2018a, b, c; Wegener 2018; Mehta and Striapunina 2017)

Crowdfunding appeared in the aftermath of the financial crisis which led to an even more increasing constraint in the provision of financial means for entrepreneurial initiatives and projects. By bundling the offer of different crowdfunding-seeking projects and potentially interested investors on platforms via the Internet, the phenomenon occurred at the same time in different developed economies (Bruton et al. 2015).

Reward-based crowdfunding was the first and dominant form of crowdfunding, and its success is ascribed to the fact that campaign backers draw personal utility out of their intrinsic motivations having contributed to the development of an aspired product or self-identification with the project (Cholakova and Clarysse 2015). Concerning the different crowdfunding types, donation-based crowdfunding is not the most important type of crowdfunding in terms of financing start-ups as it is often conducted for single projects and lending-based crowdfunding involves rather developed processes within the start-up (Agrawal et al. 2014; Ahlers et al. 2015). Equity crowdfunding developed only recently after the occurrence of reward-based crowdfunding. Mainly due to legal restrictions, it was not as dominant in terms of market volume as, e.g. reward-based or lending-based crowdfunding, in the first years of its occurrence but is now gaining in importance (Bruton et al. 2015; Cholakova and Clarysse 2015).

Compared to the continuously growing financing volumes in reward- and equity-based crowdfunding, we can observe a rapid increase in financing via an ICO in the last 5 years. Although or perhaps precisely because of no consistent regulation across the world as in the stock market, the ICO market developed from small-scale project financing within a certain community in 2013 to a multibillion dollar industry in 2018 (Boreiko and Sahdev 2018). Since there is currently no legally binding classification of tokens, we assume that the documented ICO volumes primarily serve to stimulate entrepreneurial activity. As just outlined, a comparison with reward- and equity-based crowdfunding is most likely to be made. Figure 1

illustrates the transaction volumes of ICOs compared to reward-based and equity-based crowdfunding since 2015.

In this context, the enormous increase in both the number and the volume of ICO financing is striking (Nyffenegger and Schär 2018). While in 2014 eight ICOs raised more than USD 30 million, both the number and the volume rose to 537 token sales and USD 13.7 billion already in the first half of 2018, which is more than all pre-2018 ICOs combined. This corresponds to a capital increase of almost 45,000% within a period of less than 5 years.

This rapid growth can partly be ascribed to an increased coverage of bitcoin and the underlying blockchain technology in mainstream media. The successful ICO of Ethereum (USD 18.4 million raised in 2014) is of central importance as well as the following development of the decentralised, blockchain-based platform, which has established itself as a de facto industry standard for issuing tokens since 2014 (Fenu et al. 2018).

The *ERC20* (Ethereum Request for Comments) standard allows the tokens to be interchanged and includes additional functions such as voting rights (Siegel and Gramatke 2018). In fact, only 8 blockchain projects out of the top 100 tokens on www.coinmarketcap.com are not based on the Ethereum platform (CoinMarketCap 2018a). In particular, ICOs have seen an explosion in project financing since May 2017. With several outliers, who were able to raise significantly more than USD 100 million, two big players have emerged in the still young ICO market: Telegram (USD 1700 million) and EOS (USD 4100 million) (Diemers et al. 2018). As a result, ICOs were able to raise twice as much money as venture capital investments in blockchain projects by 2017 (EYGM Limited 2018).

Market Relevance: Strong Overlaps

Depending on the type of crowdfunding and token type, different growth rates can be observed. In the context of entrepreneurial financing, reward- and equity-based crowdfunding as well as their counterparts utility and security tokens (assuming a legal regulation) are particularly important. For the first time in 2017, both alternative financing instruments recorded similarly high transaction volumes.

4 Project Focus

Crowdfunding and ICOs occurred in their beginning phases in similar industries. Crowdfunding became prominent through projects from the video gaming, music and film industry seeking financing from the crowd (Agrawal et al. 2014). The new form of financing emerged particularly in those industries since project initiators were interested in receiving both feedback from the crowd and money for being able to realise the projects. In addition, they were able to market their projects and gain

visibility. Nowadays, crowdfunding projects are still dominant in industries like design, film or gaming, but projects stem from a whole variety of industries making it an alternative for early-stage projects to receive funding (Cholakova and Clarysse 2015).

On the prominent reward-based platform Kickstarter, the highest cumulated investment volumes until May 2018 were in the categories gaming, design and technology with around USD 700–800 million each followed by the categories film and video, music and fashion with less than half of the cumulated investment amounts each (Statista 2018d). Donation-based crowdfunding is typical for projects in the domain of arts and humanities, and lending-based crowdfunding is often used by established start-ups for financing new investments or growth. Concerning the type of equity-based crowdfunding, this type is mainly used by established start-ups. The financed projects predominantly occur in industries such as "Greentech", energy and real estate (Belleflamme et al. 2014; Cholakova and Clarysse 2015).

In contrast, a clear distinction of sectors in which ICOs are used to finance blockchain-based projects is inaccurate in so far as the current hype around the technology leads to projects often being "blockchainised", although the use of conventional technologies would be more effective and cheaper. In general, the use of blockchain can be beneficial wherever:

- The documentation of activities and transactions is relevant.
- Distributed databases or peer-to-peer networks are to make a central authority obsolete.
- Certain actions are to be executed automatically upon the occurrence of if-then conditions.

Predestined areas of application are especially finance, supply chains and logistics, healthcare, identity management, cloud computing, Internet of things (IoT), energy supply, advertising and media, booking and rental and retail and e-commerce (Tait et al. 2018).

Based on empirical studies and scientific research, some of these assumptions are reflected in financing through a token sale. Mironov and Campbell (2018) show that the most popular industries for staging an ICO come from the areas exchanges and wallets, financial services, gaming and blockchain infrastructure (in more than 300 reviewed or rated projects since September 2016).

