The Economics of Crowdfunding

Startups, Portals, and Investor Behavior

Edited by
Douglas Cumming
and Lars Hornuf

The Economics of Crowdfunding

For academics, practitioners, and government policymakers, this book provides a sophisticated, comprehensive analysis of this new and important means of capital aggregation across for-profit and nonprofit sectors worldwide.

Michael Klausner,
Nancy and Charles Munger Professor of Business and Professor of Law, Stanford University

This is an excellent book, a must-read, for anyone interested in the broad phenomenon of crowdfunding.

Mingfeng Lin,
Associate Professor of Management Information Systems, University of Arizona

It is important that we recognize and respond to the opportunities and challenges arising from innovative methods of financing, such as crowdfunding. This book provides a review of the experience to date, covering important issues such as signaling, fraud, and regulatory models. The insights here are relevant to academics, entrepreneurs, investors, and policymakers.

Maureen Jensen,
Chair and CEO of the Ontario Securities Commission

Douglas Cumming • Lars Hornuf
Editors

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To Dylan and Sasha Cumming, and Maria Christina Müller.

Foreword

The "crowd" has attracted considerable attention from many academic fields. For good reason, crowd-based processes have gained more and more practical relevance, for instance in problem-solving or in finance. In this book volume on the economics of crowdfunding, Douglas Cumming and Lars Hornuf have gathered an impressive group of contributors exploring various facets of the phenomenon.

The definition of crowdfunding is comprehensive: Cumming and Hornuf include reward-based and donation-based crowdfunding, equity crowdfunding (crowdinvesting), and marketplace (peer-to-peer) lending within the scope of the investigations presented here. Given the early stage of the evolution of these processes, going for breadth is a compelling choice.

The chapters in this volume cover a wide set of topics. In Chap. 1, the editors provide an insightful overview of the literature regarding donation- and reward-based crowdfunding, crowdinvesting, and crowdlending models. The first part of the book then turns to the role of crowdfunding for small companies and start-ups. Leboeuf and Schwienbacher discuss in Chap. 2 the role of crowdfunding as a novel financing tool for small enterprises and explore which types of firms are most likely to benefit from widely available crowdfunding. Vismara (Chap. 3) addresses informational inefficiencies in crowdfunding markets and identifies various forms of signals as possible solutions to these

problems. Lambert, Ralcheva, and Roosenboom (Chap. 4) take a close look at the relationship between the entrepreneur who seeks to obtain financing and the crowd, and at the informational asymmetries that may ultimately limit the efficacy of crowdfunding. Hainz (Chap. 5) then turns to cases of fraudulent behavior in the context of crowdfunding. Coming to grips with such cases and possible underlying incentives for fraud will be an important factor in strengthening crowdfunding as a new financing tool.

Market structure aspects are studied by Fenwick, McCahery, and Vermeulen in Chap. 6, while Mollick studies the impact of reward-based crowdfunding on entrepreneurship in Chap. 7, employing surveys of Kickstarter funders. The backers of projects are also at the focus of Chap. 8 where Bayus and Kuppuswamy analyze dynamics over the project funding cycle.

The final three chapters cover regulatory aspects of crowdfunding. Bradford (Chap. 9) presents an analysis of regulation in the USA, while Klöhn (Chap. 10) explores the European regulatory environment. Amour and Enriques (Chap. 11) compare regulation in the USA and the UK. Given that countries are by now almost competing to set attractive boundary conditions for financing via the crowd, these country-level and comparative assessments should be highly relevant to policy makers and researchers alike.

For any academic or practitioner who wants to have a quick and thorough start into the fascinating and complex economics of crowdfunding, this volume is an excellent point of departure. The collection of articles tackles the phenomenon of crowdfunding comprehensively. Final answers as to how important crowdfunding will be as a novel financing instrument in the future will still have to be explored. Presently, the contributions assembled here cover major research questions, summarize the existing literature, and offer first insights regarding regulatory responses. The editors and the authors have undertaken an important step toward a better understanding of a fascinating and multifaceted phenomenon.

