# Quality Signals in Participative Financing – How Crowdfunding Supports Economically Viable and Sustainable Ventures


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**Dissertation**
**von Sven Philipp Siebeneicher**

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# Zusammenfassung

Partizipative Finanzierung im Sinne von Crowdfunding und Crowdinvesting hat das Potenzial, zur Nachhaltigkeitsentwicklung der Gesellschaft beizutragen. Die Wirksamkeit von partizipativer Finanzierung zur Nachhaltigkeitsentwicklung hängt vom jeweiligen Erfolg der Finanzierungskampagnen ab. Für den Erfolg einer nachhaltigen Kampagne entscheidend ist erstens ihre Vertrauenswürdigkeit, zweitens ihr Beitrag zur Nachhaltigkeitsentwicklung und drittens die Wirtschaftlichkeit einer Investition. Auf der Grundlage dieser drei Kriterien untersucht diese Dissertation Qualitätssignale zur Steigerung des Vertrauens von Unterstützenden in Kampagnen, inwiefern partizipative Finanzierung zur Entwicklung von Nachhaltigkeit beitragen und bei der Entwicklung wirtschaftlich tragfähiger Unternehmungen unterstützen kann. Zu diesem Zweck werden vier unabhängige Studien betrachtet.

Die Dissertation zeigt, dass das nachhaltige und persönliche Nutzenversprechen einer Unternehmung ein Qualitätssignal darstellt, das den Erfolg der zugehörigen Kampagne positiv beeinflusst. Unterstützende von belohnungsbasierten Crowdfunding Kampagnen sind sogar bereit, ihren persönlichen Nutzen zu reduzieren, um zur Erlangung eines höheren nachhaltigen Nutzens beitragen zu können. Darüber hinaus zeigt die Dissertation, dass im Kontext von leih- und eigenkapitalbasiertem Crowdfunding, die Nachhaltigkeitsorientierung zwar keinen Einfluss auf den Erfolg einer Kampagne hat, diese aber die Wirtschaftlichkeit der Unternehmung positiv beeinflusst. Denn der Erfolg nachhaltig orientierter Kampagnen ist nahezu unabhängig von der Höhe des Zinssatzes, sodass sich nachhaltige Unternehmungen zu wirtschaftlicheren Konditionen finanzieren können als reguläre Unternehmungen.

Die Inklusion der Gesellschaft in nachhaltige Transformationsprozesse ist eine wesentliche Forderung in den Zielen für nachhaltige Entwicklung der Vereinten Nationen. Die Möglichkeiten der gesellschaftlichen Partizipation könnte insbesondere dann gesteigert werden, wenn etablierte Unternehmen partizipative Finanzierungstechniken in bestehende Produkte integrieren. Auf diese Weise könnten die Vorzüge etablierter und innovativer Finanzierungsformen genutzt werden. Die Dissertation zeigt, dass Entscheidungsträger von Regionalbanken bereit sind eine hybride Form im Sinne einer partizipativen Co-Finanzierung anzubieten. Es wird allerdings auch deutlich, dass weitere Tests und Erfahrungen mit der Integration von partizipativer Finanzierung notwendig sind, um ein Verständnis für die Potenziale dieser Finanzierungsform zu schaffen. Zuletzt zeigt die Dissertation, dass soziale Interaktionen in den Communitys partizipativer Finanzierungsplattformen vertrauensbildend wirken. Plattformteilnehmende können durch Interaktionen Informationen über die Qualität von Unternehmungen austauschen, wodurch die Bereitschaft zur Teilnahme gesteigert wird.

# Abstract

Participative financing, in terms of crowdfunding and crowdinvesting, has the potential to contribute to the sustainable development of society. The effectiveness of participative financing for sustainable development depends on the success of individual financing campaigns. Trust is a crucial factor for the success of campaigns. In addition, the campaigns' contribution to sustainable development and whether it is economically viable are decisive factors. Based on these three criteria, this dissertation investigates quality signals for increasing the supporters' trust in campaigns. The dissertation investigates to what extent participative financing can contribute to sustainable development and support the development of economically viable ventures. To this end, the dissertation considers four independent studies.

The dissertation shows that the ventures' sustainable and personal value proposition is a quality signal that positively influences the success of the associated campaigns. Supporters of reward-based crowdfunding campaigns are even willing to reduce their personal value in order to contribute to achieving higher sustainable values. Furthermore, the dissertation shows that in the context of lending- and equity-based crowdfunding, sustainable orientation has no effect on the campaigns' success but positively influences the profitability of ventures. Sustainable orientation positively affects profitability, since the success of sustainably oriented campaigns is almost independent of the interest rate and these ventures can acquire capital at economically more favorable conditions compared to regular ventures.

The inclusion of society in sustainable transformation processes is an essential requirement in the Sustainable Development Goals of the United Nations. The opportunities for societal participation could be increasable if established companies integrate participative financing techniques into existing products. A hybrid model could leverage the advantages of established and innovative financing techniques. The dissertation shows that decision-makers of regional banks are willing to offer a hybrid model of participative co-financing. However, it also becomes clear that further tests and experiences regarding the integration of participative financing are necessary to advance the understanding of the potential of participative financing. Finally, the dissertation shows that social interactions in the communities of participative financing platforms have a trust-building effect. Platform participants can exchange information about the ventures' qualities through interactions, which increases the willingness to participate.

# Danksagung

Eine Promotion ist in vielerlei Hinsicht vergleichbar mit einer Crowdfunding Kampagne: Viele Einzelpersonen folgen einem offenen Aufruf, bündeln ihre Ressourcen und unterstützen so ein höheres Ziel. Für die Unterstützung, die ich für mein Promotionsvorhaben erhalten habe, bin ich sehr dankbar.

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# 1 Introduction

## 1.1 Motivation

We, the people, must find the means to develop economic systems that create value in sustainable and economically viable ways (Shepherd & Patzelt, 2011). At the World Climate Conference 2022, the member states of the United Nations once more acknowledged "that climate change is a common concern of humankind, [and] Parties should, […] promote […] a clean, healthy and sustainable environment, [and] local communities" (United Nations Framework Convention on Climate Change, 2022, p. 1). In the European Union, the Green Deal calls for the ambitious goal to turn Europe into the first climate-neutral continent (European Commission, 2019). In addition to climate change, other threats exist. Our current ways of economic value creation exhaust the limits of the earth's natural ecosystems and physiochemical systems, exceeding global boundaries (Steffen et al., 2015). The forthcoming changes are inevitable and make transformation processes necessary at macroscopic governmental and microscopic individual scales. The call for comprehensive government action (top-down) seems obvious but holds the peril of not being supported by the public and ignoring individual circumstances and potentials. Instead, if the people have the opportunity to get involved, they can create economic value through the entrepreneurial exploitation of sustainable potentials while considering specific circumstances (bottom-up) (Shepherd & Patzelt, 2011).

Participative financing, in terms of crowdfunding and crowdinvesting, could be applicable to enable sustainable action, such as sustainable ventures, for the economically viable creation of sustainable value (Böckel, Hörisch, & Tenner, 2020; Lam & Law, 2016; Vismara, 2019). This dissertation refers to crowdfunding and crowdinvesting as "participative financing" to emphasize the two key characteristics of crowd-based financing techniques. At the same time, this abstract term allows an overarching view of the different aspects of participative financing that the four studies in this dissertation investigate. Participative financing is especially helpful for sustainable ventures because it gives ventures that would not receive founding by regular means the chance to receive capital to develop and test products (Zhang & Chen, 2019). Participative financing holds the potential to support sustainable innovation (e.g., Böckel et al., 2020; Jovanović, 2019; Martínez-Climent, Costa-Climent, & Oghazi, 2019), shared goals,

communal action, resilience (Messeni Petruzzelli, Natalicchio, Panniello, & Roma, 2019), and the democratization of financing (D. Cumming, Meoli, & Vismara, 2021), while distributing economic success throughout the public. In summary, participative financing is a promising technique to foster bottom-up initiatives that support sustainable development.

The concept of pooling capital from many individuals who follow an open call to support a common interest is not new but follows historical examples and is nowadays referred to as participative financing or crowdfunding (Belleflamme, Lambert, & Schwienbacher, 2014; Schwienbacher & Larralde, 2010). Participative financing has proven to be effective in difficult times because it can support breakthrough innovations and allows for public involvement. While the idea of using participative financing for sustainable ventures is relatively young, history provides examples in which participative financing has been used successfully to support technical innovations. For instance, in 1908, a test flight of an airship built by Graf Zeppelin crashed in front of a crowd of spectators. Following an open call, the German public donated more than 6 million Deutsche Mark. The capital raised laid the financial foundation for breakthrough constructions of innovative airships and lead to the founding of the Luftschiffbau Zeppelin GmbH. Over one hundred years later, an original idea has developed into one of Germany's largest employers providing global value creation (ZF Friedrichshafen AG, 2022).

A recent example is the non-profit organization "The Ocean Cleanup". The venture develops scalable technologies to rid the oceans of plastic pollution. In 2014, the venture raised over USD 2.1 million with the support of over 38,000 participants from 160 countries. The money helped the organization to finance the initiation of its product development process and explorations at sea. At that time, the campaign was considered the most successful crowdfunding campaign ever for a non-profit organization (The Ocean Cleanup, 2022). Both examples show that participative financing can support seemingly fantastic ideas. In addition, the second example illustrates the potential for ventures with a sustainable purpose.

Today, the internet enables participative financing with low entry-barriers, in a scalable way, for various purposes, such as sustainable development. Two classes and four types of participative financing have evolved: First, the class of non-financial-return crowdfunding contains the types of (1) reward- and (2) donation-based crowdfunding (De Buysere, Gajda, Kleverlaan, & Marom, 2012; Lam & Law, 2016; Messeni Petruzzelli et al., 2019). Second, the class of financial-return crowdfunding contains the types of (3) lending- and (4) equity-based crowdfunding (Kirby & Worner, 2014; Lam & Law, 2016). The different crowdfunding types and purposes imply different motives for supporters to participate (De Buysere et al., 2012) and come with different inherent risks and legal obligations (Beaulieu, Sarker, & Sarker, 2015; Hornuf & Schwienbacher, 2017) which platform operators must obey. In recent years, multiple

platforms and meta-platforms have developed. These platforms offer differently designed features, for example, to present general information and updates about ventures (Block, Hornuf, & Moritz, 2018). Moreover, some platforms even form online communities which enable actors to interact and influence each other (Cai, Polzin, & Stam, 2021; Vismara, 2018b).

Usually, participative financing involves three actors: ventures, intermediaries, and individual participants (Block, Groh, Hornuf, Vanacker, & Vismara, 2021; De Buysere et al., 2012). The first group of actors are entrepreneurs who seek capital for their ventures and therefore initiate campaigns. Ventures can be anything from private projects to commercial businesses, such as startups or small and medium-sized companies (SME), as well as socially-oriented and cultural initiatives (Allison, Davis, Short, & Webb, 2015; De Buysere et al., 2012; Eldridge, Nisar, & Torchia, 2021; Paschen, 2017). The second group of actors are intermediaries that operate dedicated online platforms to host participative campaigns. Platforms can be operated either by independent companies (e.g., Companisto, 2021a) or in conjunction with partner companies that combine participative financing with their original business (e.g., DKB Crowdfunding GmbH, 2022). The third group of actors are individual participants who contribute resources, such as capital, to campaigns. This dissertation calls participants who commit resources "supporters". However, in financial-return crowdfunding, the term "investors" is more precise (e.g., Blaseg, Cumming, & Koetter, 2021) to describe supporters. Participative financing continues to develop, and new business opportunities evolve as new players become interested in using crowd-based financing techniques, either as investors or to acquire capital for their own ventures. In conclusion, different crowdfunding types, multiple applications and markets, actors with diverse motivations, and new adaptations of participative financing make the environment of this technique complex and provide multiple avenues for research.

This dissertation focuses on how to make participative financing campaigns successful. All actors are interested in increasing the probability of success for the campaigns they initiate, host, or support. The success of campaigns depends significantly on the individuals' willingness to support them. While the supporters' personal motives and their genuine interest in a venture are certainly crucial, it is imperative that ventures are trustworthy so that supporters are willing to commit capital (Akerlof, 1970). Ventures can raise credibility by resolving information asymmetries towards supporters. Signaling theory suggests sending signals of quality to resolve information asymmetries (Spence, 1973). Based on these signals, potential investors can assess the ventures' qualities. Eventually, participation depends on trust, which is achievable through signals of quality that effectively convince supporters.

This dissertation considers participative financing for sustainable ventures because crowd-based financing seems particularly suitable for financing sustainable ventures (Böckel et al., 2020;

Lam & Law, 2016; Vismara, 2019). However, the literature implies that sustainable ventures often have difficulties in acquiring capital (Laurell, Sandström, & Suseno, 2019; Wehnert, Baccarella, & Beckmann, 2019). Additionally, sustainable ventures often face preconceptions since the compatibility of aiming for sustainable developments and achieving economic profitability is ambiguous (e.g., Payne & Holt, 2001; Porter & Kramer, 2011; Sánchez-Fernández & Iniesta-Bonillo, 2007). Furthermore, the literature provides contradictory implications regarding the effect of ventures' sustainable orientation on crowdfunding success (e.g., Allison et al., 2015; Böckel et al., 2020; Calic & Mosakowski, 2016; Chan, Moy, Schaffner, & Torgler, 2019; Hörisch, 2015; Pietraszkiewicz, Soppe, & Formanowicz, 2017). In summary, it is unclear how participative financing can contribute to supporting ventures that are profitable and sustainable. The following section elaborates on the research gap in detail and formulates appropriate research questions to help answer the overarching research question of this dissertation:

*How do quality signals in participative financing affect the probability of campaign success to support economically viable and sustainable ventures?*

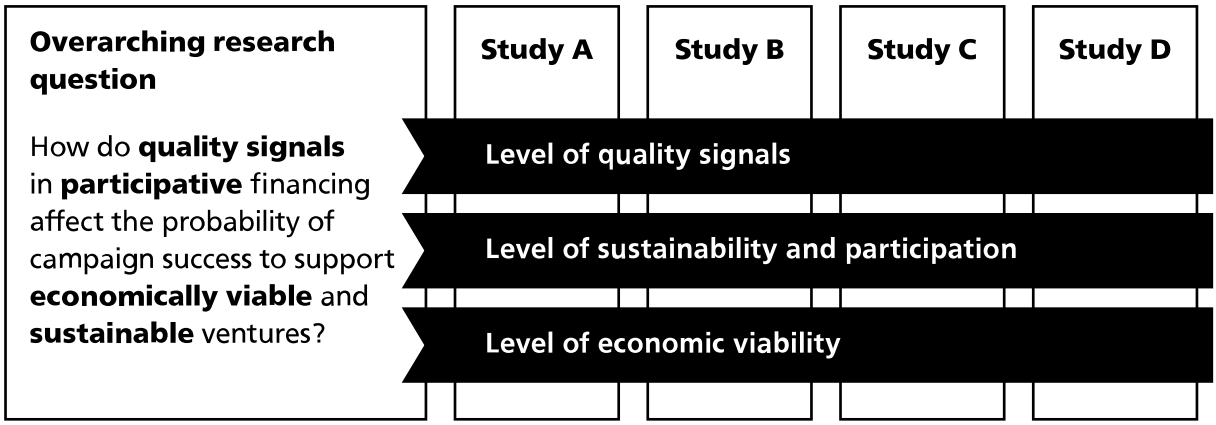


**Figure 1** Overarching research question, levels of analysis, and underlying studies

## 1.2 Research gap and research questions

The overarching motivation is to investigate venture qualities that increase the probability of successful participative financing in order to develop economically viable and sustainable ventures. Therefore, this dissertation analyzes four studies on three levels: First, on the level of quality signals, where quality either refers to venture quality or an approximation of venture quality through associated co-investors. Second, on the level of sustainability and participation, where participation is a domain of sustainability. Third, on the level of economic viability,

where economic viability refers to the ventures' and campaigns' economic profitability. Figure 1 illustrates the connection between the overarching research question and the underlying studies. Figure 1 shows how the three levels of analysis are derived from the overarching research question. The dissertation then analysis the contribution of all four Studies on each level of analysis to put the respective findings in an overarching context.

On the level of quality signals, we explore how potential supporters assess the quality of ventures and how this assessment affects participation. This level is of major interest because venture quality is the perquisite for trust, which leads to participation and therefore is necessary for effective participative financing (Akerlof, 1970). Platforms must enable ventures to send appropriate signals to resolve information asymmetries towards supporters (Bafera & Kleinert, 2022; Connelly, Certo, Ireland, & Reutzel, 2011). The academic literature offers extensive indications on how to reduce information asymmetries between entrepreneurs and investors. In the non-financial-return context, the literature provides implications about quality signals, such as videos (Mollick, 2014), textual descriptions (Liang, Hu, & Jiang, 2020), reviews (Bi, Liu, & Usman, 2017), or team information (Calic & Mosakowski, 2016). In the financial-return context, the literature provides implications about quality signals, such as financial road maps and external certifications (Ahlers, Cumming, Günther, & Schweizer, 2015), campaign updates (Block et al., 2018), or the size of the company shares at stake (Vismara, 2016). Nevertheless, the list of significant quality signals is far from complete as platforms develop new features and exploit new business opportunities.

On the level of sustainability and participation, we explore how participative financing can contribute to sustainable development. Taking up a conceptual perspective, Candelise (2018), Lam and Law (2016), and Vasileiadou, Huijben, and Raven (2016) investigate the potential of crowdfunding to support renewable energy projects. Their studies endorse the concept of a participative energy transition through crowd-based financing. Most studies on sustainable crowdfunding or crowdinvesting typically investigate how specific aspects of sustainability affect the probability of campaign success, ignoring that sustainability has multiple dimensions (Elkington, 2002). However, these studies report mixed results. For example, in the context of non-financial-return crowdfunding, Hörisch (2015) finds that an environmental orientation can affect crowdfunding success negatively, indicating that participative financing does not support sustainable development. On the contrary, Calic and Mosakowski (2016) find that the campaigns' social or environmental orientation positively relates to crowdfunding success. Chan et al. (2019) investigate textual cues about money salience and sustainable intention. They find that sustainable intentions compensate for the negative effect of excessively used money-related terms. Many studies imply a positive effect of social sustainability on crowdfunding success

(e.g., Allison et al., 2015; Calic & Mosakowski, 2016; Pietraszkiewicz et al., 2017). In the context of financial-return crowdfunding, Vismara (2019) finds no significant effect of sustainable orientation on crowdfunding success. Hörisch and Tenner (2020) find that ecologic sustainability relates positively to crowdfunding success, but social sustainability does not. In conclusion, the effectiveness of participative financing to support sustainable development remains ambiguous, and the effects of sustainable orientation on the campaigns' performance are yet unclear.

On the level of economic viability, we explore how participative financing can contribute to developing economically viable ventures. For ventures in general, participative financing holds the promise to close the financing gap that innovative ventures often face between bootstrapping and acquiring institutional funding (e.g., Belleflamme, Lambert, & Schwienbacher, 2013; De Buysere et al., 2012; Thies, Huber, Bock, Benlian, & Kraus, 2019). However, in particular sustainable ventures are often confronted with prejudices regarding the compatibility of sustainable goals and profit orientation which compromises the possibility of acquiring funding (Laurell et al., 2019; Wehnert et al., 2019). Therefore, the question arises of how companies with sustainable qualities perform compared to companies without sustainable qualities and how a sustainable orientation affects the economic prospects of the respective ventures. This question directly relates to the supporters' perspective because supporters and investors consider the value campaigns deliver in return for their participation and commitment (Iyer & Kashyap, 2009).

The dissertation poses four research questions that contribute to answering the overarching question on the levels of (1) quality signals, (2) sustainability and participation, and (3) economic viability, according to Figure 1.

Creating sustainable values is complex since sustainability is achievable on three dimensions according to the "triple bottom line": economic, environmental, and social sustainability (Elkington, 2002). Reward-based crowdfunding can support ventures that contribute to sustainable development by introducing sustainable product innovations (Böckel et al., 2020; Zhang & Chen, 2019) by facilitating social and community welfare (Butticè, Colombo, & Wright, 2017; Kuppuswamy & Bayus, 2017), or by providing financial independence (Hörisch, 2015; Lehner, 2013) to grow a sustainable business. The sustainable value that campaigns create could affect their performance and probability of success.

Thus far, the literature takes an undifferentiated view of the dimensions of sustainability in the context of reward-based crowdfunding campaigns since scholars either mix dimensions (e.g., Allison et al., 2015; Calic & Mosakowski, 2016; Hörisch, 2015; Pietraszkiewicz et al., 2017) or

only consider single dimensions while neglecting the complexity of multi-dimensional sustainable value (Chan et al., 2019). Therefore, there is a gap in the literature regarding the analysis of the effect of sustainability according to the triple bottom line on crowdfunding performance (Böckel et al., 2020).

