

Equity crowdfunding: a systematic review of the literature

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Abstract Equity crowdfunding is an emerging area of research within the broader sphere of entrepreneurship. Since 2012, research activities are steadily advancing, providing the foundation for a promising field of research. Despite ongoing scientific discussions, equity crowdfunding research is still in its infancy and scholarly knowledge remains limited and fragmented. To bring clarity to this fragmented field and to further advance the scientific process, we conduct a systematic literature review of 113 journal contributions and gray papers, published between 2012 and 2017. Based on an in-depth analysis of identified publications, we describe the landscape of the equity crowdfunding field concentrating on two aspects. First, we conduct a descriptive analysis of equity crowdfunding research to illustrate the scientific development. Second, we categorize relevant contributions into five different perspectives: capital market, entrepreneur, institutional, investor, and platform and perform a thematic analysis to reveal dominant themes and sub-themes within each perspective. Our study highlights several promising directions for encouraging further advancements in equity crowdfunding research.

Keywords Financial instruments · Entrepreneurial finance · Equity crowdfunding · Systematic literature review · Thematic analysis

JEL classification G23-L26

1 Introduction

Equity crowdfunding, an innovative way to raise external capital for new ventures (Ahlers et al. 2015; Estrin et al. 2018; Vismara 2018a), is emerging as a promising research area within the broader sphere of entrepreneurship research (Cholakova and Clarysse 2015; McKenny et al. 2017). Since the publishing of the seminal works by Belleflamme et al. (2011) and Ahlers et al. (2012), the number of equity crowdfunding studies has increased by 620% from 2012 to 2017 (Fig. 1). Researchers, practitioners, and policy makers highlight the importance of equity crowdfunding as a viable source for financing new ventures (e.g., Bruton et al. 2015; Massolution 2015; Younkin and Kashkooli 2016). The ongoing scientific discussion of equity crowdfunding in various academic entrepreneurship journals (e.g., *ET&P*, *JBV*, *Small Business Economics: An Entrepreneurship Journal*, *Venture Capital: An International Journal of Entrepreneurial Finance*) contributes to the on-going legitimization of equity crowdfunding as a sub-field of entrepreneurial finance research. Furthermore, the integration of theories and concepts from areas like social psychology (Cholakova and Clarysse 2015), marketing (Moysidou and Spaeth 2016), as well as management and finance (e.g., Vismara 2018b, 2016; Ahlers et al.

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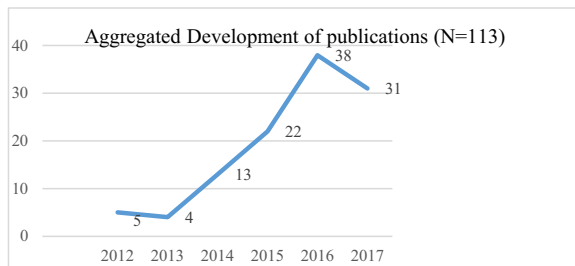


Fig. 1 Aggregated development of publications. Source: authors

2015; Vulkan et al. 2016) display its inherent interdisciplinary nature as a research field. In addition, the scientific debate about equity crowdfunding in peer-reviewed academic journals not dedicated to entrepreneurship (e.g., *Management Science, Information, and Organization; Industrial Management & Data Systems; California Management Review; The Journal of Corporation Law*) indicates the increasing significance of equity crowdfunding outside the narrow entrepreneurship research context.

However, despite the ongoing scientific and practical discourse, research on equity crowdfunding is still in its infancy, with limited and fragmented scientific knowledge (Short et al. 2017; McKenny et al. 2017; Block et al. 2018a; Cumming and Johan 2017a). The steady growth and multidisciplinary nature of the field make systematizing the current body of equity crowdfunding literature difficult, and a holistic overview of the field is needed. Thus, equity crowdfunding as a scientific field is at risk of stagnation and lacks robustness (Fayolle and Liñán 2014; Liñán and Fayolle 2015). Hence, the purpose of this study is to systematically review, categorize, and synthesize the existing body of knowledge to compile a distinct landscape of the scientific development. To provide a holistic overview of the current state of the art of equity crowdfunding research, our review is guided by the following questions:

- (1) How has equity crowdfunding literature evolved since its establishment?
- (2) Which perspectives dominate research on equity crowdfunding?
- (3) What are the emerging themes that dominate equity crowdfunding research and what future research is needed?

To answer our research questions, we conduct a systematic literature review (Tranfield et al. 2003) examining 113 scientific equity crowdfunding contributions, advanced by inductive thematic coding, (Braun

and Clarke 2006; Jones et al. 2011) to identify themes and sub-themes of current equity crowdfunding research. To the authors' knowledge, there is no systematic literature review covering equity crowdfunding. Recent reviews focus on crowdfunding and equity financing in general and derive future research questions without making a clear distinction between the various forms of crowdfunding (e.g., Moritz and Block 2016; Guan 2016; Gleasure and Feller 2016; Wallmeroth et al. 2018).

However, equity crowdfunding differs significantly from other crowdfunding forms. First, equity crowdfunding contains investment decisions with a prospect of a potential return on investment. Thus, the risk-return equation of equity crowdfunding implies higher risk levels compared to reward-based crowdfunding (Bapna 2017), where funders get material or immaterial rewards for their financial support or, in case the funding limit is not reached, a refund. Second, equity crowdfunding (crowd-) investors are less experienced and face large information asymmetries when evaluating new businesses (Ahlers et al. 2015; Bapna 2017). Due to these differences, our review concentrates exclusively on equity crowdfunding and reveals potential research streams, which are of particular interest for equity crowdfunding scholars.

Our systematic review contributes to the advancement of the field in several ways. First, we analyze the development of the literature and identify current methodological approaches. Second, we highlight current research themes and provide several implications for encouraging and guiding future research activities based on the various identified themes and sub-themes. For ensuring transparency and replicability, our approach follows "best practices" in systematic entrepreneurship literature reviews (e.g., Jones et al. 2011; Pittaway and Cope 2007; Macpherson and Holt 2007; Liñán and Fayolle 2015; Thorpe et al. 2005).

Our study continues as follows. In the next section, we summarize the method applied, and also illustrate the literature search and review strategy. We then present the findings of our systematic literature review, including a descriptive analysis of the scientific development of equity crowdfunding research, the synthesized results of the thematic analysis, and emphasize possible avenues for future research. We conclude by summarizing our main findings, considering the limitations of our study, and highlighting the implications of our review for further equity crowdfunding research.

2 Methods

Systematic literature reviews offer a suitable method for conducting a scientific overview of research activities within a specific field (Petticrew and Roberts 2006). To provide a clear overview of the scientific development and emerging research themes, we apply a variation of systematic literature reviews that base the synthesis on a content-based evaluation of relevant publications (Jones et al. 2011). Therefore, we enhance the systematic review process outlined by Tranfield et al. (2003) by including an inductive approach of thematic analysis, a method commonly used in qualitative psychology (Braun and Clarke 2006; Jones et al. 2011). To ensure transparency and replicability, we follow the approach of systematic literature reviews outlined by Tranfield et al. (2003). The following section describes the adaptation of these stages, adjusted to our research objective.

2.1 Planning the review

In the planning phase, we define suitable search terms for the selection of relevant contributions. We derived the search terms from different articles using various synonyms for equity crowdfunding, like “equity-based crowdfunding” or “crowdinvesting.”¹ To guarantee transparency, we base the selection of relevant contributions on specific inclusion and exclusion criteria (Tables 12, 13 in the appendix). To facilitate comparability among contributions, we include only those scientific publications with an abstract. Our sample consists of published and unpublished scientific contributions, e.g., journal articles, conference proceedings, working papers, and papers in edited volumes. Other publication forms, such as books, book chapters, industry reports, commentaries, and editorials, are not included due to restricted availability (Jones et al. 2011; Liñán and Fayolle 2015) and the absence of abstracts. For ensuring a transparent process of our review, we establish detailed protocols, including the literature research (Table 14 in the appendix).

2.2 Conducting the review

The process of our review includes several steps based on the three stages (planning, conducting, and reporting)

¹ The term “crowdinvesting” is frequently used in German speaking countries.

demonstrated by Tranfield et al. (2003). As a first step, we conducted an in-depth literature search in five databases, including Babson College, EBSCO, Elsevier, Google Scholar, and Web of Science. Considering the interdisciplinary nature of equity crowdfunding, we do not concentrate our search solely on citation databases. Therefore, we include Google Scholar in our search, using the Publish or Perish software, version 4. As a multidisciplinary database, Google Scholar is not limited to ISI listed journals, it includes non-English publications, and it provides increased coverage of unpublished contributions, like working papers and conference proceedings (Harzing and van der Wal 2008; Kousha and Thelwall 2007). For each database, we used the search string “Crowdinvesting” OR “Equity Crowdfunding” OR “Equity-based Crowdfunding” within the title, abstract, and keywords. The search covered studies between 2012 and 2017 and was limited to contributions published in English or German. The database search identified 3285 possibly relevant contributions. To ensure that equity crowdfunding was the main research topic, we screened identified contributions against our search terms, by reviewing the title, abstracts, and keywords. After applying all inclusion and exclusion criteria, the review process resulted in 113 relevant contributions.²

2.3 Data synthesis

To illustrate the distinct landscape of current research on equity crowdfunding, we conduct an inductive, interpretation-based approach of theme identification (Jones et al. 2011). For ensuring transparency and replicability, we follow a systematic procedure to identify themes, as outlined by Braun and Clarke (2006). Thematic analysis originates from psychological science and provides a suitable “method for analyzing and reporting patterns within data” (Braun and Clarke 2006, p. 79). According to Ryan and Bernard (2003), a theme illustrates the fundamental concepts of analyzed data. In our review, the data consists of scientific equity crowdfunding contributions, with themes derived inductively by reviewing each paper. Consequently, the identified themes are reflections of its content, thus representing core ideas and arguments resulting from

² For readers' convenience, we updated the publication dates of earlier published versions. For our analysis, we used the first published online version according to our time frame.

the specific research questions and aims (Jones et al. 2011; Liñán and Fayolle 2015; Thorpe et al. 2005).

Our understanding of each publication was formed by the stated aims, research questions, results, implications, and the conclusion. To minimize subjectivity in theme identification, we based the categorization and classification of relevant contributions on the collective judgment of three researchers. Any discrepancies in theme identification were discussed and minor adjustments incorporated. In the case that a publication addressed multiple themes, the stated aim of the paper served as our decision-criteria for categorization and classification (Liñán and Fayolle 2015). For providing a precise thematic landscape, we first categorized the relevant contributions according to the different stakeholders within the equity crowdfunding ecosystem, resulting in the five categories of *Capital Market Perspective*, *Entrepreneur Perspective*, *Institutional Perspective*, *Investor Perspective*, and *Platform Perspective*.

3 Reporting the findings

In the following section, we illustrate the synthesis of the analyzed contributions in two successive steps. To provide a detailed “rough-cut” of the development of equity crowdfunding research, the first step consists of a descriptive analysis of the body of literature. As the next step, we report the findings resulting from our thematic analysis. Therefore, we illustrate the identified themes and sub-themes, discuss possible inconsistencies, and highlight implications and avenues for advancing further research on equity crowdfunding.

3.1 Descriptive analysis of equity crowdfunding research

Recent studies that also adopted the systematic process outlined by Tranfield et al. (2003) (e.g., Macpherson and Holt 2007; Thorpe et al. 2005; Pittaway and Cope 2007) descriptively analyze the literature concerning methodological information and geographical coverage. Our descriptive analysis is oriented on the studies above; however, we also address the distribution of publication forms as well as journals and conferences that have accepted contributions on equity crowdfunding followed by a short discussion.

3.1.1 Development of the body of literature

Since 2012, the equity crowdfunding research is growing, as reflected by a wide variety of publication forms, including books, journal articles, and working papers, among others. Figure 2 presents the distribution of research among journal articles ($n = 62$) and non-journal articles ($n = 51$). The variety of journals that so far published equity crowdfunding research is summarized in Fig. 3, and Table 1 shows the distribution of research articles within entrepreneurship journals.

3.1.2 Conferences on equity crowdfunding

In addition to the acceptance of leading entrepreneurship journals, equity crowdfunding is increasingly included in various scientific conferences. Table 2 summarizes conferences within an entrepreneurship context as well as conferences not dedicated to entrepreneurship, which so far provide an audience for equity crowdfunding research.

3.1.3 Geographical coverage

With regard to the locus of the reviewed studies, the majority of our analyzed sample fall primarily in two regions: Europe and the USA. Within Europe, the majority of studies use data from Germany, followed by the UK, and then other European countries like Austria, France, Italy, the Netherlands, Sweden, and Switzerland (see Table 3). Very few studies included data from other nations like Australia, Brazil, Canada, China, India, New Zealand, Singapore, and Taiwan.

3.1.4 Methodological information

Regarding methods applied (Table 4), 59.28% of studies in our sample are empirical studies. Then,

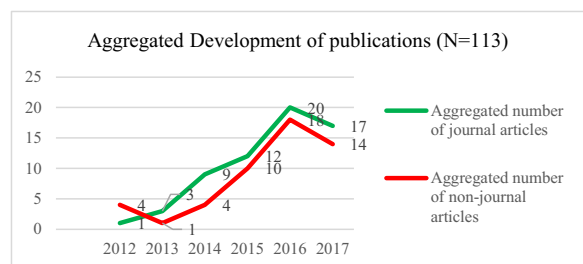


Fig. 2 Distribution of publication forms. Source: authors

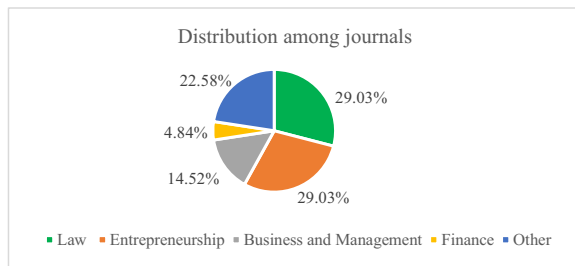


Fig. 3 Distribution among journals. Source: authors

36.28% used quantitative designs including multivariate analysis and descriptive statistics. For observational studies, the sample size ranged from 30 to 1487 campaigns whereas survey studies varying from 136 to 610 respondents. Further, 22.12% of our sample apply qualitative designs, including single or multiple case studies, interview-based studies, or reviews. Qualitative studies vary from 6 to 68 participants. The majority of empirical studies included data from European equity crowdfunding platforms, like WiSeed (France); Companisto, Innvestment, and Seedmatch (Germany); Symbid (Netherlands); and Crowdcube and Seedrs (UK). Only a few empirical contributions use data from platforms like ASSOBS from Australia; Dajiatou and Zhongchou from China; or AngelList and EquityNet from the USA.

3.1.5 Observations and implications

As a general observation, we can emphasize that equity crowdfunding is a young field of research that is currently on track to being established in the academic community.