Max Planck Institute for Innovation and Competition, Munich, Germany

Dietmar Harhoff
July 2017

Preface

This book studies crowdfunding as a new financing tool in the entrepreneurial finance ecosystem. The analyses in the book serve multiple purposes. From an academic perspective, the book attempts to give a topical overview over the recent scholarly literature on crowdfunding. While five years ago, very few academics started to shift their attention toward this new topic, by the end of the decade almost no finance and certainly no entrepreneurial finance conference goes without research findings in crowdfunding. Even entire conferences have been dedicated to crowdfunding. On February 8, 2013, the *Crowdinvesting Symposium* took place for the first time at LMU Munich and on October 17, 2013, the *Berkeley Crowdfunding Symposium* discussed the latest research on crowdfunding. Journals like *Entrepreneurship Theory and Practice* as well as *Small Business Economics* have dedicated special issues to crowdfunding. From a practitioners' perspective, this book summarizes what works in crowdfunding and what does not. Portal owners and entrepreneurs looking for funding might use the insights provided here to structure their campaigns effectively. Investors learn from empirical studies about their own behavior and potentially avoid making costly mistakes. Finally, from a policymaker perspective, the book provides evidence whether crowdfunding should be fostered or prohibited as a new financing tool. To address these questions in a rigorous and state-of-the-art manner, we have gathered some of the most well-known scholars in the field.

The book tackles four broad topics. The first three are economic in nature and investigate what we have learned so far about start-ups, portals, as well as backers and investors in the crowdfunding realm. These topics are covered by 19 outstanding management, finance, and economics scholars. Thereafter, based on the economic evidence, four outstanding legal scholars have investigated how crowdfunding is currently regulated and potentially ought to be regulated in the future. Their focus is on the USA, the European Union, as well as individual member states such as the UK and Germany.

Moreover, to make the book more readable and consistent, we decided on the following simple terminologies. Crowdfunding encompasses four major business models. The *donation-based crowdfunding* model involves, for example, the funding of philanthropic and research projects. Under this model, backers donate money to support a project without expecting compensation. This differs under the *reward-based crowdfunding* model in which backers are promised tangible or intangible perks, such as a supporter T-shirt or having their name posted on the campaign website. At times, the reward-based model of crowdfunding may resemble a pre-purchase, such as when backers fund a product or service they wish to consume and which is still to be developed by the entrepreneur. Under these models, the crowd is referred to as *backers*, because they do not invest but donate their funds or pre-purchase a product or service. Popular examples are video games (e.g., Star Citizen) or the Pebble smartwatch. Portals include, for example, Crowdfunder.co.uk, Indiegogo, Kickstarter, and Startnext.

Crowdinvesting—which is also referred to as investment-based crowdfunding, securities crowdfunding, or equity crowdfunding—is a subcategory of crowdfunding and refers to an alternative form of external finance for firms in countries that permit the solicitation of the general public. The solicitation often takes place without or with a "light" version of a securities prospectus (e.g., JOBS Act Title III in the USA or the Small Investor Protection Act in Germany). The crowd participates in the uncertain future cash flows of a firm via equity, mezzanine, or debt finance. The crowd is referred to as *investors*, as they make a financial decision and do not consume a product. Portals include, for example, Companisto, Crowdcube, Republic, Seedrs, Seedmatch, and WiSeed.

Crowdlending is another subcategory of crowdfunding where loans are extended to an individual or firm at a fixed interest rate. The crowd is referred to as *lenders*. Unlike in the crowdinvesting domain, repayment by the borrowers starts immediately. Portals include, for example, LendingClub, FundingCircle, and Auxmoney.

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Introduction

Douglas Cumming and Lars Hornuf

Crowdfunding has experienced tremendous growth and developed into a global multibillion-dollar business over the course of the last five years. The most successful segment of the nascent market is crowdlending, which is also referred to as peer-to-peer lending or marketplace lending, and had an estimated global market volume of USD 25 billion in 2015 (Massolution 2016). Although more recent figures on the overall market volume are not yet available, market growth has most likely continued during the years 2016 and 2017. The portal Lending Club alone reported to have funded loans worth USD 31 billion by the end of 2017. The other market segments are considerably smaller and are comparable in