Besides sustainable value for the environment, communities, or businesses, campaigns can also deliver personal value that is for the supporters' personal benefit only and not shared with other systems (e.g., Holbrook, 1999; Schaltegger & Wagner, 2011; White & Peloza, 2009). Some scholars suggest a trade-off between sustainable and personal values (e.g., Payne & Holt, 2001; Porter & Kramer, 2011; Sánchez-Fernández & Iniesta-Bonillo, 2007); others suggest a consensual relation (Emerson, 2003; Sánchez-Fernández & Iniesta-Bonillo, 2007). Potential supporters may assess the ventures' qualities based on their bundle of sustainable and personal values (Amit & Zott, 2001). The assessment of the ventures' qualities based on their values could affect the level of economic viability. For ventures, economic viability is attainable if they successfully achieve their funding goal and invest their money to create an economically self-sustaining business. However, the effect of sustainable and personal values on crowdfunding success is unclear and ambiguous. This ambiguity leads to the first research question.

**Research question 1** *How do signaled values of sustainability affect the relation of signaled personal value and reward-based crowdfunding success?*

The market for participative financing is complex due to different crowdfunding types, multiple platforms and meta-platforms with diverse specifications, for example, regarding the geographic scope. This complexity causes several research gaps. First, regarding crowdfunding types, the majority of studies in the literature focus on non-financial-return crowdfunding. In contrast, financial-return crowdfunding is relatively unresearched (Böckel et al., 2020; D. Cumming & Johan, 2013; Mochkabadi & Volkmann, 2020; Shneor & Vik, 2020). Findings in the context of non-financial-return crowdfunding are only limitedly transferable to financial-return crowdfunding since the crowdfunding types have different characteristics (Beaulieu et al., 2015). Second, the determinants of crowdfunding success in the German-speaking realm are unexplored (Angerer, Brem, Kraus, & Peter, 2017). Third, crowdfunding platforms pre-select ventures to ensure a certain level of campaign quality (Löher, 2017). This platform-specific pre-selection could bias the quality of ventures. Scholars, therefore, suggest conducting a cross-platform analysis to mitigate the effect of potential selection biases (Mochkabadi & Volkmann, 2020).

In particular financial-return crowdfunding could contribute significantly to sustainable development. Many platforms that offer financial-return crowdfunding focus on sustainable

projects. In the German market of financial-return crowdfunding, investments in the energy sector increased significantly in recent years (Harms, 2021). These platforms contribute to sustainable development, first, by fostering ventures that create sustainable values and, second, by enabling societal participation, for example, in the renewable energy transition process.

The fact that ventures have a sustainable purpose could be a quality that potential investors consider when assessing a campaign. Additional signals of venture quality could be the campaign duration (Hornuf & Schwienbacher, 2018b; Lukkarinen, Teich, Wallenius, & Wallenius, 2016; Mollick, 2014; Pitschner & Pitschner-Finn, 2014; Vismara, Benaroio, & Carne, 2017) and the campaigns' interest rate (Feng, Fan, & Yoon, 2015; Moreno-Moreno, Sanchis-Pedregosa, & Berenguer, 2019; Stiglitz & Weiss, 1981). In addition, the interest rate also plays a decisive role in evaluating economic viability. For investors and ventures, the interest rate determines the profitability of an investment. For sustainable ventures, the interest rate is decisive since it determines their ability to refinance the investment. Investigating the interest rate also contributes to answering the question of how profitable sustainable ventures can be compared to non-sustainable ventures. In conclusion, the second research question arises.

**Research question 2** *How does a sustainable orientation in financial-return crowdfunding campaigns affect crowdfunding success and the determinants of success?*

Participative financing could be an alternative means to established banking. It is unclear whether participative financing may even pose a competitive threat to banks in an already turbulent financial market, as Gomber, Koch, and Siering (2017) state. Banks could opt for a differentiation strategy to delineate themselves from participative financing. Alternatively, banks could choose an integration strategy by expanding their established product portfolio. By integrating participative financing, banks can combine the advantages of innovative participative financing and established bank financing to exploit the emanating potentials. Regional banks, in particular, could benefit from such an innovation. We claim that regional banks and crowdfunding are compatible by common interests. Both share the primary objective to finance a specific purpose (Belleflamme et al., 2014; Deutscher Sparkassen- und Giroverband, 2019), enable participation (Chiorazzo, D'Apice, DeYoung, & Morelli, 2018; Deutscher Sparkassen- und Giroverband, 2019), rely on digital innovations (Belleflamme et al., 2014; De Buysere et al., 2012; Kleemann, Voß, & Rieder, 2008), and are market-oriented (Deutscher Sparkassen- und Giroverband, 2019; Flögel & Gärtner, 2018; Mollick, 2014; Parhankangas & Renko, 2017).

We refer to the hybrid of participative financing and bank financing as participative co-financing. Participative co-financing could contribute to sustainable development by

supporting regional economies and communities. In addition, participative co-financing enables that capital, which the regional value creation yields, can be reinvested regionally to strengthen the regional economy sustainably. Moreover, regional banks enable economic and democratic participation to foster and finance regional activities and development. In addition, regional banks might be able to advance their business model (Chiorazzo et al., 2018; Deutscher Sparkassen- und Giroverband, 2019).

Potential supporters might see the participation of an accredited bank as a signal of venture quality. In turn, banks can validate the quality of ventures by using crowd-participation to analyze the market. Overall, participative co-financing improves the assessment and distribution of investment risks. For ventures, this collaborative financing technique could have a positive economic impact. Ventures that would not have received funding through traditional methods might receive support from this hybrid approach. The academic literature holds no evidence about the banks' genuine intention to integrate participative co-financing, which motivates the third research question.

**Research question 3** *Which potentials affect the intentions of decision-makers in regional banks to offer participative co-financing?*

Besides using co-investing banks as indicators for venture quality, investors could also use other investors from the platforms' communities as indicators for venture quality. Investors, who invest in startups via participative campaigns, often are private retail investors (Moreno-Moreno et al., 2019) with limited investment experience and limited capabilities to perform an extensive due diligence on ventures (Blaseg et al., 2021; Kromidha & Li, 2019). Therefore, retail investors can benefit from using experienced co-investors to reduce uncertainties about the ventures' qualities. However, retail investors do not select co-investors randomly but could identify sophisticated lead investors for their orientation (e.g., K. Kim & Viswanathan, 2019; Kromidha & Li, 2019; Li et al., 2016).

The effectiveness of lead investors as surrogate signals of venture quality could depend on whether the lead investors themselves signal appropriate qualifications and are, therefore, credible (Bafera & Kleinert, 2022). Through interactions within the community (Brown, Mawson, & Rowe, 2019), retail investors can assess the quality of lead investors, which might resolve information asymmetries between investors (Brown et al., 2019; Estrin, Khavul, & Wright, 2022; Fehrer & Nenonen, 2020). The literature provides many indications on how to reduce information asymmetries between entrepreneurs and investors (e.g., Ahlers et al., 2015; Block et al., 2018; Vismara, 2016). However, there is a research gap regarding how to resolve information asymmetries between retail investors and lead investors within the online

communities of crowdinvesting platforms (Brown et al., 2019; Estrin et al., 2022; Fehrer & Nenonen, 2020).

Trustworthy relations between investors can increase the effectiveness of participative financing (Cai et al., 2021; Granovetter, 1985). By sharing informational resources about ventures, inexperienced investors can assess the venture quality to make better investment decisions. Better funding performance facilitates sustainable development. On the level of sustainability, lead investors, who pick up a role model position, can encourage retail investors to participate in financing startups – a sort of investment they would not participate in by conventional means. Including new investors in the venture capital market is sustainable as the value creation is distributed among all investors. Moreover, on the level of economic viability, ventures could benefit because they can acquire more capital for lower costs due to higher transparency and fewer risks for investors, which improves the economic viability of the ventures.

Sharing informational resources through interactions in communal networks creates social capital on three dimensions: cognitive, relational, and structural social capital (Kemper, Schilke, & Brettel, 2013; Nahapiet & Ghoshal, 1998). Signaling effects of social capital could explain how lead investors can serve as signals of quality and credibility to facilitate the retail investors' investment decisions. From this claim arises the fourth research question.

**Research question 4** *Within the social communities of crowdinvesting platforms, how do signals of structural, cognitive, and relational social capital sent by lead investors affect retail investors' investment decisions?*

## 1.3 Conceptual background

### 1.3.1 Characteristics and challenges of participative financing

Digitization yields multiple innovations for the financial industry. Many innovations introduce or use decentralized and participative techniques (Flögel & Gärtner, 2018), such as crowdfunding and crowdinvesting, or token-based initial coin offerings.[1] Participative financing has great potential for ventures that would not receive financial support by traditional means (e.g., Belleflamme et al., 2013; De Buysere et al., 2012; Thies et al., 2019). This dissertation uses the umbrella term participative financing to comprise multiple variations of crowd-based

[1] Initial coin offerings are a special form of participative financing. Initial coin offerings are realizable by utilizing innovative distributed ledger technologies, such as Blockchains. The author of this dissertation has investigated the international Blockchain landscape in separate study that is not included in this work. The study is published as Bock, C., & Siebeneicher, S. (2019). Die Vermessung der globalen Blockchain-Start-up-Landschaft. In W.-C. Hildebrand (Ed.), *VWI Fokusthema* (Vol. 2, pp. 1–68). Bremen: Verband Deutscher Wirtschaftsingenieure e.V. (VWI).

financing. For example, participative financing includes crowdinvesting, which the literature also refers to as equity-based crowdfunding (Mäschle, 2012b), and participative co-financing, which describes a combination of innovative crowdfunding and established bank financing and is analyzed in this dissertation. Like crowdfunding, participative financing "involves an open call, mostly through the internet, for the provision of financial resources either in the form of donation or in exchange for the future product or some form of reward to support initiatives for specific purposes" (Belleflamme et al., 2014, p. 588; Schwienbacher & Larralde, 2010, p. 4).

Each of the four types, donation-, reward-, lending-, and equity-based crowdfunding (see section 1.1), is suitable for different sorts of sustainable ventures due to their different characteristics. Following Belleflamme, Omrani, and Peitz (2015), donation-based crowdfunding is suitable for supporting non-profit or humanitarian causes for voluntary, communal, and altruistic reasons. Reward-based crowdfunding usually attracts early adopters or prosumers interested in acquiring a product as early as possible. Investors of lending-based crowdfunding grant credits in return for interest payments, for instance, to provide capital for large solar-energy plants. Finally, equity-based crowdfunding, or crowdinvesting, enables investors to become shareholders of ventures to profit from their value growth. The order in which this dissertation presents the crowdfunding types also represents their complexity and risk (from least to highest) (Wilson & Testoni, 2014). Participative financing, in terms of financial-return crowdfunding, usually involves more sophisticated ventures and higher individual investments, which contributes to the inherent risks (Beaulieu et al., 2015). Since the applications of the four types are different, they also fall under different legal regulations (Heminway & Hoffman, 2012; Hornuf & Schwienbacher, 2017; Y. Zhao, Harris, & Lam, 2019) that platform operators must obey.

Participative financing offers many advantages for ventures and especially sustainable ventures (Laurell et al., 2019; Wehnert et al., 2019). Participative financing enables testing innovative ventures for acceptance to decrease uncertainties (Lam & Law, 2016; Laurell et al., 2019; Vismara, 2019; Wehnert et al., 2019), it helps to raise attention and interest (Belleflamme et al., 2013), supports the commercialization of products (Motylska-Kuzma, 2018), bridges financing gaps (e.g., Belleflamme et al., 2013; De Buysere et al., 2012; Thies et al., 2019), facilitates democratic participation (Allison, Davis, Webb, & Short, 2017; B. C. Davis, Hmieleski, Webb, & Coombs, 2017; Zheng, Hung, Qi, & Xu, 2016), and thus, can contribute to the development of sustainable ventures. Participative financing is suitable to support various kinds of ventures (D. J. Cumming, Leboeuf, & Schwienbacher, 2017; Wallmeroth, Wirtz, & Groh, 2018), such as startups, product developments (Allison et al., 2015; De Buysere et al., 2012; Eldridge et al., 2021; Paschen, 2017), regional and culture initiatives (Donelli, Mozzoni, Badia,

& Fanelli, 2022; Moon & Hwang, 2018), and charitable purposes (Allison et al., 2015). Some platforms also specialize in financing renewable energy projects and sustainable ventures in general (e.g., Lam & Law, 2016).

While supporting a specific goal with capital is the main reason for participating in a campaign, social aspects also matter. Participative financing is a social activity (Bouncken, Komorek, & Kraus, 2015; Butticè et al., 2017; Kuppuswamy & Bayus, 2017). Relations that develop between supporters and ventures can affect the funding process and influence the probability of campaign success (Colombo, Franzoni, & Rossi-Lamastra, 2015; Fehrer & Nenonen, 2020; Vismara, 2016). Therefore, crowdfunding platforms often implement features to form online communities (Faraj, Krogh, Monteiro, & Lakhani, 2016; Mollick, 2014) and social networks (Agrawal, Catalini, & Goldfarb, 2015), which create social capital (Cai et al., 2021; Colombo et al., 2015). According to social capital theory, "networks of relationships constitute a valuable resource for the conduct of social affairs", which is often underpinned by "mutual acquaintance and recognition" (Nahapiet & Ghoshal, 1998, p. 243), encompassing the three dimensions of social capital (cognitive, relational, structural) (Cai et al., 2021; Nahapiet & Ghoshal, 1998).

Usually, participants in these communities are laypersons, who only have limited investment experience (Allison et al., 2015), lack the capabilities to assess ventures thoroughly (Ralcheva & Roosenboom, 2020), and only invest relatively small amounts compared to institutional investors (Ahlers et al., 2015; Belleflamme et al., 2014; Malmendier & Shanthikumar, 2007). Therefore, the supporters' or investors' trust towards ventures and platforms is elementary for successful participative financing.

In recent years, participative financing has developed and matured, now attracting professional investors and financial institutions that explore the potential of this technique. Based on the characteristics of participative financing and regional banks, we claim that regional banks and crowdfunding are compatible by common interests. The advancement of participative financing ultimately also depends on how great the acceptance of professional players is to use this form of financing or even integrate it into existing business structures.[2] The technology acceptance model is a suitable theory to investigate potentials that affect the intention to integrate and offer participative financing in the context of an established organization (F. D. Davis, 1986).

[2] Not included in this dissertation is a study conducted by the author of this dissertation in collaboration with the Fraunhofer Center for International Management and Knowledge Economy. The aim of this study was to investigate the potentials that emanate for regional banks when combining innovative crowdfunding with established bank financing to offer participative co-financing. The study is published as Rockel, J., Bock, C., Siebeneicher, S., Krowicka, M., Duttmann, S., Thieleke, C., & Bürger, R. (2020). *Crowdfunding und Kreditfinanzierung: Ein zukunftsfähiges Co-Finanzierungsmodell?* Leipzig: Fraunhofer-Gesellschaft.

### 1.3.2 Assessing quality in participative financing campaigns

The trustworthiness of ventures and platforms is essential for successfully conducting campaigns to acquire funding (Cai et al., 2021; D. Chen, Lai, & Lin, 2014). Platforms must provide suitable features that enable supporters to gain trust towards ventures, platforms, and other supporters by resolving information asymmetries (Akerlof, 1970). Participative financing is prone to information asymmetries (Ahlers et al., 2015; Vismara, 2019), which occur if actors on platforms have different knowledge (Stiglitz, 2002). According to signaling theory (Spence, 1973), adequate signals of quality can resolve information asymmetries.

Connelly et al. (2011, p. 43) refer to quality as "the underlying, unobservable ability of the [venture] to fulfill the needs or demands of [a supporter] observing the signal." Thus, quality depicts the characteristics of a product, campaign, or venture that meet the supporters' requirements. We add to this view that venture quality refers to the ventures' characteristics and the ventures' reliability in achieving these characteristics. Quality signals are even stronger if the unobservable ability correlates with the quality signals sent (Bafera & Kleinert, 2022; Vanacker, Forbes, Knockaert, & Manigart, 2020).

The blended value proposition for sustainable customer value uses quality as one aspect of a product's value bundle (Emerson, 2003). For example, Sweeney and Soutar (2001) propose quality as one elementary customer value. In addition, the triple bottom line calls for "environmental quality" (Elkington, 2002, p. 70). However, quality, in terms of the value proposition, is different from venture quality. Since this dissertation discusses the level of quality signals from a signaling perspective, quality in terms of the value proposition is only one characteristic that supporters consider when assessing venture quality.

Platforms implement sophisticated features that enable the communication of venture qualities (Zheng et al., 2016) or even implement cumbersome quality assessment processes to pre-select high-quality ventures for their platform (e.g., Companisto, 2021b; Löher, 2017). The literature reports a variety of different signals that ventures and platforms can send to indicate high quality, such as videos (Mollick, 2014), textual descriptions (Liang et al., 2020), in terms of the number of words (Larrimore, Jiang, Larrimore, Markowitz, & Gorski, 2011; Parhankangas & Renko, 2017), human capital, in terms of team information (Calic & Mosakowski, 2016), campaign reviews (Bi et al., 2017), or the ventures' balance sheet data, patent information, and general venture characteristics (e.g., geographic location) (Mäschle, 2012b). On the contrary, the literature also presents signals to communicate low quality, such as relatively longer campaign durations (Lukkarinen et al., 2016). Finally, some signals could have an ambiguous meaning, such as the interest rate (Feng et al., 2015; Stiglitz & Weiss, 1981), which could either signal high quality in terms of higher returns or low quality in terms of higher risks. Besides

quality signals from ventures, supporters could also observe the behavior of other supporters to approximate the quality of ventures since research shows that funding dynamics play a significant role and participants on platforms interact and influence each other (Belleflamme et al., 2014; Bikhchandani, Hirshleifer, & Welch, 1992; Cai et al., 2021; Vismara, 2018a).

### 1.3.3 Economically viable and sustainable ventures

The literature presents contradictory arguments about the compatibility of sustainable aims and economic profitability. While some might argue for a trade-off between economic and sustainable orientation, others advocate the compatibility of both objectives (e.g., Payne & Holt, 2001; Porter & Kramer, 2011; Sánchez-Fernández & Iniesta-Bonillo, 2007). Regardless of this ambiguity, the definitions of sustainability in this thesis require a combination of ecologic, economic, and social objectives. By definition, sustainable ventures pursue actions to "preserve nature, life support, and community" while achieving economic gains (Shepherd & Patzelt, 2011, p. 142). Elkington (2002, p. 70) defines that sustainable action encompasses developing "economic prosperity, environmental quality, and […] social justice". Earlier Brundtland (1987, p. 41) defined that "[s]ustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The United Nations (2015) declared 17 sustainable development goals (SDGs) and claimed their agenda to be "a plan of action for people, planet and prosperity". This claim and the SDGs once more emphasize the triad of ecologic, economic, and social sustainability. The SDGs address various challenges which are relevant in the context of sustainable ventures. For example, the United Nations (2015, p. 14) advocate "affordable, reliable, and sustainable energy" (Goal 7), "sustainable consumption and production patterns" (Goal 12), and "urgent action to combat climate change" (Goal 13). Among the SDGs, it stands out that some goals emphasize the inclusion of people. For instance, they call for "inclusive and sustainable economic growth" (Goal 8), "inclusive and sustainable industrialization" (Goal 9), and "inclusive societies for sustainable development" (Goal 16). Therefore, inclusion or participation is a domain of sustainability that also contributes to the distribution of wealth throughout society. There is hardly any form of financing that does more justice to the demand for inclusion than participative financing, which offers a technique to democratize financing and societal decision processes (Allison et al., 2017; D. Cumming, Meoli, & Vismara, 2021). Conceptually, participative financing should be quite capable of supporting sustainable development. However, further empirical evidence is needed to support this prediction.

## 1.4 Overview of research studies

This dissertation includes four studies. Each study addresses one of the four research questions (see section 1.2) and contributes to answering the overarching research question (Figure 1). Table 1 presents a detailed overview of the four studies and summarizes the studies' implications on the levels of quality signals, sustainability and participation, and economic viability. This section first elaborates on the differences and key findings of the studies to better distinguish them from each other. Then, a brief presentation of the individual studies follows.

Study A is the only study to investigate non-financial-return crowdfunding by considering the reward-based platform Kickstarter. Hence, in study A, participants who commit capital are called supporters, while they are called investors in all other studies that examine financial-return crowdfunding. Study A is the only one to investigate an international (primarily USA) geographic scope. The other studies focus mainly on Germany or the German-speaking realm. Study A finds that sustainable venture qualities positively affect the campaign performance, and supporters are willing to reduce their personal value to achieve more sustainable values.