In addition to Mironov and Campbell (2018), the consulting company Ernst & Young also confirms that in particular blockchain infrastructure, finance and gaming platforms are the leading segments for the amount of money raised during a token sale (collected data on 372 projects that have conducted an ICO from 2015 to 2017) (EYGM Limited 2018). Compared to 2017, only minor changes can be observed within the most popular segments by number of projects staging an ICO (Mironov and Campbell 2018). The majority of ICOs consider themselves to be a platform for decentralised businesses (Adhami et al. 2018; Fenu et al. 2018).

Project Focus: Strong Overlaps

Generally, a large variety of projects but certain sectors enjoy equal popularity in both crowdfunding and ICO campaigns. The main difference is that ICO projects are always based on a *distributed ledger technology* (DLT)[6] such as blockchain.

5 Project Development Stage

Concerning the project status in crowdfunding campaigns, it can be stated that the project status of campaigns seeking crowdfunding has become more and more advanced over the course of time. In early times, often only a description of the envisioned product was presented, and projects were in their seed stage in the best case. Nowadays, many campaigns have developed prototypes presented in a professional video or have already founded a start-up. Platform providers for equity crowdfunding often demand campaign initiators to disclose specific information on their company and to present a business plan and financial forecast (Agrawal et al. 2014; Décarre and Wetterhag 2014; Signori and Vismara 2016).

Mollick and Kuppuswamy (2014) report, e.g. that about 90% of successfully reward-based crowdfunded projects continue their entrepreneurial initiative within 1–4 years after the campaign. Colombo and Shafi (2016) also find evidence that firms seeking reward-based crowdfunding often had prior external financing before the campaign or acquired business angel or venture capital financing after the campaign.

With this in mind, we note that the initial developments in crowdfunding are reflected in the current development of the ICO market. In general, a token sale can be done before the entrepreneurial project has launched a product (pre-seed/seed stage), to further develop a product/prototype[7] (start-up stage) or to expand the business model/tokenisation/launch of new products and utilities (expansion stage) (Hahn and Wons 2018).

Since an ICO usually takes place on dedicated websites and no platforms have been developed to date that preselect projects as in crowdfunding, investors must determine the development stage of an ICO project based on the information provided on the website and in particular through a so-called white paper.

[6] *Distributed ledger technologies* (DLTs) can be seen as a generic term for emerging technologies based on decentralised and distributed structures. Instead of a central entity that collects and verifies all data, participants trust the network, which derives its integrity from a specific consensus and validation system (Yates et al. 2018). In addition to blockchain, tangle (e.g. IOTA) or hashgraph should also be mentioned as forms of DLT.

[7] A minimum viable product (MVP) fulfils the basic requirements and properties.

However, in examining 450 white papers, Zetzsche et al. (2018) found that in more than a half, no valid postal address was provided, and about a quarter did not include any information about the token issuer at all. Less than a third mentions the law applicable to the ICO, while the vast majority omits the issue of regulation at all. Moreover, the majority of white papers does not provide the financial information necessary to take an investment decision, and none of them used an external auditor to ensure the quality of the information given (Fiedler et al. 2018).

The most frequently used phrases in white papers such as "Next-generation platform", "Decentralized network that puts users in the driver's seat" or "We are creating a community/ecosystem/economy" do not provide any information about the development stage but rather serve to attract inexperienced investors (EYGM Limited 2018). Furthermore, the reasons for using blockchain technology or a token ecosystem are often not given. In most cases, the tokens acquired serve as a means of payment within a blockchain ecosystem. However, this ecosystem or platform is mostly under development at the time of the ICO. The road from prototype status to final launch is usually expected after 1 year or more (EYGM Limited 2018).

Another empirical study confirms these assumptions, but from the investor's point of view. Investors should sell their tokens within the first 4 months, as the majority of ICO projects have very low to no entrepreneurial activity after this period, resulting in a price loss of nearly 100% of the issued tokens (Benedetti and Kostovetsky 2018). As a result, many projects are either not implemented at all or are poorly executed. Successfully implemented projects later often accept fiat currency in return for a product/service, which negatively affects the token value (EYGM Limited 2018).

This development is also reflected in recent studies, in which almost half of the ICOs examined in the first quarter of 2018 can only present the idea at the time of the ICO. Barely 0.5% can rely on a programme code (Mironov and Campbell 2018). Aside from the richness of information provided by a white paper, in some cases the team only consists of economic and marketing experts who developed the business case. Only after a successful ICO, developers will be engaged to implement the project (Fenu et al. 2018).

Project Development Stage: Strong Overlaps

The development stage of current ICO projects reminds one of the early days of crowdfunding. At the same time, it must be stated that rating websites are not exactly comparable to crowdfunding platforms in terms of preselection and quality assurance of projects. This fundamental difference may show more coherence in the future since a sort of evaluation or quality assessment (as it is provided by crowdfunding platforms) may be demanded.

6 Campaign Procedure

As already indicated, crowdfunding platforms take on a fundamental role in the development of the crowdfunding market and accordingly shape the course of a campaign. The typical procedure of a crowdfunding campaign is as follows: Campaign initiators need to register on a crowdfunding platform and need to prepare comprehensive documents about their project or product idea usually with the help of specified consultants and advisors (Ahlers et al. 2015). The information provided for all different types of crowdfunding campaigns includes material about the founding team, key information about the envisioned project, milestones that have already been achieved as well as future milestones to be reached, information about the business model, a market analysis, financial information and forecasts and terms and conditions concerning the investment (Ahlers et al. 2015; Colombo et al. 2015).

Moreover, the provision of a campaign video explaining further details, giving a deeper impression about the founding team or presenting the functioning of a prototype is advisable (Mollick 2014). Also, the funding goal, the funding period, potential minimum contribution thresholds and characteristics of the financial instrument used such as repayment dates or interest rates need to be determined (Koch and Cheng 2016). Based on that, the crowdfunding campaign can typically be launched if all the platform's requirements are met. During the campaign lifetime, the initiators can post updates for important information. The duration of typical campaigns lasted up to 90 days in the early development phases of crowdfunding. However, nowadays, a campaign duration of about 30 days is common and recommended (Mollick 2014). During crowdfunding campaigns, the status of the contributions, the number of backers, the amount collected as well as the days left of the campaign can be tracked in real-time (Colombo et al. 2015).