Table 1 Published articles in entrepreneurship journals

| Entrepreneurship Journals | Articles published |
|--|--------------------|
| Small Business Economics: An Entrepreneurship Journal | 7 |
| Venture Capital: An International Journal of Entrepreneurial Finance | 3 |
| Entrepreneurship Theory & Practice | 3 |
| Magazine for SME and Entrepreneurship (German ZfKE) | 2 |
| Journal of Business Venturing | 1 |
| Journal of Business Venturing Insights | 1 |
| The Journal of Entrepreneurial Finance | 1 |

Table 2 Conferences including equity crowdfunding

| |
|--|
| Entrepreneurship conferences |
| Academy of Management Annual Meeting |
| United States Association for Small Business and Entrepreneurship (USASBE) |
| International Conference on Innovation and Entrepreneurship (ICIE) |
| Interdisciplinary Conference on Entrepreneurship, Innovation, and SMEs (G-Forum) |
| Non-entrepreneurship conferences |
| Americans Conference on Information Systems (AMCIS) |
| European Conference on Information Systems (ECIS) |
| Hawaii International Conference on System Sciences |

The increasing number of publications in journals dedicated to, e.g., entrepreneurship, law, information systems, and business and management, demonstrates the significance of equity crowdfunding inside and outside the narrow entrepreneurship context as well as the multidisciplinary nature of equity crowdfunding research. As a subfield of entrepreneurial finance, equity crowdfunding combines various concepts (e.g., entrepreneurship, finance, law) and led to new research avenues referring to these concepts (Cumming and Groh 2018; Cumming and Johan 2017b; Cumming and Vismara 2017). Therefore, it is not surprising that the majority of our sample is published in entrepreneurship and law journals (in each case 29.03%). However, only a few studies (4.84%) were published in finance journals (e.g., Moritz et al. 2015; Chen et al. 2016; Turan 2015), whereas the leading finance journals (e.g., *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Corporate Finance*) remain uncovered. Traditionally, research on entrepreneurial finance has its origin in entrepreneurship journals (e.g., *ET&P*, *JBV*), which are still dominant in publishing research activities referring to entrepreneurial finance topics (Cumming and Johan 2017b). Similar to entrepreneurial

Table 3 Geographical coverage

| Region | Total (%) |
|---------------------|-----------|
| Europe | 54.78 |
| USA | 19.47 |
| Other/not specified | 25.66 |
| European Countries | |
| Germany | 40.32 |
| UK | 30.65 |
| Other | 29.03 |

Table 4 Methods applied

| Method | Total (%) |
|---|-----------|
| No empirical studies | 40.71 |
| Quantitative | 36.28 |
| Qualitative | 22.12 |
| Mixed methods | 0.88 |
| Quantitative | |
| Observations | 73.17 |
| Surveys | 26.83 |
| Regressions (OLS, PLS, hierarchical, probit, logit, binomial) | 90.24 |
| Structural equations | 4.88 |
| Descriptive statistics | 2.44 |
| Mean differences (<i>T</i> tests, ANOVA, MANOVA, Chi square) | 2.44 |
| Qualitative | |
| Interview-based studies | 48.00 |
| Case study | 28.00 |
| Literature review | 8.00 |
| Descriptive | 16.00 |

finance in general also equity crowdfunding research was first published in these entrepreneurship journals (Cumming and Johan 2017b). One possible reason for the pioneering role of entrepreneurship journals referring to equity crowdfunding publications could be the interdisciplinary nature of the field. Referring to Cumming and Johan (2017b), finance journals are disciplinary-focused and therefore tend to reject multidisciplinary research on entrepreneurial finance, i.e., equity crowdfunding. In addition, finance scholars are less likely to reference research in entrepreneurship journals, e.g., research on equity crowdfunding (Cumming and Groh 2018; Cumming and Johan 2017b; Cumming and Vismara 2017) which may lead to hurdles regarding the scientific process of equity crowdfunding. These circumstances highlight the needs for interdisciplinary exchanges between finance and entrepreneurship scholars, to reduce the risks of segmented research and stagnation (Cumming and Vismara 2017).

Despite the infant state of equity crowdfunding research, the existing diversity of empirical studies is somewhat surprising. Numerous studies empirically analyze the behavior of market participants and the underlying mechanisms, thus serving as a base for the further development of equity crowdfunding research. However, the majority of empirical studies are observational studies. Only three

studies employ an experimental design. Thus, for further advancing equity crowdfunding as a research field, we encourage scholars to apply experimental designs. Equity crowdfunding is characterized by interactions between various stakeholders, conditions of uncertainty, and asymmetric information. Therefore, equity crowdfunding seems to be well suited for employing experimental research designs. While results based on observations could be affected by unobserved variables, conducting experiments could lead to the disclosure of causalities (Azoulay et al. 2013). Within an equity crowdfunding context, experiments could confirm, if not extend, the results of observational studies (e.g., Ahlers et al. 2015; Vismara 2018b, 2016; Vulkan et al. 2016; Li et al. 2016) to quantify possible causal-effects. As a bonus, results based on experimental designs are more replicable (Manzi 2012).

3.2 Thematic analysis

In this section, we report the findings resulting from our thematic analysis. To navigate through the complexity, we present and discuss our results along the identified perspectives. The 113 relevant contributions can be divided into 5 different categories: *Capital Market Perspective*, *Entrepreneur Perspective*, *Institutional Perspective*, *Investor Perspective*, and *Platform Perspective*. For each perspective, we present the synthesis of each theme and possible opportunities for further advancing equity crowdfunding research. Within each perspective, several themes and subthemes emerged, which we highlighted in italics.

3.2.1 Capital market perspective

In this section, we report the synthesis of contributions that analyze the potential relevance for the early-stage venture capital market. In sum, we assign 14 publications (Table 5) to this category addressing two themes: *functioning and development* and the *potential role* of equity crowdfunding alongside traditional finance alternatives. Two studies provide a *review* of existing literature.

Functioning and development of equity crowdfunding For analyzing the functioning of equity crowdfunding, some studies (Grüner and Siemroth 2016; Kumar et al. 2015) develop a theoretical model. Based on a Bayesian investment game, Grüner and Siemroth (2016) investigate theoretically, which circumstances lead to an efficient allocation of capital to

Table 5 Capital market perspective

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|---------------------------------------|--|-------------------------------------|--|-------------------------------------|---|
| Functioning and development | | | | | |
| Tomboc (2013) | Analysis of how asymmetric information can lead to a lemons problem | Conceptual | n. a | n. a | n. a |
| Turan (2015) | Analysis of significant risk categories and factors for stakeholders | Conceptual | n. a | n. a | n. a |
| Kumar et al. (2015) | Analysis of the functioning of equity crowdfunding | Conceptual; mathematical model | n. a | n. a | n. a |
| Pelizzon et al. (2016) | Overview about the development of equity crowdfunding | Conceptual | n. a | n. a | n. a |
| Grüner and Siemroth (2016) | Analysis of the allocative effects of equity crowdfunding | Conceptual; mathematical model | n. a | n. a | n. a |
| Potential role of equity crowdfunding | | | | | |
| Nascimento and Querette (2013) | Analysis of the potential of equity crowdfunding in Brazil | Conceptual | n. a | n. a | n. a |
| Borello et al. (2015) | Analysis of the organizational structure and business model of platforms | Qualitative; descriptives | 119 platforms from Europe | n. a | n. a |
| Hornuf and Schwienbacher (2016) | Analysis of differences and similarities between crowdfunding and angel investing. | Conceptual | n. a | n. a | n. a |
| Abdullah and Oseni (2017) | Examines the potential of equity crowdfunding for halal firms | Qualitative; interview--based study | Six platforms registered in Malaysia | n. a | n. a |
| Mokhtarrudin et al. (2017) | Examines the potential role of equity crowdfunding for young Malaysian start ups | Quantitative; regression | 202 surveys of Malaysian entrepreneurs | Crowdfunding as a source of funding | Types of crowdfunding models, levels of awareness |
| Kim and Moor (2017) | Highlights the potential of equity crowdfunding for small social enterprises | Conceptual | n. a | n. a | n. a |
| Dilger et al. (2017) | Examines the suitability of equity crowdfunding for energy co-operatives | Qualitative; case study approach | n. a | n. a | n. a |
| Reviews | | | | | |
| Moritz and Block (2016) | Overview of crowdfunding literature (all forms) | Qualitative; literature review | 92 contributions | n. a | n. a |
| Gleasure and Feller (2016) | Overview of crowdfunding literature (all forms) | Qualitative; literature review | 120 contributions | n. a | n. a |

new ventures. The authors argue that an efficient capital allocation can be achieved when the difference between income and wealth among investors is rather small, and all investors are wealthy enough to invest. In other words, wealth inequality among investors will lead to inefficient capital allocation, because investments only reflect preferences of investors who are wealthy enough

to invest, but not the future demand. In a similar setting, Kumar et al. (2015) analyze the design of an optimal crowdfunding contract. The authors develop a theoretical model where a monopoly wants to raise funds via equity crowdfunding. Based on this model, Kumar et al. (2015) suggest that a specific funding target and a pre-sales price determine an optimal crowdfunding contract.

For an efficient functioning of equity crowdfunding (e.g., fraud preventing), it is also crucial to find ways to mitigate potential risks for stakeholders. Two studies (Tomboc 2013; Turan 2015) address potential risks from a stakeholder's perspective. To solve the risk of asymmetric information, Tomboc (2013) explores the rationales for a "lemons problem" in equity crowdfunding. He concludes that reputation systems—like on eBay or Amazon—friendship networks, and discussion boards have the potential to signal quality to potential investors and thus effectively reduce information asymmetries. Turan (2015) classifies potential risk factors stakeholders are facing into five different categories: financial, regulatory, operational, reputational, and strategic risks. He argues that to reach its fullest potential, equity crowdfunding needs to mitigate these risks by implementing specific risk reduction measures, like establishing a secondary market for shares, investor education, or third party judges to evaluate the quality of ventures. Pelizzon et al. (2016) provide a descriptive overview of the development of equity crowdfunding and distinguish between the various forms existing.

3.2.2 Potential role of equity crowdfunding

With regard to the *potential role* of equity crowdfunding within the entrepreneurial finance landscape, seven studies address this subject. Nascimento and Querrete (2013) review various contexts in which equity crowdfunding has been applied to derive its potential for Brazilian entrepreneurs. The authors argue that equity crowdfunding could promote micro-businesses in Brazil, due to mitigating financial constraints. Hornuf and Schwiwenbacher (2016) and Borello et al. (2015) study the question, whether equity crowdfunding will complement or substitute traditional financing forms. By comparing equity crowdfunding practices of different countries with angel financing (Hornuf and Schwiwenbacher 2016) and analyzing the business models and organizational structure of 119 European crowdfunding platforms (Borello et al. 2015), both studies conclude that no clear answer exists. Due to differences in platform designs and regulatory frameworks in some countries, equity crowdfunding might play both roles, as a complement and a substitute. Abdullah and Oseni (2017) examine the potential of equity crowdfunding in Islamic finance. By analyzing six equity crowdfunding platforms registered in Malaysia, the authors highlight the need for a Shari'ah compliant financing platform for halal SMEs. Based on the principles of Islamic finance, Abdullah and

Oseni (2017) provide an equity crowdfunding model to facilitate access of halal SMEs to equity crowdfunding. Mokhtarrudin et al. (2017) analyze the potential role of equity crowdfunding as a funding alternative for Malaysian micro businesses. Based on a survey of 202 micro-entrepreneurs, the authors highlight that micro businesses are less likely to prefer equity crowdfunding due to the higher risks associated with equity crowdfunding. Kim and Moor (2017) illustrate the potential of equity crowdfunding for social enterprises. The authors argue that due to the increased difficulties of receiving external capital from traditional financiers, equity crowdfunding might be a promising alternative to meet the financing needs of small social enterprises.

Dilger et al. (2017) analyze the suitability of equity crowdfunding for energy co-operatives. Based on a multiple case study approach (22 cases), the authors illustrate that equity crowdfunding can be a financial alternative for energy co-operatives. In addition, equity crowdfunding is seen as an appropriate add-on referring to strengthening network ties and acquire more potential members.

3.2.3 Review

Two studies in this category provide a literature review on crowdfunding research. Moritz and Block (2016) review 92 crowdfunding contributions, including all forms of crowdfunding. The authors classify the literature according to the main actors (capital seekers, capital providers, intermediaries) and highlight future research streams referring to all crowdfunding. Similarly, Gleasure and Feller (2016) review 120 crowdfunding contributions, as well including all forms and provide further research areas.

3.2.4 Discussion and future research avenues for the capital market perspective

The majority of publications in this perspective are conceptual and theorize about the role of equity crowdfunding as a complement to, or substitute for, entrepreneurial finance. Since some studies argue that equity crowdfunding can play a supporting role in reducing the early stage gap (e.g., Hagedorn and Pinkwart 2016; Moritz and Block 2016), it is astonishing that no study examines how this could function. Therefore, turning to future research avenues, we strongly support the notion of Block et al. (2018a) to explore *how, and to*

what extent, can equity crowdfunding contribute to reducing the early-stage-financing gap? In line with this, scholars need to clarify to what extent equity crowdfunding can complement established forms of early-stage venture financing, such as bank loans or business angel investments. As some authors argue that equity crowdfunding serves as a complement to conventional funding sources (Gabison 2014; Bruton et al. 2015; Lukkarinen et al. 2016; Short et al. 2017), interested scholars could examine *how does equity crowdfunding interact with traditional financing forms?* Some studies provide evidence, that the proportion of successful equity crowdfunded ventures is higher compares to ventures receiving venture capital (Ahlers et al. 2015; Cumming et al. 2018a; b). Thus it might be of interest if a successful campaign can also serve as a signal for professional investors to provide subsequent financing. Professional investors might be interested in equity crowdfunded ventures due to the reason of portfolio diversification (Cumming et al. 2018a). More precisely, *does the use of equity crowdfunding increase the probability of subsequent financing (e.g., business angels, venture capitalists, etc.)? How do successful equity crowdfunding campaigns influence the behavior of VC and BA when considering crowdfunded ventures as investment opportunities? What are the potential barriers for professional investors to consider successful equity crowdfunded ventures as an investment opportunity?*

Another promising research avenue could lie in the analysis of how country-specific differences can influence equity crowdfunding outcomes. Some studies show that equity crowdfunding practices differ due to various country-specific regulations³ (Hornuf and Schwienbacher 2016; Borello et al. 2015). Thus, to explore the effects of country-specific characteristics, it might be of scholarly interest to analyze how contextual conditions can influence equity crowdfunding outcomes. Since McKenny et al. (2017, p. 8) claim, “we need to understand the higher-level antecedents, consequences, and contexts of crowdfunding,” we see great potential in examining *how, e.g., socio-cultural factors can affect funding outcomes in specific countries?* Analyzing socio-cultural factors can be a first step toward understanding why funding performance differs across nations (McKenny et al. 2017).