Study B departs from other studies since it examines a cross-platform dataset instead of focusing on a single platform. Compared to studies A and D, in study B, the dependent variable "crowdfunding success" does not refer to the monetary outcome but operationalizes the number of participants. Study B finds that sustainable orientation has a positive but non-significant effect on the performance of participative campaigns. Nevertheless, a sustainable orientation enables more cost-efficient financing.

Study C stands out from the other studies for several reasons. First, study C is the only study which does not rely on signaling theory but follows the technology acceptance model. Second, this study considers a broad range of applicable ventures, such as startups, cultural initiatives, SMEs, and individual personas, while the other studies take a narrower perspective on ventures. In Addition, study C is the only study that does not investigate an actual platform but explores the potentials that emanate if regional banks operate their own platform or join a partnership with an independent platform to offer participative co-financing. Study D concludes that decision-makers from regional banks are open to the idea of participative financing but need more experience to assess the potentials of communal inclusion better.

Study D has a clear focus on startups. Study D is distinguishable from the other studies due to the unique panel dataset provided by the German-based crowdinvesting platform Companisto. According to Study D, the lead investors' investment amounts positively affect retail investors, thereby facilitating the inclusion of investors who could not benefit from the value creation of startups by conventional financing.

**Table 1** Detailed overview of this dissertation's studies

| | | Study A | Study B |
|---|---|---|---|
| Context and background | **Research question** | How do signaled values of sustainability affect the relation of signaled personal value and reward-based crowdfunding success? | How does a sustainable orientation in financial-return crowdfunding campaigns affect crowdfunding success and the determinants of success? |
| | **Theory** | ▪ Signaling theory<br>▪ Triple bottom line<br>▪ Blended value proposition | ▪ Signaling theory |
| | **Class** | Non-financial-return crowdfunding | Financial-return crowdfunding |
| | **Type** | Reward-based crowdfunding | Lending-based and equity-based crowdfunding |
| Actors | **Entrepreneur and venture** | Entrepreneurs and ventures<br>(e.g., technology, design, fashion, and food) | Entrepreneurs and ventures<br>(e.g., energy and sustainability, real estate, e-commerce) |
| | **Participants** | Supporters | Investors |
| | **Intermediary** | Kickstarter | Cross-platform analysis<br>(40 independent platforms) |
| Methodology | **Data source** | Web scraping | Investmentcheck database and hand-collected |
| | **Geography** | International, primarily United States of America | Austria, Germany, Switzerland |
| | **Data** | Cross-sectional | Cross-sectional |
| | **Observations** | 45,608 campaigns | 434 campaigns |
| | **Dependent variables** | ▪ Crowdfunding success | ▪ Crowdfunding success |
| | **Independent variables** | ▪ Ecologic value<br>▪ Economic value<br>▪ Social value<br>▪ Supporters' personal value | ▪ Sustainable orientation<br>▪ Interest rate<br>▪ Campaign duration |
| Findings and implications on the levels of analysis | **Findings** | ▪ All value categories affect crowdfunding success positively<br>▪ Sustainable values have a negative moderating effect on the relation of supporters' personal value and crowdfunding success (crowding-out) | ▪ Interest rate affects crowdfunding success positively<br>▪ Sustainable orientation does not affect crowdfunding success<br>▪ Sustainable orientation moderates the relation of the interest rate and crowdfunding success negatively; thus, sustainable orientation supersedes the interest rate |
| | **Quality signals** | ▪ Campaign values (blended value proposition) are significant qualities<br>▪ The effectiveness of value signals differs for teasers and descriptions | ▪ The interest rate is a significant positive quality<br>▪ Sustainable orientation and the campaign duration are insignificant qualities |
| | **Sustainability and participation** | ▪ Supporters have a positive attitude towards sustainable development<br>▪ Crowdfunding can support sustainable development<br>▪ In reward-based crowdfunding, supporters accept reduced personal value for more sustainable value<br>▪ Sustainability might have a positive marketing effect<br>▪ Crowdfunding might enable early feedback for sustainable innovations | ▪ Financial-return crowdfunding enables active participation in the energy transition contributing to sustainable development<br>▪ Participative financing offers an advantage for sustainable ventures compared to non-sustainable ventures because their financing is more cost-efficient<br>▪ Participative financing for sustainable ventures is competitive with regular ventures |
| | **Economic viability** | ▪ Economic viability of sustainable ventures is achievable because acquired resources must not be spent on supporters' personal values but can be invested in economic value creation<br>▪ Provides reward-based funding while supporting sustainable customer value | ▪ For sustainable ventures, financial-return crowdfunding can provide funding for lower interest rates than for non-sustainable ventures<br>▪ For sustainable ventures, crowdfunding success does not depend on the interest rate, which is why sustainable ventures benefit from increased economic viability |

**Table 1** (continued) Detailed overview of this dissertation's studies

| | | Study C | Study D |
|---|---|---|---|
| Context and background | **Research question** | Which potentials affect the intentions of decision-makers in regional banks to offer participative co-financing? | Within the social communities of crowdinvesting platforms, how do signals of structural, cognitive, and relational social capital sent by lead investors affect retail investors' investment decisions? |
| | **Theory** | ▪ Technology acceptance model (TAM)<br>▪ Social capital theory | ▪ Signaling theory<br>▪ Social capital theory |
| | **Class** | Financial-return crowdfunding | Financial-return crowdfunding |
| | **Type** | Lending-based and equity-based crowdfunding | Equity-based crowdfunding (crowdinvesting) |
| Actors | **Entrepreneur and venture** | Startups, cultural initiatives, SMEs, individual persons | Entrepreneurs and startups |
| | **Participants** | Investors | Investors |
| | **Intermediary** | Regional banks<br>(potential partners or operators of platforms) | Companisto |
| Methodology | **Data source** | Survey among decision-makers and managers of regional banks | Supplied by Companisto |
| | **Geography** | Germany | Germany |
| | **Data** | Cross-sectional | Panel |
| | **Observations** | 108 responses | 8153 investment transactions<br>(3211 investors, 32 startups) |
| | **Dependent variables** | Decision-makers' intention to offer ...<br>▪ lending-based co-financing<br>▪ equity-based co-financing | ▪ Investors' investment decision |
| | **Independent variables** | ▪ Perceived usefulness<br>▪ Perceived ease of use<br>▪ Experience | ▪ Leaders' amount<br>▪ Leaders' angel-status<br>▪ Leaders' profile<br>▪ Retailer's profile |
| Findings and implications on the levels of analysis | **Findings** | ▪ Decision-makers generally accept participative co-financing<br>▪ Decision-makers are unaware of emanating potential<br>▪ Business-related experiences positively moderate the perception of usefulness | ▪ Leaders' amount, leaders' profiles, and retailer's profile affect the investment decision positively<br>▪ The leaders' angel status can even have a negative effect<br>▪ No significant interaction between retailers and leaders with public profiles |
| | **Quality signals** | ▪ Enables mutual assessment of venture quality: The crowd reflects the demand for a venture, while the banks reflect the ventures' quality based on a due diligence<br>▪ From the perspective of bank customers, participative co-financing signals the banks' quality in terms of its innovativeness | ▪ Leaders have a positive effect by raising trust, acting as role models, and reducing uncertainties<br>▪ However, trust can be impaired if the leading investors act unexpectedly |
| | **Sustainability and participation** | ▪ More business-related experience moderates the decision-makers' propensity to use participative co-financing for sustainable ventures (e.g., cultural initiatives)<br>▪ Participative co-financing enables a low entry hurdle technique for societal inclusion in the regional community and economy, contributing to the SDGs | ▪ The market for startup investments becomes accessible to retail investors since there are only low entry hurdles<br>▪ Participation creates inclusion |
| | **Economic viability** | ▪ A reduction of risks due to mutual quality assessments enables lower financing cost<br>▪ New target groups that would not be applicable for bank financing with regular means of financing receive early access to bank financing<br>▪ Ventures can receive more funding from a hybrid than from a single source of funding, which increases the economic viability | ▪ Reduction of matching cost for investors and capital-seekers: Capital seekers are presented in front of many capital providers; in turn, capital providers have an easily accessible pre-assessed selection of potentially interesting startup investments |

**Study A** follows research question one, which aims to answer how sustainable values relate to the supporters' personal value in a reward-based crowdfunding context to shed light on the effect of value creation through sustainable crowdfunding. Crowdfunding allows introducing innovative products that potentially create sustainable value (Hörisch & Tenner, 2020; Lam & Law, 2016; Vismara, 2019). Signals indicating the products' sustainable value proposition should be effective to enable quality assessments and increase the chances of crowdfunding success. However, it is unclear how the products' sustainable value and personal value proposition affect crowdfunding success. Moreover, the relation between both categories of value is ambiguous. We predict a consensus between both value categories (Emerson, 2003; Sánchez-Fernández & Iniesta-Bonillo, 2007). Following Emerson (2003), we adopt a "blended supporter value proposition" perspective to the crowdfunding context. We distinguish between ecologic, economic, and social sustainable value (triple bottom line) and aggregate all other notions of values as the supporters' personal value (e.g., Sweeney & Soutar, 2001).

We describe the communication of values through the lens of signaling theory (Spence, 1973). We hypothesize that ecologic, economic, social, and the supporters' personal values positively affect crowdfunding success. Furthermore, we predict that all three sustainable values positively moderate the relation between the supporters' personal value and crowdfunding success. We rely on a dataset with 45,608 observations from the reward-based platform Kickstarter (Mollick, 2014). We conduct text analysis using custom-built software (Gafni, Marom, & Sade, 2019; Pietraszkiewicz et al., 2017) to measure the value that entrepreneurs communicate. Therefore, we employ methodically derived word lists (Short, Broberg, Cogliser, & Brigham, 2010).

We find that if entrepreneurs signal quality in terms of ecologic, economic, social, or supporters' personal value, they can positively influence the probability of crowdfunding success. Moreover, supporters are willing to accept a reduced personal value to maximize the creation of sustainable values. Thus, people do not participate in crowdfunding simply for personal gain but also seek to support sustainable communal aims. This finding means that companies can allocate resources more economically to develop sustainable values without compromising the probability of funding success. Our research once more implies that crowdfunding can leverage sustainable development. Our unique composition of the blended supporter value proposition and signaling theory enables us to illuminate the interaction effects between sustainable values and personal value. Finally, we depart from predeceasing studies by considering signal effectiveness. We distinguish between the campaigns' short teasers and long descriptions. For teasers, we find evidence of a positive moderating effect through sustainable values on the relation between personal value and crowdfunding success. In contrast, the marginal effect of additional emphasis on sustainable values is significantly declining for descriptions.

**Study B** aims to answer research question two, which concerns the effect of a sustainable orientation on financial-return crowdfunding campaigns. This research question is motivated by a threefold research gap: (1) an imbalance between non-financial-return and financial-return crowdfunding research (Böckel et al., 2020), (2) the under-researched German-speaking crowdfunding market (Angerer et al., 2017), and (3) the need for cross-platform research to compensate for potential biases due to the platforms' pre-selection (Löher, 2017). We focus on the capabilities and constraints of the financial-return crowdfunding market in the German-speaking realm and investigate how crowdfunding can contribute to realizing sustainable development, such as the energy transition (Lam & Law, 2016; Martínez-Climent et al., 2019; Vasileiadou et al., 2016).

Signaling theory is adequate for investigating the effect of success determinants in financial-return crowdfunding (Moritz & Block, 2014; Spence, 1973). Investors look for appropriate signals that indicate the trustworthiness and quality of interesting campaigns (Connelly et al., 2011; Spence, 1973). Therefore, we explain crowdfunding success based on three hypotheses, each representing a different signal of quality. We claim that sustainable orientation negatively affects crowdfunding success, which we operationalize as the number of participating investors. Further, we claim that the interest rate positively affects participation, but sustainable orientation has a negative moderating effect. Finally, we propose that the campaign duration has a negative effect on participation, but sustainable orientation has a positive moderating effect. We test the hypotheses by considering four different meta-platforms which aggregate crowdfunding campaigns. Our dataset consists of 434 financial-return crowdfunding campaigns, mainly from Austria and Germany.

The study contributes one of the first cross-platform overviews of the German-speaking financial-return crowdfunding market that utilizes multivariate regression analysis and highlights the energy and sustainability sector. Our findings imply no significant effect of sustainable orientation on the probability of crowdfunding success, confirming the findings of Vismara (2019). We find that entrepreneurs can increase the probability of campaign success by raising the interest rate. However, sustainable orientation can compensate for the effect of increasing interest rates. Regarding the campaign duration, we find neither a significant direct effect nor a significant interaction effect. From a practical perspective, sustainable orientation enables ventures to offer reduced interest rates without depleting the chances of success, which contributes to the economic viability of sustainable ventures.

**Study C** analyzes the potentials that emanate from the hybrid technique of participative co-financing, which combines innovative crowdfunding with established bank financing (see section 1.2). Regional banks know the needs of their regional customers well but lack the resources and innovativeness to address current challenges (e.g., digitization) (Diener & Špaček, 2021). We claim that regional banks and crowdfunding are compatible by common interests. Participative co-financing enables combining the regional banks' services with the capabilities of participative financing. Hence, at the intersection of both techniques emanate potentials for new businesses, products, and services, as well as new potential target groups that formerly were out of scope. While we propose viewing crowdfunding and established regional banking as complements, it is still unclear whether they complement or substitute each other (Gomber et al., 2017).

The integration of participative co-financing depends on the acceptance of this financing technique. The technology acceptance model (TAM) depicts the effects of (1) perceived usefulness, (2) perceived ease of use, and (3) experience on behavioral intentions (F. D. Davis, Bagozzi, & Warshaw, 1989). Accordingly, we hypothesize that perceived usefulness and perceived ease of use positively affect the intention of the regional banks' decision-makers. Furthermore, perceived ease of use mediates perceived usefulness. Additionally, we claim that experience positively moderates perceived usefulness and perceived ease of use. We use potential synergies and potential new and existing target groups as reflective variables for perceived usefulness. We operationalize the bank's existing know-how as a reflective variable of perceived ease of use. Further, we operationalize the decision-makers' business-related experiences with crowdfunding to reflect the variable experience. Finally, focusing on financial-return crowdfunding, we measure the decision-makers' intention to offer either of the two prominent types of financial-return crowdfunding. Together with the Fraunhofer Center for International Management and Knowledge Economy, we surveyed decision-makers and managers of independent subsidiaries from an association of German savings banks. We received 108 complete and independent answers.

We contribute to research on crowdfunding, the first study to investigate participative co-financing by exploring variables of technology acceptance. We provide initial insights on examining and designing participative co-financing. We develop a framework featuring the intersection of crowdfunding and regional banking. We provide evidence that decision-makers generally accept participative co-financing as an innovative technique but need to become more aware of the emanating potentials. We observe potential synergies and target groups that reflect the perceived usefulness of participative co-financing. Furthermore, business-related experiences with crowdfunding positively moderate the perception of usefulness.

**Study D** addresses research question four, which asks if lead investor can serve as surrogate signals of venture quality for retail investors in the context of equity-based crowdfunding for startups. Lead and retail investors interact within the communities of crowdinvesting platforms. Thus, lead investors might affect retail investors (Belleflamme et al., 2014; Vismara, 2018a). We distinguish between both types of investors based on their investment amounts and sequence. Retail investors invest relatively smaller amounts and participate after lead investors. Lead investors qualify as advocates for investments because they acquire relatively larger shares (Bock & Hackober, 2020), might be more capable of assessing a startup, and likely have more experience and knowledge in the field of venture valuation (Di Pietro, Grilli, & Masciarelli, 2020; Vismara, 2018a). When retail investors assess an investment opportunity, they might search for substantial references and, thus, consider lead investors (e.g., K. Kim & Viswanathan, 2019; Kromidha & Li, 2019; Li et al., 2016). However, lead investors can only serve as credible references if they effectively signal their qualifications (Bafera & Kleinert, 2022). Through social interactions within the platforms' communities, lead investors may signal their qualifications and raise trust by reducing information asymmetries towards retail investors.

We combine signaling theory (Spence, 1973) and social capital theory (Nahapiet & Ghoshal, 1998) since both theories provide a framework in which signals of quality become accessible through interactions in social communities (Cai et al., 2021). We hypothesize a positive relation between the retail investors' investment decisions and lead investors' investment amounts, lead investors' status as accredited angel investors, and lead investors' public profiles. We also claim that retail investors with public profiles invest higher amounts and that lead investors with public profiles moderate the retail investors' investment decision. We investigate the signaling effect of social capital based on a dataset from the German crowdinvesting platform Companisto. Our panel dataset consists of 8153 investments by 3211 investors who invested in 32 startups.

Our results broadly confirm a positive relation between lead and retail investors (Cai et al., 2021; Kromidha & Li, 2019; Li et al., 2016). In practical terms, this indicates that platform operators can use lead investors as proxies for venture quality to build trust. We find that the amounts that lead investors invest positively affect the retail investors' investment decisions (cognitive social capital). A greater number of lead investors with public profiles also has a positive effect, but lead and retail investors with public profiles do not interact significantly (structural social capital). Contrary to our expectations, lead investors who are labeled as accredited angel investors affects retail investors negatively (relational social capital). We contribute to theory through our unique combination of signaling and social capital theory.

# Study A

## Sustainable aim and personal gain? How sustainable value affects the relation between personal value and crowdfunding success


### Abstract

We extend the entrepreneurship literature by investigating how the relation between sustainable values and personal value affects crowdfunding success. Therefore, according to the triple bottom line, we disaggregate sustainable values into ecologic, economic, and social value. Relying on the blended value proposition and signaling theory, we identify the value proposed in campaign teasers and descriptions by deriving and employing reliable word lists for text analysis. Our findings suggest that sustainable and personal values positively affect crowdfunding success. The marginal effect of sustainable on personal values increases for teasers but decreases for descriptions. We consider a sample of 45,608 Kickstarter campaigns.



### Keywords

Crowdfunding, Sustainability, Blended value proposition, Signaling theory, Triple bottom line

### Publication

Siebeneicher, S., & Bock, C. (2022). Sustainable aim and personal gain? How sustainable value affects the relation between personal value and crowdfunding success. *Technological Forecasting and Social Change*, *183*, 121938. https://doi.org/10.1016/j.techfore.2022.121938.

### Conferences

Presented at the *24. Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand (G-Forum)*, 2020, Karlsruhe, Germany, and online.

Presented at *Praxis trifft Forschung zum Thema Impact Investing – Online-Workshop des Arbeitskreises Gründungs- und Mittelstandsfinanzierung*, 2021, online conference.

Presented at the *100 Jahre VHB: Jubiläumstagung des Verbands der Hochschullehrerinnen und Hochschullehrer für Betriebswirtschaft e.V.*, 2022, online conference.

Presented at the *82nd Annual Meeting of the Academy of Management*, 2022, Seattle, United States of America, and online.

# Study B

## Financial-return crowdfunding for energy and sustainability in the German-speaking realm


### Abstract

The transformation of the energy system is among the most relevant topics of the current public debate in the German-speaking realm. Crowdfunding is suitable for promoting sustainable development, such as financing renewable energies. We investigate success determinants of financial-return crowdfunding to understand how this financing technique can contribute to realizing sustainable development, such as the energy transition. We conduct a cross-platform study and consider sustainably oriented campaigns to answer two research questions: First, what determinants influence financial-return crowdfunding success? Second, how does a sustainable orientation affect these success determinants? We rely on signaling theory to investigate the effect of quality signals. We consider four meta-platforms that aggregate campaigns with sustainable and other funding purposes, obtaining a dataset of 434 financial-return crowdfunding campaigns, mainly from Austria and Germany. We use hierarchical linear regression models for our statistical analysis. Our findings indicate that sustainable orientation alone does not significantly affect crowdfunding success. Entrepreneurs can increase their chances of campaign success by raising the interest rate unless their campaign has a sustainable orientation. In sustainably oriented campaigns, the effect of the interest rate is compensated. Finally, we find no significant evidence suggesting that the campaign duration affects sustainable or non-sustainable crowdfunding success.



### Keywords

Crowdfunding, Crowdinvesting, Crowdlending, Sustainability, Sustainability financing, Financial return, Cross-platform analysis, Signaling theory

### Publication

Siebeneicher, S., Yenice, I., & Bock, C. (2022). Financial-Return Crowdfunding for Energy and Sustainability in the German-Speaking Realm. *Sustainability*, *14*(19), 12239. https://doi.org/10.3390/su141912239.