Basically, there are two different models for crowdfunding campaigns to collect financing. In the "all-or-nothing" approach, the crowdfunding projects receive the financial means if they collect at least a prespecified target amount. This is currently the dominant model. In the "keep-it-all" approach, crowdfunded projects receive the amount they collect from the crowd without having to reach a specific threshold (Koch and Cheng 2016; Lukkarinen et al. 2016; Mollick 2014).

People interested in supporting reward- or donation-based crowdfunding campaigns mostly have to register on the respective platforms with basic information such as name and postal address. In equity and typically also in lending-based crowdfunding, campaign backers need to provide further information such as their intended amount to invest, information on their personal income and wealth status, and they must confirm that they are aware of the risks associated with the investment in equity crowdfunding (Ahlers et al. 2015). They can then browse the information of different campaigns and make their personal contributions via a platform-specific payment system (Colombo et al. 2015).

In contrast, the digital units generated during an ICO are usually sold to interested investors in a non-standardised sale accessible through the Internet. The purchase price is typically paid in the cryptocurrencies bitcoin or *ether* (necessary element for

operating the distributed platform *Ethereum*) and sometimes in a legal currency (fiat currency) (Aschenbeck and Drefke 2018). According to the decentralised nature of an ICO, there are no platforms that cumulate projects as in crowdfunding. Additionally, there is no registration requirement, making it difficult to track the entire ICO market (Fisch 2018). Nevertheless, several platforms (e.g. ICORating, ICObench, Coinschedule) have been established which monitor the market and rate selected projects according to their own criteria (Hartmann et al. 2018).

Since the publication of the Bitcoin white paper in 2008, blockchain technology has gained worldwide attention. Following this example, many token issuers use white papers as the foundation for marketing their project (Fisch 2018). The token issuer normally describes his project in detail and provides explanations and information regarding the ICO such as token economics, development roadmaps and procedures of the token sale (Heck 2017). In contrast to standardised prospectuses in the stock market or the required documents in crowdfunding mentioned above, there is no regulation for white papers resulting in a very heterogeneous design in terms of length (1-pagers, 100-pagers), quality (badly formatted documents, professional brochures) and content (business plans, technical documents, financial outlooks) (Adhami et al. 2018; Fisch 2018). In addition to a white paper and a website, the terms and conditions are a third key component of a token sale.

Compared to a crowdfunding campaign, a token sale can take very different courses. In the simplest case, a fixed price and a fixed offer duration or token quantity can be set. However, this is a rather unusual procedure (Nyffenegger and Schär 2018). With respect to the limited scope of this article, the forms of structuring an ICO are visualised in Fig. 2.

The token price is based on the evaluation of the current project development stage by the issuer. The issuer usually keeps a part of the tokens for the future project development and business financing (Chen 2018). Moreover, it is typical that the single phases of token sales have varying and significant discounts (Benedetti and Kostovetsky 2018) to create investment incentives for the increased willingness to

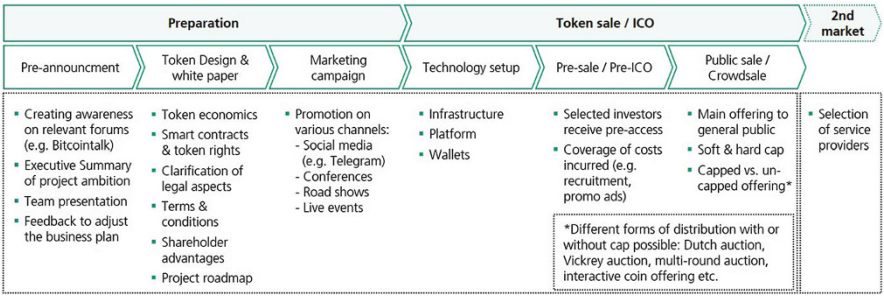

Fig. 2 Conceptual design and execution of an ICO (Own illustration based on Hahn and Wons 2018; Siegel and Gramatke 2018; Nyffenegger and Schär 2018)

take risks in the early stage. Ideally, the underlying *smart contract*[8] should also implement a mechanism for returning funds in case of a failed ICO (Siegel and Gramatke 2018). In the past, token sales could be observed in terms of length from a few hours or a day up to a whole year. According to Mironov and Campbell (2018), the average period increased from 30 days to 2 months in the first quarter of 2018.

Campaign Procedure: Medium Overlaps

Even if the campaign process can be designed very individually (especially for token sales), both alternative forms of financing are essentially based on a digital backend and use the extensive possibilities of web 2.0 to market the fundraising on a global scale with the exception of equity crowdfunding due to legal restrictions.

7 Backer's Motivation

Crowdfunding backers are not primarily looking for a financial return—this may be a backer's motive mainly in lending-based and equity financing—but often invest due to intrinsic motivations, such as personal interest in the product to be developed, the feeling of being connected and part of a community or general preference for projects in a specific sector (Cholakova and Clarysse 2015; Lukkarinen et al. 2016). So, the patronage model was the origin of crowdfunding to establish itself and is still relevant for the ongoing success of crowdfunding (Mollick 2014).

Backers often have a high willingness to pay for receiving a finalised product as a reward for supporting a crowdfunding campaign since they feel privileged about contributing to the successful realisation of specific products (lead users) (Belleflamme et al. 2014; Gerber et al. 2012; Kaminski et al. 2016). So, whereas the motivation of reward-based crowdfunding backers rather rely on intrinsic values, a potential financial gain is of higher importance for a lending-based and equity crowdfunding backers (Collins and Pierrakis 2012; Lukkarinen et al. 2016).

Due to the use of Internet-based platforms for promoting campaigns and for contributing, crowdfunding, with the exception of equity crowdfunding, is suited to overcome traditional national borders. Agrawal et al. (2014) state, for example, that 86% of the campaigns' capital stems from people that are more than 60 miles away from campaign initiators and that the average distance between campaign initiators and backers is about 3000 miles. However, Mollick (2014) also finds that many reward-based projects on the platform Kickstarter have a local component which

[8] *Smart contracts* are programmes for automating human interactions in the form of a digital, rule-based transaction log that can independently check and document defined if-then conditions and execute or inhibit transactions accordingly (Swan 2015).

may be explained by a local cultural connectedness being a motivation for campaign backers to contribute.