³ Research areas referring to legal and regulatory issues will be part of chapter 3.4.4

With regard to mitigate potential risks for various stakeholders in equity crowdfunding, few studies conclude that risk reduction measures like comments or discussion boards or the implementation of a secondary market might have the potential to overcome informational and finance risks (Tomboc 2013; Turan 2015). Since the UK platform Seedrs announced in May 2017, the introduction of a secondary market for trading equity crowdfunding shares,⁴ future research can explore how this implementation can influence equity crowdfunding performance. To the knowledge of the authors, before the Seedrs announcement, only the German platform Innvestment maintains a second price auction similar to a secondary market. Since no study investigates the design and possible effect of a secondary market in equity crowdfunding, we strongly support the call of McKenny et al. (2017) to analyze the development, design, and impact of secondary markets. Since literature on mitigating information asymmetries also remains quite limited, exploring the mechanisms for reducing information asymmetries in equity crowdfunding is a promising avenue of research. As compared to other forms, investors in equity crowdfunding have limited possibilities to reduce information asymmetries through contracts, pre-investment screening, and post-investment monitoring. As nearly all-active equity crowdfunding boards already implemented investor discussion boards, interested scholars could investigate to what extent platform provided discussion boards are suitable to mitigate information asymmetries. More precisely, *can active discussions lead to a reduction of perceived information asymmetries?*

3.3 Entrepreneur perspective

The studies in this category address issues relevant for the entrepreneur as an actor within the equity crowdfunding eco-system. In sum, we identify 26 contributions (Table 6) that can be clustered into three themes: *rationales for equity crowdfunding, determinants of campaign success, and gender issues.*

3.3.1 Rationales for equity crowdfunding

As equity crowdfunding evolves as a viable source of external capital for young and innovative ventures

⁴ This information was received from the Seedrs Blog. <https://www.seedrs.com/learn/blog/seedrs-news/features-updates/secondarymarket> (Accessed 4 December 2017).

Table 6 Entrepreneur perspective

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|---|---|---|---|---------------------|---|
| Rationales for equity crowdfunding | | | | | |
| Belleflamme et al. (2014) | Comparison of reward-based and equity-based crowdfunding | Conceptual; theoretical/-mathematical model | n. a | n. a | n. a |
| Dorfleitner et al. (2014) | Investigation of the terms of crowdinvesting and discussion of the suitability of crowinvesting for SME's | Quantitative; descriptives | 85 campaigns | n. a | n. a |
| Brem et al. (2014) | Analysis if crowdinvesting is a suitable funding alternative for cooperatives | Qualitative; interview-based study | Interviews with six cooperatives | n. a | n. a |
| Brown et al. (2015) | Explores drivers of entrepreneurs to use equity crowdfunding and effects resulting from using equity crowdfunding | Qualitative; interview-based study | Interviews with 42 successful ventures | n. a | n. a |
| Blaseg and Koetter (2015) | Examination of the impact of bank instability on ventures' use of equity crowdfunding as a source of external finance | Quantitative; regression analysis | 357 German ventures (157 using equity crowdfunding) | Use of crowdfunding | Venture and bank characteristics |
| Miglo (2016) | Analysis of conditions under which entrepreneurs prefer equity instead of reward-based crowdfunding and crowdfunding instead of traditional financing forms | Conceptual; theoretical/-mathematical model | n. a | n. a | n. a |
| Determinants of campaign success | | | | | |
| Ahlers et al. (2015) | Investigation of the effectiveness of start-up signals (financial roadmaps, certificates, internal governance, risk factors) on funding success | Quantitative; regression analysis | 104 offerings of ASSOB (Australia) | Funding success | Human, social, intellectual capital |
| Kshetri (2015) | Examines the effects of formal and informal institutions on funding success | Conceptual | n. a | n. a | n. a |
| Vulkan et al. (2016) | Analysis of which factors in the early stage of a campaign affect the probability of funding success. | Quantitative; regression analysis | 636 campaigns of Seedrs | Campaign success | Campaign characteristics (e.g., funding goal, # of entrepreneurs, etc.) |

Table 6 (continued)

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|--------------------------------|---|---|--|--|---|
| Block et al. (2018b) | Investigation of the effects of posting updates on funding success | Mixed-Method; qualitative coding; regression analysis | 71 campaigns from Seedmatch and Companisto | Campaign success | Team; business model; external certification; product development; cooperation projects; campaign development; new funding; business development; promotions |
| Ralcheva and Roosenboom (2016) | Exploration of the impact of third-party signals on campaign success | Quantitative; regression analysis | 541 campaigns from Crowdcube | Campaign success | Awards; professional investor; previous crowdfunding experience; grants; intellectual capital; advisory boards, non-executive directors |
| Lukkarinen et al. (2016) | Analysis of campaign characteristics as success drivers for campaigns | Quantitative; regression analysis | 60 campaigns from Investdor | Campaign success | Success drivers (human capital, growth potential, etc.); campaign characteristics; networks; understandability |
| Li et al. (2016) | Examination of the role of information disclosure (about the team size and experience, updates, etc.), and lead investors as quality signals on funding success | Quantitative, regression analysis | 49 projects from Dajiatou | Campaign success | Project characteristics (e.g., updates, # of words used); human capital; lead investor |
| Le Pendeven (2016) | Analysis of the impact of ventures' degree of innovation on funding success | Qualitative; descriptives | 39 ventures financed on Anaxago | n. a | n. a |
| Vismara (2016) | Analysis of the impact of signals (equity retention and social capital) on funding success | Quantitative; regression analysis | 271 project from Crowdcube and Seedrs | Campaign success | Equity offered, social capital |
| Bapna (2017) | Investigates the individual and combined effect of third-party signals on campaign success | Quantitative; field experiment; regression analysis | 519 surveys of investors | Interest in investing; invested; amount invested | Prominent affiliate; social proof; product certification; product certification + social proof; product certification + prominent affiliate; prominent affiliate + social proof |
| Di Pietro et al. (2017) | Analysis of non-financial involvement of (crowd-) investors and how this is related to ventures later performance | Qualitative; interview-based study | 60 European ventures | n. a | n. a |

Table 6 (continued)

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|---------------------------------|---|------------------------------------|--|--|---|
| Dorfleitner et al. (2017) | Analysis of the effect of a social orientation of ventures | Qualitative; case study approach | Paulowina s.l.r.; Assiteca Crowd | n. a | n. a |
| Piva and Rossi--Lamastra (2017) | Examines the influence of human capital signals on campaign success | Quantitative; regression analysis | 284 campaigns from SiamoSoci | Success (funded, target capital share, investor number) | Human capital signals (business education, industry-related education, entrepreneurial experience, industry-specific work experience, other work experience) |
| Angerer et al. (2017) | Analysis of success factors from an entrepreneurs perspective | Qualitative; interview-based study | Nine interviews with start-ups and platforms | n. a | n. a |
| Angerer et al. (2017) | Analysis of the effects of posting updates on funding performance | Quantitative; regression | 168 campaigns (Seedmatch, Companisto) | Update, update categories, time; Language (positive, negative, we, past | Success, #investments, amount |
| Giga (2017) | Analysis of the relative importance of human capital signals compared to business information on campaign performance | Quantitative; regression | 1487 campaigns from EquityNet | Funds raised | Years of industry experience, management experience (# of previous start ups founded, years in management), management size, graduate, undergraduate, revenue, a product available, patents, TM, copyright |
| Hornuf and Schmitt (2017) | Analysis of determinants of follow-up financing and firm failure after a successful campaign | Quantitative; regression | 505 successful campaigns | Follow-up funding by BAs/VCs, time until follow-up funding by Bas/VCs, firm failure, time until firm failure | # of senior management member, average age of senior management team, # of granted trademarks, # of granted patents, # of filed patents, # of subsequent successful campaigns, total amount of capital raised, total amount of the funding target, total # of investors, business valuation, ratio of amount raised to the funding target |
| Nevin et al. (2017) | Analysis of how the conveyance of firms social identity attracts campaign success | Quantitative; n. a | Planned data from crowdcube | Total investment; average investment | # of documents; years in business; # of social media posts; most popular social media; most popular category |

Table 6 (continued)

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|--------------------------|---|-----------------------------------|---|--|--|
| Nitani and Riding (2017) | Analysis of how disclosure requirements, firm and owner characteristics and social network influence campaign success | Quantitative; regression | 319 campaigns from four platforms (Companisto, Crowdcube, Invesdor, FundedByMe) | Success (target reached, the speed of funding) | Disclosure; risk and return (entrepreneurs experience, education; generated sales; positive net income; firms age; EBITDA); social network activity (#of contacts) |
| Gender issues | | | | | |
| McGuire (2016) | Explores the potential of equity crowdfunding to reduce the gender gap in entrepreneurship | Quantitative; regression analysis | CrunchBase API | Aggregate funding | Firm characteristics (gender, # of founders, etc.) |

(Cholakova and Clarysse 2015; Vismara 2018b), it is essential to shed light on the driving forces that determine the utilization of equity crowdfunding. We find six publications in this area.

Some studies (Belleflamme et al. 2014; Blaseg and Koetter 2015; Brown et al. 2015; Miglo 2016) analyze the rationales of capital-seeking entrepreneurs for choosing equity instead of reward-based crowdfunding as a funding source. Belleflamme et al. (2014), as one of the first studies on equity crowdfunding, and Miglo (2016) build a theoretical model to determine the conditions under which entrepreneurs prefer equity instead of reward-based crowdfunding. The results suggest that entrepreneurs tend to choose equity crowdfunding if a more substantial amount of capital is needed. In addition, Belleflamme et al. (2014) show that equity crowdfunding is preferred if information asymmetries are high, whereas Miglo (2016) suggests that the presence of information asymmetries lead to a favored use of reward-based crowdfunding. Beyond that, Miglo (2016) shows that entrepreneurs prefer crowdfunding to traditional forms of finance when the funding goal is rather small (reward-based) or entrepreneurs want to trigger and grow potential future demand of their product or service (equity-based). Blaseg and Koetter (2015) empirically examine the effects of external shocks on banks (e.g., bank instability, credit crunch) on the probability of choosing equity crowdfunding rather than bank loans. Based on regressions, the authors indicate that bank-related ventures affected by external shocks tend to use equity crowdfunding when seeking external capital. Brown et al. (2015) focus on the drivers of UK-

based entrepreneurs to engage in equity crowdfunding. By conducting interviews with 42 successful equity crowdfunded ventures, the authors find that the adoption of equity crowdfunding is influenced by factors like a perceived lack of funding alternatives, funding speed, increasing attention by potential customers, the maximum level of autonomy, media presence, and feedback received. Other studies (Brem et al. 2014; Dorfleitner et al. 2014) empirically discuss the suitability of equity crowdfunding for capital-seeking ventures. Based on six interviews with German cooperatives, Brem et al. (2014) show that equity crowdfunding could have an increased potential for financing cooperatives. In addition, Dorfleitner et al. (2014) argue that equity crowdfunding seems to be most suitable for rather small ventures in Germany.

3.3.2 Determinants of campaign success

Equity crowdfunding has a significant impact on early-stage venture funding in various countries (Massolution 2015; Vulkan et al. 2016). To extend the significance, it is essential to identify potential factors that influence the performance of equity crowdfunding campaigns. For facilitating campaign success, capital-seeking entrepreneurs need to reduce information asymmetries (Vismara 2018c). Therefore, it is crucial that entrepreneurs find ways to signal quality and credibility to potential investors. We identified 19 publications that empirically examine the *effectiveness of signals*, predominantly based on signaling-theory, for illustrating credibility and high quality. Ahlers et al. (2015) provide the first study

exploring the significance of signals in equity crowdfunding. Based on 104 offerings from the Australian platform ASSOB, Ahlers et al. (2015) investigate what information disclosed by entrepreneurs can influence funding performance. The authors indicate that information about risk factors (e.g., financial projections), planned exit strategy, human capital (e.g., size and educational degree of the management team), and the amount of equity retained can be interpreted as quality signals that significantly increase campaign success, whereas social (e.g., alliances) and intellectual capital (e.g., patents) have no significant effect on funding success. In a UK-based study of 271 equity crowdfunded ventures, Vismara (2016) empirically confirms that the amount of equity retained is linked to campaign success. Additionally, Vismara (2016) highlights that ventures with a more extensive social network have a higher probability of funding success. In contrast to Ahlers et al. (2015), Vismara (2016) shows that disclosing information about planned exit strategies has no significant effect. Based on a cross-platform analysis of four European equity crowdfunding platforms, Nitani and Riding (2017) also confirm the relevance of an extensive social network, the amount of equity retained, entrepreneur's management experience, and education as well as financial information on campaign success. In addition, the authors highlight that more compelling disclosure requirements and risk warnings are not significant for the success of campaigns.

In a Chinese equity crowdfunding context, Li et al. (2016) empirically confirm the relevance of human capital (team size and experience) by analyzing 49 successful equity crowdfunding campaigns from Dajiatou. In addition, based on an elaboration likelihood model and regressions, Li et al. (2016) emphasize the importance of project updates and information about lead investors as success drivers. Similarly, Block et al. (2018b) support the positive effect of updates by examining the content of updates, posted by 71 German equity crowdfunded ventures. Based on a mixed methods approach, the authors first use a qualitative coding system to categorize the updates according to their content. Subsequently, by using regression analysis, the authors examine the content of updates and find that updates containing information about new funding sources, business development processes, and marketing campaigns influence funding success in particular. In contrast, updates informing investors about the team and product development have no significant effect.

Based on the coding system developed by Block et al. (2018b), Dorfleitner et al. (2017) analyze the communication behavior of start-ups during and after the campaign. By analyzing 168 campaigns of German ventures (97 update data set, 71 investor data set), the authors provide evidence that entrepreneurs' use updates strategically to increase investments. More precisely, entrepreneurs post updates with linguistic styles that enhance group identity and cohesion as well as updates containing information about business development. In addition, the authors show that ventures post more updates during than after the campaign.

Concerning human capital signals, Piva and Rossi-Lamastra (2017) validate the influence of entrepreneurs' education and experiences on campaign success. Based on 129 campaigns listed on the Italian platform SiamoSoci, the authors illustrated the significant impact of an entrepreneur's business education (i.e., management and economics) and previous entrepreneurial experiences on campaign success. In a US context, Giga (2017) also supports the importance of human capital signals on campaign performance. Based on 1487 campaigns listed on EquityNet, the author examines the relative significance of human capital signals compared to business characteristics. In line with Piva and Rossi-Lamastra (2017), the results also illustrate a positive relationship of previous entrepreneurial experiences, as a dimension of management experience, to capital raising. In contrast, business characteristics have no significant impact on campaign performance. By conducting nine interviews with German start-ups and platforms, Angerer et al. (2017) confirm the relevance of team quality and an active communication strategy as drivers for campaign success. In addition, Angerer et al. (2017) highlight that a comprehensive pre-campaign preparation including the development of a roadmap (marketing strategy) and the mobilizing of friends and family as pioneer investors is crucial for a successful campaign. Some studies (Bapna 2017; Ralcheva and Roosenboom 2016) empirically analyze the effect of signals from third parties on overall funding success. By employing a randomized field experiment, Bapna (2017) examines the individual and combined causal effects of various signals that reduce uncertainty (e.g., of product certification, cooperation with well-known organizations, and the behavior of preceding investors) on campaign success. The results indicate that only a combination of the signals product certification and prominent affiliate or product certification and

social proof affect funding success significantly. Ralcheva and Roosenboom (2016) introduce certification theory in equity crowdfunding and explore the effect of third-party signals on campaign success by analyzing 541 campaigns listed on Crowdcube. Based on regressions, the authors suggest that third-party signals like investors as partners, project awards, grants, and intellectual property rights have a positive impact on overall campaign success.