# Study C

## The "C" in crowdfunding is for co-financing – Exploring participative co-financing, a complement of novel and traditional bank financing


### Abstract

We explore the potentials of participative co-financing as a means for regional banks to integrate an innovative financing technique that enhances their strengths. Our goal is to interest platform operators, decision-makers of regional banks, and researchers in the potentials of participative co-financing. We define participative co-financing as capital provision, where professional financing sources provide one part, and the other is supplied via participative crowdfunding. We claim that crowdfunding and regional banks are compatible by common interests. We explore potentials emanating at the intersection of both fields by drawing on entrepreneurship and finance literature. Eventually, we bridge the gap between both fields of research. To guide our research, we develop a framework featuring the intersection of crowdfunding and regional banks. We ask: Which potentials affect the intentions of decision-makers in regional banks to offer participative co-financing? The technology acceptance model (TAM) provides a theoretical foundation for our analysis. We conduct a twofold analysis by looking at the direct effects of potentials first and acceptance according to the TAM second. Thereby we consider the intention to offer lending- and equity-based co-financing. We surveyed decision-makers from an association of German savings banks and derived 108 answers. We show that regional banks generally accept participative co-financing as an innovative financing technique. The most likely model is lending-based co-financing, with individual persons, startups, and SMEs as target groups. Decision-makers hope to profit from cross-selling and being perceived as innovative. Nevertheless, further research and trials are necessary to advance participative co-financing.



### Keywords

Banking, Co-financing, Crowdfunding, Crowdinvesting, Financing, Participation

### Publication

Bock, C., Siebeneicher, S., & Rockel, J. (2022). The "C" in crowdfunding is for co-financing: exploring participative co-financing, a complement of novel and traditional bank financing. *Journal of Business Economics*, *92*(9), 1559–1602. https://doi.org/10.1007/s11573-022-01112-w.

### Conferences

Presented at the *24. Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand*, 2020, Karlsruhe, Germany, and online.

Presented at the *PDMA Virtual Innovators Conference and JPIM Research Forum*, 2022, online conference.

# Study D

## What did you do and who are you anyways? How lead investors affect retail investors in equity crowdfunding


### Abstract

Crowdinvesting platforms often form online communities in which investors interact. Crowdinvesting is prone to information asymmetries between stakeholders, including imperfections in between investors. When retail investors use crowdinvesting to invest in startups, they may consider lead investors as role models to reduce uncertainties regarding the eligibility of a startup. However, lead investors may only serve as a credible reference if they effectively signal their qualifications. We combine signaling and social capital theory to investigate the dissolution of information asymmetries between lead and retail investors. We consider signals from all three dimensions of social capital, which can increase credibility. We find that the lead investors' average investments (cognitive social capital) and higher numbers of lead investors with public profiles (structural social capital) positively affect retail investors' investment decisions. In contrast to our expectations, lead investors, who are labeled as accredited angel investors (relational social capital), affect retail investors negatively.



### Keywords

Equity crowdfunding, Crowdinvesting, Social capital theory, Signaling theory, Lead investors, Retail investors

### Publication

The version of the working paper presented as part of this dissertation is written by Sven Siebeneicher, Carolin Bock and Diemo Urbig. It has not yet been considered for publication.

### Conferences

Application pending for the *30th IPDMC: Innovation and Product Development Management Conference*, 2023, Lecco, Italy.

# 5 What did you do and who are you anyways? How lead investors affect retail investors in equity crowdfunding

## 5.1 Introduction

Crowdinvesting platforms are social networks that often form online communities (Cai et al., 2021; Mollick, 2014). Within these communities, platform operators, entrepreneurs, and investors interact and influence each other (Belleflamme et al., 2014; Vismara, 2018a). Herding explains the mutual influence of investors as one individual investor simply follows the behavior of the preceding investors (Bikhchandani et al., 1992). Crowd investors, who often are retail investors with limited experience and capabilities to assess investments, are prone to follow others based on little information and judgment (Estrin et al., 2022; Kromidha & Li, 2019). On the contrary, the explanatory power of herding is limited for equity crowdfunding, where investment amounts and risks are significant and investors may not follow blindly (Cai et al., 2021).

In contrast to following the majority, retail investors may search for a more substantial orientation and identify lead investors. However, lead investors can only serve as credible references if they effectively signal their qualifications (Bafera & Kleinert, 2022). Through social interactions within the platforms' communities, lead investors may signal their qualifications, reduce information asymmetries towards retail investors, and raise their trust.

Information asymmetries arise if independent parties with different knowledge convene (Stiglitz, 2002). The academic literature provides countless implications on how to dissolve information asymmetries between entrepreneurs and investors since quality signals are decisive for the investors' investment decisions (e.g., Ahlers et al., 2015; Block et al., 2018; Vismara, 2016). Yet, there is a research gap in the literature regarding how to dissolve information asymmetries in between retail and lead investors who interact in networks within the crowdinvesting platforms' online communities (Brown et al., 2019; Estrin et al., 2022; Fehrer & Nenonen, 2020). We aim to contribute towards closing this gap.

In this study, we examine startup financing through equity crowdfunding, which we call crowdinvesting, following Mäschle (2012b). Apart from the entrepreneurs' signals about their

startups, investors can utilize other investors as a reference to make a better valuation themselves. Nevertheless, retail investors do not pick random co-investors. Instead, they might identify lead investors who provide guidance (e.g., K. Kim & Viswanathan, 2019; Kromidha & Li, 2019; Li et al., 2016). We distinguish between lead and retail investors based on investment amounts and time sequence. Lead investors qualify as advocates for investments because they acquire the largest shares (Bock & Hackober, 2020).

In comparison, retail investors invest smaller amounts and, from a timeline perspective, participate after lead investors. Additionally, lead investors might be better able to get a more detailed picture of a startup than regular investors. This capability is due to more experience and knowledge in the field of venture valuation. Retail investors might understand the lead investors' investment decisions as quality signals of startups (Vismara, 2018a). Eventually, if lead investors signal their qualifications, their valuation might become a useful resource that facilitates the retail investors' investment decision.

Signaling theory explains how signals sent by and about lead investors must be composed to effectively reduce information asymmetries (Connelly et al., 2011), which are particularly pronounced in crowdinvesting (Vismara, 2019). If platforms have appropriate signals in place, lead investors could become a resource for retail investors through the network that spans across the platforms' online communities. Previous research shows that in order to facilitate the retail investors' investment decisions, it is a decisive factor that informational resources become accessible through social interactions within the community (Brown et al., 2019). Sharing resources, such as information, through interactions in communal networks creates social capital (Nahapiet & Ghoshal, 1998). Hence, social capital theory provides a framework in which signals of quality become accessible through interactions in social communities to raise credibility (Cai et al., 2021). The signaling effects of social capital can explain how lead investors can become signals of quality and credibility.

Cai et al. (2021) provide a systematic literature review on social capital in the context of crowdfunding. They define three dimensions of internal and external social capital: cognitive, relational, and structural social capital (Kemper et al., 2013; Nahapiet & Ghoshal, 1998). Investigating the social communities of crowdinvesting, we aim to answer the following research question:

**Research question 4** *Within the social communities of crowdinvesting platforms, how do signals of structural, cognitive, and relational social capital sent by lead investors affect retail investors' investment decisions?*

We investigate the signaling effect of social capital based on a dataset from the German crowdinvesting platform Companisto (Companisto, 2021a). Our sample consists of 8153 investments by 3211 investors who invested in 32 startups. We perform a hierarchical regression analysis based on ordinary least square regression models.

Regarding the dimension of cognitive social capital, we find that the amounts invested by lead investors have a significant positive effect on the retail investors' investment decisions. Additionally, concerning structural social capital, a greater number of lead investors with public profiles also has a positive effect. We test whether the effect of lead investors with public profiles is amplified for investors who disclosed their profiles themselves but find no support for this moderation. In contrast to our expectations, in terms of relational social capital, if lead investors are labeled as accredited angel investors, this affects retail investors negatively.

We contribute to theory through our unique combination of signaling and social capital theory. The lead investors' investment amount is a costly and strong signal of cognitive social capital, increasing trust between lead and retail investors. The number of angel status lead investors represents a strong and costly signal of relational social capital. Surprisingly, our findings imply that relational signals can decrease trust if they signal unexpected behavior. Despite public profiles only being costless and weak signals of structural social capital, lead investors' public profiles help form the online community which promotes trust.

Our key practical contribution is that we support the thesis that lead investors positively influence the crowdinvesting performance (Cai et al., 2021; Kromidha & Li, 2019; Li et al., 2016). Platform operators can use lead investors to build trust. In doing so, they should connect lead and retail investors primarily through communal relationships. Furthermore, platform operators must be careful to implement features that promote social capital rather than diminish it to avoid negative effects.

## 5.2 Theory and background

Within the virtual environments of crowdinvesting platforms (Mollick, 2014), social networks can affect the participating investors' investment decisions because networks enable investors to influence each other (Cai et al., 2021; Estrin et al., 2022; Nielsen, 2018). Since investors interact, they make resources accessible to each other, which are valuable for evaluating startups, and thereby create social capital (Vismara, 2018b). Lead investors may be particularly influential since they can signal credibility on the three dimensions of social capital (Cai et al., 2021). We elucidate how crowdinvesting platforms function as online communities in section 5.2.1, why lead investors might be effective signalers in section 5.2.2, and how we combine signaling theory with social capital in sections 5.2.3 and 5.2.4.

### 5.2.1 Crowdinvesting platforms as online communities

Crowdinvesting platforms often form social networks that bring entrepreneurs and investors together, following a one-to-many network architecture (Belleflamme et al., 2015; Bouncken et al., 2015). Crowdinvesting is a social activity by design (Butticè et al., 2017; Cai et al., 2021; Kuppuswamy & Bayus, 2017). Social network relationships that develop on these platforms are essential for successfully funding a startup (Colombo et al., 2015; Fehrer & Nenonen, 2020; Vismara, 2016). Relationships do not only develop between entrepreneurs and investors (Ahlers et al., 2015; Di Pietro et al., 2020) but, more importantly for this study, can develop in between investors (Moritz, Block, & Lutz, 2015).

Crowdinvesting platforms provide various features on their platforms and continuously improve these features, which facilitate relationships between investors, enabling them to connect and interact. For example, investors can use the crowdinvesting campaigns' comment sections to communicate and exchange their thoughts and assessments about startups (Vismara, 2018b). Moreover, on the lending-based crowdfunding platform "Prosper", investors can confer about investments in self-created communities (Cai et al., 2021). Apart from platform proprietary communication solutions, investors can also use established external social networks (Belleflamme et al., 2014; Vismara, 2018b).

We apply the properties of online communities on crowdinvesting to manifest the environment in which investors participate. According to Faraj et al. (2016), online communities (1) enable and establish the *participation* of large numbers of juristic entities and natural persons, (2) have the purpose of *supporting* activities, interests, or identities, (3) facilitate the collaborative creation and tactic flow of *knowledge* among participants or by scrutinizing a common subject of interest, and (4) are the result of deliberate social *interactions* that are maintainable through engaging in digital online technologies. Moreover, online communities "[…] allow participants to share hard-to-codify knowledge such as competence and experience, which are typically transferred via observation and imitation rather than writing or speech […]" (Faraj et al., 2016, p. 669).

In the communities of crowdinvesting platforms, various kinds of participants interact. De Buysere et al. (2012) or Block et al. (2021) distinguish three key actors in crowdfunding communities: (1) project owners (e.g., entrepreneurs), (2) funders (e.g., investors), and (3) platforms as intermediaries. However, in the specific context of crowdinvesting, further actors can be added who illustrate the increasing professionalization of crowdinvesting. For instance, Mochkabadi and Volkmann (2020) also distinguish (4) representatives of the capital market and (5) institutional representatives. Furthermore, we differentiate crowd investors on two

scales: first, their usual investment amounts, and second, their professionalism (Signori & Vismara, 2018). The second level refers to experiences, capabilities, and education in the field of startup valuation and crowdinvesting (Vismara, 2018a). Both scales are independent. However, moving down on a scale is easier than moving up. On crowdinvesting platforms, most investors have little experience and only invest small amounts (Ahlers et al., 2015; Belleflamme et al., 2014; Malmendier & Shanthikumar, 2007). Nevertheless, crowdinvesting has matured over the past years and now also attracts professional investors who invest large amounts.

Although the transition between these two archetypes is fluent, the likelihood of professional investors investing small amounts is greater than the likelihood of non-professionals investing large amounts. The fact that investors are assignable to these two scales aggravates the issue of information asymmetries even more severe, especially if retail investors choose lead investors as a reference.

### 5.2.2 How lead investors resolve information asymmetries

We distinguish retail and lead investors based on their investment amounts and sequence of investments. Retail investors invest small amounts after someone else has already invested a higher amount. Lead investors invest substantially higher amounts, thus, receiving more shares of a startup than retail investors (Bock & Hackober, 2020). Also, lead investors invest so that others can follow.

Lead investors qualify as role models due to various attributes, which also distinguish them from retail investors. For example, they are likely to have higher education, specific experience in certain industries, and an investment history in the field of startup financing (Vismara, 2018a). Their qualifications and resources enable lead investors to conduct a thorough due diligence before investing in a startup and enable them to monitor the startup's development after the investment (Di Pietro et al., 2020). The objective to maximize returns is inherently connected to professional investors. Professional lead investors likely follow a different decision logic than non-professional lead investors or retail investors, who, while aiming for maximum return, cannot scrutinize startups equally well (Fisher, 2009). Vismara (2019) suggests that in crowdinvesting, retail investors might follow a community logic instead of more professional investors who follow a market logic. Since lead investors take greater risks and invest higher amounts than retail investors, a thorough due diligence and monitoring are cost-efficient relative to retail investors (Ahlers et al., 2015; Vismara, 2019).

Lead investors might be essential drivers of crowdinvesting success. For example, Li et al. (2016) find indications that lead investors can promote crowdinvesting campaigns. Lead investors might affect campaigns similarly, like expert investors (K. Kim & Viswanathan, 2019)

or third-party endorsements (Courtney et al., 2017). In crowdinvesting, investors must bear high risks and put great trust in the pre-selection of startups by platform operators (Giudici, Guerini, & Rossi-Lamastra, 2020). For retail investors, lead investors take up the position of role models, offering the opportunity to mitigate uncertainties and risks (Kromidha & Li, 2019).

Retail investors benefit from the securities and support that lead investors can provide. The literature holds evidence that lead investors can send a positive signal by investing in a startup, which insinuates they have inside knowledge about the eligibility of an investment (Bafera & Kleinert, 2022). Thereby, they might trigger "social contagion" and encourage retail investors to follow (Bikhchandani et al., 1992; Vismara, 2018a; Watts & Dodds, 2007). Fearing fewer uncertainties, lead investors likely invest earlier than retail investors. On the contrary, retail investors might delay their investment until some lead investors have already made their investment (Bikhchandani et al., 1992). Within the crowdinvesting community, retail investors have access to many other investors who might take up a lead investor role, thereby providing support for retail investors who can assess a startup quicker and make their investment decision faster (Estrin et al., 2022).

Lead investors help to build trust and motivation to convince retail investors to invest (Cai et al., 2021; Li et al., 2016; Xiao, 2020). The investments of lead investors indicate that a startup is credible, of high quality, and, therefore, eligible for receiving funding (Li et al., 2016). The social networks within the platforms' online communities could be effective catalysts to transmit credibility between network participants (Fehrer & Nenonen, 2020; Lin, Prabhala, & Viswanathan, 2013), eventually leading to collective action (Faraj et al., 2016).

Finally, lead investors help to reduce information asymmetries between startups and all investors through their resources and professional assessment (Agrawal, Catalini, & Goldfarb, 2016; L. Chen, Huang, & Liu, 2016). While the literature presents multiple explanations why lead investors might reduce asymmetric information between startup entrepreneurs and retail investors (e.g., Ahlers et al., 2015; Block et al., 2018; Vismara, 2016), it remains open to what extent information asymmetries exist in between investors that need to be resolved.

### 5.2.3 Effective signals of trust

In this study, we investigate the relations between lead and retail investors. If lead investors have different knowledge than retail investors, they have asymmetric information (Stiglitz, 2002). To amplify the eligibility of startup investments and to affect the crowdinvesting process positively through leading investors, retail investors must be convinced of the lead investors' credibility. Therefore, resolving information asymmetries between the two types of investors is necessary.

Building trust is indispensable for lead investors to affect the retail investors' investment decisions. By relying on signaling theory, we investigate which activities and attributes lead investors can communicate to retail investors to resolve the negative effects of imperfect information and eventually raise trust (Connelly et al., 2011; Spence, 1973). Lead investors (signalers), who have an information advantage since they know about their credibility, can transmit signals about their otherwise unobservable qualities so that retail investors (receivers) can receive and decipher this information to obtain an impression about the lead investors' credibility (Bafera & Kleinert, 2022; Spence, 1973).

Lead investors can raise credibility by overcoming information asymmetries towards retail investors through signals of quality and intention. Signals of quality disclose the lead investors' unobservable capabilities, which entitle them as qualified leaders. Signals of intention disclose the lead investors' behavior and objectives, for example, what they intend to do if the investment thrives and brings returns (Connelly et al., 2011).

Lead investors must meet specific requirements to send signals effectively. According to Connelly et al. (2011), signals must be observable and costly, where observability refers to how well receivers can recognize signals, and cost refers to the expense that signalers must bear before being able to transmit a signal. According to Bafera and Kleinert (2022), signal cost are more of a characteristic than a driver of effectiveness. Nevertheless, their definition of signal cost is equal to the definition by Connelly et al. (2011). Bafera and Kleinert (2022) claim that effectiveness depends on signal strength, quantity, and timing. A signal is strong if it correlates with its underlying quality (Bafera & Kleinert, 2022; Vanacker et al., 2020). Signal quantity depicts how frequently a signal is sent, making it more observable. Signal timing pertains to when a signal is most effective. For example, lead investors who invest earlier might have a more effective timing than later lead investors (Bikhchandani et al., 1992; Vismara, 2018a).

Since we investigate how retail investors can relate to lead investors as a surrogate signal about the startups' quality, we are interested in understanding how lead investors can increase the effectiveness of their signals. Retail investors appreciate credible and honest signals by lead investors because they facilitate making better decisions (Ahlers et al., 2015; Connelly et al., 2011). Lead investors can increase their credibility by interacting with retail investors in the platforms' communities (Cai et al., 2021).

### 5.2.4 Signaling social capital

If lead and retail investors interact on crowdinvesting platforms, they can create social capital (Cai et al., 2021), which contributes to the dynamics of crowdinvesting (Butticè et al., 2017; Colombo et al., 2015). Many scholars have contributed to the development of social capital

theory (Burt, 1992; Coleman, 1988). We follow Cai et al. (2021), who rely on the definition of social capital according to Nahapiet and Ghoshal (1998) in their literature review on social capital in crowdfunding.

Social capital theory states that "networks of relationships constitute a valuable resource for the conduct of social affairs", which is often underpinned by "mutual acquaintance and recognition" (Nahapiet & Ghoshal, 1998, p. 243). Furthermore, social capital encompasses three dimensions: cognitive, relational, and structural social capital (Cai et al., 2021; Nahapiet & Ghoshal, 1998). Within communal networks, social capital increases the efficiency of information diffusion and supports adaptive efficiency in terms of encouraging the development of cooperative behavior (Nahapiet & Ghoshal, 1998).

The networks that span across crowdfunding platforms play a fundamental role in our theoretical concept. For one thing, crowdfunding platforms are the signaling environment in which both types of investors exchange signals (Bafera & Kleinert, 2022). Additionally, the platforms provide the infrastructure and means to grow and maintain networks across the crowdinvesting community (Cai et al., 2021; Faraj et al., 2016). According to Granovetter (1985), information attained through such networks is more valuable because the relational structures provoke trust and discourage participants from acting unlawfully. Investors of crowdinvesting communities are not limited to the network within the platform but also are linked to outside-networks. For this reason, Nahapiet and Ghoshal (1998) distinguish between internal and external networks. In this study, we only focus on the social network within the platform's community, which is why we focus on internal social capital (Cai et al., 2021). Findings by Colombo et al. (2015) imply that internal social capital supports the creation of valuable resources within and out of the crowdinvesting community.

We consider signaling effects according to the three dimensions of social capital since they provide a conceptual foundation to explain how lead investors can raise credibility through interactions. Clustering the facets of social capital in three dimensions is analytically plausible. Nevertheless, the separation remains ambiguous because of the high interrelations between the facets (Nahapiet & Ghoshal, 1998). Next, we briefly introduce the fundamental concepts behind each dimension.

First, cognitive social capital characterizes resources that enable shared interpretations, representations, and meanings within a community (Cicourel, 1973; Nahapiet & Ghoshal, 1998). Cognitive social capital refers to the individuals' contribution of personal knowledge to the community (Cai et al., 2021) and promotes mutual understanding of shared goals and values in societies or communities (Tsai & Ghoshal, 1998).

Second, relational social capital characterizes resources that emerge from and thrive on interpersonal relations that develop through interactions of individuals in a community (Granovetter, 1985; Tsai & Ghoshal, 1998). Relational social capital refers to the individuals' commitment, communication, respect, and social motives like sociability, approval, and prestige (Cai et al., 2021; Nahapiet & Ghoshal, 1998). Further, it promotes trust and credibility, obligations and expectations, norms and sanctions, as well as identity and identification (Nahapiet & Ghoshal, 1998).