Unlike lending-based and equity crowdfunding, ICO investors should ideally acquire highly liquid assets in the form of tokens that can be actively traded on various crypto asset exchanges or (over the counter) with other investors (Chen 2018). For this purpose, Benedetti and Kostovetsky (2018) investigated a dataset of more than 4000 planned and executed ICOs. However, only 25% of the projects were able to list their tokens on a crypto asset exchange. Conversely, three quarters of the ICO investors own an illiquid token, which has no function until the completion of the planned project and is purely a speculative object. These investors can be considered as highly risk-oriented lead users or speculators.

In 2017 in particular, many investors were attracted by breath-taking returns of up to 32,000% (CoinMarketCap 2018b) and an average return of investment for the representative ICO investor of 82% (Benedetti and Kostovetsky 2018). Currently, Mironov and Campbell (2018) assume that 83% of the tokens listed after completion of the ICO were traded below their selling price in the first quarter of 2018. Moreover, many tokens are overpriced and finally decline in value (Benedetti and Kostovetsky 2018). In this context, many investment decisions may have been based less on rational and fundamental criteria or motives than on the "*fear of missing out* (FOMO)" investment opportunities.

It may also be assumed that smart money such as venture capital firms (Preuß et al. 2017), hedge funds and family offices as well as so-called whales[9] drive part of the ICO demand. These investor groups seem to be most likely to evaluate ICOs according to fundamental criteria and to assess the underlying smart contracts (Cohney et al. 2018) and could therefore serve as a credible signal for further investors. In addition, ICO tokens allow professional investors to diversify their portfolio, as there is little correlation with the performance of conventional asset classes at the moment (Chen 2018).

Finally, early-stage projects are generally limited to a small geographical area and are restricted to professional investors. An ICO allows small investors and early adopters, similar to crowdfunding, the same opportunities to participate in early-stage projects, with the increased risk of default, however (Chen 2018).

Backer's Motivation: Weak Overlaps

Some motives overlap. In principle, however, crowdfunding contributors want to support the realisation of an idea in order to get early access (lead users), while ICO investors are supposed to have more profit-oriented motives in mind.

[9]Large-scale investors who have been active in the crypto market since the very beginning (long-term investors). Due to the high concentration of capital on a few *whales* in the Bitcoin network (4% hold 96% of all bitcoins), market manipulation cannot be ruled out (Preuß et al. 2018a).

8 Campaigns' Success Factors

A lot of applied research so far has tried to disentangle crowdfunding campaigns' success factors. Since large information asymmetries exist between campaign initiators and backers as the information can only be provided through online platforms, the quality of the information given plays a decisive role. In general, it seems to hold that the better and the more detailed the information provided, the better the investors' judgement of the project's quality (Ahlers et al. 2015). Duarte et al. (2012) find that campaigns with trustworthy photographs from the initiators default less often. A higher quantity of explanations on the project's idea as well as an explanatory video seems to increase the success rate for campaigns (Koch and Cheng 2016).

Moreover, a good social network of the campaign initiators, a high amount of early contributions, a further developed project status, having run a successful crowdfunding campaign before and giving project updates during the campaign are said to be factors which increase the campaign's success rate (Moritz and Block 2015; Colombo et al. 2015; Koch and Cheng 2016; Kuppuswamy and Bayus 2015; Lin et al. 2013).

Factors like gender, race and personal characteristics also seem to play a role (Marom et al. 2015). However, a long duration of the funding period is said to negatively affect a campaign's success which potentially is ascribed to the campaign initiators' lack of confidence in being able to reach the funding goal fast (Mollick 2014).

Typically, in the initial phase of a crowdfunding campaign, people personally known to the campaign initiators are of high importance (Colombo et al. 2015; Ordanini et al. 2011). These investments often trigger word of mouth as a new phenomenon of crowdfunding being particularly important since social networks play an increasing role for crowdfunding campaigns and their success (Colombo et al. 2015; Mollick 2014).

Another aspect detected so far found that in reward-based crowdfunding, most project backers are one-time backers who may stem from the personal network of the campaign initiators, whereas in donation-, lending- and equity-based crowdfunding, more "serial backers" can be found (Kuppuswamy and Bayus 2015).

Block et al. (2018) provide a coherent overview of prior findings on relevant signals in equity crowdfunding campaigns and their effects on campaigns' success. They find themselves that particularly positive information on new developments of the start-up provided in updates leads to a higher number of investments in equity crowdfunding campaigns.

Some platforms such as Kickstarter initiated campaigns like "kicking it forward" which comprises the rule that 5% of the campaign's profit should be invested in other campaigns (Colombo et al. 2015).

Since no ICO platforms exist that cumulate projects and link these with potential supporters, ICO research does not focus on platform properties as in crowdfunding

but on the investigation of project characteristics or attributes of token issuers (Adhami et al. 2018).

As one result, there are usually no entry barriers for the launch of an ICO, such as a due diligence process or the request for a prototype by crowdfunding platforms. In addition, the projects are mostly in the idea stage combined with a complex technology that is at the very beginning of its development. Therefore, Amsden and Schweizer (2018) refer to the listing of a token on a marketplace (tradability) and its trading frequency to measure the likelihood of ICO success.

First, the marketplaces seek to maintain their reputation by undertaking due diligence similar to crowdfunding platforms. Second, the tradability of tokens is directly linked to the ongoing existence of ICO projects. In the case of security tokens, investors can monetise their tokens afterwards, while the token issuers can liquidate unsold tokens at a later stage for additional capital. Utility tokens often allow access to a blockchain-based platform or serve as a means of payment for the use of products and services at the same. Therefore, the tradability for the token issuer is of huge importance to increase the community around the platform (Amsden and Schweizer 2018).

Adhami et al. (2018) came to the remarkable conclusion that despite the great heterogeneity of projects and often predominant information asymmetries, the success rate of token sales is very high at 81%. The general availability of a whitepaper does not affect this but rather the information provided if there is any (Fisch 2018). Nevertheless, and with regard to missing standards or audits for white papers, Fisch (2018) implies that white papers are not as important for the evaluation of a token sale as they may first suggest.