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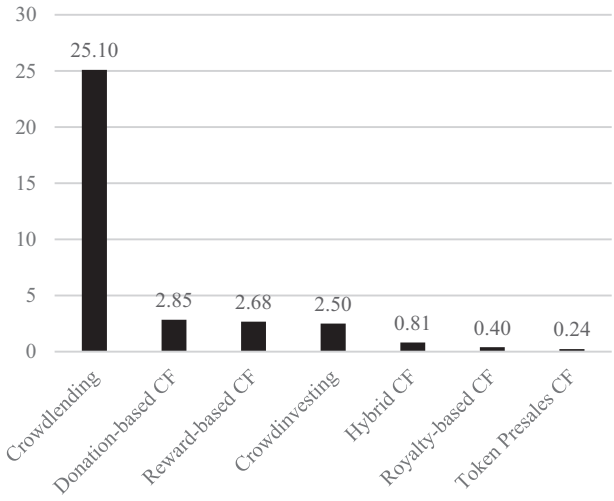

Fig. 1.1 Global crowdfunding market by segment volume, USD billions in 2015

size. According to Massolution (2016), donation-based crowdfunding reached a global volume of USD 2.85 billion, reward-based crowdfunding USD 2.68 billion, and crowdinvesting USD 2.50 billion in 2015. New segments such as royalty-based crowdfunding, hybrid forms of crowdfunding, and token presales or Initial Coin Offerings exhibit relatively small market volumes (Fig. 1.1).

Depending on the jurisdiction under which platforms are operating, their business models often cut out traditional financial intermediaries. On the upside, this might reduce transaction costs and make financial services more cost-efficient. Furthermore, crowdlending portals may be well equipped to develop credit risk models that are geared to high-risk loans. They may thus provide a better assessment of high-risk customers than traditional financial intermediaries that used to refuse certain individuals and businesses access to mainstream financial services. Put differently, crowdfunding portals have identified the inability of traditional banks to extend loans as a business opportunity and consequently seek to fill the existing funding gaps. At the same time, many crowdfunding markets lack financial intermediaries that screen and monitor borrowers. Portals have regularly no skin in the game and consequently have little

incentives to consider the performance of their investors. Under the new US crowdinvesting rules, the funding portals and their directors are even prohibited to have any financial interest in the issuer. From a macroeconomic and systemic risk perspective, this might be a desirable setting, as no crowdfunding platform can become too big to fail.

Moreover, all crowdfunding platforms cater per definition to two-sided markets. This means that platforms need not only attract borrowers, start-ups, or charity beneficiaries but also individuals who are willing to donate or put their money into a risky investment. Thus, if platforms intend to operate in the market over a considerable period of time, they should, in line with Rochet and Tirole (2003), have good incentives to serve the interest of all market participants including the investors. Whether the owners and managers of a crowdfunding platform intend to operate a long-term business or rather engage in fly-by-night operations is ultimately an empirical question. However, some caution is warranted. Over the course of one and a half years, the Chinese crowdlending platform Ezubao, for example, had attracted a total of USD 7.6 billion from around 900,000 investors. In January 2016, it became obvious that the portal operated a Ponzi scheme and senior executives had spent considerable amounts of investors' money on private expenses, making very little real investments.

Platforms are not the only market players that engage in fraud. Several project creators in reward-based crowdfunding have been identified as being scams (Cumming et al. 2016). For example, the Kobe beef jerky campaign was just about being completed, when Kickstarter stopped the USD 120,309 going to the fraudsters' bank account. Whether the crowd is well positioned to identify scams is not clear. Mollick and Nanda (2015) find, for a sample of theater projects, that the financing decisions of the crowd and professional funders are quite consistent and that there is no difference in the quality of projects that receive funding by the crowd and those funded by professionals. On the other hand, crowdfunding platforms lack some of the features that Surowiecki (2004) identified as being important for the 'wisdom of the crowd' to emerge. Although the crowd might be a diversified enough group to distinguish valuable projects and scams, the decision-making process of backers and investors on the various Internet platforms is hardly independent and

might also be driven be irrational herding. Some early contributions from the crowdlending realm indicate that investors can, however, also engage in strategic and rational herding (Herzenstein et al. 2011a).

If operations did not already fall under existing securities or banking laws, policy makers have so far taken a wait-and-see approach or implemented a light form of regulation that is to be adapted once regulators have learned more about the functioning of crowdfunding markets. The reason for the reluctant approach of many regulators is that they also understand the potential of serving underbanked individuals and small businesses that are at the core of economic growth. Large groups of the population might for the first time receive funding that was not available to them but should have been from an economic efficiency standpoint. Furthermore, crowdfunding also has a democratizing element in the sense that investors get access to a new asset class that was not available to them before.