Third, structural social capital characterizes how individuals are connected in a community (Nahapiet & Ghoshal, 1998) and refers to the individuals' direct and indirect links and connections within the community network (Tsai & Ghoshal, 1998). Structural social capital promotes embedding interpersonal relationships in the community to support the acquisition information as a resource.

The fundamental proposition of social capital claims that relations within communal networks constitute valuable resources for various types of social affairs (e.g., business affairs) in terms of providing collective information to the community (Bourdieu, 1986; Nahapiet & Ghoshal, 1998). Hence, we hypothesize how lead investors can interact with retail investors within the three social capital dimensions to raise trust and, thus, create credible social capital, which helps retail investors to make better decisions.

## 5.3 Hypotheses

For crowdinvesting platforms, it is essential to know which signals from lead investors affect retail investors. The more credible signals from lead investors become, the greater their effect on retail investors (Estrin et al., 2022). Lead investors can increase credibility in several ways. First, credibility can be achieved just by belonging to one community (Ahlers et al., 2015; Granovetter, 1985). Second, communal interactions increase credibility (Cai et al., 2021; Faraj et al., 2016; Lin et al., 2013). Lead investors can become signalers and raise credibility through the signals they actively send to retail investors (Connelly et al., 2011). Since, according to social capital theory, lead and retail investors can interact on three dimensions (Nahapiet & Ghoshal, 1998), lead investors can transmit signals on each of these dimensions. We derive appropriate hypotheses to investigate lead investor signals on all three dimensions of social capital (Nahapiet & Ghoshal, 1998).

Platforms have developed and implemented various features which enable interactions between lead and retail investors. We test our hypotheses based on a sample from the crowdinvesting platform Companisto, which finances innovative startups (Companisto, 2021a). On their platform, investors can view a list of how much previous investors invested in a startup

campaign. The list sorts investments from the highest to the smallest amount and associates the respective investor names. Hence, retail investors can identify lead investors.

Additionally, the list depicts whether investors have a public profile and if they have attained an expert status, which is called "angel investor" status on Companisto (see section 5.4.1). We investigate the signaling effects of the three dimensions by analyzing signals from lead investors based on specific platform features: invested amounts, public profiles, and "angel" status. Figure 12 displays our research framework and how we match the platforms' features to the social capital dimensions.

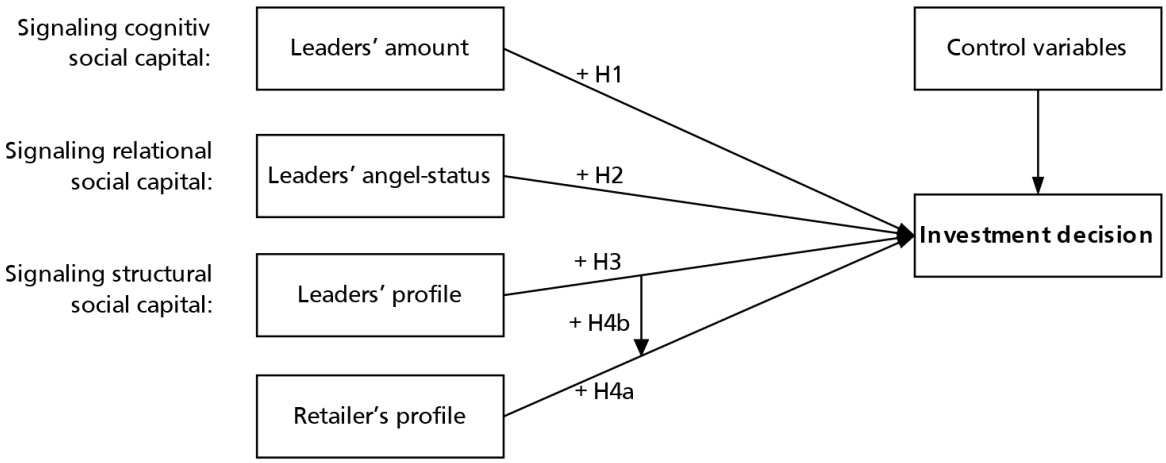


**Figure 12** Research framework with hypotheses

## 5.3.1 Signaling cognitive social capital

We condense the concept of cognitive social capital to the resources which lead investors contribute to the crowdinvesting platforms' communal knowledge that has a uniform meaning for retail investors, as these resources promote shared goals and values (Nahapiet & Ghoshal, 1998). On crowdinvesting platforms, the participants share the goal of financing startups by acquiring investments. Investment amounts that contribute to financing a startup are an embodiment of this common goal. Platforms can display a campaign's previous investment amounts and make the leading investors visible. By doing this, they signal cognitive social capital regarding shared values. Additionally, lead investors' investment amounts indicate the underlying startups' valuation. Thus, sharing this information in the communities' networks contributes to the common knowledge about a startup.

The literature supports a positive relation between early (leading) investment amounts and investments from following investors. Considering the context of reward-based crowdfunding, Ordanini, Miceli, Pizzetti, and Parasuraman (2011) find that the amount of early investments

relates positively to the investment decisions of the following investors. In a study on equity crowdfunding, Vismara (2018a) finds that a greater number of early investors is positively related to funding success while ignoring the actual investment amounts. However, since the chances for higher investments increase with greater numbers of investors, we assume that higher investment amounts also have a positive effect on the individual investors' investment decisions.

We consider investment amounts by lead investors to be costly signals since higher investments involve higher costs. Additionally, the lead investors' investments have a shared goal and a uniform meaning to all participants. Thus, the investment amounts of lead investors, representing cognitive social capital, can signal quality to increase the lead investors' credibility. We claim the following hypothesis:

**Hypothesis 1** *A greater average investment amount by lead investors has a positive effect on the retail investors' investment decisions.*

### 5.3.2 Signaling relational social capital

For this study, we distill the concept of relational social capital to indirect interactions between lead and retail investors, through which lead investors communicate their prestigious status and promote credibility, expectations, norms, as well as identification (Nahapiet & Ghoshal, 1998). On Companisto, investors can apply for an expert status. These investors are labeled as "angel investors" (Companisto, 2022). On the one hand, the angel status grants certain privileges, which enables investors to invest in extra "Angel Club campaigns". Angel Club campaigns differ from regular campaigns because they do not follow the strict legal regulations that crowdinvesting platforms must obey.

On the other hand, the angel status is also associated with certain obligations that angel status investors must fulfill. For example, angels must verify an adequate financial background and must invest a minimum of EUR 25,000 per year. However, angel status investors can also participate in regular campaigns, where retail investors can identify them as angels by their labels. If angel status investors participate in regular campaigns, they can invest any amount within the legal boundaries of crowdinvesting regulations. Hence, angel status investors do not necessarily have to be lead investors.

The angel status represents expertise and privilege. The label signals investor-quality and sophistication, as well as past financial success, which might indicate some experience in the capital market. The participation of angel status investors may positively affect retail investors by creating a sense of trust in the startup (Di Pietro et al., 2020). Moreover, being referred to as "angels", they may also amplify the crowdinvesting communities' identity of enabling startup

financing. The signals that angel status investors send correspond to the facets of relational social capital (Nahapiet & Ghoshal, 1998). The higher the number of angel status investors among lead investors, the more credible an investment might be for retail investors due to the relational capital that angel status investors create.

The literature provides implications regarding a positive effect of lead investors that hold a certain status. Investigating leadership in social trading which is closely related to crowdinvesting, Kromidha and Li (2019) find that the lead investors' credentials have a great effect on following investors. We conclude that the angel status might have a similar reassuring effect on retail investors because it contributes to the lead investors' sophistication and credibility. Furthermore, in other contexts, such as IPOs and venture capital investments, the prestigious status of associated underwriters was found to have a positive effect on following investors (e.g., Carter, Dark, & Singh, 1998; Megginson & Weiss, 1991).

The number of angels among lead investors can be considered a costly signal since investors undergo a costly application process and verify a solid financial background. Moreover, angel status lead investors have attained a prestigious status promoting credibility and expectations of expertise. Therefore, the number of angels among lead investors, representing relational social capital, might increase the retail investors' trust. We claim the following hypothesis:

**Hypothesis 2** *A greater number of lead investors with an angel status has a positive effect on the retail investors' investment decisions.*

### 5.3.3 Signaling structural social capital

Social capital is creatable through interactions. The structural dimension of social capital describes how these interactions can be carried out within the community (Cai et al., 2021). We summarize structural social capital as the means investors use to interact indirectly and to promote interpersonal relations that support the acquisition of credible information about each other and the startups.

According to social capital theory, the contacts one individual investor has with other investors represent the structural dimension of social capital (Granovetter, 1985). The literature provides examples where researchers use proxy-variables, which are correlated with the actual variable of interest, to approximate the investors' connectedness. For example, Kang et al. (2017) approximate the investors' connections by looking at the number of followers because someone who has many followers may also follow many others.

To proxy the open-mindedness of investors to connect with other community participants, we consider the publicity of investor profiles. Some platforms enable investors to create profiles

that can be published in the crowdinvesting community (Vismara, 2018a). Through profiles, investors can share profile pictures, professional backgrounds, experiences, skills, and interests with other investors. By publishing their profiles, investors give access to the information presented on their profiles. However, on Companisto, only those investors who published their own profiles can access other investors' profiles to receive their information. Nevertheless, investors without public profiles can still see whether an investor has a public profile. Therefore, private profile investors can see how many lead investors have a public profile.

Profiles signal structural social capital because they provide the means for retail investors to interact and receive detailed information about whom they might invest with. The structural social capital increases if the number of community members with public profiles increases. Moreover, by publishing their profiles, investors allow others to inquire about their education, experiences, and other background information to appraise their quality (Vismara, 2018a). This possibility is particularly helpful for retail investors, who can learn about the lead investors' qualifications.

Likely, lead and retail investors would not provide public profiles if they had nothing to show. For this reason, retail investors with private profiles, who cannot access other investors' profiles, might still perceive investors with public profiles as credible. In general, the disclosure of lead investors' profiles should build additional trust from retail investors.

Reviewing the literature, we find support for a positive effect of public profiles on individual investors' investment decisions. Investigating reward-based crowdfunding, T. Kim, Por, and Yang (2017) find that entrepreneurs can increase their chances of funding success by disclosing their identities (name and picture). Analyzing the effect of public investor profiles on the crowdinvesting platform Crowdcube, Vismara (2018a) finds that the number of investors with public profiles positively affects individual investors' investment decisions. However, Vismara (2018a) does not look at lead investors specifically.

The number of public profiles among lead investors cannot be considered a costly signal, especially since we do not consider the quality of the profiles' details but simply look at whether someone has a profile. Creating a profile involves only minimal cost. Nevertheless, profiles indeed signal that a lead investor is interested in communal interactions, which facilitates trust, according to the concept of structural social capital. Based on our arguments above, we claim the subsequent hypothesis:

**Hypothesis 3** *A greater number of lead investors with public profiles has a positive effect on the retail investors' investment decisions.*

Essential for the creation of structural social capital is the interaction between investors (Faraj et al., 2016; Nahapiet & Ghoshal, 1998). Interactions include engaging in the community by reciprocal receiving and sending profile information (Cai et al., 2021). Therefore, if retail investors have a public profile, they might participate in a campaign with special engagement and, thus, invest more than their fellow retail investors with private profiles.

More importantly, since interactions are crucial in the context of structural social capital, retail investors with public profiles should be affected even more by lead investors with public profiles than private profile investors. It should be all the more important that only those who have published their own profile can see the profiles of other investors. After all, the interactions between retail and lead investors with public profiles best describe interactions in the sense of structural social capital (Faraj et al., 2016; Nahapiet & Ghoshal, 1998).

Apart from their technical advantage of accessing other profiles, for retail investors with public profiles, it might be more important that other investors also share their profiles. Ultimately, retail investors with public profiles show interest in communal interactions and, therefore, rely on other investors' profile disclosures. Hence, we claim that the number of lead investors with public profiles moderates the effect that the retail investors' own public profiles have on their investment decisions. We conclude this chapter with the following two hypotheses:

**Hypothesis 4a** *The individual investors' profile disclosure has a positive effect on their investment decisions.*

**Hypothesis 4b** *A greater number of lead investors with public profiles positively moderates the effect of the retail investors' own public profiles on their investment decisions.*

## 5.4 Data and methodology

### 5.4.1 Data from the crowdinvesting platform Companisto

The crowdinvesting platform Companisto was founded in June 2012 in Germany with the objective to provide an alternative financing solution for startups (Bade & Walther, 2021; Goethner, Luettig, & Regner, 2021). Until June 2021, the platform has acquired EUR 100,254,874 in funding for 176 startups. Initially, the platform offered lending-based startup investments. After several iterations, the company switched to an equity crowdinvesting model, starting in December 2018, operating a first-come, first-serve mechanism (Goethner, Luettig, & Regner, 2021; Hornuf & Schwienbacher, 2018b).

Simultaneously to introducing the equity model, Companisto implemented two groups of investors: (1) the "Investment Club", which is for regular retail investors who are legally allowed to invest a maximum amount of EUR 25,000 per year, and (2) the "Angel Club", for

investors who are interested in investing more than EUR 25,000 annually on a professional scale (Companisto, 2021a). This split enables the platform to meet the legal requirements of crowdinvesting while allowing professional investors to surpass the legal restrictions regarding the investment amounts. Investors who successfully applied for the Angel Club are labeled as angel status investors. To become an angel status investor, investors must meet specific requirements. For example, investors must invest at least EUR 25,000 annually or must be members of an accredited business angel network. Thereby, the platform ensures that the general quality of Angel Club members does not dilute. Compared to regular investors, angel status investors receive the opportunity to meet face-to-face with entrepreneurs and other angel status investors (Companisto, 2022).

Companisto organizes two types of campaigns. (1) Angel Club campaigns allow only angel status investors to participate. (2) Investment Club campaigns are open for regular and angel status investors. Angel status investors can decide whether to invest on a professional or retail level; regular investors can only invest on a regular basis. Figure 13 shows all campaigns that Companisto accomplished between December 2018 and June 2021. The platform performed 35 Angel Club and 33 Investment Club campaigns during this period. The numbers in front of the bars in Figure 13 indicate the startups associated with a campaign. Accordingly, a total of 40 startups received funding. Figure 13 shows that some startups only receive funding from either an Angel Club or Investor Club campaign, while most startups acquire funding from both types of campaigns. For example, startup 2 received funding only from an Investment Club campaign, while startup 12 solely received Angel Club investments. Furthermore, Figure 13 depicts that two campaigns that support the same startup usually take place in consecutive order, with the Angel Club campaign starting shortly before the Investment Club campaign.

The original panel dataset we obtained from Companisto includes 93.107 investments that were issued since the platform's foundation in 2012 until July 8$^{th}$, 2021, at noon, which is the time of the last record in our dataset. All investments are issued by a total of 23.581 investors. However, the number of registered users is supposedly much higher (Harms, 2021).

Due to the iterations of the funding model and the belated implementation of features, such as investor profiles, investments are not comparable and consistent throughout the whole dataset. To attain a homogeneous dataset, we eliminate all campaigns and investments that took place before December 5$^{th}$, 2018. On that date, the platform started the first campaign that follows the newly introduced equity model. Simultaneously, features such as investor profiles and angel status investors were implemented. Since we investigate the effect of lead investors on retail investors, Angel Club campaigns are generally not applicable because they only consist of investments by angel status investors who must invest on a professional scale and are not

comparable to retail investors. As a consequence, we eliminate all Angel Club campaigns from our sample. Lastly, we remove one outlier. After homogenizing our dataset, our sample consists of 8153 investments by 3211 investors, who invested a total of EUR 17,541,737 in 32 startups (only in Investment Club campaigns).

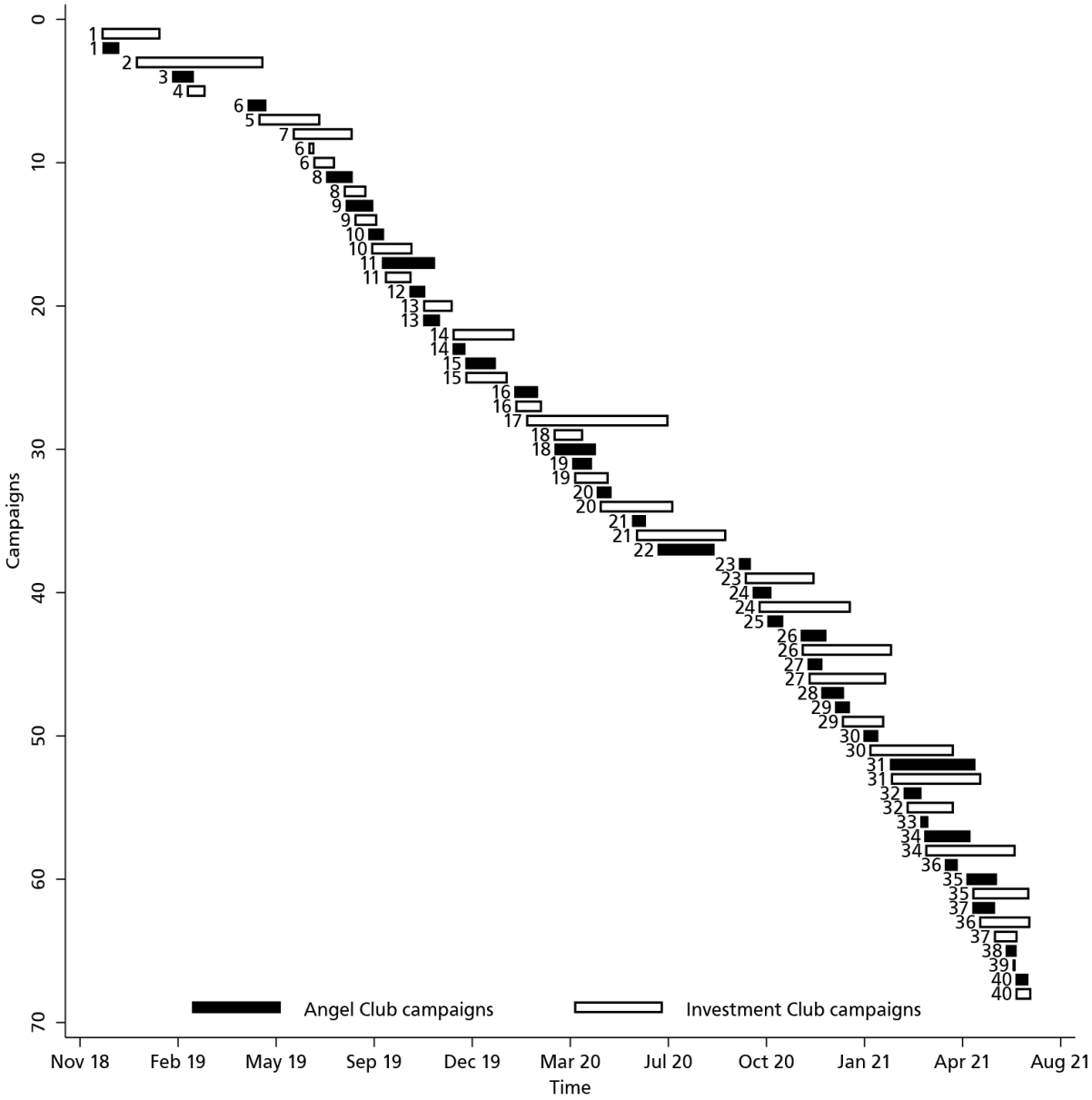


**Figure 13** History of Angel Club and Investment Club campaigns launched on Companisto

We provide an overview of the descriptive statistics for our dependent, independent, and control variables in Table 20. In the following sections, we present all our variables in detail. In addition, we present the correlations matrix in Table 22 in Appendix G.