Lines of code (e.g. smart contracts) are much more important. The availability of complete code or code parts seems to be like a proof of concept and has a strong positive influence on the likelihood of ICO success (Adhami et al. 2018). Furthermore, Adhami et al. (2018) determine that market movements of the native tokens of underlying blockchains have no influence on investment decisions and thus on the ICO success. Finally, Benedetti and Kostovetsky (2018) also show that ICO investors tend to spot and underfund fraudulent projects.

Campaigns' Success Factors: Medium Overlaps

ICO research is still in its infancy stage, but it can be concluded that the quality of the information provided through code, code parts or a white paper in token sales and a description text and/or campaign video in crowdfunding have a positive influence on the probability of success.

9 Risks and Limitations

According to Agrawal et al. (2014), crowdfunding backers have to deal with three main risks. Firstly, campaign initiators can be incompetent so that the promised reward or product or other remuneration is not delivered. Secondly, fraud may occur which means that campaign initiators do not intend to deliver a reward, a product or any financial return to their backers. Thirdly, project risk is a relevant threat as projects may not turn out the way crowdfunding initiators and backers envisioned them. One factor inherent in all three situations increases the threat associated with those risks. This factor is the high degree of information asymmetry between the initiators of crowdfunding campaigns and the backers.

Agrawal et al. (2014) project potential future developments resulting from the high risks associated with crowdfunding and suggest that either social welfare will be diminished to a great extent by the exploitation of crowdfunding backers or we will perceive a market consolidation consisting of reduced market volumes. Both aspects are in principle also valid for the further potential development of the ICO market. Mollick (2014) finds, however, in his analysis of more than 48,000 Kickstarter campaigns that the risk of fraud is quite limited in reward-based crowdfunding.

Mollick (2014) shows that about a quarter of reward-based campaigns deliver their promised product on time and from the remaining campaigns about 75% deliver later than promised. Agrawal et al. (2014) state that many crowdfunding backers had to adapt their expectations downwards. However, according to Kickstarter, more than 80% of the failed campaigns that were not able to target the envisioned funding amount clearly failed since they collected less than 20% of their envisioned funding amount (Statista 2018d). Some performance data on equity crowdfunding investments in the UK report that more than 80% of the companies that raised equity crowdfunding between 2011 and 2013 were still active in 2015. Concerning a cohort of companies founded in 2013, about one third of them either went bankrupt or showed signs of having difficulties (Weeks 2015).

Regarding equity crowdfunding, information asymmetries play an even greater role as the investors in those campaigns typically expect a financial return but cannot really judge the campaign initiators' ability to increase the equity value of a venture (Agrawal et al. 2014; Thies et al. 2018; Vismara 2016). Common reporting requirements in other security types which reduce information asymmetry problems are often not standard in equity crowdfunding settings. Equity crowdfunding is therefore not as common as other types of crowdfunding in many countries due to the issue of investor protection. The expansion of equity crowdfunding platforms into different jurisdictions is problematic as security regulations vary (Bruton et al. 2015; Vismara 2016).

At the same time, an ICO is by no means devoid of risks and limitations, and many of the outlined risks for crowdfunding backers and initiators are relevant for ICO investors and token issuers as well. Especially in view of the partly dark history

Table 2 Specific risks associated with token sales

Investor (backer, contributor)	Token issuer (project initiator)
• Fraud and scam due to a lack of law and regulation (e.g. disappearing issuers after successful token sale, one to one copies of white papers) (Hartmann et al. 2018)	• Utility tokens that are only used as payment for goods and services are becoming impractical for users as the number of different tokens increases (Mironov and Campbell 2018)
• Hacks of crypto exchanges and online wallet providers, phishing attacks on ICO websites (Hönig 2018)	• ICOs may be tax inefficient compared to equity financing if the funds raised are treated as revenue or deferred revenue (Chen 2018)
• Risk of total loss of investment due to high risk in the early stage (Chen 2018) and lack of investor protection	• ICOs can be unfavourable compared to venture capital if more than half of the tokens are issued in the case of security tokens (Chen 2018)
• Pump and dump schemes by manipulation of large-scale investors (whales), insiders, cartels and advisors (Cohney et al. 2018)	• Regulatory uncertainty regarding token sales, notably in the differentiation and treatment of security tokens (Chen 2018)
• Information asymmetries regarding project and need for own due diligence before investment (Chen 2018)	
• Strong differences in evaluation and transparency between ICO evaluation websites; often a technical analysis (e.g. token economics, smart contract code) is missing (Hartmann et al. 2018); operating on a "pay to be rated" model is common practice (Cohney et al. 2018)	
• Market liquidity (trading volume) and technical infrastructure regarding secure storage of crypto assets currently insufficient for institutional investors and often lack expertise (Labetzsch 2018)	

Own illustration

of bitcoin (e.g. Silk Road[10]) (Rosenberger 2018) and complex cryptocurrency issues (cyber security, scalability, use of resources, volatility, etc.) (Sixt 2017), further specific risks and limitations emerge concerning an ICO for both investors and issuers. Table 2 shows a summary of the specific risks associated with a token sale.

In this context, it is not surprising that Benedetti and Kostovetsky (2018) estimate that the survival rate for projects 120 days after completion of the token sale is only about 44%. Yates et al. (2018) finally come to the conclusion that the current ICO market represents a self-fulfilling prophecy, since the tokens issued are usually traded in return for bitcoin or ether. This increased demand of bitcoin and ether drives the price of both leading crypto assets upwards, affecting the market as a whole as bitcoin and ether pairs (e.g. BTC/XRP, ETH/EOS) are often traded on crypto asset exchanges. The resulting increase in market capitalization in the overall

[10]Silk Road was an anonymous marketplace for primarily illegal products and services in the so-called darknet with integrated bitcoin payment function (Rosenberger 2018).

market leads to new investors and speculators as well as new token issuers looking for a lucrative business. And here the cycle starts again (Yates et al. 2018).