A few studies (Vulkan et al. 2016; Lukkarinen et al. 2016) focus on the effect of specific campaign characteristics on funding performance. Vulkan et al. (2016) analyze 636 ventures listed on the UK platform Seedrs. Based on regressions, the authors show that the amount of capital received in the first week, the largest single investment, and a large number of investors have a positive effect on overall funding success. Only a relatively high stated funding goal is negatively associated with campaign success. In the Finnish context, Lukkarinen et al. (2016) support the relevance of various campaign characteristics. By analyzing 60 campaigns listed on Invesdor, the authors show that investment criteria traditionally used by VC and BA are not relevant in equity crowdfunding. Instead, (crowd-) investors seem to base investment decisions on easily observable features like the previous funding amount collected from entrepreneurs' private networks, social media networks, minimum investment amount, campaign duration, and a B2C orientation of ventures. Feola et al. (2017) explore the effect of a social orientation of ventures on campaign success. Based on a case study of the Italian social venture Paulownia Social Project s.l.r., the authors show that equity crowdfunding can meet the financing needs of social-oriented ventures. In their research in progress paper, Nevin et al. (2017) explore how the conveyance of a ventures' social identity influence campaign performance. Based on social identity theory, Nevin et al. (2017) developed a theoretical model of how different campaign characteristics (e.g., communication, social media usage, etc.) influence the average investment size of ventures. However, their empirical model has not yet been tested.

With regard to *post campaign success factors*, Di Pietro et al. (2017) analyze the relation of non-monetary inputs offered by the crowd on ventures later performance. Based on interviews with 60 successfully European equity crowdfunded ventures, the authors

show that equity crowdfunding investors can contribute to ventures later performance (i.e., survival rates, fundraising achievements) by providing product and market knowledge as well as network ties with relevant stakeholders (e.g., investors, potential employees, etc.). Especially less experienced entrepreneurs, in terms of industry and management experience, are more interested in involving the crowd as a source of non-monetary inputs. Hornuf and Schmitt (2017) examine the determinants of follow-up funding and firm survival of 426 German and UK firms that successfully obtained capital through equity crowdfunding. By analyzing 505 equity crowdfunding campaigns,⁵ the authors illustrate significant differences between German and UK equity crowdfunded firms. In contrast to UK ventures, German ventures have a higher likelihood of obtaining subsequent financing from BAs or VCs. By including a temporal component to the analysis, German ventures have a 50% probability of receiving additional capital through BAs/VCs 36 month after a successful campaign, whereas UK firms only have a 20% likelihood. However, with regard to firm survival, the authors show that UK firms have a lower chance of failure (5%) 36 month after the campaign, while the probability of firm failure of German ventures is 24%. Referring to determinants of follow-up funding and firm survival, the authors indicate that a higher number of TMT members, a successful second equity crowdfunding campaign, and the presence of VC investors increases the probability of follow-up funding. In addition, a successful subsequent equity crowdfunding campaign decreases the chance of firm failure.

Concerning the *innovation level* of ventures, one study (Le Pendeven 2016) explores the impact of ventures innovation degree in three dimensions (market, technology, and business model) on overall funding success. By analyzing 39 ventures from the French platform Anaxogo, the results indicate that more innovative ventures (technology, ventures with patents) raise higher amounts of capital and account for a higher number of investors than less innovative ones.

Concerning *institutional factors/institutions*, one study (Kshetri 2015) investigates equity crowdfunding from an institutional perspective. By adopting institutional theory, Kshetri (2015) examines how institutions affect funding success. The author argues that formal

⁵ Some ventures have successfully obtained a subsequent equity crowdfunding campaign.

(regulatory framework) and informal (e.g., trade associations) institutions support the establishment of equity crowdfunding campaigns and, therefore, positively affects the campaign outcome.

3.3.3 Gender issues

It is widely recognized that female entrepreneurship plays a significant role concerning the economic development in various countries (Minniti et al. 2005; Langowitz and Minniti 2007). However, some studies show that women are less involved in entrepreneurial activities than men (Delmar and Davidsson 2000; Minniti et al. 2005; Langowitz and Minniti 2007). We identify one study (McGuire 2016) that empirically emphasizes the potential role of equity crowdfunding in minimizing the gender gap in entrepreneurship. By analyzing 15,605 companies from CrunchBase, McGuire (2016) argues that the implementation of the US JOBS Act significantly influences female entrepreneurs seeking external capital because it improves the chances for women to receive external funding.

3.3.4 Discussion and future research activities for the entrepreneur perspective

Several themes emerge for equity crowdfunding researchers interested in issues surrounding the entrepreneur perspective. In sum, we identify three themes, while the main emphasis of scholars lies on the investigation of drivers that facilitate campaign success. Thereby, campaign success is predominantly defined as the achievement of the funding target and the number of investors at the end of a campaign. The most relevant determinants for campaign success (Table 7) are similar to those used in more professional equity investment contexts, e.g., Venture Capital and Business Angel financing.

The majority of subsequent studies confirm the results of previous studies regarding the significance of signals used by entrepreneurs, i.e., human capital, third party, and posted updates. However, we find contradictory evidence concerning the impact of intellectual property rights on campaign success. Whereas Ralcheva and Roosenboom (2016) indicate that ventures holding intellectual property rights (e.g., patents, trademarks, copyrights) are more likely to succeed in equity crowdfunding campaigns, some studies (Ahlers et al. 2015; Vismara 2018b) imply that intellectual capital is not per se a significant factor for predicting

campaign success. Rather, intellectual capital seems to be an important factor increasing the probability of follow-up financing (Signori and Vismara 2018). These contradicting outcomes may occur due to various reasons. First of all, the sample size of Ralcheva and Roosenboom (2016) is nearly five times larger compared to Ahlers et al. (2015) and Vismara (2016), which

Table 7 Signals used in equity crowdfunding

| Signal type | Definition | Author |
|--------------------------|--|--|
| Human capital | TMT size, education, industry, and entrepreneurial experience | Ahlers et al. (2015), Vismara (2016), Li et al. (2016), Piva and Rossi-Lamastra (2017), Nitani and Riding (2017), Giga (2017), Angerer et al. (2017) |
| Equity retention | Percentage of equity offered to investors | Ahlers et al. (2015), Vismara (2016), Nitani and Riding (2017) |
| Social capital | The higher number of social network contacts | Vismara (2016), Nitani and Riding (2017) |
| Active communication | # and content of posted updates | Block et al. (2018b), Li et al. (2016), Dorfleitner et al. (2017), Angerer et al. (2017) |
| Third party | Grants, intellectual property rights (patents, trademarks, copyrights), professional investors as partners, product certification, social proof, prominent affiliate | Ralcheva and Roosenboom (2016), Bapna (2017) |
| Campaign characteristics | Amount of capital gained in the first week, largest single investment, # of investors, prior funding amount collected, minimum investment amount, campaign duration, B2C orientation | Vulkan et al. (2016), Lukkarinen et al. (2016) |
| Post campaign | # of TMT members, the presence of professional investors, second successful campaign | Hornuf and Schmitt (2017) |

provides more room for the significance of intellectual capital. Second, the studies differ regarding the operationalization of the intellectual capital variable. Whereas Ahlers et al. (2015) and Vismara (2016) use patents as the most common predictor of intellectual capital, Ralcheva and Roosenboom (2016) summarize patents, trademarks, and copyrights as intellectual property rights. Another possible explanation for these differences might be that the individual effect of intellectual property rights is not strong enough to convince investors. Gompers and Lerner (Gompers and Lerner 2001) argue that intellectual capital may only become significant when combined with signals of feasibility, i.e., processes or technologies that intellectual property rights involved. As such a signal, Audretsch et al. (2012) analyze the individual and combined effect of a developed prototype and intellectual capital (i.e., patents) on obtaining capital. The results suggest that ventures with patents and a developed prototype are more likely to obtain capital from investors. Since the majority of crowdfunded ventures are IT ventures (Bapna 2017), a similar study in an equity crowdfunding context might provide clarity regarding the role of intellectual property rights for campaign success. In addition, such research activities will enhance our so far limited knowledge about the complementarity of signals in equity crowdfunding. More precisely, *do intellectual property rights (e.g., patents) only become significant in combination with a developed prototype? Which other types of signals are likely to complement each other?* A further promising research area could be to differentiate the effect of specific signals according to campaign stages. Since Vismara (2016) indicates that specific quality signals (i.e., patents) are significant for early investors, it might be of scholarly interest to analyze if dynamic signals during the campaign (e.g., updates, funding speed, amount of capital received, number of investors) mitigate the significance of pre-campaign signals induced by entrepreneurs. For example, *do dynamic during campaign signals (e.g., updates, funding speed and amount, number of investors) mitigate the significance of pre-campaign signals?* Another potential research area referring to signals used in equity crowdfunding could be the relation of a venture's industry classification and quality signals used. None of the studies in our sample compiles a comparative analysis of ventures industry characteristics and signaling strategies. Hence, we encourage interested scholars to investigate if the significance of signals used differs according to the

specific industry classification of the ventures. Essentially, *do technology ventures in equity crowdfunding use the same signals as non-technology ones? Is the significance of signals used by ventures across all industry sectors the same?* Since some studies (Block et al. 2018b; Li et al. 2016; Dorfleitner et al. 2017) provide insights that communication strategies affect funding performance, we see great potential in analyzing how the language used in updates and project proposals relates to campaign success. More specifically, *how does entrepreneurial rhetoric influence crowd participation, thus facilitating campaign success?* The studies of Lounsbury and Glynn (2001), Martens et al. (2007), and Allison et al. (2013, 2015) can serve as inspiration for interested scholars. Lounsbury and Glynn (2001) analyze the effect of entrepreneurial storytelling on forming ventures' identity, whereas Martens et al. (2007) investigate the influence of entrepreneurial narratives to secure external venture capital. By applying warm-glow theory⁶ in the context of microlending investments, Allison et al. (2013) find that credit applications using a language style that creates warm-glow effects have a positive effect on funding performance. In a follow-up study, Allison et al. (2015) show that narratives framed as an opportunity to help other instead of a business opportunity are more likely to attract supporters.

With regard to the post-campaign performance of ventures, we see great potential to complement the work of Di Pietro et al. (2017) and Hornuf and Schmitt (2017). Since Di Pietro et al. (2017) indicate the potential value of non-monetary benefits provided by the crowd regarding product and market knowledge and network ties, it might be worth investigating what other additional benefits are provided by the crowd and how do these relate to a ventures' later performance. More precisely, *does equity crowdfunding act as a knowledge sharing tool between investors and entrepreneurs? In what other ways are (crowd-) investors involved in the day-to-day business of ventures?* Hornuf and Schmitt (2017) indicate that German equity crowdfunding ventures have lower survival rates compared to the UK-based ventures. Due to this circumstance, we strongly support the notion of Vismara (2018c) to analyze if the signals which are significant for campaign success are also predictors to overall venture performance

⁶ For further information on warm-glow theory, see Andreoni (1990).

after the campaign. More precisely, *does a successful equity crowdfunding campaign positively influence post-campaign performance indicators (growth of sales and profit, subsequent financing, innovation degree)?*

Further fruitful research streams could also derive from empirical studies of other crowdfunding contexts. In reward-based crowdfunding contexts, for instance, some studies show (e.g., Thürridl and Kamleitner 2016; Hobbs et al. 2016) the influence of various rewards as strategic assets on campaign success. Since the UK platform, Crowdcube offers entrepreneurs additionally the possibility to include rewards in campaigns; it might be of scholarly interest to analyze how these rewards can facilitate campaign success (individual funding amounts?). More specific, *to what extent can additional rewards in equity crowdfunding campaigns influence campaign success? What types of rewards (involving vs. haptic rewards) seem most promising for overall funding success?*

As claimed by Welter (2012), trust is essential for starting a new venture. However, as no single studies within the entrepreneur perspective investigate trust-building opportunities of entrepreneurs, we see a strong need to examine this subject. In equity crowdfunding, investors rely solely on the integrity of information disclosed by entrepreneurs. Consequently, entrepreneurs need to find ways to be trustworthy to increase the probability of a successful campaign. Therefore, we suggest research on *how entrepreneurs can build and maintain trust in equity crowdfunding?* Exemplary, Ba et al. (2003) and Bammens and Collewaert (2014) provide insights into trust-building opportunities for e-businesses and online markets, thus serving as an orientation for interested scholars.

Knowledge about female entrepreneurial activities is somewhat limited in equity crowdfunding. However, by investigating the supply-side of female entrepreneurs, Vismara (2016) indicates that women-led ventures receive less capital compared to male-led ones. Future research could analyze the rationales for this circumstance by highlighting possible differences between male- and female-led firms. On this basis, future studies can evaluate opportunities to increase the participation of women in equity crowdfunding, both as investors and entrepreneurs, thus helping to reduce the gender gap in entrepreneurship.

3.4 Institutional perspective

The institutional perspective category comprises publications examining the legal conditions for equity crowdfunding in different countries. In total, we identified 38 publications (Table 8) applying a legal lens to equity crowdfunding, addressing three themes: *impact of laws, comparison of legal conditions, contracting practices*.

3.4.1 Impact of laws

The majority of contributions (26 publications) investigate the possible *impact of laws* on stakeholders in various jurisdictions. With regard to the US JOBS Act, Whitbeck (2012) discusses the requirements for participating parties and highlights the potential positive impact of these regulations on capital formation and investor protection. Similarly, by reviewing the JOBS Act, Jeng (2012) mirrors the positive potential impact on capital formation and investor protection. Malach et al. (2015) analyze 452 stakeholder comments (issuers, investors, intermediaries) regarding the rules proposed by the SEC on equity crowdfunding to examine the main issues raised by affected parties. Their analysis results in 16 issue categories. Among these categories, the most important ones for stakeholders are investor and issuer limits, due diligence/disclosure, and financial reporting. The results suggest that stakeholders are aware of the importance and thoroughness of financial disclosure for investor protection and capital formation. However, stakeholder concerns about potential fraud in equity crowdfunding seem only to be minor.