**Table 20** Descriptive statistics

| | N | Mean | Median | Std. dev. | Variance |
|---|---|---|---|---|---|
| Investment decision | 8153 | 800.852 | 392.857 | 3116.401 | 9,711,958.000 |
| Leaders' amount | 8153 | 9148.288 | 7840.000 | 5711.012 | 32,600,000.000 |
| Leaders' angel status | 8153 | 4.549 | 5.000 | 2.339 | 5.472 |
| Leaders' profiles | 8153 | 3.313 | 4.000 | 3.074 | 9.450 |
| Retailer's profile | 8153 | 0.230 | 0.000 | 0.421 | 0.177 |
| Ln(Funding goal) | 8153 | 14.127 | 13.592 | 1.089 | 1.186 |
| Founders | 8153 | 1.159 | 1.000 | 0.366 | 0.134 |
| Webinars | 8153 | 0.538 | 1.000 | 0.499 | 0.249 |
| Updates | 8153 | 3.926 | 4.000 | 2.915 | 8.499 |
| Angel campaign | 8153 | 0.787 | 1.000 | 0.410 | 0.168 |
| Campaign duration | 8153 | 60.819 | 58.000 | 34.310 | 1177.184 |
| Age | 8153 | 42.323 | 42.000 | 11.493 | 132.092 |
| Gender | 8153 | 0.935 | 1.000 | 0.247 | 0.061 |
| No experience | 8153 | 0.164 | 0.000 | 0.371 | 0.137 |
| Angel status | 8153 | 0.155 | 0.000 | 0.361 | 0.131 |
| Investor's last investment | 8153 | 205.454 | 56.955 | 357.961 | 12,8136.000 |
| Campaign's last investment | 8153 | 5.312 | 0.931 | 13.308 | 177.107 |
| Time profile disclosure | 8153 | 42.465 | 0.000 | 106.746 | 11,394.690 |
| Year 2019 | 8153 | 0.312 | 0.000 | 0.463 | 0.215 |
| Year 2020 | 8153 | 0.286 | 0.000 | 0.452 | 0.204 |
| Year 2021 | 8153 | 0.320 | 0.000 | 0.467 | 0.218 |

### 5.4.2 Dependent variable

We aim to explain how signals of social capital affect the individual retail investors' investment decisions. Presumably, their decisions depend, to a large extent, on their personal circumstances (Kirby & Worner, 2014), like age, education, and in particular, income, and may also depend on personal investment strategies or the investors' personal aversion or affinity towards risk (Goethner, Hornuf, & Regner, 2021; Moreno-Moreno et al., 2019). While personal circumstances vary over the long run and across investors, they are likely to be relatively constant for each investor over the short period covered by our dataset. We account for individual-level fixed effects when calculating the dependent variable *Investment decision*.

To calculate our dependent variable *Investment decision*, we demean each individual investor's investment amount with the average of all previous personal investments. Consequently, our dependent variable is positive if investors decide to invest above their personal average and negative if they invest below their personal average. Since investors who invest for the first time have no average investment yet, our approach requires appropriate control variables, which we introduce and explain in section 5.4.4.

### 5.4.3 Independent variables

On Companisto's campaign websites, investors can see the list of other investors' investment amounts. The list is sorted from the highest to the lowest investment. We identify lead investors based on that list's top ten leading investors. The threshold of ten is random. However, due to

the website layout, most investors will likely recognize roughly the top ten positions. If investors want to view all investments or change the sorting, they must overcome the hurdle of several extra clicks. The list changes if newer investors replace earlier investors with higher investments. Hence, we update the actual list of the top ten investors for every individual investment.

To test hypothesis 1, we introduce the variable *Leaders' amount*. We calculate this variable as the average amount invested by the top ten investors. At the beginning of a campaign, when the number of all investors is below ten, we adapt the calculation of the average accordingly. We test the effect of angel status investors among lead investors, according to hypothesis 2, by counting the absolute number of lead investors with an angel status. We refer to the resulting variable as *Leaders' angel status.* In the same manner, we test the effect of investors with public profiles among lead investors. According to hypothesis 3, we calculate the absolute number of investors with public profiles among lead investors to derive the variable *Leaders' profiles* (Vismara, 2018a). Finally, we introduce the variable *Retailer's profile* to capture whether individual investors disclosed their profiles. The variable is a dichotomous variable, which is coded as one if investors have a public profile and zero otherwise.

We must point out that the profile disclosures and attainment of the angel status are time-dependent. For example, investors might not have a public profile at the beginning of our data record but decide to disclose their profiles later. When counting the number of lead investors with an angel status or public profiles, we consider the dates of attainment or disclosure.

### 5.4.4 Control variables

We use a set of control variables to account for effects that may influence the investors' decisions. In terms of a startup and its underlaying campaign, many scholars find a highly significant effect of the campaigns' funding goals. Accordingly, we include the variable *Ln(Funding goal)* (Hornuf & Schwienbacher, 2018a, 2018b; Koch & Cheng, 2016; Lukkarinen et al., 2016). Campaign success may also depend on the campaign duration (Lukkarinen et al., 2016; Mochkabadi & Volkmann, 2020). We encompass the variable *Campaign duration*, which controls for the total length of a campaign in days. Not all Investment Club campaigns have a related Angel Club campaign (Figure 13). The variable *Angel campaign* is coded as one if a startup was financed through both types of campaigns and zero otherwise.

Startup-specific qualities could also affect the investors' decision. We include the number of *Founders* because Crescenzo, Ribeiro-Soriano, and Covin (2020) and Vismara (2016) find that startup funding is positively related to the number of founders. The startup pitch is important for potential investors because it contains much highly relevant information (Lukkarinen et al.,

2016; Ralcheva & Roosenboom, 2020), which are important for assessing a venture. On Companisto, startups get the opportunity to pitch their startups in webinars, which are uploaded to the campaign-website. We include the respective variable *Webinars* to count how many video-uploads a startup provides. Furthermore, for instance, Block et al. (2018) find that regular updates have a significant positive effect on the funding performance in crowdinvesting. We add the variable *Updates*, which counts how many updates a startup makes.

Since the investors' investment decision depends on personal circumstances (Kirby & Worner, 2014), we include the variables *Age* and *Gender* (Giudici et al., 2020). Moreover, investors may have different levels of experience. Someone who is a first-time investor may decide differently than someone who is an experienced investor. Moreover, since we demean our dependent variable, the mean is zero for new investors, which might distort our dependent variable. We add the variable *No experience*, which is coded as one if investors invest for the first time and zero otherwise. To determine the investors' experiences, we consider all available data, including those from the original dataset. In doing this, we account for the experience of investors who had already invested before the new equity model was introduced.

Angel status investors can choose whether to invest in Angel Club or Investment Club campaigns. On the contrary, regular investors can only invest in Investment Club campaigns. Angel status investors may consider the information provided in Angel Club campaigns but then invest in Investment Club campaigns. In these cases, their decision would be affected by information from Angel Club campaigns. However, even experienced angel status investors could sometimes feel insecure about an investment and invest late and smaller amounts in an Investment Club campaign. Investment Club campaigns allow angel status investors to participate in an investment but on a less professional basis. Inevitably, the angel status investors' decision logic converges from a professional's decision logic towards a retail investor's decision logic when investing in an Investment Club campaign (Fisher, 2009). To compensate for the status of investors, we include the variable *Angel status*, which is coded as one for respective investors and zero otherwise.

The crowdinvesting process takes time and likely depends on dynamic effects (Brown et al., 2019; Hornuf & Schwienbacher, 2018b). For example, the time between two investments may be shorter in the earlier stages of a campaign (Lukkarinen et al., 2016). Also, investors who invest frequently may decide differently than those who only invest rarely. On the investor level, we control for the time that passed in days since the *investor's last investment*. On the campaign level, we control for the time that passed in hours between the last investor's investment until the focal investor's investment by including the variable *Campaign's last investment*. Since we analyze the effect of public profiles, we also control for the time that passed between the

publication of a profile and the respective investor's investment. Hence, we add the variable *Time profile disclosure*, which counts the days between the profile disclosure and an investor's investment. Finally, we control for the year in which an investment was issued. Since our dataset covers four years, we include three dichotomous *Year* control variables.

### 5.4.5 Estimation models

We conduct a multivariate regression analysis using ordinary least square regression models since our dependent variable is continuous. We include clustered standard errors at the level of individual investors. We design our models in accordance with Figure 12. Table 21 presents the results of our analysis. Model 1 includes only control variables. Models 2 to 5 analyze the direct effects as proposed in hypotheses 1 to 4a. We present the interaction effect according to hypothesis 4b in model 6. Finally, model 7 presents the full model.

## 5.5 Results

The mean value for the variable *Investment decision* is EUR 800.85 (Table 20). Since the value is positive, investors generally tend to invest more than their previous personal average. The mean value for *Investment decision* might be distorted due to first-time investors, who naturally will always invest more than their previous average. However, the mean value for *No experience* is only 0.164, indicating that most investors are experienced investors since *No experience* indicates whether someone is an unexperienced first-time investor (see section 5.4.4). Furthermore, the average investment of lead investors is EUR 9128.29. According to Table 20, the number of angel status investors is slightly underrepresented among lead investors, as the value of 4.5 out of 10 indicates. Similarly, on average, only 3.3 out of 10 lead investors have public profiles.

In hypothesis 1, we predict that higher average investment amounts by lead investors positively affect retail investors. According to model 2, if the lead investors' average amount increases by one euro, retail investors invest EUR 0.05 more than they did on average so far (M2, b = 0.050, p = 0.000). We find the effect is positive and highly significant, also in the full model 7. This finding supports our first hypothesis and implies that signaling cognitive social capital affects retail investors positively.

We predict a positive relation between the number of angel status lead investors and the retail investors' investment decisions. Model 3 shows, in contrast to our expectations, angel status lead investors have a negative but non-significant effect. More interestingly, when computing the full model, the effect of *Leaders' angel status* remains negative but becomes highly significant (M7, b = -73.454, p = 0.000). These findings imply that ceteris paribus, one additional lead

investor with an angel status, affects retail investors so that they will invest EUR 73.45 less. Eventually, we find no support for hypothesis 2, which claims that signaling relational social capital positively affects retail investors.

**Table 21** OLS regressions explaining retail investors' investment decisions

| Dependent variable: Investment decision | M1 | M2 | M3 | M4 | M5 | M6 | M7 |
|---|---|---|---|---|---|---|---|
| Ln(Funding goal) | 738.917*** | 564.445*** | 753.122*** | 750.476*** | 745.334*** | 755.442*** | 610.554*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Founders | 822.790*** | 704.895*** | 881.579*** | 783.118*** | 814.173*** | 776.442*** | 838.248*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Webinars | 339.338* | 310.624* | 370.586** | 264.347 | 325.262* | 254.227 | 324.475* |
| | (0.016) | (0.026) | (0.010) | (0.061) | (0.021) | (0.071) | (0.023) |
| Updates | -123.465*** | -83.771*** | -127.121*** | -123.283*** | -125.805*** | -125.460*** | -93.874*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Angel campaign | -1200.013*** | -931.595*** | -1209.611*** | -1250.585*** | -1217.589*** | -1265.367*** | -1002.250*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Campaign duration | -10.985*** | -11.912*** | -10.605*** | -12.012*** | -11.054*** | -12.054*** | -11.826*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Age | 15.863*** | 15.696*** | 15.864*** | 16.025*** | 16.201*** | 16.344*** | 16.166*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Gender | -48.648 | -49.235 | -46.065 | -44.367 | -57.670 | -53.221 | -45.547 |
| | (0.698) | (0.696) | (0.713) | (0.724) | (0.645) | (0.670) | (0.715) |
| No experience | 2062.707*** | 2014.248*** | 2061.275*** | 2057.376*** | 2063.817*** | 2058.605*** | 2000.929*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Angel status | -346.957* | -349.442* | -345.732* | -341.785* | -365.786* | -362.435* | -360.687* |
| | (0.046) | (0.044) | (0.047) | (0.050) | (0.036) | (0.038) | (0.039) |
| Investor's last invest. | 0.456*** | 0.418*** | 0.460*** | 0.448*** | 0.491*** | 0.482*** | 0.453*** |
| | (0.000) | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Campaign's last invest. | 2.248 | 1.593 | 2.327 | 2.412 | 2.325 | 2.492 | 2.027 |
| | (0.341) | (0.490) | (0.323) | (0.309) | (0.325) | (0.294) | (0.379) |
| Time profile disclosure | -1.426* | -1.382* | -1.445* | -1.452* | -2.646** | -2.617** | -2.636** |
| | (0.013) | (0.016) | (0.011) | (0.011) | (0.001) | (0.001) | (0.001) |
| Year 2019 | 177.715 | 97.856 | 137.432 | 196.091 | 185.653 | 201.580 | -16.317 |
| | (0.172) | (0.454) | (0.284) | (0.134) | (0.152) | (0.123) | (0.898) |
| Year 2020 | 64.562 | -110.690 | 10.921 | -171.328 | -27.831 | -282.584 | -639.213*** |
| | (0.621) | (0.413) | (0.933) | (0.245) | (0.836) | (0.067) | (0.000) |
| Year 2021 | -89.607 | -394.664* | -141.898 | -372.973* | -147.754 | -453.450* | -946.404*** |
| | (0.555) | (0.020) | (0.340) | (0.035) | (0.335) | (0.013) | (0.000) |
| Leaders' amount | | 0.050*** | | | | | 0.054*** |
| | | (0.000) | | | | | (0.000) |
| Leaders' angel status | | | -22.640 | | | | -73.454*** |
| | | | (0.177) | | | | (0.000) |
| Leaders' profiles | | | | 63.961** | | 67.318** | 65.379* |
| | | | | (0.004) | | (0.003) | (0.013) |
| Retailer's profile | | | | | 474.236*** | 572.547* | 544.345* |
| | | | | | (0.001) | (0.034) | (0.046) |
| Leaders' profiles × Retailer's profile | | | | | | -20.602 | -15.286 |
| | | | | | | (0.585) | (0.687) |
| Constant | -9678.772*** | -7627.520*** | -9820.783*** | -9722.476*** | -9750.352*** | -9777.118*** | -7994.123*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Observations | 8153.000 | 8153.000 | 8153.000 | 8153.000 | 8153.000 | 8153.000 | 8153.000 |
| R-sqr | 0.168 | 0.172 | 0.168 | 0.169 | 0.170 | 0.171 | 0.175 |
| adjusted-R-sqr | 0.167 | 0.170 | 0.167 | 0.167 | 0.168 | 0.169 | 0.173 |
| p-Value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

* p<0.05, ** p<0.01, *** p<0.001; p-values reported in parentheses; all models are OLS regressions with clustered standard errors for investors.

Our third hypothesis claims that higher numbers of lead investors with public profiles positively affect the retail investors' investment decisions. In model 4, we find that if one additional investor with a public profile joins the lead investors, retail investors invest EUR 63.96 more (M4, b = 63.961, p = 0.004). This effect is significant at a 1%-level. The effect of *Leaders' profiles* is consistent for the interaction and full models 6 and 7. Therefore, we find support for hypothesis 3, implying a positive relation between signals of structural social capital.

According to hypotheses 4a and b, investors with public profiles invest more than private profile investors, and the number of public profile investors amplifies their investment decision. While we find support for hypothesis 4a, we do not find support for hypothesis 4b. Apparently, investors with public profiles invest EUR 474.24 more than investors with private profiles (M5, b = 474.24, p = 0.001). Yet, the number of lead investors with public profiles has no moderating effect on public profile investors (M6, b = -20.602, p = 0.000). These findings are against our expectations regarding the effect of structural social capital. In conclusion, the full model (M7) confirms all our findings of models 2 to 6 except for the effect of *Leaders' angel status* (M3). We will discuss the implications of these findings in the next chapter.

## 5.6 Discussion and conclusion

In line with findings by previous researchers (e.g., Cai et al., 2021; Kromidha & Li, 2019; Li et al., 2016), our results imply that lead investors usually have a positive effect on retail investors (signaling cognitive and structural social capital). We are surprised to find that, under certain conditions, lead investors might even have a negative effect on retail investors (signaling relational social capital). We will discuss our findings in detail in the following sections.

### 5.6.1 How cognitive social capital affects investment decisions

From a signaling perspective, the investment amount is suitable to signal quality (Connelly et al., 2011). Investment amounts are directly related to the signal cost that lead investors must bear to become lead investors. Due to the close correlation between a startup's value and the investment amounts by lead investors, the average investment amount can be considered a strong signal (Bafera & Kleinert, 2022). Through higher investments, lead investors signal that they believe in a startup's future and business case, which will eventually pay off with high returns. Retail investors may therefore perceive higher investments from lead investors as quality signals.

From a social capital perspective, the average amount invested by lead investors supports the creation of social capital (Nahapiet & Ghoshal, 1998): First, investment amounts are quantifiable by all investors, facilitating a shared interpretation of the community. In that sense,

the average amount is interpretable as an indicator of value and risk, capable of reducing common uncertainties in the community. While uncertainties regarding the startups' value may be most concerning, uncertainties about adequate investment amounts are also resolvable. Second, investors, who invest significant amounts, contribute significantly to achieving the common goal of financing an innovative startup.

The lead investors' average investment amount resolves information asymmetries regarding the leaders' assessment but leaves questions regarding the investors' actual qualifications unanswered. Ultimately, investors could also be self-overestimating show-offs who wastefully spend surplus capital. Since the interpretation of investment amounts comes with some uncertainties regarding the quality of lead investors, retail investors might search for other signals from lead investors.

### 5.6.2 How relational social capital affects investment decisions

According to our prediction, the negative and non-significant effect of angel status investors among lead investors is unanticipated, especially since we find various implications regarding a positive effect of professionals and expert investors in the literature (K. Kim & Viswanathan, 2019; Vismara, 2018a). We expected that angel status lead investors who signify the expertise, capabilities, and professionalism that are associated with usual angel investors through their label (Vismara, 2018a), endorse the underlying startups' quality (Courtney et al., 2017), and affect retail investors positively. However, from the relational social capital perspective, we believe three facets provide the best explanation for the negative effect of angel status lead investors: expectations, identification, and commitment (Nahapiet & Ghoshal, 1998).

First, if angel status investors do not comply with the retail investors' expectations (Nahapiet & Ghoshal, 1998) and act contrary to their anticipated decision logic (Fisher, 2009), they can become underwhelmed. If angel status investors participate in a regular Investment Club campaign instead of a professional Angel Club campaign, retail investors might suspect that lead investors with an angel status want to avoid the commitment and consequences that arise from investing capital at a higher and more professional scale. In that case, lead investors with an angel status may lose their credibility towards retail investors. Instead of reassuring the investment decision of retail investors, angel investors, who participate in Investment Club campaigns, may increase uncertainties.

Second, the prestigious angel status may not promote identification but instead cause a perception of segregation, as it diverts regular and professional investors from each other. Therefore, angel status investors diminish communal relations (Granovetter, 1985; Tsai & Ghoshal, 1998). Third, an alternative interpretation of the unexpected finding could be that

retail investors do not perceive angel status investors as committed professionals. However, commitment and expectations are two essential facets of cognitive social capital (Nahapiet & Ghoshal, 1998).

Finally, from a signaling point of view, the Angel status should be perceived as a costly signal which expresses investor-quality. Perhaps, however, retail investors do not perceive the angel status as a label that signifies expertise because they are not aware of the associated costs and requirements. Hence, the angel status might also have an irritating effect.

### 5.6.3 How structural social capital affects investment decisions

As our findings imply, the number of lead investors with public profiles has a positive effect on the investment decisions of retail investors. Albeit the cost of disclosing one's profile is low, investors with public profiles send an unmistakable signal of being interested in community interactions, contributing the communal knowledge, and participating in the networks (Nahapiet & Ghoshal, 1998).

A public profile sends a strong signal of structural social capital for multiple reasons (Nahapiet & Ghoshal, 1998). First, if investors with public profiles were not interested in activities that create social capital, they would not spend the time to edit and disclose their profiles. Second, public profiles signal the lead investors' open-mindedness, creating the impression of proximity between lead and retail investors (Agrawal et al., 2015). This impression of proximity may have a strengthening effect on the internal network. Third, public profiles might increase the credibility of lead investors because they enhance transparency and express that they have nothing to hide, which augments trust, even if interactions through profiles are only indirect.

As expected, the number of lead investors with public profiles affects retail investors, who receive the signal, positively, which provides a first implication that structural social capital can increase credibility. Yet, especially in terms of structural social capital, reciprocal interactions may be important since the information in communal networks is exchanged in both directions (Cai et al., 2021). Therefore, we investigate whether retail investors with public profiles have an enhanced perception of lead investors with public profiles. Before testing the interaction according to hypothesis 4b, we test whether investors with public profiles invest higher amounts than investors with private profiles.

Our results imply that investors with public profiles invest more than investors with private profiles. This effect may be due to a generally stronger engagement of public profile retail investors in the community. These investors may want to contribute to the community not only through investments but also through their personal backgrounds and shared knowledge (Cai et al., 2021). Additionally, investors who disclose their profiles may feel a stronger connection

to the community, and according to Granovetter (1985), participants who have a closer communal connection are increasingly willing to trust, contribute, and invest.

On Companisto, only investors with public profiles can view other investors' profiles. Hence, the motivation of investors with public profiles to disclose their profiles could be to receive access to other profiles, for example, to check whether the current leaders are high-quality investors. However, we do not find a significant interaction effect supporting this assumption.