Risks and Limitations: Medium Overlaps

In general, there are very similar risks to money exchange between certain parties, with the difference that there are specific threats to ICOs due to a low level of regulation and the lack of professional platforms (such as crowdfunding) to ensure higher quality projects. However, in both cases a total loss of money invested is possible (Tokenguru 2017).

10 Secondary Market

A crucial difference between any reward and return in crowdfunding and tokens issued in an ICO is the tradability on a secondary market. Typically, investing in a crowdfunding campaign does not offer trading possibilities during the investment time on secondary markets since crowdfunding is not a liquid investment (Hornuf and Neuenkirch 2016; Mollick and Nanda 2016). In this vein, Ahlers et al. (2015) state that secondary sales for crowdfunding investments on their analysed Australian platform rarely occur. They only count five secondary market transactions until February 2014.

The establishment of secondary markets for crowdfunding is complicated by legal hurdles due to investor protection and since volumes that would be tradable are rather small (Signori and Vismara 2016). However, some crowdfunding platforms already launched secondary market share trades in 2017 where investors could trade a prior investment (Crowdcube 2017; Prosser 2017).

In contrast, tokens are tradable by design, even if only a few ICO projects are currently able to list their tokens on a secondary market. Mironov and Campbell (2018) show that not all tokens issued necessarily receive a listing on a marketplace. Thus, 89 tokens of 412 ICO could be traded on a secondary market in the first quarter of 2018 which is very similar to the investigations of Benedetti and Kostovetsky (2018). On average, the tokens are listed and tradable 21 days after the end of the ICO.

Nevertheless, tokens offer a degree of liquidity that is not possible in regular crowdfunding. At the beginning of August 2018, 1768 crypto assets existed, which could be traded on 12,362 marketplaces (CoinMarketCap 2018c). The purchase and exchange of crypto assets are possible on crypto asset exchanges, trading platforms (between private individuals) and online brokers. Tokens can normally be traded 24/7. Many marketplaces allow users to switch crypto assets among themselves as well as against fiat currencies such as dollars, euros or yuan (Hönig 2018).

Albeit, the secondary market has its downsides especially because it is not fully regulated. Due to arrangements between whales, the abuse of inside information

(insider trading) or so-called advisory deals[11] (Preuß et al. 2018b), pump and dump schemes can be frequently observed (Cohney et al. 2018).

Secondary Market: Weak Overlaps

With respect to a secondary market, there are fundamental differences in the tradability and transferability of assets within crowdfunding and ICOs. Nevertheless, first efforts can be observed that individual investments of equity crowdfunding campaigns can be traded on a kind of secondary market (Crowdcube 2017; Prosser 2017).

11 Legal Framework

The legal regulation for the three types of crowdfunding, reward-, donation- and lending-based, is not a huge issue since no general restrictions apply to potential crowdfunding backers (Belleflamme et al. 2014). A crowdfunding platform, however, typically needs to be registered with a securities' commission in a country and needs to take steps to instruct investors and try to limit fraud by campaign initiators (Agrawal et al. 2014). In the early days of crowdfunding, some countries followed a rather liberal approach, e.g. Australia, which helped a widespread acceptance of crowdfunding in those markets, e.g. for equity crowdfunding in the UK (Ahlers et al. 2015; Bruton et al. 2015; Steinhoff 2014; Vismara 2016). In the USA, using the Internet for collecting money through private placements was extremely restricted before the introduction of the Jumpstart Our Business Startups (JOBS) Act under President Obama in 2012 (Kaminski et al. 2016).

Concerning equity crowdfunding, legal obligations are stricter. Many countries banned equity crowdfunding completely in the beginning phase which led to a slower development of equity crowdfunding compared to the other three types (Bruton et al. 2015). In the USA equity crowdfunding was only allowed for accredited investors, and it was basically one of the first countries to regulate equity crowdfunding (Hornuf and Neuenkirch 2016). The SEC introduced a special "regulation crowdfunding" to implement the Title III JOBS Act provisions for crowdfunding (Agrawal et al. 2014; Lukkarinen et al. 2016; Securities and Exchange Commission 2016).

It regulates that the general public is also allowed to invest in equity crowdfunding under specific individual investment restrictions and that companies can raise up to USD 1,000,000 (Agrawal et al. 2014). Most countries have

[11]These advisors are more engaged in marketing the project and less in consulting. It is not uncommon for those consultants to receive the tokens at an 80–90% discount. Such a market power can allow price manipulation and result in pump and dump schemes (Preuß et al. 2018b).

restrictions concerning the maximum number of investors a company can have (Griffin 2012).

In Germany, equity crowdfunding has always been possible for the general public. The European Union regulation applies for European nations which can be specified by the national states. Up to a total investment amount of EUR 100,000, equity crowdfunding has always been possible for project initiatives too. The Small Investor Protection Act (*Kleinanlegerschutzgesetz*, *KlAnSG*) amended in 2015 regulates equity crowdfunding more specifically. It now outlines that companies can raise up to EUR 2,500,000 in equity crowdfunding without having to file for a prospectus. But companies raising equity crowdfunding have to deposit an information sheet (*Vermögensanlagen-Informationsblatt*, *VIB*) about their project with the Federal Financial Supervisory Authority (*Bundesanstalt für Finanzdienstleistungsaufsicht*, *BaFin*). The investment amount by a single investor in a campaign should not exceed EUR 1000, but investors can invest a maximum amount of EUR 10,000 in a single campaign if they personally own more than EUR 100,000 (Hornuf and Schwienbacher 2014). However, it is important to note that those regulations concerning equity crowdfunding only apply to specific securities under German law. One form of subordinated loan as a debt-like instrument, participating loans, is, for example, exempted from filing for a prospectus if not more than EUR 2,500,000 are raised. Therefore, campaign initiators dispose of different options for structuring the financial instrument used in their crowdfunding campaign and can choose an instrument for which equity crowdfunding restrictions do not apply (Hornuf and Schwienbacher 2014; Klöhn et al. 2016).

Applied research on the effect of regulation on crowdfunding has been scarce so far. Some studies, however, suggest investigating this aspect more deeply since regulation seems to influence the acceptance of crowdfunding compared to other forms of entrepreneurial financing (Bruton et al. 2015; Colombo and Shafi 2016).