In contrast, some studies provide a critical analysis of the JOBS Act. Urien and Groshoff (2013), Groshoff et al. (2014), Groshoff (2016), Hogan (2014), McAllister Shepro (2014), and Oranburg (2015) highlight various shortcomings (fraud potential, insufficient capital limit, increased costs of compliance) of the Act. The authors suggest amendments (e.g., higher capital limits, reduced compliance costs for small ventures, increased investor protection) to facilitate equity crowdfunding as a viable funding source for new ventures. In addition, Oranburg (2015) highlights the need for an increased capital-raising limit, between 1 and 5 million US Dollars so that ventures can use equity crowdfunding as a bridge funding opportunity. Dorff (2014) provides another critical analysis of the JOBS Act. The author argues that despite the disclosure

Table 8 Institutional perspective

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|---------------------------|---|------------------------------------|--|--|---|
| Impact of laws | | | | | |
| Whitbeck (2012) | Analysis of the impact of the JOBS Act on capital formation and investor protection | Conceptual | n. a | n. a | n. a |
| Jeng (2012) | Discussion of the impact of the JOBS Act on capital formation and investor protection | Conceptual | n. a | n. a | n. a |
| Urien and Groshoff (2013) | Critical analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Cumming and Johan (2013) | Examination of how market participants would design equity crowdfunding regulations | Quantitative; regression analysis | 144 surveys from the National Crowdfunding Association of Canada | Education; maximum investor amount; aggregate funding amount; disclosure requirements; portal requirements; redemption rights; capital threshold | Financial and non-financial incentives; portfolio diversification; network opportunities; support |
| Groshoff et al. (2014) | Critical analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Hogan (2014) | Critical Analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Dorff (2014) | Critical analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| McAllister Shepro (2014) | Critical analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Anand (2014) | Analysis of the impact of Canadian regulations | Conceptual | n. a | n. a | n. a |
| Figliomeni (2014) | Analysis of the impact of Canadian regulations | Qualitative; case study approach | n. a | n. a | n. a |
| Oranburg (2015) | Examination of the impact of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Mitchell (2015) | Comparison of intrastate crowdfunding laws and the JOBS Act | Conceptual | n. a | n. a | n. a |
| Tsai (2015, 2016) | Examination of the impact of Taiwanese equity crowdfunding regulations | Qualitative; interview-based study | Interviews with five market participants | n. a | n. a |

Table 8 (continued)

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|-----------------------------|---|-----------------------------------|--|-----------------------|---|
| Ying (2015) | Analysis of the impact of Singaporean regulations | Conceptual | n. a | n. a | n. a |
| Malach et al. (2015) | A Balancing Act: identifying stakeholder issues in the regulation of equity crowdfunding | Quantitative; regression analysis | Analysis of 452 comments on SEC proposed rules | Frequency of comments | 16 identified issues |
| Majumdar (2015) | Analysis of the potential impact of Indian regulatory conditions | Conceptual | n. a | n. a | n. a |
| Ancev (2015) | Analysis of Australian regulations | Conceptual | n. a | n. a | n. a |
| Murray (2015) | Overview and analysis of regulations in New Zealand | Conceptual | n. a | n. a | n. a |
| Klöhn et al. (2016a) | Analysis of the impact of the German Small Investor Protection Act | Conceptual | n. a | n. a | n. a |
| Pierce-Wright (2016) | Comparison of interstate crowdfunding laws to the JOBS Act | Conceptual | n. a | n. a | n. a |
| de la Vina and Black (2016) | Comparison of interstate crowdfunding laws to the JOBS Act | Conceptual | n. a | n. a | n. a |
| Groshoff (2016) | Critical analysis of the JOBS Act | Conceptual | n. a | n. a | n. a |
| Keeper (2016) | Analysis of New Zealand's regulatory conditions | Conceptual | n. a | n. a | n. a |
| Nehme (2017) | Analysis of the impact of Australian regulations on investor protection and capital formation | Conceptual | n. a | n. a | n. a |
| Chen (2017) | Analysis of the impact of the JOBS Act to resolve adverse selection | Quantitative; regression analysis | 431 crowdfunding filings, 133 successful campaigns | Success; big success | Net income; revenue; total assets, # of employees; the age of financing |

Table 8 (continued)

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|---------------------------------|--|---|--|--------------------|----------------------|
| Martins Pereira (2017) | Analysis of the Impact of Portuguese regulation on investor protection and capital formation | Conceptual | n. a | n. a | n. a |
| Comparison of legal regulation | | | | | |
| Klöhn and Hornuf (2012) | Comparison of German and US regulations | Conceptual | n. a | n. a | n. a |
| Wilson and Testoni (2014) | Comparison of US and European regulations | Conceptual | n. a | n. a | n. a |
| Gabison (2014) | Comparison of different regulatory approaches (Europe and US) | Qualitative; case study approach | 68 projects listed on Crowdcube | n. a | n. a |
| Pekmezovic and Walker (2015) | Comparison of legal regulations in various countries (Europe, US, New Zealand) | Conceptual | n. a | n. a | n. a |
| Ho (2016) | Comparison of UK and US regulation as an example for Hong Kong | Conceptual | n. a | n. a | n. a |
| Lombardi et al. (2016) | Comparison of Italian regulatory conditions to European regulations and the JOBS Act | Qualitative; interview-based study | Interviews with executive managers of innovative start ups | n. a | n. a |
| Hornuf and Schwienbacher (2017) | Comparison of various European regulations | Conceptual; theoretical/-mathematical model | n. a | n. a | n. a |
| Duoqi and Mingyu (2017) | Comparison of Chinas legal regulations on equity crowdfunding and private equity investments | Conceptual | n. a | n. a | n. a |
| Đurđenić (2017) | Comparison of Croatian laws on equity crowdfunding to other European and US regulation | Conceptual | n. a | n. a | n. a |

Table 8 (continued)

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|-----------------------|---|---|----------------------------|--------------------|----------------------|
| Contracting practices | | | | | |
| Wroldsen (2016) | Examination of US contracting practices after the legalization of equity crowdfunding | Qualitative; descriptives | 39 campaigns | n. a | n. a |
| Li (2016) | Analysis of Chinese contractual terms | Qualitative, descriptives/case study approach | 53 projects from Renrentou | n. a | n. a |
| Klöhn et al. (2016b) | Analysis of German contractual terms | Qualitative, descriptives | 255 campaigns | n. a | n. a |

requirements and investor protection mechanisms, equity crowdfunding should exclude unaccredited investors, because of the risk of losing money. Dorff (2014) concludes that ventures which can raise capital through professional investors (BA, VC) will not use equity crowdfunding. Thus equity crowdfunding will be likely used by rather unpromising ventures. Chen (2017) shows that current regulations in the JOBS Act (i.e., Title III) are unsuitable for resolving the “lemons problem” (Akerlof 1970) in equity crowdfunding. Based on a theoretical model, enhanced by an empirical analysis of 461 crowdfunding filings of firms and 133 successful campaigns, Chen (2017) provides evidence that the Title III equity crowdfunding market is not suitable for the funding of high-quality firms regarding revenues and profitability. Chen (2017) shows that the Title III market predominantly consists of small low profitable ventures from sectors associated with lower information asymmetries, e.g., food, beverages, and restaurants.

Due to the delayed implementation of the JOBS Act, a few studies (Mitchell 2015; Pierce-Wright 2016; de la Vina and Black 2016) compare intrastate crowdfunding laws relying on SEC rule 504 to the JOBS Act. Mitchell (2015) and Pierce-Wright (2016) suggest that, due to high registration requirements and insufficient investor protection mechanisms, individual intrastate laws are inappropriate to meet the capital-raising needs of ventures. In addition, Pierce-Wright (2016) proposes amendments (e.g., scaled per-investor limits, tiered disclosure requirements) to facilitate investor protection. In contrast, de la Vina and Black

(2016) show that intrastate regulations are more appropriate in facilitating equity crowdfunding due to the allowance of more small investors to participate and a higher number of total investments. With regard to German equity crowdfunding regulations, Klöhn et al. (2016a) explore the impact of the German Small Investor Protection Act. The authors highlight the need to improve investor protection further and propose investor education and communication as viable mechanisms. In a Canadian context, three studies analyze the impact of regulations on capital formation and investor protection. Cumming and Johan (2013) empirically explore how market participants would design equity crowdfunding regulations. Based on 144 surveys from various stakeholders, the authors show that entrepreneurs prefer less restriction referring to the amount of capital raised in each year. More precisely, portals prefer fewer disclosure requirements and tradeable shares, and investors favor greater restrictions, e.g., greater portal due diligence and limits on amounts entrepreneurs can raise to mitigate risks. Figliomeni (2014) and Anand (2014) suggest that the regulatory framework proposed by the Ontario Securities Commission will benefit capital formation and investor protection. In addition, based on a case study about the movie “age of the stupid,” Figliomeni (2014) shows the benefits of equity crowdfunding for the entertainment/cultural sector. Martins Pereira (2017) analyses the Portuguese regulatory framework on investor protection and capital formation. The author suggests that further improvements are necessary to ensure the long-term success of equity crowdfunding.

More precisely, Martins Pereira (2017) recommends additional monitoring responsibilities of platforms and the implementation of an investors' discussion board, to reduce information asymmetries. In a Taiwanese context, Tsai (2015, 2016) examines the impact of Taiwanese regulations that have its origin in the US JOBS Act. Based on interviews with equity crowdfunding stakeholders, Tsai (2015, 2016) shows that the implementation of regulations based on the US model would lead to increased investor protection, which adversely affects capital formation. With regard to Singaporean regulations, Ying (2015) analyses the impact of legal regulations formulated by the Monetary Authority of Singapore (MAS). The author concludes that the MAS approach to open equity crowdfunding only for professional investors combined with high disclosure requirements will decrease the potential of equity crowdfunding. For facilitating equity crowdfunding in Singapore, Ying (2015) proposes new regulations on prospectus requirement and investor protection. By analyzing the potential impact of regulatory conditions in India, Majumdar (2015) mirrors the result of Ying (2015). Ancev (2015) explores equity crowdfunding regulations in Australia. The author states that existing Australian securities and financial service laws are inappropriate to balance the development of equity crowdfunding and investor protection effectively. For facilitating the initial development and gain further information to determine an optimal framework in the long term, the author proposes a decentered experimental regulation approach predominantly based on platform activities to establish and control specific codes of conduct for equity crowdfunding participants. More precisely, Ancev (2015) suggests limiting the annual investment amount of investors and imposing investor education mechanisms as tools for investor protection. In contrast to Ancev (2015), Nehme (2017) suggests that a limit on investment amounts could hinder the development of equity crowdfunding in Australia. Instead, the author suggests a more active role of the Australian Securities and Investments Commission (ASIC) in monitoring and controlling ventures to facilitate trust of investors in equity crowdfunding and enhance investor protection. In addition, Nehme (2017) recommends a step-by-step capital raising model where capital raising thresholds (e.g., every AUD\$ 100.000) are linked to specific milestones. Only when these milestones are achieved, the venture has the justification to raise more money for next milestones. Murray (2015)

and Keeper (2016) focus on laws regulating equity crowdfunding in New Zealand. Murray (2015) shows that New Zealand ventures face fewer disclosure requirements but are limited in opportunities for secondary trading of shares, whereas Keeper (2016) concludes that current regulations are not able to appropriately balance investor protection and capital formation.

3.4.2 Comparison of legal conditions

Nine studies focus on a *comparison of legal conditions* in different countries. Klöhn and Hornuf (2012) compare and discuss German and US equity crowdfunding regulations and highlight differences between them. Another study (Wilson and Testoni 2014) also illustrates the differences and similarities in, by comparing the US and European regulations. Similarly, Hornuf and Schwienbacher (2017) compare and examine the impact of equity crowdfunding regulations in seven European countries. Based on a mathematical model in which a small firm considers raising capital either from professional investors (BA and VC) or equity crowdfunding, the authors derive three implications: greater investor protection has a negative effect on capital formation; the benefits of using equity crowdfunding are lower in the presence of a well-developed VC and BA market; and equity crowdfunding needs tailored regulations to reach its fullest potential. Gabison (2014) compares different regulations in Europe, the USA, and Australia and highlights that each country focuses on different actors (entrepreneurs, investors, platforms). US and UK regulations concentrate more on investor protection, whereas the Italian CONSOB focuses on entrepreneurs and platforms. The same applies to French regulations. To show the positive impact of implemented UK regulations for capital seeking ventures, the author analyzes 68 successful campaigns from Crowdcube. Gabison (2014) illustrates that the number of investors and the amount raised in equity crowdfunding increased since the implementation of UK regulations. Pekmezovic and Walker (2015) compare legal regulations in various OECD countries, including the UK, USA, Germany, Italy, and New Zealand. The authors point out that policy makers should focus on managing the tradeoff between disclosure requirements and investor protection. Ho (2016) compares US and UK regulations on equity crowdfunding and evaluates their

suitability exemplary for Hong Kong. The author suggests following the more cautious US approach to prevent potential investors through imposing investment limits based on the income. Similarly, due to the absence of a specified equity crowdfunding regulation in China, Duoqi and Mingyu (2017) analyze the suitability of China's legal framework of private equity investments for equity crowdfunding. The author suggests that these regulations are inappropriate for equity crowdfunding and highlight the need to follow the equity crowdfunding regulations of other countries, e.g., US and UK regulations. In addition, Lin (2017) recommends increasing responsibilities of Chinese platforms concerning due diligence or background checks of entrepreneurs to verify the risks of the investment and enhance investor protection.

Lombardi et al. (2016) compare Italian regulatory conditions to other European regulations and the JOBS Act and illustrate the differences and similarities of these frameworks. Similarly, Đurđenić (2017) illustrates similarities between European (UK, France, Germany, Italy) and US regulations to current Croatian laws.

3.4.3 Contracting practices

Three studies in our sample examine *contracting practices* in the USA (Wroldsen 2016), China (Li 2016), and Germany (Klöhn et al. 2016b). Wroldsen (2016) analyzes the contractual terms of the first 39 campaigns since the legalization of equity crowdfunding. The author argues that these contracts are similar to those used by professional investors (VC) but more standardized and simplified in their design. The author explains that due to this simplicity, these contracts are not adequate for investor protection. Li (2016) explores the contractual agreements of 53 campaigns from the Chinese platform Renrentou and shows that the primary purpose of contracts is to secure the right of investors to get a monetary return. Based on a content analysis of deals from 255 campaigns from German platforms, Klöhn et al. (2016b) highlight characteristics of equity crowdfunding contracts. The authors reveal that contracts include a minimum duration between 6 and 8 years, offer investors a fixed interest payment and exit participation, contain no veto rights, and the common contract type is a subordinated profit-participating loan.