This finding regarding the interaction effect may have several explanations: First, for example, investors might not look into other co-investors' profiles. This behavior could be the case if they were not interested in who invests along with them. However, it is more likely that the information they receive is sufficient, even without viewing other public profiles. By default, investors with public profiles always show their job titles and company name. Hence, this information alone could be enough to signal credibility. Second, public profiles could be convenient features that facilitate the creation of communities. These communities increase the individual investors' trust, which explains the significance of the direct effects (M5 and M6). Third, the feature of interacting via profiles may simply not yet have reached a critical level to be effective. Finally, fourth, the platform could already offer a different and more practical feature for investor interactions.

### 5.6.4 Theoretical implications

To the best of our knowledge, ours is the first study to combine signaling and social capital theory to investigate the dissolution of information asymmetries between lead and retail investors. We find that combining the signaling and social capital theory facilitates investigating investment decisions because it allows a differentiated analysis of facets and structure, explaining why signals have a certain effect. Informational resources that flow between investors in a network constitute social capital. However, the effectiveness of information depends on its credibility and quality, which each dimension of social capital facilitates differently. In the remainder of this section, we reflect on the signaling effects of each dimension of social capital.

On the dimension of cognitive social capital, information asymmetries between investors might exist regarding common goals and interpretations of the startups' values (Cicourel, 1973; Nahapiet & Ghoshal, 1998). The lead investors' investment amount increases trust between lead and retail investors as the amount represents a costly and strong signal of social capital (Bafera & Kleinert, 2022; Connelly et al., 2011). In addition, retail investors can reduce two uncertainties when considering this indicator: First, they learn how other investors assess

startups. Second, they learn what amounts other investors generally invest, which also implies characteristics of lead investors.

On the dimension of relational social capital, information asymmetries between investors might exist regarding the lead investors' expectations and commitment and their credibility as qualified investors. We consider the number of angel status investors to be a strong and costly signal. Against our prediction, we conclude that relational signals can decrease trust and therefore impair the retail investors' decisions. We identify various reasons: First, the negative effect might result from underwhelmed expectations, for example, since angel status investors are expected to invest in a dedicated Angel Club campaign at a more professional scale than in a regular Investment Club campaign at the scale of small investors. Second, the prestigious angel status may segregate the community instead of unifying it. We assume retail investors might not know about the obligations that angel status investors must obey before attaining their prestigious label and therefore do not interpret their label as a signal of quality.

On the dimension of structural social capital, information asymmetries between investors might exist regarding the lead investors' willingness to provide personal and startup-related information and their willingness to connect with the community (Cai et al., 2021; Nahapiet & Ghoshal, 1998). Despite public profiles involving only low cost and being weak signals (Bafera & Kleinert, 2022; Connelly et al., 2011), lead investors with public profiles reduce information asymmetries towards retail investors. Communities that are built on relations promote trust (Granovetter, 1985). Public profiles help form relations by making investors and their information accessible, as well as by increasing the virtual proximity between investors. While profiles are, per se, interpretable as signals of investor-quality, we do not find evidence that the profiles' details contribute significantly to the impression of quality.

### 5.6.5 Practical implications

Our study provides valuable practical implications for platform operators. Our findings show that platform operators can exploit lead investors to raise trust and enhance the performance of their campaigns. According to our results, lead investors have the greatest effect on retail investors if they invest high amounts and have public profiles; however, an angel status is not recommended. Platforms can support their campaigns by deliberately accentuating lead investors, who comply with these attributes, and by encouraging potential lead investors to adopt the same attributes.

Additionally, platform operators can optimize the features on their platforms to signal social capital more effectively. First, the investment amount holds two informational aspects: it indicates the value of a startup based on the lead investors' assessment and provides a

benchmark for an adequate investment amount. Platform operators should optimize existing and new features according to these aspects. A new feature to resolve uncertainties regarding the startups' value could be an independent rating that is presented on the campaign website. Another new feature that provides an indication of an appropriate amount could be statistical indicators. These indicators should take the individual investors' previous investment amounts into account. For example, the indicators could provide a reference of how much other investors with similar experiences have invested, how much one needs to invest to outperform the investor with the next highest investment, etc.

Second, features that promote community building, such as public profiles, facilitate the decision process of retail investors. Platform operators can use public profiles to enable interactions between investors in order to decrease the anonymity between investors and increase the proximity of participants within the communal network. Features should facilitate interpersonal relations and the possibility of forming direct and indirect connections to promote interactions in terms of structural social capital. We find that public profiles have a highly significant effect, despite only allowing for indirect interactions. Therefore, we encourage the implementation of features that enable indirect interactions since they mean only a low initial hurdle that facilitates participation in the community. Furthermore, we find it interesting that neither investment amounts nor public profiles explicitly make a statement about the quality of an investor or startup. Instead, in our study, both signals are implicit, rely on interpretation, and therefore are "hard-to-codify"; yet, they contribute relevant knowledge to the community (Faraj et al., 2016, p. 669).

Third, since a privileged status of lead investors can have a negative effect on the investment decision of retail investors, platform operators should be aware that a privileged status might have a segregating effect, reduce identification with the community, or even create uncertainty rather than trust. Our findings imply that platform operators must implement privileged investor status wisely. Furthermore, we believe, to use the investor status as a signal of quality, platforms must make the requirements for attaining the status transparent and clear so that the status is understandable for everybody and does not cause misinterpretations.

In conclusion, we follow Vismara (2019, p. 8), who finds that "[retail] investors are more sensitive to a community logic" as compared to professional investors. Nevertheless, we stress that this tendency of retail investors does not contradict that retail investors prefer high- over low-quality startups and presuppose that an investment is financially successful. Platform operators may facilitate the community-building process and strengthen communal relations while making it easier for retail investors to scrutinize their lead- and co-investors' qualifications.

### 5.6.6 Limitations and future research

The key contribution of our study is that we use quantitative methods to understand which signals of social capital lead investors can use to establish trust towards retail investors by dissolving information asymmetries in between investors. However, our study has some limitations. In the context of social capital theory, we identify three limitations. First, we only consider internal social capital, letting aside the effect that signals of the (same) three dimensions of external social capital might have on the retail investors' investment decision. Our study is limited to the fact that we only consider interactions that take place within the platform. When considering external networks, the equivalent to lead investors would be, for example, opinion leaders or influencers. While some studies have already investigated the effect of third-party endorsements (Courtney et al., 2017), an investigation based on social capital signals could help to attain insights into creating trust between signal senders and receivers.

Second, the distinctions between the social capital dimensions are not clear-cut (Nahapiet & Ghoshal, 1998). Therefore, our approach to assigning technical features from a crowdinvesting platform to a specific dimension is ambiguous. We encourage future researchers to pursue our theoretical approach in order to test the effect of other platform features, which will eventually elucidate the effect of signals from each dimension of social capital.

Third, in our study, we only measure indirect interactions, such as interactions through profiles. Indirect interactions are based on monodirectional signals that a focal investor can receive from others but to which the focal investor cannot respond with a signal to the original sender. However, some platforms enable personal or public communication in proprietary chat rooms between entrepreneurs and investors as well as in between investors. Further, some platforms enable direct and personal contact between investors in the style of social media friends. Analyzing the impact of direct communication between investors may unravel further insights regarding all three dimensions of social capital.

Additional limitations are attributable to our dataset. For example, we cannot measure the quality of lead investors based on the information they provide on their profiles. In a panel data setting, it would also be necessary to account for profile changes to measure the profile quality. Also, our dataset is limited in terms of measuring the startups' quality. Despite including various control variables, we might miss critical factors that explain the investors' startup assessment. As platforms mature, features evolve, and crowdinvesting develops further, the capabilities to create social capital will thrive. We believe the true potential of crowdinvesting is in the resources that become available by enabling communal participation. We encourage future researchers to explore the potentials of social capital because the resources that originate from crowdinvesting communities are precious for all participants of internal and external networks.

## 5.7 Appendix G

**Table 22** Correlations of dependent, independent and control variables

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Investment decision | 1.000 | | | | | | | | | | | | | | | | | | | | |
| 2 | Leaders' amount | 0.235 | 1.000 | | | | | | | | | | | | | | | | | | | |
| 3 | Leaders' angel status | 0.087 | 0.432 | 1.000 | | | | | | | | | | | | | | | | | | |
| 4 | Leaders' profiles | -0.142 | 0.123 | 0.061 | 1.000 | | | | | | | | | | | | | | | | | |
| 5 | Retailer`s profile | -0.112 | -0.010 | -0.082 | 0.424 | 1.000 | | | | | | | | | | | | | | | | |
| 6 | Ln(Funding goal) | 0.206 | 0.355 | 0.142 | -0.267 | -0.121 | 1.000 | | | | | | | | | | | | | | | |
| 7 | Founders | 0.139 | 0.306 | 0.371 | -0.191 | -0.153 | -0.140 | 1.000 | | | | | | | | | | | | | | |
| 8 | Webinars | -0.138 | -0.059 | -0.143 | 0.680 | 0.377 | -0.290 | -0.469 | 1.000 | | | | | | | | | | | | | |
| 9 | Updates | -0.110 | -0.331 | -0.174 | -0.050 | -0.040 | 0.111 | -0.128 | -0.313 | 1.000 | | | | | | | | | | | | |
| 10 | Angel campaign | -0.093 | -0.181 | -0.223 | 0.314 | 0.209 | 0.249 | -0.700 | 0.562 | -0.152 | 1.000 | | | | | | | | | | | |
| 11 | Campaign duration | -0.137 | -0.083 | 0.136 | 0.215 | 0.037 | -0.358 | 0.269 | -0.141 | 0.429 | -0.495 | 1.000 | | | | | | | | | | |
| 12 | Age | 0.050 | 0.060 | 0.009 | 0.022 | 0.009 | 0.047 | 0.009 | 0.034 | -0.059 | 0.031 | -0.061 | 1.000 | | | | | | | | | |
| 13 | Gender | -0.032 | 0.010 | 0.011 | 0.050 | 0.073 | 0.033 | -0.036 | 0.066 | -0.052 | 0.096 | -0.039 | -0.059 | 1.000 | | | | | | | | |
| 14 | No experience | 0.201 | -0.013 | -0.050 | 0.003 | -0.084 | -0.090 | -0.040 | 0.000 | 0.088 | -0.062 | 0.102 | -0.097 | -0.090 | 1.000 | | | | | | | |
| 15 | Angel status | -0.054 | 0.027 | 0.031 | -0.040 | 0.151 | 0.011 | 0.061 | -0.010 | -0.087 | -0.012 | -0.057 | 0.173 | 0.032 | -0.157 | 1.000 | | | | | | |
| 16 | Investor`s last invest. | 0.026 | 0.107 | 0.067 | 0.027 | -0.104 | 0.091 | 0.053 | -0.032 | 0.001 | -0.011 | -0.018 | 0.016 | 0.004 | -0.255 | -0.083 | 1.000 | | | | | |
| 17 | Campaign`s last invest. | -0.050 | -0.067 | -0.018 | 0.092 | 0.028 | -0.177 | -0.026 | 0.100 | 0.061 | -0.013 | 0.156 | -0.011 | -0.013 | 0.042 | 0.008 | -0.043 | 1.000 | | | | |
| 18 | Period Profile disclosure | -0.134 | 0.013 | -0.087 | 0.320 | 0.727 | -0.087 | -0.160 | 0.348 | -0.125 | 0.196 | -0.056 | 0.024 | 0.068 | -0.138 | 0.186 | -0.068 | -0.002 | 1.000 | | | |
| 19 | Year 2019 | 0.113 | -0.099 | 0.006 | -0.726 | -0.369 | -0.124 | 0.277 | -0.486 | -0.067 | -0.445 | -0.148 | -0.034 | -0.065 | 0.057 | 0.031 | -0.060 | -0.026 | -0.268 | 1.000 | | |
| 20 | Year 2020 | -0.077 | -0.079 | -0.030 | 0.348 | 0.162 | -0.018 | 0.102 | 0.035 | 0.337 | -0.007 | 0.380 | 0.024 | 0.037 | -0.037 | 0.013 | 0.035 | 0.082 | -0.020 | -0.426 | 1.000 | |
| 21 | Year 2021 | -0.067 | 0.177 | -0.099 | 0.572 | 0.305 | -0.143 | -0.299 | 0.637 | -0.324 | 0.358 | -0.207 | 0.032 | 0.031 | 0.006 | -0.038 | 0.006 | 0.004 | 0.355 | -0.463 | -0.434 | 1.000 |

# 6 Discussion

This dissertation investigates participative financing techniques, such as crowdfunding, crowdinvesting, and participative co-financing, which have the potential to facilitate sustainable development. The objective of the dissertation is to shed light on the overarching question of how quality signals in participative financing affect the probability of campaign success in order to support economically viable and sustainable ventures. After motivating this overarching question, introducing relevant literature, and identifying related research gaps, the dissertation presents four research studies. Each study yields an individual contribution to the literature. This Chapter discusses the overall contribution to the literature and provides answers to the overarching research question. Section 6.1 summarizes each studies' key findings. Section 6.2 presents the implications across the four studies according to the levels of quality signals, sustainability and participation, and economic viability.

## 6.1 Conclusion

Participative financing techniques are particularly prone to information asymmetries (Ahlers et al., 2015; Vismara, 2019). Sustainable ventures face preconceptions regarding the compatibility of developing sustainability and achieving profitability simultaneously (Porter & Kramer, 2011; Shepherd & Patzelt, 2011; Wehnert et al., 2019). Knowledge about how to signal venture quality effectively is essential to resolve information asymmetries and preconceptions in order to raise trust and encourage participation. This dissertation poses four research questions and provides contributions on all three levels of analysis. First, it investigates new quality signals that help raise trust. Second, the dissertation provides insights that contribute to resolving ambiguous implications regarding the effectiveness of participative financing to support sustainable ventures. Third, it shows how participative financing can support the development of economically viable ventures.

The research question in study A addresses the relation between values of sustainability and personal value, where sustainable values relate to the communities and environment (e.g., Abdelkafi & Täuscher, 2016), while personal value relates to the supporters' private profit (e.g., Sheth et al., 1991; Sweeney & Soutar, 2001). In the context of reward-based crowdfunding, the findings in study A indicate that ventures can encourage participation by signaling ecologic,

economic, social, or supporters' personal values (Abdelkafi & Täuscher, 2016; Connelly et al., 2011; Emerson, 2003). Thereby, in comparison to previous research, study A captures all three dimensions of sustainability in a disaggregated way. Study A indicates that "the first impression matters" in participative financing. While sustainable values have a positive moderating effect on the relation between supporters' personal values and crowdfunding success in teasers, the effect is negative in descriptions. Nevertheless, since campaigns with more sustainable values are always more successful than campaigns with fewer sustainable values, the findings imply that crowdfunding is suitable for supporting sustainable ventures. Moreover, the results imply a crowding-out effect in the sense that supporters accept fewer personal gains to achieve more sustainable and communal aims.

In study B, considering financial-return crowdfunding, the research question addresses the relation between the ventures' sustainable orientation and profitability, similar to study A. However, in study B, profitability relates to the campaigns' interest rates. The results in study B imply that ventures with a sustainable orientation are neither more nor less successful than ventures with no particular sustainable orientation (Vismara, 2019). Regular ventures can increase participation by raising the interest rate, while the interest rate does not affect participation in sustainable ventures, improving their economic viability. A theoretical explanation for this effect is that the interest rate signals venture quality by indicating higher profitability for investors; however, sustainable orientation mitigates this effect. In contrast, the campaign duration does not affect the probability of crowdfunding success. Lastly, study B contributes a cross-platform analysis that focuses on the German-speaking market for financial-return crowdfunding and highlights the sustainability and energy sector.

Regarding the research question of study C, the empirical evidence implies that decision-makers in regional banks accept and consider financial-return crowdfunding types for participative co-financing. Study C is the first to investigate how an established financial service provider can exploit the potential of a hybrid financing technique that combines the advantages of participative financing with established banking. The investigation is based on a dedicated conceptual framework and uses the technology acceptance model as a theoretical foundation (F. D. Davis, 1986). Being perceived as innovative and targeting startups (each reflecting perceived usefulness) positively affects the acceptance of participative co-financing. Existing know-how (reflecting perceived ease of use) and business-related experiences also have a positive effect. These findings are consistent for lending- and equity-based crowdfunding. Study C reveals that only experienced decision-makers see relevant potential in targeting cultural activities, thereby supporting communal development. In conclusion of study C, decision-

makers must collect more experiences to be able to better assess the potentials of participative co-financing as means for communal inclusion and regional development.

Study D is concerned with research question four which addresses the interaction between retail and lead investors based on signaling theory (Akerlof, 1970; Spence, 1973) and social capital theory (Nahapiet & Ghoshal, 1998). Social capital theory has already been used in study C as a motivation to explore the potentials that arise from crowd participation. Study D contributes a unique combination of signaling theory with social capital theory to investigate where social capital originates and what signaling effects it has. Study D finds that lead investors can help to raise the retail investors' trust in the ventures' quality. Trust is achievable by sending signals of cognitive social capital in terms of higher investment amounts, which signify venture quality. Signaling the lead investors' qualities through public profiles, in terms of structural social capital, also raises trust. However, our findings imply that signals of relational social capital might even diminish trust if they disappoint expectations and emphasize differences in status, thereby impairing communal cohesion (Faraj et al., 2016). In conclusion, a sense of community and interactions between investors might be more important to retail investors than the actual qualifications of role model lead investors.

## 6.2 Implications for research

The four studies present valuable implications for research about how quality signals affect the success of participative financing campaigns. Moreover, the studies show how participative financing can contribute to developing economically viable and sustainable ventures. All four studies provide answers to their respective research questions. Sections 6.2.1 to 6.2.3 explain how each study contributes to the three levels of analysis in this dissertation, answering the overarching research question.

### 6.2.1 Implications on the level of quality signals

On the level of quality signals, the four studies examine the effects that quality signals have on the performance of participative financing from different points of view. In doing so, the dissertation contributes several relevant qualities to the literature and contributes findings regarding the effectiveness of signals. The dissertation finds that certain aspects of sustainability and signals from lead investors are quality indicators and that the communal orientation within a platform helps to exchange signals. These signals significantly affect the performance of participative financing.

First, in reward-based crowdfunding, study A implies that values, according to the blended supporter value proposition (Emerson, 2003), are qualities that have a positive effect on crowdfunding success. These quality signals are ecologic, economic, and social values, as well as the supporters' personal value. Regarding ecologic value, our findings are in line with Böckel et al. (2020) and Calic and Mosakowski (2016) but are opposite to Hörisch (2015). Regarding economic value, our findings are opposite to Chan et al. (2019), who find that money salience negatively affects crowdfunding success (see section 6.2.3). Lastly, the literature makes a mostly uniform claim regarding the effect of social value. In line with, for example, Allison et al. (2015), Calic and Mosakowski (2016), and Parhankangas and Renko (2017), we find a positive relation between social value and crowdfunding success.

Second, in financial-return crowdfunding, study B implies that the campaigns' sustainable orientation has a positive but non-significant effect on the probability of success. This observation is in line with Vismara (2019). Nevertheless, study B finds that a sustainable orientation mitigates the effect of the interest rate, which is beneficial for the ventures' economic viability. Study B shows that the interest rate represents a venture quality with a positive effect on financial-return campaigns (Feng et al., 2015; Stiglitz & Weiss, 1981). In contrast to the anticipated effect (Lukkarinen et al., 2016; Mollick, 2014; Pitschner & Pitschner-Finn, 2014), the campaign duration does not affect financial-return crowdfunding negatively. Overall, according to studies A and B, this dissertation finds a positive relation between sustainable venture qualities and campaign performance.

Third, lead investors can transmit signals about the ventures' qualities, according to study D. Study D finds that the investment amount by lead investors has a significant effect on the decision of retail investors. On the one hand, the lead investors' investment amounts are surrogate signals for the ventures' quality (Cai et al., 2021). On the other hand, they signal a reference amount, which helps subsequent investors determine an adequate investment amount. Thus, study D confirms that lead investors can help reduce uncertainties and increase trust in ventures through quality signals to leverage the campaign performance (Ahlers et al., 2015; Connelly et al., 2011). In contrast to the qualities examined in studies A and B, the lead investors' investment amount rather is an indirect signal, which relies on a shared interpretation and common understanding of a community (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998); where direct quality signals are sent directly from the ventures (e.g., values in description texts), and indirect signals are conceivable only indirectly through other participants within the community.

Fourth, the effectiveness of indirect quality signals depends much on the environment in which they are sent and received. Participative financing campaigns are realized on dedicated

platforms, which serve as the environment where the crowd can form communal networks, interact, and exchange informational resources (Bafera & Kleinert, 2022; Faraj et al., 2016). Especially study D elucidates the importance of communal interactions to create trust and encouragement participation, in line with Brown et al. (2019). The lead investors' public profiles and prestigious angel status are signals that retail investors can receive through interacting on the platform. Retail investors can utilize these signals to assess the quality of lead investors, who indirectly indicate the venture quality through their investment amounts. The findings of study D imply that the lead investors' public profiles support the creation of communal cohesion (Faraj et al., 2016), while the lead investors' angel status impairs the creation of relational ties between retail and lead investors on crowdinvesting platforms. We argue that lead investors with public profiles facilitate the creation of communities because they express open-mindedness and interest in communal interactions (Vismara, 2018a) while contributing to the community's knowledge (Nahapiet & Ghoshal, 1998). Thereby, they give the impression of proximity between individual investors (Agrawal et al., 2015), which strengthens internal networks.