In comparison, an international review of the legal framework for token sales is essential due to the decentralised nature of crypto assets. In order to understand how an ICO can be legally classified, it is useful to look at the international regulations regarding the leading crypto asset bitcoin (Fig. 3). Nevertheless, it should be noted that bitcoin regulations do not have to apply to altcoins (alternative coins) and even less to an ICO.

In Germany, the Federal Financial Supervisory Authority *BaFin* has classified bitcoin as a unit of account according to § 1 para. 11, line 1 German Banking Act (*Kreditwesengesetz*, *KWG*).[12] Since there is no central issuer, the classification as a digital currency or electronic money (*E-Geld*) in the sense of the Payment Services Supervision Act (*Zahlungsdiensteaufsichtsgesetz*, *ZAG*) does not apply either. As a result, a classification as legal tender, respectively, foreign currency (*Devise*) or sort

[12]Reference should be made to the judgement of a Berlin Court of Appeal on 25 September 2018, in which bitcoin is not classified as a financial instrument within the meaning of the KWG. It remains to be seen to what extent this will have consequences for bitcoin trading in Germany (Online and Recht 2018).

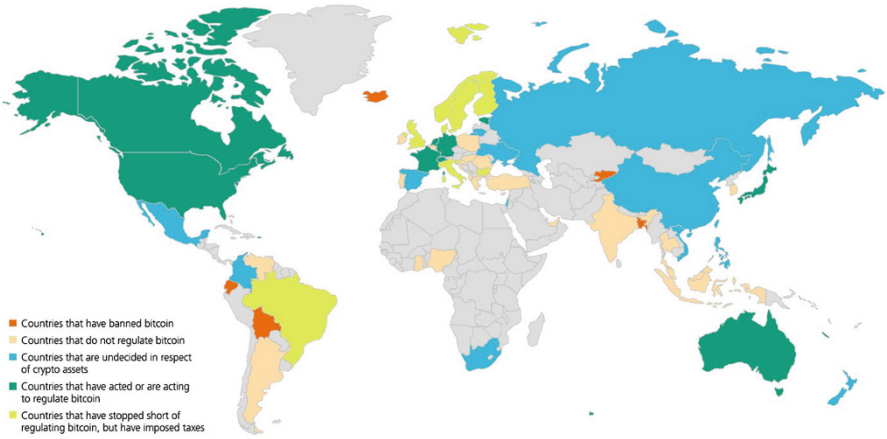

Fig. 3 Global regulation (or non-regulation) of bitcoin (Own illustration based on Anderson et al. 2017)

(*Sorte*), also fails. Rather, bitcoin should be regarded as a surrogate currency or complementary currency (Münzer 2014). An international perspective is even more complicated as there are often significant differences in legal terms such as currency or security (Siedler 2018). To avoid misunderstandings, we have chosen the term crypto assets.

Although there is no independent ICO law yet, token sales do not occur in an unregulated area (Birkholz 2017). Depending on the design of the tokens, an ICO rather has to follow the existing regulatory requirements. Even today, a large number of norms can be applied, which are indicated here. Tokens can be classified as:

- Securities in accordance with the German Securities Trading Act (*Wertpapierhandelsgesetz*, *WphG*) and the German Securities Prospectus Act (*Wertpapierprospektgesetz*, *WpPG*)
- A share in an investment fund as defined by the German Capital Investment Act (*Kapitalanlagegesetzbuch*, *KAGB*)
- An investment under the German Capital Investment Act (*Vermögensanlagengesetz*, *VermAnlG*).

This entails corresponding legal implications such as prospectus obligations, licencing obligations under the German Banking Act (*KWG*) or even personal criminal sanctions in the case of infringements. In addition, further regulations are applicable such as e-commerce obligations, requirements on money laundering, guidelines on the accounting and tax treatment of tokens or privacy policy (Weitnauer 2018).

Besides existing regulations, national (Federal Financial Supervisory Authority, *Bundesbank*) and European authorities (European Central Bank, European Banking Authority, European Securities and Markets Authority) have repeatedly provided their assessments, warnings and advice on ICOs (Hönig 2018). While South Korean

and Chinese authorities have in the meanwhile banned token sales (Aschenbeck and Drefke 2018), the less restrictive approach in European areas is certainly to be appreciated for the development of the crypto scene.

In summary, it can be stated that in particular, the rights linked to a token must be meticulously checked to determine a regulatory classification (Weitnauer 2018). This corresponds to the individual case assessments already made by the *BaFin* in Germany. Nevertheless, an individual ICO law and specifically the regulation of the secondary market (e.g. insider trading) can ensure an improved legal certainty and a more stable development of the entire market.

Legal Framework: Weak Overlaps

The decentralised nature and therefore the worldwide presence of token sales ideally require a global legal framework. Even though equity crowdfunding was also banned in the early days, crowdfunding in general has already passed the regulatory wave (Aschenbeck-Florange and Dlouhy 2015).

12 Summary

In the preceding text, it becomes clear that not all crowdfunding types are equally suitable for entrepreneurial financing. Similarly, not every ICO aims to finance start-ups. Table 3 therefore includes in particular reward- and equity-based crowdfunding as well as the corresponding ICO types in the context of entrepreneurial finance.

13 Conclusion

Initial Coin Offerings (ICOs) are more comparable to crowdfunding than to an Initial Public Offering (IPO) in terms of the reasons for their emergence—Table 3 shows a comparative summary of crowdfunding and token sales. With this in mind, it becomes clear how similar token sales are to crowdfunding, especially in terms of the main characteristics such as appearance, project development stage and community involvement. The decisive aspect here is above all the stage of development when entrepreneurial projects choose a certain financing instrument in the corporate life cycle. Furthermore, some patterns of the early days of crowdfunding can be recognised in the development of ICOs (e.g. treatment by regulatory authorities). Overall, a comparison with an IPO is therefore not applicable, as an ICO has neither legal nor technical similarity (Bundesanstalt für Finanzdienstleistungsaufsicht 2017). What ultimately remains is the similarity between the two terms IPO and ICO, which leads to misunderstandings and wrong expectations.