3.4.4 Discussion and future research avenues for the institutional perspective

Most studies within this perspective investigate the influence of implemented legal frameworks for regulating equity crowdfunding on participating stakeholders. Since most legal frameworks are relatively new (e.g., the German Small Investor Protection Act, the US JOBS Act), only one study (Gabison 2014) examines the actual impact of UK regulations. To shed light on the effect of implemented rules on equity crowdfunding in other countries, we want to encourage interested scholars to analyze *to what extent did implemented legal regulations promote funding for small businesses?* In line with this, some studies (e.g., Hornuf and Schwienbacher 2017) reveal country-specific differences according to the regulation of equity crowdfunding participants. Therefore, it might be of scholarly interest to investigate whether country-specific characteristics lead to differences in funding performance between countries. More specific, *to what extent do country-specific attributes in regulations affect equity crowdfunding performance?*

Since governments and institutions play a central role in developing an entrepreneur-friendly environment, the so-called entrepreneurial ecosystems (Isenberg 2010; Hechavarria and Ingram 2014), it might be of scholarly interest to examine how governments and policies can shape such an environment. More specifically, *how can government/policy interventions promote an equity crowdfunding ecosystem for fostering and sustaining venturing? How can cooperation's between the state, universities, incubators, and equity crowdfunding platforms create a crowdfunding friendly entrepreneurial ecosystem?* So far, evidence about the interplay of various financing forms and equity crowdfunding as well as the effect of successful campaigns on scaling-up subsequent finance is rather scarce. As one exemption, Cumming et al. (2018a) analyze the interaction of numerous forms of finance, including equity crowdfunding, and highlight possible positive and negative externalities on scaling-up. Cumming et al. (2018a) highlight that one of the significant barriers that can impede the attraction of subsequent investors is ownership dilution (Signori and Vismara 2018). Therefore, in line with Cumming et al. (2018a), future studies could analyze *how policy interventions need to be formed to facilitate the scaling-up of equity crowdfunded ventures?*

Table 9 Investor perspective

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|-------------------------------------|--|---|--|------------------------|---|
| Motives for investing | | | | | |
| Cholakova and Clarysse (2015) | Analysis of the extent to which financial or nonfinancial motives determine the decision to invest | Quantitative; quasi-experiment; regression analysis | 155 surveys from Symbid | Decision to invest | Motivation scale: help others, collect rewards, financial return, support ideas, community |
| Moysidou and Spaeth (2016) | Examination of how cognitive and affective factors impact funding decisions | Quantitative; regression analysis | 309 crowdfunding backers | Willingness to support | Financial, functional, social, emotional, informational, esthetic, novelty value |
| Bretschneider and Leimeister (2017) | Examination of the crowd's investment motives | Quantitative; structural equation model | 300 surveys from Innvestment | Investment | intrinsic (fun to invest, curiosity, altruism, identification) and extrinsic motives (recognition, personal need, return) |
| Daskalakis and Yue (2017) | Analysis of the importance of drivers to invest | Quantitative; regression | 317 surveys | Investment willingness | Gender; age; education level; income level; risk perception (fraudulent raiser/borrower and platform, poor information and returns); investment motivation (higher return, interest/excitement, increased diversification, disappointment of traditional finance) |
| Investment evaluation | | | | | |
| Brem and Wassong (2014) | Analysis of crowd investors' decision making process/evaluation process | Quantitative; regression analysis | Survey of 221 students | Intention to invest | Rational dimension (human capital, profit prospect); emotional dimension (utility, geographical distance) |
| Moritz et al. (2015) | Examination of whether and how investor communication influence investors' decision making process | Qualitative; interview-based study | 17 interviews | n. a | n. a |
| Günther et al. (2015) | Analysis of crowd investors' decision making process/evaluation process | Quantitative; regression analysis | 136 surveys of Seedmatch investors | Investment amount | Investor expertise; investment experience, time spent for evaluation |
| Kang et al. (2016) | Analysis of the impact of trust between investor and entrepreneur on decision-making processes | Quantitative; structural equation model | 610 respondents of angelcrunch and zhongchou | Willingness to invest | Network externality; perceived informativeness; perceived accreditation; third-party seal |
| Homuf and Neuenkirch (2017) | Analysis of the pricing of cash flow rights | Quantitative; regression analysis | 44 campaigns of Innvestment | Willingness to pay | Campaign characteristics, investor sophistication, funding amount collected, herding, stock market volatility |

Table 9 (continued)

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|---------------------------------|--|-----------------------------------|--|---|---|
| Zunino et al. (2017) | Analysis of the consequences of failure experiences by entrepreneurs on campaign performance | Quantitative; regression analysis | 318 participants | Likelihood of investing; amount invested | Failure, no quality signal; failure with quality signal; success with quality signal; success, no quality signal |
| Investor type | | | | | |
| Hornuf and Schmitt (2016) | Analysis of a local bias in equity crowdfunding | Quantitative; regression analysis | 74 campaigns from Companisto, Innovestment | Local bias | Portal/campaign characteristics; firm characteristics (industry, valuation); investor characteristics (experience, average amount invested, gender, residence); investment characteristics (investment in early days of the campaign, largest investment amount, investment time and day) |
| Wallmeroth (2016) | Analysis of investor-level behavior (strategic vs. less strategic investors) | Quantitative; regression analysis | 59 campaigns from companisto | Investor behavior | Strategic investor; FF investors; naive diversifiers, remaining investors, gender |
| Günther et al. (2018) | Investigate equity crowdfunding investors sensitivity to distance | Quantitative; regression analysis | 104 projects from ASSOB | Investor sensitivity to distance | Human capital (# of board members, education); social capital; intellectual capital (grants, patent); equity share; financial projections |
| Mohammadi and Shafi (2018) | Investigation of gender differences in investment patterns | Quantitative; regression analysis | 31 campaigns from FundedByMe | Female investors | Firm age, technology firm, equity offering |
| Vismara et al. (2017) | Analysis of gender diversity in equity crowdfunding | Quantitative; descriptives | 58 campaigns from Seedrs | Campaign success | Target capital; equity offered; campaign duration; TMT-size, video, female CEO, female TMT members; # of male and female investors; male and female unit investment |
| Abrams (2017) | Examines investor types on US equity crowdfunding platforms | Quantitative; regressions | 146 campaigns and associated investor profiles | Amount invested and number of investors at the start and the end of campaigns | Investors background/social media profiles |
| Hervé et al. (2017) | Analysis of the effect of gender and local factors on investment decisions | Quantitative; regression analysis | 97 campaigns from WiSeed | Campaign success | Investor characteristics (gender, age amount invested experience); firm characteristics (age, sector); campaign characteristics (amount raised, # of investments received, campaign start) |
| Investment dynamics | | | | | |
| Hornuf and Schwienbacher (2015) | Analysis of investment dynamics | Quantitative; regression analysis | 89 campaigns from Innovestment, Companisto, | Number of investments on day t | Information disclosure (Updates; comments, expert claim, second-time investors, comment length) |

Table 9 (continued)

| Author(s) | Research issue | Research design | Data | Dependent variable | Independent variable |
|----------------------------|---|-----------------------------------|---|--|--|
| Vismara (2018b) | Analysis of the effect of early investors on the behavior of later investors | Quantitative; regression analysis | Seedmatch, United Equity 111 project listed on Crowdcube | Campaign success | Percentage of public profile investors; early investors |
| Åstebro et al. (2017) | Analysis of the reaction of future investors on previous (high value) investors | Quantitative; regression | 710 companies of Seedrs | Log amount pledged; investment in the period (dummy); campaign success | # of pledges: max amount invested; # of backer in 1 week; log pre-money evaluation; equity offered; SEIS/EIS tax relief; # of entrepreneurs; |
| Return on investment | | | | | |
| Signori and Vismara (2016) | Evaluation of returns in equity crowdfunding | Quantitative; regression analysis | 212 ventures from Crowdcube | Campaign success; # of SEOs | Age; diversification; positive sales; patents; target capital; equity offered; voting rights, SEIS; #of investors; professional investors |

However, government and policy approaches need to develop over time. To guarantee a proper and a mutually beneficial functioning of the equity crowdfunding market, government interventions (e.g., legal improvements) need to adjust to the continuous changes in equity crowdfunding.

3.5 Investor perspective

Within equity crowdfunding, investors play a crucial role. Capital-seeking entrepreneurs rely solely on the investment behavior of a multitude of investors. Therefore, it is of great importance to gain a deeper understanding of the investors' behavior in equity crowdfunding. In sum, we identify 21 articles (Table 9) that contribute to a better understanding of investor decision making. Our review reveals five thematic areas within this cluster: *motives for investing*, *investment evaluation*, *investor type*, *investment dynamics*, and *return on investment*.

3.5.1 Motives for investing

Exploring (crowd-) investors' motives is one significant step to foster a detailed understanding of investor behavior in an equity crowdfunding context. We identify four publications that analyze the

motivational structure of investors in equity crowdfunding. Cholakova and Clarysse (2015) provide the first evidence regarding the motivation of equity crowdfunding investors. Grounded on self-determination theory and cognitive evaluation theory, Cholakova and Clarysse (2015) examine the interplay between financial and non-financial motives in equity and reward-based crowdfunding. By conducting a quasi-experiment including 155 participants from Symbid, the authors analyze how the existence of both campaign-types for the same project influences the decision to invest or to pledge. The results suggest that financial motives (expected reward or return) play a significant role for both crowdfunding types (expected reward or return), whereas non-financial motives (e.g., helping others, support ideas) only have a small impact on the decision to invest. Similarly, Moysidou and Spaeth (2016) confirm the results of Cholakova and Clarysse (2015). Based on consumption value theory, Moysidou and Spaeth (2016) conduct a factorial survey of 309 crowdfunding supporters. The authors illustrate that decision-making differs across the various forms of crowdfunding and highlight the significance of financial, respectively rational motives for investors in equity-based crowdfunding. In contrast, Bretschneider and

Leimeister (2017) emphasize the importance of various non-financial motives in equity crowdfunding. Based on 300 surveys, the authors show that in addition to the (financial) reward motive, other motives like receiving recognition from others (recognition motives), the liking of specific ventures (liking motive), to be well regarded by others (image motive), and influencing the fruition of specific projects (lobbying motivation) are relevant for equity crowdfunding investors. Daskalakis and Yue (2017) in part support the results of Bretschneider and Leimeister (2017). Based on 317 surveys of European funders⁷, the authors show that non-financial motives, i.e., interest and excitement, are the highest rated drivers of respondents in equity crowdfunding.

3.5.2 Investment evaluation

To advance our understanding of investor behavior in equity crowdfunding, it is of great importance to uncover the factors that influence the evaluation process of (crowd-) investors. A stream of publications examines the decision-making process of equity crowdfunding investors, predominantly in the German context.

Based on a survey of 221 German students, Brem and Wassong (2014) find that primarily rational factors (e.g., management competencies, venture stage, USP, perceived return on investment) significantly affect the investor's decision-making process. With regard to the flow of information in equity crowdfunding, Moritz et al. (2015) investigate how investor communication affects the decision-making process. Based on 17 interviews with various market participants (investors, platforms, entrepreneurs, experts), the results suggest that third-party communication (e.g., other investors, experienced investors, experts, and customers) are especially valued as quality signals and influence investors' evaluation process. Günther et al. (2015) focus on the due diligence of crowd investors and analyze whether the amount invested correlates with the thoroughness of the evaluation process. By evaluating 136 surveys of investors listed on Seedmatch, the results suggest that (crowd-) investors assess business ideas with regard to their specific expertise, experience, and effort spent on the due diligence process. In addition, Günther et al. (2015) show that a higher degree of industry and

financial expertise of equity crowdfunding investors positively affects the amount invested. Zunino et al. (2017) examine the consequence of failure experience by entrepreneurs, as a negative quality signal, on investor decision making. Based on an online experiment with 328 participants, the authors compare the individual effect of past entrepreneurial failure to a combination of past entrepreneurial failure and a quality signal on the probability to invest. The results suggest that compared to past entrepreneurial success, investors discriminate entrepreneurs who have experienced past entrepreneurial failure. However, this effect is diminished by a provision of failure experience combined with a positive quality signal of entrepreneurial skill.

Hornuf and Neuenkirch (2017) analyze 44 campaigns from Innvestment to investigate the pricing of cash flow rights. In contrast to other equity crowdfunding platforms, "Innvestment runs a multiunit sealed bid second price auction where backers can specify the price they are willing to pay" (Hornuf and Neuenkirch 2017, p. 807). As a result, investors have the opportunity to outbid each other for specific shares. By analyzing this unique auction mechanism, Hornuf and Neuenkirch (2017) indicate that campaign characteristics (e.g., funding goal, initial price), herding momentums, a ventures funding progress, and stock market volatility influence the pricing of cash flow rights. By examining fundraiser-related, project-related, and platform-related characteristics on a Chinese equity crowdfunding platform, Kang et al. (2016) analyze the potential impact of trust between the entrepreneurs and investors on investment decisions. The authors show that various project-related (e.g., network externality, perceived informativeness), platform-related (e.g., perceived accreditation, third-party seal), and fundraiser-related factors (e.g., social interaction) facilitate calculus-based (on individual knowledge) and relationship (build through social exchange) trust⁸ and, therefore, affect the decision of individual equity crowdfunding investors to invest.

3.5.3 Investor type

The composition of the crowd is another crucial aspect for advancing a common understanding of investor behavior in equity crowdfunding. In sum, we identify seven publications that analyze investor behavior

⁷ No further information about the sample is available (e.g. platforms, equity crowdfunding experiences etc.)

⁸ For more information about calculus and relationship trust, see e.g. Ba et al. (2003) and Urban et al. (2009).

according to different investor types in equity crowdfunding.

In various capital markets, *gender-related factors* are widely studied (see, e.g., Becker-Blease and Sohl 2011; Harrison and Mason 2007; Croson and Gneezy 2009; Powell and Ansic 1997), including reward-based crowdfunding (Marom et al. 2016; Greenberg and Mollick 2016). Within an equity crowdfunding context, we find three publications that investigate gender differences in investment behavior. Based on regression analysis of 31 campaigns from the Swedish platform FundedByMe, Mohammadi and Shafi (2018) find evidence that female investors are more risk averse and invest less frequently in young and high technology ventures in contrast to male ones. In addition, the authors show that female investors prefer ventures with a high percentage of male investors. In a French context, Hervé et al. (2017) validate the greater risk aversion of female investors. By analyzing 97 campaigns from WiSeed, the authors further demonstrate that social interactions (with the founders or other investors) have a positive effect on the investment behavior of female investors. By analyzing 58 projects from the UK platform Seedrs, Vismara et al. (2017) show that equity crowdfunding attracts more women compared to other entrepreneurial finance markets. Nearly one-quarter of firms top management team (TMT) consists of females. Also, the results indicate that female investors especially prefer to invest in ventures led by female entrepreneurs. A few studies within this theme (Günther et al. 2018; Hornuf and Schmitt 2016) investigate the *effect of geographic distance* on investor behavior. Günther et al. (2018) analyze 104 projects from the Australian platform ASSOB. The results suggest that a home bias only exists for home country investors, while overseas investors are not significantly affected by geographical distance. Based on a sample of 74 German equity crowdfunding campaigns, Hornuf and Schmitt (2016) support the existence of local biases. The authors indicate that investors who invest a substantial amount show a larger local bias. This bias is also valid for investors listed on Innvestment compared to investors of Companisto. One study in our sample (Wallmeroth 2016) differentiates investor behavior between more and less strategic investors. By analyzing 59 campaigns from Companisto, Wallmeroth (2016) suggests significant differences

among investor behavior. The results indicate that strategic investors provide the majority of capital by investing less frequently but with higher investment amounts. Also, strategic investors tend to be more selective in their investments, thus resulting in a higher probability to select successful ventures. In a US context, Abrams (2017) illustrates that 6 months after the legalization for unaccredited investors, equity crowdfunding attracts more than just unsophisticated ones (family and fools). By empirically analyzing 146 campaigns and all social media accounts of involved investors, Abrams (2017) provides evidence that equity crowdfunding also attracts more sophisticated investors (e.g., experts from financial sectors). Furthermore, Abrams (2017) shows that less sophisticated investors are more likely to provide funds in the first weeks of campaigns, while more sophisticated investors become active nearly to campaign end.