In recent years, the academic literature has also shown a growing interest in crowdfunding. Some segments have received attention earlier than others, which was mostly due to data availability and the relevance of the respective crowdfunding segments. As noted in the *Preface* of this book, crowdfunding consists of four different business models. The funding of philanthropic and research projects is known as the *donation-based crowdfunding* model, where *backers* donate money to a project without subsequently receiving a monetary compensation. Still, backers may derive utility from the act of donation, for which Andreoni (1989) coined the term warm-glow effect. In an early study, Saxton and Wang (2014) analyzed data from Facebook Causes. They evidence that in the Internet traditional economic explanations are less important for charity-giving decisions than social network effect explanations are. Moreover, they revealed that health-related causes were most appealing to donors. Crowdfunding platforms that return donations in the event of not meeting capital goals tend to lead to larger contributions in total according to simulations (Wash and Solomon 2014) and empirical evidence (Cumming et al. 2015). Further, donors often invest very early or very late in crowdfunding and projects are more likely to be completely funded if donors invest early (Solomon et al. 2015).

Under the *reward-based crowdfunding* model, *backers* are promised a product or a perk. In a seminal article, Mollick (2014) examined the delivery rate in reward-based crowdfunding campaigns. Using data from Kickstarter, he found that most project creators intend delivering the product they promised, but many deliver it with a considerable delay. *Crowdinvesting*, which is also referred to as investment-based crowdfunding, securities crowdfunding, or equity crowdfunding, is an Internet-based form of external finance for firms. Solicitation of *investors* often takes place without or with a 'light' version of a securities prospectus. Investors participate in the uncertain future cash flows of a firm via equity, mezzanine, or debt finance. In one of the first articles on the topic, Ahlers et al. (2015) examine the effectiveness of signals that start-ups use to induce investors. They find that retaining equity and providing more detailed information about risks are interpreted as effective signals by the crowd. In another seminar article, Agrawal et al. (2015) find that local funders are less responsive to information about the cumulative funds raised during a crowdinvesting campaign. They further evidence that this effect is largely driven by investors during the early phase of the campaign who have an offline social relationship with the creator.

Crowdlending is another form of crowdfunding where loans are extended to an individual or firm at a fixed interest rate. Under this model, the crowd may adequately be referred to as *lenders*. Unlike in the other crowdfunding models, repayment often starts immediately. In one of the first articles, Lin et al. (2013) find that female borrowers secure financing more often than men. Moreover, Herzenstein et al. (2011b) show that a detailed loan description positively affects the probability of financing. Recently, Iyer et al. (2015) have highlighted that soft factors together with the rating category of the loan enable lenders to infer approximately one-third of the variation in the creditworthiness indicated in the borrower's credit score. While a complete overview of the literature on crowdlending goes beyond the scope of this introduction, a worthwhile summary of the most important articles for the different crowdfunding segments is provided by Dorfleitner et al. (2017, 85ff.).

While this book gives an overview of the current state of crowdfunding research and partly develops it further, we also want to provide a glimpse on what we believe are future research topics. First, while rigorous research

has developed in all segments of crowdfunding, little research exists that takes a comparative stance. For example, one might ask whether firms fare better when they are funding new projects through reward-based crowdfunding, crowdinvesting, or crowdlending. On the other side of the coin, it is not yet clear whether it is more efficient for backers to invest in a firm, to extend a loan, or to receive a product that can later potentially be resold or consumed. Second, while scholarly literature has looked at funding success, not much is known about the ultimate success of a venture. Future research might thus ask whether crowdfunding creates sustainable firms and what the relevant success factors are to that respect. Third, little is known about the motives of backers and investors. While pure or impure altruism most likely plays a role in donation-based crowdfunding, the warm-glow effect might to some extent even exist in crowdinvesting and crowdlending. Given that some investors might systematically lose money from these investments and still decide to support this type of ventures for non-monetary reasons, it raises interesting policy questions that ought to be answered in the future. The authors in this book already answer some of them.