In contrast, the lead investors' angel status can impair the creation of online communities because they segregate the community into status- and non-status-holders. Moreover, retail investors expect angel status holders to invest in dedicated Angel Club campaigns. Therefore, their participation in regular campaigns disappoints the retail investors' expectations and raises uncertainties (Nahapiet & Ghoshal, 1998). This behavior diminishes participants' trust and communal relations (Granovetter, 1985; Tsai & Ghoshal, 1998).

Study A confirms the relevance of socially motivated communal action in participative financing. Many investors commit to participative financing because they want to help others and support social ventures (e.g., Allison et al., 2015; Pietraszkiewicz et al., 2017) to achieve sustainable and communal aims. Study A also shows that a campaign's social value has a positive effect on supporters and that supports are willing to reduce personal profits to increase the campaigns' sustainable value creation, which includes communally shared values (Abdelkafi & Täuscher, 2016; Emerson, 2003; Porter & Kramer, 2011). Moreover, the identity of platforms examined in studies A and D might induce the importance of communal aspects (Hörisch, 2015). Kickstarter focuses on communal and social welfare (Butticè et al., 2017), while Companisto identifies as one of the largest online networks of startup investors. Thus, both platforms make communal and network relations a part of their identity. Ventures and participants that contribute to the manifestation of these identities may comply most with what other supporters and investors are looking for and thus encourage them to participate on a particular platform (Cai et al., 2021; Nahapiet & Ghoshal, 1998). From a different point of view,

study C contributes to the findings regarding the relevance of online communities in participative financing. Study C implies that experiences with participative financing have a significant effect on recognizing the potentials that arise from the communal character of participative financing. Study C shows that decision-makers with business-related experiences see potential in offering participative financing for communal and cultural ventures, while inexperienced decision-makers do not see this potential.

Fifth, following signaling theory, the effectiveness of quality signals plays a major role. Effectiveness depends, for example, on the observability of signals (Bafera & Kleinert, 2022; Connelly et al., 2011). Study A contributes to the literature by being the first study that distinguishes between teasers and descriptions to account for the observability of qualities. The findings imply that the effect of qualities differs depending on where the quality is signaled. For example, social value is only a little effective in teasers, while it is highly effective in descriptions. In addition, the studies consider signal costs, which are also crucial for the effectiveness of signals (Bafera & Kleinert, 2022; Connelly et al., 2011). While the results of this dissertation generally confirm the effectiveness of costly signals, study D, for example, shows that low-cost signals, such as the public profiles of lead investors, can also affect the probability of campaign success.

### 6.2.2 Implications on the level of sustainability and participation

On the level of sustainability and participation, this dissertation finds that participative financing can contribute to sustainable development because sustainable qualities are realizable through participative financing. Moreover, societal inclusion is a relevant aspect of societies' sustainable transformation process (United Nations, 2015). Participative financing enables the inclusion of society.

First, studies A and B contribute findings from financial-return and non-financial-return crowdfunding, which imply that sustainable qualities positively affect the performance of participative financing campaigns. These positive effects make participative financing a suitable technique to successfully support ventures with a sustainable aim. The dissertation considers a variety of sustainable ventures, such as innovative product developments (Allison et al., 2015; De Buysere et al., 2012; Eldridge et al., 2021; Paschen, 2017), communal activities (Messeni Petruzzelli et al., 2019), and renewable energy plants (Lam & Law, 2016). These newly gained insights complement the literature about sustainable crowdfunding by clarifying the ambiguous results of previous studies that observe a positive (e.g., Böckel et al., 2020; Calic & Mosakowski, 2016) or negative (e.g., Hörisch, 2015) relationship between sustainable aspects and crowdfunding success.

Second, the opportunity for societal inclusion, as demanded by the United Nations (2015), in the funding process of ventures is an intrinsic characteristic of participative financing. Study B describes how participative financing can enable the active participation of the general public in the renewable energy transition (Lam & Law, 2016). Thereby, participative financing yields benefits for various stakeholders: (1) The environment benefits from eco-friendly technology, (2) sustainable ventures benefit from capital, and (3) investors receive interest as a return which promotes social justice.

Since the success of social transformation processes depends heavily on the inclusion of all stakeholders, it is helpful if established institutions integrate and democratize this transformation process. Established institutions already have existing structures that make it easier to reach all members of society. Regional banks could be applicable institutions for this goal since regional banks are established financial service providers. Moreover, participative financing and regional banks are compatible due to the common interest of both financing techniques. Therefore, study C explores the potential of participative co-financing. The study implies that decision-makers of regional banks generally would accept offering participative co-financing but have not yet realized the potential to foster communal participation. Study C finds that experience, which is a factor that is regularly used as an external variable in the context of the technology acceptance model (e.g., King & He, 2006; Legris et al., 2003; Venkatesh, 2000), moderates the decision-makers propensity to offer participative co-financing to communal ventures, such as cultural initiative. If regional banks offer participative co-financing, they can contribute to achieving their corporate social responsibilities by adding a sustainable product to their product portfolio (Deutscher Sparkassen- und Giroverband, 2019; Salzmann, 2013).

Finally, study D presents participative financing as an alternative to enable sustainable inclusion through participation in the economic value creation of startups. Study D examines how inexperienced investors can have a chance to participate in the value creation of startups since the low entry hurdles of participative financing enable the inclusion of yet inexperienced investors. Participative financing platforms can enhance their inclusive character by forming social online communities in which inexperienced investors receive access to information from other investors through social networks which they can use as a reference.

### 6.2.3 Implications on the level of economic viability

On the level of economic viability, the four studies find that participative financing can contribute positively to the development of economically variable ventures. Participative financing enables access to capital for ventures that would not receive funding by established

means. Participative financing can improve the profitability of ventures, and eventually, aiming for sustainable development does not contradict economic profit.

First, participative financing facilitates access to capital for various ventures and is compatible with established financing techniques. While study A investigates innovative commercial and non-commercial ventures at early stages, studies B and D investigate more mature ventures and startups at later stages. In line with earlier findings (e.g., Belleflamme et al., 2013; De Buysere et al., 2012; Thies et al., 2019), studies A, B, and D indicate that participative financing is effective in providing capital. In addition, on a conceptual basis, study C investigates the propensity of decision-makers to offer participative co-financing to target groups that would be outside the scope of regular banking. The findings imply that decision-makers are open to offering lending-and equity-based co-financing to startups. This finding is remarkable because, due to the startups' risk profiles, they are usually not applicable for bank financing. Nevertheless, banks and startups would benefit from participative financing. Startups could benefit, first, from the quality advocacy of a professional capital provider and, second, from a higher total amount of capital than they would receive by utilizing either of the two types. Access to higher amounts of funding contributes to the startups' economic performance. Banks could be able to connect to clients early to build a lasting and mutually beneficial customer relationship enabling after-sales at a time when the startup has become more mature. Likewise, study C also implies that cross-selling is a decisive factor for why decision-makers would offer participative financing. Besides startups, other target groups like private persons and SMEs could benefit similarly. As a result, instead of viewing participative financing and bank financing as competitors, this dissertation recommends viewing both means as complements (Gomber et al., 2017). In summary, participative financing techniques are effective in providing access to capital for various kinds of ventures.

Second, on the level of economic viability, participative financing can improve the economic performance of ventures. Study A provides a twofold contribution to the literature. First, in contrast to Chan et al. (2019), who find that economic terminology negatively affects crowdfunding success, study A indicates that economic values affect crowdfunding success positively. We argue that signaling economic value indicates financial independence, cost-effeciency, rationality, and reasoning, which are quality signals (Majumdar & Bose, 2018). For ventures, this finding implies that they can purposefully communicate their economic intentions and plan an economically reasonable venture while increasing their chances of funding success, which increases their overall economic viability.

Moreover, study A implies that the effect of personal value decreases for higher levels of sustainability, indicating a crowding-out effect. Hence, we argue that supporters are willing to

accept less personal value in return for more sustainable value. For ventures, this implies that they can spend more resources on achieving sustainable aims. This economically efficient allocation of resources, which is possible because of participative financing, contributes to the economic viability of sustainable ventures. Finally, following study B, in the context of financial-return crowdfunding, the funding success of sustainable ventures is independent of the interest rates' levels. Since this observation allows for more cost-efficient financing and, therefore, is essential for ventures. Sustainable ventures can improve their economic viability by employing participative financing to acquire capital without relying on expensive interest rates to attract participants.

The implications from studies C and D, on the level of economic viability, are independent from considering sustainable aspects. Nevertheless, the results from these studies provide a different perspective on how participative financing can improve the economic viability of ventures. Study C implies that decision-makers prefer to address target groups with participative co-financing that are commercially oriented. These target groups fit best with the banks' own commercial intent. Moreover, by offering participative co-financing, regional banks can better assess the risks involved with an investment by using the crowd to research the market (Motylska-Kuzma, 2018; Ordanini et al., 2011). This improved risk assessment enables lower financing costs, which benefits ventures, investors and banks. Similarly, study D reduces the matching cost for investors and ventures, which is especially more cost-efficient for investors. Investors benefit because financial-return crowdinvesting platforms usually pre-select attractive ventures (Löher, 2017). Investors must not undertake the tedious work of screening numerous investment opportunities themselves. However, the pre-selection is laborious, which is why platforms charge a reasonable fee for every campaign they host (Companisto, 2021a). In the non-financial-return context, this fee is much smaller. Therefore, these platforms usually scrutinize the ventures on their platforms only superficially or not at all (Kickstarter, 2021).

Third, simultaneously aiming for sustainability and profitability is not contradictory for participants of crowd-based financing techniques, as the findings of studies A and B imply. Iyer and Kashyap (2009) claim that supporters mix the goals of profitability and sustainability, balance them, and occasionally favor sustainable gains. Our findings from studies A and B support this claim. Further, supporters can be driven by either egoism or altruism (Andreoni, 1990; White & Peloza, 2009), which influences their willingness to forgo personal gains for sustainable value creation. In Addition, for example, Payne and Holt (2001), Porter and Kramer (2011), and Sánchez-Fernández and Iniesta-Bonillo (2007) propose that a trade-off exists between both goals.

The definitions of sustainability by Brundtland (1987), Elkington (2002), and the United Nations (2015) all suggest that sustainability is only attainable by reconciling sustainability and profitability. Studies A and B resolve the argument regarding a trade-off relation. Both studies show that supporters are willing to give up personal profit in the form of personal value or interest if a venture promotes a sustainable purpose. In study A, more sustainability leads to more success, although the effect of personal value on success decreases for increasing levels of sustainability. In study B, sustainable campaigns do not make ventures more successful but in sustainable campaigns a change of the interest rate does not affect the campaigns probability of success. Therefore, the findings imply that sustainability and profitability is attainable together. Relying on the crowd is suitable to support sustainable ventures because the crowd supports sustainable values and decides whether the value creation of a venture is appealing. Finally, the dissertation affirms that sustainable and economic goals are reconcilable and adds that participative financing helps to achieve this.

## 6.3 Implications for practice

This dissertation offers various valuable implications for practitioners. All studies take the perspective of platform operators, asking how to increase the probability of success for participative financing campaigns. Platforms and ventures profit from knowledge about how to optimize their campaigns. However, ventures usually only conduct one single campaign, while platforms frequently host new campaigns. Therefore, platforms must provide auxiliary instructions for ventures and adequate features that enable ventures to present themselves. Platforms must understand the mechanisms that drive funding success. Investors and ventures can only use whatever means and features the platforms stipulate to send and receive information. Hence, this chapter focuses solely on practical implications for platforms.

First, since trust plays a major role in participative financing, platforms should take measures so that supporters can build trust in platforms and ventures or campaigns, respectively (Connelly et al., 2011). Platforms must enable ventures to reveal their qualities (e.g., Blaseg et al., 2021). To this end, this dissertation provides practical implications regarding which signals to send and how to send these signals (see section 6.2.1). The dissertation presents several quality signals that positively affect campaign success and some signals that ventures should avoid. Qualities in the sense of the ventures' blended value proposition increase the probability of success. For example, through suitable textual signals, campaigns should explain to what extent they create sustainable and personal value. In this context, attention should be paid to when a venture's quality signal is sent. Study A finds that the effect of quality signals in teasers differs from that in descriptions. Accordingly, in teasers, economic value has the greatest effect

on campaign success, then ecologic and social value. However, in descriptions, social value has the greatest effect, then economic and ecologic value. This finding is critical because campaigns compete against each other and must differentiate themselves within one platform and across platforms. Therefore, knowledge about the effectiveness of values is crucial. Finally, when using sustainable quality signals, platforms and ventures should also consider that the marginal utility of sustainable values declines.

Furthermore, platforms should consider which crowdfunding type they offer. While sustainability signals increase success in reward-based platforms, sustainable orientation does not significantly influence financial-return platforms. Nevertheless, financial-return platforms must emphasize their sustainable orientation since study B shows that ventures can offer a lower interest rate if they are sustainably oriented while maintaining the same probability of success. Moreover, the length of campaigns does not affect campaign success. However, platforms should still specify the campaign duration since this specification signals commitment and omitting this information from the campaign could have a negative effect.

Second, community interactions and collective actions play a major role in participative financing (Cai et al., 2021). Platforms should offer features that reinforce a sense of community (Brown et al., 2019; Estrin et al., 2022; Fehrer & Nenonen, 2020). The results from studies A and D imply that investors and supporters participate in campaigns because they cherish collective action, community welfare (Butticè et al., 2017), and supporting innovative ventures through their participation (e.g., Böckel et al., 2020; Jovanović, 2019).

In addition, many uncertainties exist among investors, as they usually have only limited experience (e.g., Ahlers et al., 2015; Belleflamme et al., 2014). However, participating in crowd-based financing is associated with risks (Beaulieu et al., 2015; Hornuf & Schwienbacher, 2017). Study D shows that lead investors can positively affect retail investors as they are role models, dissolve uncertainties and create trust. Platforms should single out and highlight lead investors. According to study D, especially their investment amounts function as a reference for retail investors and positively affect the retail investors' investment decisions. Platforms should avoid signals that diminish the sense of community or have a segregating effect. Such signals include, for example, information about different investor statuses (Cai et al., 2021; Nahapiet & Ghoshal, 1998). Study D also examines the interaction effect between individual retail investors' profile publications and the public profiles of lead investors. Study D implies that there is no significant interaction. Nevertheless, the public profiles of lead investors do have a positive effect on retail investors. Regarding the interaction of public profiles, the results of study D are not clear. The findings might imply that investors value openness from co-investors but do not value active interaction very much. Future studies should further investigate.

In conclusion, studies A, C, and especially D shed light on the extent to which community aspects and interactions between participants can affect campaign success. Platforms should offer investors the opportunity to form networks to interact with each other in order to generate trust between participants through the creation of social capital (Cai et al., 2021). After all, as noted above, the community plays a major role in participative financing.

Third, participative financing is continuously developing further, even though it has already reached a high degree of maturity. Platforms should find ways to give potential cooperation partners the opportunity to collect experiences with participative financing. Platforms should demonstrate the potentials that emanate from combining participative techniques with established business models. Study C shows that many advantages can arise from such combinations. Furthermore, study C implies that experience is essential for decision-makers to assess participative financing or co-financing. This dissertation appeals to practitioners and researchers to develop and investigate new forms of participative financing.

## 6.4 Future research

While the dissertation answers the overarching research question, new questions arise that seem worthwhile exploring. The remainder of this section is structured around the theoretical concepts used in this dissertation. Studies A, B, and D rely on signal theory (Akerlof, 1970; Spence, 1973). Study A addresses the signaling effect of each dimension of sustainability by measuring each dimensions' direct effect. We do not analyze the interrelation between the individual dimensions of sustainability. However, future research could investigate the interrelatedness of the dimensions of sustainability and sustainable value signals, and how these interrelations affect the campaign performance (Anglin et al., 2018; Stern et al., 2014).

Since participative financing is market-oriented and campaigns are in a competitive relationship with each other (Belleflamme et al., 2015; Dushnitsky et al., 2016), ventures must differentiate their campaigns from others to get noticed and attract attention. Thus, effective signaling is essential. In this sense, study A shows that first impressions matter (Asch, 1946; Schraven et al., 2020). Since the same values have a different effect depending on when they are observable (Connelly et al., 2011), in the teaser or description, future research should investigate the effect of the sequence in which certain signals are presented. Moreover, future studies could examine the order of signals, how these signals interrelate, and how these interrelations affect campaign success.

Study A uses textual signals to investigate the ventures' sustainable value (McKenny et al., 2013). Yet, other signals could be used that provide a more explicit indication of the ventures' sustainable orientation than textual signals. For example, some campaigns report the ventures'

potential for tons of CO2 saved, which sustainable development goals they realize (United Nations, 2015), or the number of households they provide with clean electricity. Admittedly, collecting these data is difficult for quantitative research because complete data are challenging to obtain. Hence, future research could use a qualitative approach to clarify the effectiveness of explicit indicators, for example, based on experiments.

Furthermore, study A uses word lists created explicitly for the dataset to measure the frequency of values in the campaigns' texts (Short et al., 2010). The specification of the word lists limits their applicability in other contexts. However, since sustainability assessment is also relevant in other contexts, future research could refine the word lists from study A for more generalizability.

Study D examines the signaling effects of co-investors. Study D finds that lead investors can serve as positive signals, provided they contribute to the creation of social capital (Cai et al., 2021). Looking at participative financing from the perspective of interactions between participants seems to open up multiple promising avenues for future research. Currently, platforms are primarily concerned with drawing monetary resources from the crowd. However, the crowd could also contribute knowledge, ideas, and resources other than money. Future research should therefore investigate what other resources can be harnessed in the context of crowd participation (Resch & Kock, 2021).

The possibility of collective interactions could also be interesting for regional banks to support a common goal (Gomber et al., 2017), as study C shows. While study C explores participative co-financing from the perspective of regional banks, future research could explore participative co-financing from the investors' perspective, for example, by asking how does the banks' participation affect the intention of private investors to participate? Study C shows further, following the technology acceptance model (F. D. Davis, 1986), that experience with participative financing affects the assessment of its potentials. This finding should not only encourage practitioners to actively test new forms of participative financing, but also inspire researchers to continue exploring participative financing. Instead of asking what drives campaign success, researchers could ask what drives the acceptance and expansion of participative financing. This dissertation, therefore, appeals to practitioners and researchers to conduct further tests, experiments, and pilot projects to explore and demonstrate the possibilities of participative financing.

In the course of writing this dissertation, it became evident that participative financing can support ventures which aim for sustainability and profitability. Moreover, since participative financing is an inclusive technique, it holds the potential to facilitate societal involvement to

leverage sustainable development. Nevertheless, during this dissertation, it also became clear that participative financing is often not taken seriously as an effective form of financing, that it is fraught with many preconceptions, and some mistake it as a ludic financing technique. However, the projects examined in the dissertation demonstrate that participative financing is capable of realizing even large projects in a serious setting. Based on these observations, with regard to the future of participative financing, the following questions remain to be addressed by future researchers: How can participative financing be further established? How can preconceptions be reduced? How can trust in participative financing be strengthened further? Reliable partners such as regional banks could be one alternative to advance crowd-based financing techniques. The better participative financing can prove its capabilities and overcome preconceptions, the more this innovative form of financing can develop its full potential and contribute to supporting economically viable and sustainable ventures.

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# Declaration of Authorship

The dissertation is provided by me with a list of all sources used. I declare that I have written the thesis on my own – apart from the help explicitly mentioned in it.

The thesis has not been published anywhere else nor presented to any other examination board.

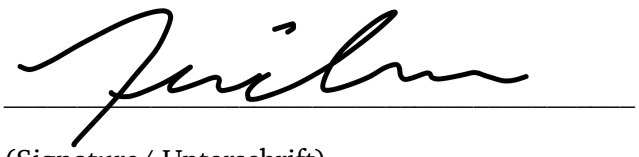
Die Dissertation ist von mir mit einem Verzeichnis aller benutzten Quellen versehen. Ich erkläre, dass ich die Arbeit – abgesehen von den in ihr ausdrücklich genannten Hilfen – selbstständig verfasst habe.

Die Arbeit wurde bisher weder einer anderen Prüfungsbehörde vorgelegt noch veröffentlicht.

Sven Siebeneicher

Darmstadt 23.12.2022

(Place/ Ort) (Date/ Datum)



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