3.5.4 Investment dynamics

Within various capital markets (e.g., stock markets, microloan markets, donation, and reward-based crowdfunding), it is known that late investors are influenced by the behavior of early investors (see, e.g., Welch 1992; Aggarwal et al. 2002; Zhang and Liu 2012; Kuppuswamy and Bayus 2015; Burtch et al. 2013). With regard to equity crowdfunding, we identify three publications that apply the insights of the studies above to investigate signaling dynamics between investors in equity crowdfunding. Hornuf and Schwiembacher (2015) analyze factors on investment dynamics based on 89 campaigns from various German platforms. The authors show that equity crowdfunding investors react on large prior investments and comments posted by other investors. In addition, Hornuf and Schwiembacher (2015) indicate that entrepreneur induced updates and the way securities are provided to investors cause investment dynamics. Vismara (2018a) confirms this kind of herding momentum. Based on an analysis of 111 projects listed on Crowdcube, Vismara (2018a) investigates the role of early investors on the behavior of late investors. The author indicates that early investors, as well as investors who made their profile public, can initiate cascades that increase the number of late investors. By analyzing 710 campaigns from Seedrs, Åstebro et al. (2017) support the results of the studies above. Examining the reaction of past

investments on future investors, Åstebro et al. (2017) provide evidence that prior investment amounts of investors serve as a quality signal which leads to an increasing amount invested by subsequent investors. Also, the authors show a negative effect between investment size and time elapsed since the last investment. Åstebro et al. (2017) argue that a larger time horizon between investments serves as a negative or inverse quality signal, thus leading to small follow-on investments or no investments at all.

3.5.5 Return on investment

The future sustainability of equity crowdfunding as a source for venture financing depends, to a degree, on the post-campaign outcomes at the investor level. We identify one study (Signori and Vismara 2016) that offers first insights into the annualized returns on equity crowdfunding investments based on 212 successfully funded campaigns listed on Crowdcube. The authors show that nearly 30% of their sample received additional finance (private investors or second equity crowdfunding round) or were sold, whereas 10% of the sample failed. Using unrealized returns of the 30% ventures, Signori and Vismara (2016) calculate the expected annual return based on an increase of capital (follow up investments through private investors or an equity crowdfunding platform). The authors show that the expected annual return of ventures that successfully received additional finance equals 8.8%. In addition, Signori and Vismara (2016) suggest that factors like diversification, non-executive directors, and tax incentives can affect the annualized return.

3.5.6 Discussion and future research avenues for the investor perspective

In the investor perspective, all identified contributions are empirical studies and make fundamental contributions toward the understanding of investor behavior in equity crowdfunding. While the majority of publications address issues concerning the evaluation process of investors and the behavior of different investor types, only a few studies discuss motivational factors and funding dynamics. However, our analysis shows that the major part of publications bases their results on observations of platforms in one country. Cross-national studies addressing the outlined themes are rather scarce, indicating that the results found may be

country-specific. To control for country-specific differences, we encourage scholars to conduct cross-national studies concerning the behavior of equity crowdfunding investors. Although research on the investor perspective in equity crowdfunding reveals essential insights into how investors behave, greater attention is still warranted. Since some authors (e.g., Cholakova and Clarysse 2015; Moritz et al. 2015; Wallmeroth 2016) state that more research is needed to clarify what kind of investors are active in equity crowdfunding, we see great potential in a typology of investors as a future research avenue. A first starting point could be derived from the study of Sullivan and Miller (1996). The authors segment informal venture capital investors according to the perceived values/benefits investors' desire; investors fall into economic, hedonistic, and altruistic clusters. A segmenting study within an equity crowdfunding context provides further insights according to the types of investors and underlying motivations in equity crowdfunding. Essentially, *what types of investors are active in equity crowdfunding? Moreover, do different investor types seek different values/benefits from investing? Are investors sophisticated or unsophisticated?*

Abrams (2017) provide evidence that also sophisticated investors are active in equity crowdfunding. The author shows that sophisticated investors are more likely to invest in the last week of campaigns. This result implies that early investors might comprise of family and friends investors or investors who have a closer connection to the entrepreneur. Further research should attempt activities to support this suggestion by analyzing the timing of investments linked to the personal relation of investors to entrepreneurs. More precisely, *what role does family and friends as investors play in equity crowdfunding? Do family and friend investors differ in investment behavior compared to other investors?* As one example, Polzin et al. (2018) suggest differences in investment behavior of investors having strong or weak personal ties with the entrepreneur. To further contribute knowledge about investment patterns of different investor types, we strongly support the notion of Polzin et al. (2018) to enhance research activities about the causality of relationships in funding decisions.

With regard to the motivational structure of investors, we find contradictory findings referring to the significance of non-financial motives. This could be due to differences relating to the inclusion and operationalization of various non-financial motives. Thus, more research is needed to compile a clear picture of motivational patterns of equity crowdfunding investors. For example, interested scholars

Table 10 Platform perspective

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|---------------------------------|---|--|---|--|---|
| Platform design | | | | | |
| Mäschle (2012a) | Analysis of disclosure requirement on German platforms | Conceptual; theoretical/-mathematical model | n. a | n. a | n. a |
| Mäschle (2012b) | Analysis of the securities allocation mechanism on German platforms | Conceptual; theoretical/-mathematical model | n. a | n. a | |
| Hornuf and Schwienbacher (2014) | Investigate to what extent affect portal design crowd participation | Quantitative; regression analysis | 181 German campaigns from 16 German platforms | # of investors; successful campaign; total amount raised | Funding goal; venture age; minimum ticket; pooled investment; profit participating loans; portal fee; portal experience |
| Braun (2015) | Analysis of the role of platforms on reducing information asymmetries | Conceptual | n. a | n. a | n. a |
| Belleflamme et al. (2015) | Analysis of the functioning of platforms | Conceptual | n. a | n. a | n. a |
| Agrawal et al. (2016) | Investigation of the role of investor syndicates in equity crowdfunding | Qualitative; case study approach | AngelList | n. a | n. a |
| Chen et al. (2016) | Comparison of pure and hybrid crowd designs in equity crowdfunding | Conceptual | n. a | n. a | n. a |
| Salomon (2016) | Comparison of the evaluation and investment process of equity crowdfunding platforms and VC funds | Qualitative; case study approach | Ten interviews with VC funds, BA, and equity crowdfunding platforms | n. a | n. a |
| Grundy and Ohmer (2016) | Descriptive analysis of German equity crowdfunding platforms | Qualitative | 31 German portals | n. a | n. a |
| Löher (2016) | Investigation of the preselection process of German equity crowdfunding platforms | Qualitative; interview-based study | 21 interviews with market participants | n. a | n. a |
| Mäschle and Dalvai (2016) | Analysis of the securities allocation mechanism on German platforms | Conceptual; theoretical/-mathematical model | n. a | n. a | n. a |
| Hagedorn and Pinkwart (2016) | Analysis of the financing process of equity crowdfunding platforms | Qualitative; interview-based study | 16 platforms | n. a | n. a |
| Itenberg and Smith (2017) | Comparison of syndicated and non-syndicated deals | Quantitative; mean differences test (t-test) | n. a | Company acquired; inactive | Company and deal characteristics (e.g., amount raised, #of investors, the total amount) |

Table 10 (continued)

| Author(s) | Research issue | Research design | Data | Depended variable | Independent variable |
|----------------------|--|---|--------------------------------|-------------------|--|
| | | | | twitter account | raised, industry, #of employees, etc.) |
| Shareholder risks | | | | | |
| Arenas et al. (2015) | Identification of main risks on platforms for stakeholders | Qualitative; multiple case study approach | AngelList, Crowdfunder, Seedrs | n. a | n. a |

could examine if the motives to invest vary from platform to platform or from country to country to illustrate platform and country differences regarding the composition of the crowd. Also, it might be of interest to investigate whether the investment amounts relate to the motives for investing. More specifically, *how does the investor motivation and sophistication relate to the amount invested?* One possibility would be to distinguish between two groups of investors (small vs. large amounts invested) and perform tests to compare these groups. Another way is to compare investors from different platforms (small minimum investment vs. relatively large minimum investment).

With regard to the evaluation process of (crowd-) investors, our review shows that the literature on this topic is rather limited. Therefore, we need clarification about the evaluation of business ideas in equity crowdfunding. More precisely, *how do (crowd-) investors evaluate potential ventures for investing?* In addition, *what factors determine the decision to invest?*

A first starting point could be derived from theories of the field of behavioral finance. Considering irrational behavioral patterns of (crowd-) investors, concepts like the prospect theory (Kahneman and Tversky 1979) and the competence hypothesis (Heath and Tversky 1991) may be well suited to investigating investment decision making in equity crowdfunding. Another promising approach to investigate the evaluation process and decision making in equity crowdfunding may originate from marketing research. As a supplement to the study of Moysidou and Spaeth (2016), the testing of concepts like the theory of buying behavior (Howard and Sheth 1969) and the theory of consumption values (Sheth et al. 1991)⁹ can explain causalities of investor behavior from a rather “emotional” instead of the typical “economic” perspective.

Since nearly all active equity crowdfunding platforms have implemented a discussion board or an

investor forum, it might be of scholarly interest to analyze how active discussions affect investment behavior or investment dynamics. For investors, it might be possible that disclosed project description does not cover all relevant aspects for an investment decision. Thus, interested scholars could examine *what essential evaluation criteria are addressed in discussion boards on platforms?* At the same time, one can evaluate if the responses of entrepreneurs to specific questions or comments raised by investors have an effect on the participation of later investors and thus trigger herding momentums. Estrin et al. (2018) provide the first evidence that communication among investors seems to be essential for an investment decision. Therefore, it might be of scholarly interest to analyze *if active discussions affect investment behavior during campaigns?* Herding behavior is an object of research on reward and donation-based crowdfunding as well as in microloan markets (Zhang and Liu 2012; Kuppaswamy and Bayus 2015; Burtch et al. 2013). However, little attention is given to herding in equity crowdfunding markets. Some studies (Hornuf and Schwienbacher 2015; Vismara 2018b) find evidence for herding momentums in equity crowdfunding, but without determining whether it is rational or not. Investigating if herding behavior in equity crowdfunding is rational or irrational is also a promising avenue for research. Given the newness of equity crowdfunding, the probability is high that investor behavior will continue to evolve. Therefore, it might be of scholarly interest to investigate whether and in what matter the decision-making process of investors will develop over time and if investor education takes place.

Drawing on results from studies examining the eval-

⁹ For a systematic review of research on the theory of consumption values, see Sánchez-Fernández and Iniesta-Borillo 2007.

uation behavior of informal investors can also shed light on the kind of evaluations (crowd-) investors use. By analyzing the decision-making process of business angels, Huang and Pearce (2015) and Harrison et al. (2015) show that decision making of angel investors is rather intuition-based. A similar study within an equity crowdfunding context could reveal *what kind of heuristics do (crowd-) investors use?* As a bonus, it may be possible to identify if equity crowdfunding investors show similar behavioral patterns to sophisticated investors or unsophisticated ones.

3.6 Platform perspective

Within the equity crowdfunding ecosystem, platforms serve as intermediaries between capital-seeking entrepreneurs and investors (Löher 2016; Hagedorn and Pinkwart 2016). Consequently, platforms perform a vital role concerning the organization of transactions, contractual framework, and the preselection of promising ventures (Löher 2016). In sum, we identify 14 scientific contributions (Table 10) that analyze the functioning of equity crowdfunding platforms and address the thematic areas of *platform design* and *shareholder risks*.

3.6.1 Platform design

In addition to the managing role of equity crowdfunding platforms, the design of platforms is crucial for attracting promising ventures and a large potential investor base. We identified 13 publications that investigate the design of equity crowdfunding platforms around the globe.

With regard to the *operating conditions* of equity crowdfunding platforms, we find nine publications that address various organizational processes and requirements on equity crowdfunding platforms. Mäschle (2012a) analyzes the disclosure requirements on German portals and states that these are too restrictive in preventing the reduction of information asymmetries. Based on a three-staged theoretical model, Mäschle (2012a) suggests that increasing competition among platforms should result in optimal disclosure requirements, thus, increasing transparency and decreasing information asymmetries. Also, the author recommends that especially younger firms (< 2 years) should disclose information about resources and company costs, e.g., bills of tangible assets and operating

expenses, to show investors how much was invested before using equity crowdfunding for further financing.

In a second study, Mäschle (2012b) investigates the allocation mechanism on German equity crowdfunding platforms. The author states that the “first come-first serve” principle is not optimal to protect the interests of later, potentially uninformed, investors, because early and better-informed investors can cause a scarcity of shares. Based on a theoretical model, Mäschle (2012b) shows that a so-called zero-rationing threshold will guarantee early better-informed investors a specific number of shares and later investor’s market participation. In a follow-up paper, Mäschle and Dalvai (2016) support this assumption. Based on a case study approach, Salomon (2016) compares the evaluation and investment process of promising ventures of VC funds and the Swiss equity crowdfunding platform Investiere. Salomon (2016) reveals that the platform Investiere grounds their selection and evaluation decisions on the social proof principle, whereas traditional venture capital funds apply in-depth due diligence. In particular, ventures registered on Investiere join the unique platform’s ecosystem where many different stakeholders, e.g., industry experts, professional investors, will evaluate start-ups according to collective judgments. Similarly, Löher (2016) explores the preselection process of German equity crowdfunding platforms. Interviewing 21 equity crowdfunding participants (platforms, funded ventures, experts), Löher (2016) shows that German platforms follow a systematic and structured process, based on four stages: sourcing of deals, screening and evaluation, structuring the deal, and preparing the campaign. In each of these stages, the platforms take an active role and rely on their networks consisting of business analysts, lawyers, financial service providers, and external accountants. More precisely, platforms’ selection criteria change from economic and product/service characteristics in the early stages to human capital factors in later stages of the evaluation process. In addition, platforms perform desk research for plausibility checks of received information of entrepreneurs and help ventures to reduce information asymmetries by supporting them in communicating with investors. In contrast, by analyzing 16 equity crowdfunding platforms in Germany, Hagedorn and Pinkwart (2016) show that platforms differ according to characteristics like the minimum investment amount, holding period, services, etc. Based on interviews with platform providers, the authors classify the process of equity crowdfunding in

seven steps: Application, Screening and Selection, Contracting, Roadshow, Subscription, Holding, and Exit. Hornuf and Schwienbacher (2014) investigate the effect of the various portal and contractual mechanisms on crowd participation. By analyzing 16 equity crowdfunding platforms in Germany, the authors observe that platforms that provide a rather small minimum share price, a pooled investment vehicle, and profit-participating loans have a larger number of investors participating. Braun (2015) discusses the mediating role of platforms and states that platforms have a high potential to reduce information asymmetries because platforms manage the information flow between the involved parties and preselect suitable ventures for campaigns.