Table 3 Overview of the comparisons made between crowdfunding and token sales

Criteria	Crowdfunding	Initial Coin Offering
Appearance and characteristics	• Four main types of crowdfunding with occasional hybrid forms	• Four main types of tokens so far with hybrid models in most cases
Market relevance	• Small transaction size, different growth rates depending on the crowdfunding type	• Small to medium transaction size, rapid growth since 2017
Project focus	• Design, gaming, music and film and technology in the early days • Large variety of industries now	• Blockchain infrastructure (including platforms, exchanges and wallets), finance and gaming • Generally large variety of industries
Project development stage	• Projects in early development stages, often prototypes exist or start-ups are already founded • Crowdfunding platforms cumulate projects and select due to certain requirements (e.g. legal form)	• Tokens usually serve as a means of payment within a blockchain ecosystem which is mostly under development • ICOs are conducted on dedicated websites and partly evaluated by independent rating websites
Campaign procedure		
Representation	• Standardised project pages on crowdfunding platforms with a campaign video showing further details	• Dedicated websites, usually with white papers containing the main information about the token sale
Phases and length	• "All-or-nothing" or "keep-it-all" approach with an average length of around 40 to 80 days and a recommended length of around 30 days	• Partly complex auction procedures with an average length of 2 months (first quarter 2018)
Promotion	• Social media channels, in particular Facebook	• Social media channels, relevant forums, e.g. Bitcointalk
Requirements for contributing	• Registration on the crowdfunding platform often required, self-disclosure on income conditions (in case of crowdinvesting)	• Occasional KYC processes[a], without verification of suitability as an investor
Backer's motivation	• Intrinsically motivated backers (family and friends, personal interests, lead user) outweigh extrinsically motivated backers (return on investment in equity crowdfunding) • Backer's lists often available	• Extrinsically motivated backers (speculators, "FOMO") seem to outweigh intrinsically motivated backers ("believers"/long-term investors, early adopters) • Backers rarely known by name (pseudoanonymity)
Campaigns' success factors	• Quality of information provided, good social network of the campaign initiators, a high amount of early contributions, a further developed project status, giving project updates during the campaign affects a campaign positively, a long duration affects a campaign negatively	• Tradability of a token, code or code parts (e.g. smart contracts) • Content of a white paper, but not its mere existence

(continued)

Table 3 (continued)

Criteria	Crowdfunding	Initial Coin Offering
Risks and limitations	• Incompetence of project initiators, fraud, failure to reach the goal	• Risk of "blockchainising" every project, fraud, failure to reach the goal, lack of investor protection, cyber security lacks • Participation conditions for institutional investors largely not given at the moment
Secondary market (transferability, tradability)	• Secondary markets for crowdfunding are complicated by legal hurdles and small transaction sizes and therefore do not de facto exist	• Secondary market with its specific downsides (e.g. illiquid tokens, transaction volumes too small for institutional investors), lack of regulation (e.g. insider trading)
Legal framework	• Generally independent laws at an international level, Small Investor Protection Act (*KlAnSG*) in Germany	• Existing laws can be applied as far as possible, independent ICO laws rarely exist, individual decisions by the *BaFin* in Germany

Own illustration

[a]Know-your-customer (KYC) processes are legitimacy checks of new customers to prevent money laundering, especially in the financial sector (Cumming and Hornuf 2018)

ICOs can take the form of more than one financing instrument—Token sales vastly expand the financing opportunities for entrepreneurs. Theoretically, ICOs can take the form of different financing instruments, allowing them to be a perfect substitute for reward-, donation-, lending- or equity-based crowdfunding, security issuance and to some extent venture capital (Amsden and Schweizer 2018). Security Token Offerings (STOs) can represent a next development step but are not limited to the existence of blockchain or distributed ledger technology (DLT)-based business models. The actual innovations made possible by token economies should not be forgotten when considering ICOs as a (mere) form of financing. By tokenising assets, for example, it would become possible to trade units of real estate tokenised in square metres around the world (Frank 2018).

Crowdfunding and token sales combined could create added value and overcome inefficiencies—Inefficiencies in crowdfunding, such as the transfer of ownership (transferability, tradability), partial ownership or the possibility for investors to cash out immediately (liquidity), could be eliminated through the issuance of tokens (Amsden and Schweizer 2018). When (equity) crowdfunding investments were tradable on specific exchanges, their integration into the broader financial system would be facilitated making them a more viable alternative for traditional forms of entrepreneurial financing like venture capital or business angel financing (World Economic Forum 2017). Also from an investors' point of view, completely new possibilities for portfolio diversification arise. Finally, valuable feedback from the crowd or development work may be incentivised more strongly with the help of tokens. In the context of open innovation, the potential to provide decentralised financing for teams working across borders or to compensate the core developers to

retain the financial independence of open-source projects becomes apparent (Chen 2018; Adhami et al. 2018).

Displacement effects between crowdfunding and ICOs are not to be expected—Displacement effects especially of ICOs on crowdfunding cannot be identified yet as the underlying technology of token sales, or the projects themselves to some extent represent a barrier for the participation of retail investors and thus only address a specific target group of tech-savvy people. In addition, a distinction can be made between predominantly intrinsic motives for crowdfunding backers and assumed extrinsic motives for ICO investors. Overall, the crowdfunding market has not yet reached a stage of saturation in many countries, especially in Germany.

Democratising entrepreneurial finance through crowdfunding and ICOs—Finally, the progressive development of crowdfunding and ICOs or the emergence of a combined form contributes to reshaping the landscape of entrepreneurial finance (Boreiko and Sahdev 2018). On the one hand, entrepreneurs are enabled to raise funds directly from contributors worldwide, and, on the other hand, interested investors have the opportunity to support the realisation of early-stage projects around the globe (Chen 2018). In summary, the access to capital as well as the access to investment opportunities is highly democratised through ICOs and the more established crowdfunding. Given the necessary time for further technical development, a full regulatory embedding (ideally worldwide) and the adaptation by a broad mass, both alternative forms of financing can contribute to a democratisation of entrepreneurial finance.

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