Two studies investigate the *crowd composition* on different platforms. Based on a case study of the US equity crowdfunding platform AngelList, Agrawal et al. (2016) highlight the role of investor syndicates in equity crowdfunding. The authors suggest that a syndicated investor structure composed of professional lead investors and (crowd-) investors will effectively reduce information asymmetries due to the thorough respectively professional evaluation of lead investors. Similarly, Chen et al. (2016) mirror the advantages of a hybrid¹⁰ over pure crowds for reducing information asymmetries and mitigating market failures in equity crowdfunding. Itenberg and Smith (2017) examine differences in the performance of syndicated deals and non-syndicated deals. Compared to non-syndicated deals, the authors show that syndicated deals tend to be younger, smaller, and have a lower probability of getting acquired.¹¹ Two publications provide a *descriptive analysis* of specific characteristics of equity crowdfunding platforms. Belleflamme et al. (2015) indicate that cross-group and within-group external effects, as well as information asymmetries, characterize the interaction of the involved parties on equity crowdfunding platforms. Grundy and Ohmer (2016) provide a descriptive overview of various characteristics of German equity crowdfunding platforms including the minimum investment amount, platform fees, and payback period.

¹⁰ Pure crowd = without lead investors, Hybrid crowd = crowd is led by a lead investor.

¹¹ Due to variation according the final number of observations, we are not able to name the exact number of syndicated and non-syndicated deals compared.

3.6.2 Shareholder risks

Another stream of literature in the platform perspective addresses the revealing of the major risks associated with equity crowdfunding. While a few studies analyze potential risks occurring in reward-based crowdfunding (Schwienbacher 2015; Smith 2013), we identify only one study that deals with the main risks for stakeholders in an equity crowdfunding context. By analyzing three equity crowdfunding platforms, the authors show that the main risks for stakeholders arise through agency problems on platforms. Arenas et al. (2015) classify various risks on equity crowdfunding platforms according to the Work System Risk Framework¹² and develop a risk scheme relevant for entrepreneurs, investors, and platforms including, e.g., legal risks, informational risks, and technical risk factors.

3.6.3 Discussion and future research avenues for the platform perspective

Our thematic analysis of the platform perspective reveals two distinct themes, namely *platform design* and *shareholder risks*. However, the majority of publications predominantly focuses on the design of equity crowdfunding platforms. Since equity crowdfunding platforms reject an average of 90% of their applicants (Klöhn and Hornuf 2012; Lukkarinen et al. 2016), platforms select which ventures may receive financing or not. In equity crowdfunding, platforms function as a gatekeeper and play a significant role in ensuring the quality of approved ventures for a campaign. Therefore, the services provided by platforms are highly significant for mitigating information asymmetries and reducing the risk of adverse selection. Hence, it is astonishing that only a few articles (Salomon 2016; Löher 2016) address the pre-selection process of equity crowdfunding platforms. The studies of Salomon (2016) and Löher (2016) provide first insights of how equity crowdfunding platforms preselect and evaluate ventures; however, the results are based on an analysis of platforms in one country. Therefore, turning to future research avenues regarding behavioral patterns of equity crowdfunding platforms, we encourage scholars to extend and validate the work of Salomon (2016) and Löher (2016) through a cross-national-cross-platform analysis. Also, a cross-national-cross-platform study could reveal

¹² This framework incorporates all information system related risks. For more information, see Sherer and Alter (2004).

differences regarding the preselection and evaluation criteria, which may provide significant implications for the operational processes of equity crowdfunding platforms. In line with this, we suggest the following research avenue: *How do platforms pre-select ventures?* In addition, it might be of interest to examine what key factors do platforms value in considering ventures for approval. In other words, *what elements of a ventures application lead to an acceptance of platforms for a campaign? What are possible key factors that influence to a rejection ventures application? To what extent does pre-selection and evaluation criteria of platforms mitigate adverse selection?*

Moreover, we know little about services that platforms provide after the ventures approval to conduct a campaign. As an exemption, Cumming and Zhang (2018) and Rossi and Vismara (2018) provide first evidence on platform services in the context of crowdfunding. Cumming and Zhang (2018) investigate 51 Canadian crowdfunding platforms to show if due diligence services of platforms are associated with a successful campaign. The authors show that due diligence efforts of platforms (e.g., background checks, site visits, credit checks, cross-checks, monitoring accounts, third-party proof) are associated with higher funds raised and an increasing probability of a successful campaign. However, Cumming and Zhang (2018) do not differentiate between the various forms of crowdfunding platforms, whereby the effect of these services in particular for equity crowdfunding campaigns remains unclear. Rossi and Vismara (2018) adopt the approach of Cumming and Zhang (2018) and mirror the analysis on various European investment-based platforms, including real estate and equity crowdfunding platforms. By differentiating the service provided according to pre-campaign, during the campaign, and post-campaign stages, the authors show that especially platforms' post-campaign services, i.e., growth advisory and exit assistance, lead to an increased number of successful campaigns. For enhancing the knowledge provided by these studies, it might be of scholarly interest to investigate if due diligence services provided do not only affect campaign success but also venture success after the campaign. More precisely, *how effective are these services in reducing information asymmetries? Do platforms due diligence services predict also venture success in the long term?* Also, Cumming and Zhang (2018) indicate that platforms might have different service standards. Therefore, for exploring differences between platforms' services and performance, scholars could examine how these services are designed and applied.

Another promising avenue for research lies in comparing different types of equity crowdfunding platforms. Since equity crowdfunding is characterized through principal-agent conflicts (Belleflamme et al. 2015; Agrawal et al. 2014), Agrawal et al. (2016) show that equity crowdfunding syndicates can lead to a reduction of information asymmetries. Therefore, we encourage scholars to contribute to the results of Agrawal et al. (2016) through a cross-platform comparison of syndicate platforms and non-syndicate platforms. The comparison of operational processes will extend our knowledge of how to reduce information asymmetries through various platform designs. The study of Braun (2015) could serve as an orientation of how platforms can decrease information asymmetries. Furthermore, scholars should investigate how syndicate platforms manage the interplay between the platform, ventures, and institutional, respectively professional, investors, thus serving as a role model for shaping such relationships. In addition, it might be of interest to analyze whether and how syndicates in equity crowdfunding affect campaign success and venture performance. By comparing venture performance, during and after the campaign, scholars could explore whether, and if so, how, a syndicate structure can increase the probability of campaign success.

Moreover, scholars could investigate how the design of platforms can influence follow-up financing. Since Signori and Vismara (2018) indicate that a more dispersed investor-structure of equity crowdfunded ventures reduce the probability to achieve follow-up financing from professional investors (BA and VC), we see great potential in investigating *how pooling mechanisms of platforms can influence the likelihood of receiving subsequent equity?* The German equity crowdfunding platform Companisto pools the shares of investors to improve ventures probability of receiving subsequent funding from VCs. Thus, Companisto can serve as an example for interested scholars to investigate the effect of pooled shares on follow-up financing rounds.

4 Conclusion and limitations

The steady growth of publications and ongoing academic discussion highlight the growing reputation, legitimization, and institutionalization of equity crowdfunding as a research field. However, as a body of literature evolves, "more questions arise that need addressing" (Liñán and Fayolle 2015, p. 20). Thus, the purpose of our study is to

Table 11 Future equity crowdfunding research areas

| Perspective | Possible future research avenues |
|--|---|
| Capital-Market | How and to what extent can equity crowdfunding contribute to reduce the early stage gap? |
| | How can relationships between crowdfunding and traditional finance providers be shaped? |
| | How does equity crowdfunding interact with traditional financing forms? |
| | Does the use of equity crowdfunding increase the probability of subsequent financing (e.g., Ba, VC)? |
| Entrepreneur | How can socio-cultural factors influence funding outcomes in various countries? |
| | Do intellectual property rights (e.g., patents) only become significant in combination with a prototype? |
| | What are other signals likely to complement each other? |
| | Do dynamic (during campaign signals) mitigate the significance of pre-campaign signals? |
| | Is the significance of signals used by ventures across all industry sectors the same? |
| | How does entrepreneurial rhetoric/storytelling influence campaign success? |
| | Does equity crowdfunding act as a knowledge sharing tool between investors and entrepreneurs? |
| | Does a successful equity crowdfunding campaign positively influence post-campaign performance indicators (e.g., growing sales and profit, subsequent financing, innovation degree)? |
| | To what extent can additional rewards in equity crowdfunding campaigns influence campaign success? |
| | What types of rewards (involving vs. haptic rewards) seem most promising for overall funding success? |
| | How can entrepreneurs build and maintain trust in equity crowdfunding? |
| | How do business angels and venture capitalists value equity crowdfunded ventures? |
| | Institutional |
| How do country-specific characteristics in regulations affect equity crowdfunding performance? | |
| How can government/policy interventions promote an equity crowdfunding ecosystem? | |
| How can cooperation's between the state, universities, incubators, and platforms create | |

Table 11 (continued)

| Perspective | Possible future research avenues |
|--|--|
| Investor | an equity crowdfunding friendly entrepreneurial ecosystem? |
| | What types of investors are active in equity crowdfunding? |
| | What role does family and friends as investors play in equity crowdfunding? |
| Platform | To what extent does the investment amount shape the underlying investment motives? |
| | What types of investors are active in equity crowdfunding? Do different investor types seek different values/benefits from investing? |
| | How do investors evaluate potential ventures? What factors determine the decision to invest? |
| | Do active discussions in platform provided discussion boards affect investment behavior during campaigns? |
| | How do platforms pre-select ventures? |
| | What factors of ventures applications lead to an acceptance for a campaign? What are the potential factors that lead to a reception of ventures? |
| | How can pre-selection and evaluation criteria of platforms mitigate adverse selection? |
| | How effective are the platforms' due diligence services in reducing information asymmetries? |
| | Do due diligence services also predict ventures success in the long-term? |
| | How can syndicates in equity crowdfunding affect campaign success and venture performance? |
| Do pooling mechanisms of platforms influence the likelihood of receiving subsequent finance? | |

provide a clear picture of current equity crowdfunding research and critically evaluate the existing literature. The results of our systematic review and thematic analysis of 113 publications illustrate that equity crowdfunding research can be categorized into five research perspectives (capital market, entrepreneur, institutional, investor, and platform). Research to date has contributed significantly to knowledge about the behavior of equity crowdfunding participants, using a variety of methodological approaches. Based on our findings, we highlight several promising future research avenues in each perspective (Table 11). Consequently, our study provides an initial step for further advancing equity crowdfunding research, serving as a scientific knowledge base for guiding and encouraging future research efforts. However, the list of potential future

research questions is not exhaustive. As equity crowdfunding gains increasing popularity as a viable funding alternative, the analysis of determinants predicting post-campaign success might be a fruitful future research avenue. Since equity crowdfunding is the beginning of building a sustainable business, there is a need to analyze ventures' post-campaign performance (Rossi and Vismara 2018). For the success of equity crowdfunding in the long term, future studies need to examine what factors determine post-campaign success and if signals associated to campaign success are also predictors for overall venture success after a successful campaign. In addition, for the future of equity crowdfunding as a viable funding alternative, the analysis of differences of services provided by platforms and their association to campaign and venture success will attract more scholarly attention. In particular, platforms' pre-selection processes and services as measures for mitigating the risk of asymmetric information and adverse selection are highly relevant for optimal functioning of the market. Due to differences in the operationalization of various success determinants as independent variables, there is a need to confirm and extend current knowledge about factors determining campaign success. In addition, as dynamic signals seem to play a role during a campaign, potential future studies should focus on the specific influence of these signals on campaign success.

Despite the enlightened character of our study, it does not come without limitations. Our literature review uses five electronic databases and, thus, may ignore contributions from other databases. In particular, due to our defined inclusion and exclusion criteria, we only include studies published in English or German and exclude sources like books, editorials, and industry reports. To enhance validity and minimize subjectivity in theme selection, we base our theme identification on collective judgments (Ryan and Bernard 2003; Thorpe et al. 2005) of three researchers who are familiar with equity crowdfunding research. However, subjectivity cannot entirely be eliminated. Consequently, we acknowledge that the proposed themes are neither fixed nor final and encourage scholars to enlarge the thematic landscape illustrated in our study. Clearly, we are only beginning to see the evolution and impact of equity crowdfunding on various stakeholders within the equity crowdfunding ecosystem. A whole host of future research activities is needed to investigate this impact further and strengthen the common ground of equity crowdfunding. We are confident that our study serves as a first starting point to enhance "what we know and what we need to

know" (Short et al. 2017, p. 9) to enable further interdisciplinary scientific discussions of equity crowdfunding.

Appendix

Table 12 Inclusion criteria

| No. | Criteria | Reason |
|-----|---|---|
| 1 | Theoretical scientific papers | Usually provides the base of any emerging research field |
| 2 | Quantitative/Qualitative empirical studies | Capture empirical evidence and provide a deeper understanding of the phenomenon |
| 3 | Published as well as unpublished contributions (Working Paper, Conference Paper, Journal article) research in progress papers | Emerging research fields are mostly dominated by "gray papers." |
| 4 | No strict focus on entrepreneurship databases | ECF is an interdisciplinary field |
| 5 | Scientific papers of the last full year | Under-coverage bias |

Table 13 Exclusion criteria

| No. | Criteria | Reason |
|-----|--|--|
| 1 | Foreign language | Exclude all articles that are not written in English or German (scholars are not multilingual) |
| 2 | Papers < 10 pages (no editorials etc.) | Focus on scientific papers |
| 3 | Thesis (Bachelor and Master) of students available in the internet | Focus on peer-reviewed contributions |
| 4 | No exact phrase or synonym in Title, Keywords, Abstract, | Ensure recurrence to umbrella term (the concept of ECF) |
| 5 | Qualitative content-based measures; Focus on ECF | Ensure that ECF for start-ups and ventures is the main topic |
| 6 | Duplications | Bibliometric axiom (Glänzel 2003) |

Table 14 Research protocol

| Host/ Publisher | Database(s) | Number of results based on search string ("Crowdfunding" OR "Equity Crowdfunding" OR "Equity-based Crowdfunding") | Number of relevant documents: applying inclusion criteria | Number of relevant documents: applying exclusion criteria | Total number of relevant documents |
|------------------------|--|--|---|---|---|
| Google | Google Scholar | 3220 | 352 | 101 | 101 |
| EBSCO Host | Business Source Elite | 227 | 23 | 5 | 106 |
| Babson Col- lege | Frontiers of Entrepreneur- ship Research | 62 | 51 | 4 | 110 |
| Elsevier | Science Direct | 24 | 5 | 2 | 112 |
| Web of Sci- ence | SCI-Expanded, SSCI, A&HCI | 6 | 4 | 1 | 113 |

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