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Part I

Startups

2

Crowdfunding as a New Financing Tool

Gaël Leboeuf and Armin Schwienbacher

2.1 Introduction

The lack of access to finance is well recognized as being one of the main difficulties for many start-ups, especially risky and innovative ones (Carpenter and Petersen 2002). While much of this difficulty stems from the severe information asymmetries and agency costs that many start-ups face, others may be due to the lack of fit with the investors' investment objectives. When external finance is required, selecting the right form of finance is crucial for successfully developing an entrepreneurial activity, and this choice involves different trade-offs, owing to different pros and cons for each type of financing source (Cosh et al. 2009). For example, in general, start-ups with an intermediate level of growth prospects are not eligible for venture capital finance, as managers seek investments in risky

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but high-growth companies. These start-ups may then receive funding from business angels or friends and family. Similarly, while most traditional start-ups rely on bank loans (Robb and Robinson 2014), candidates for bank loans need to provide collateral and sufficient cash flows to sustain interest payments, two elements that research and development (R&D)-intensive start-ups typically do not have.

The digital revolution, combined with social media and structured crowdfunding platforms that act as intermediaries between fund seekers (entrepreneurs) and small fund providers (the crowd), offers new opportunities to raise capital to develop a company or launch a project, and sometimes even to finance risky R&D expenditures in existing entrepreneurial companies (Belleflamme et al. 2014; Mollick 2014). Internet-based crowdfunding now allows even small entrepreneurs to raise funds from a large crowd, as communication costs have virtually disappeared with the Internet. In countries with a lack of sufficient seed and start-up capital such as angel finance and friends and family, crowdfunding has the potential to help fill the funding gap because it allows nonqualified individuals to also invest in innovative start-ups (Hornuf and Schwienbacher 2017). In the case of reward-based crowdfunding, the amount of funds collected during the campaign may further offer valuable feedback on the market prospects of the product being produced by the entrepreneur (Chemla and Tinn 2016; Schwienbacher 2014).

While research on crowdfunding still offers a largely incomplete picture of the phenomenon, existing studies indicate that crowdfunders participate for very different reasons and that these reasons also vary across the different types of crowdfunding. Moreover, entrepreneurs launching a crowdfunding campaign may self-select to do so, as crowdfunding may not be the best choice for all entrepreneurs. Therefore, in this chapter we argue that while crowdfunding may fill a funding gap, specific types of entrepreneurs are more likely to benefit, as they are better able to match crowdfunders' preferences for participating in a crowdfunding campaign and reap the benefits of crowd participation.

In this chapter, we first discuss how crowdfunding fits into the traditional financing cycle of small businesses and start-ups. We then raise the question as to whether crowdfunding solves a specific funding gap, a necessary condition to justify crowdfunding as a viable source of entrepreneurial finance in the long run. Finally, we elaborate on the type of

entrepreneurial activities and entrepreneurs who are more likely to benefit from crowdfunding. Many of these issues are covered in more detail in subsequent chapters.

2.2 The New Financing Cycle

Start-ups get financed under what is commonly described as the so-called financial growth-cycle paradigm, proposed by Berger and Udell (1998). This paradigm largely considers a linear relationship between sources of funding and stages of development, in which the type of funding is a function of the start-up's stage of development. In this framework, each funding source is characterized by its relative capacity to deal with information asymmetries and moral hazard and, most crucially, by its funding capacity in terms of size. Start-ups at their initial stage may rely on friends and family, bootstrap finance, and business angels, all of which may provide limited amounts of capital. For larger amounts, venture capital funds may be tapped, as they often make staged investments of several millions of dollars or euros. Much larger and more developed companies may go public through an initial public offering as a means to raise money on a regulated, public stock market. These firms, however, are already at a more mature stage, with lower technological and market risks, and thus are prone to less information asymmetry problems. Bank finance may be available for any amount (Schwienbacher 2013) but is not suitable for start-ups exhibiting high levels of information asymmetry or moral hazard problems or start-ups with a lack of collateral and insufficient revenues to support interest payments.

A first-order question is where crowdfunding is situated in this framework. We suggest that the answer depends largely on the type of crowdfunding considered. Reward-based crowdfunding more closely resembles supplier finance, while crowdlending resembles bank finance, an equity-based crowdfunding angel (Hornuf and Schwienbacher 2016), and, to a lesser extent, venture capital finance (and perhaps even an initial public offering on smaller stock market segments, such as the Marché Libre in Paris or the Alternative Investment Market in London, though only for some outliers for the time being). Indeed, recently, some start-ups have raised several millions of euros on equity-crowdfunding platforms in

Germany, making it a potentially credible alternative to venture capital (Hornuf and Schwienbacher 2017). Donation-based crowdfunding may at times resemble bootstrap finance, insofar as bootstrap finance sometimes involves relying on "free" resources. Considering these distinctions, crowdfunding typically fits with early stage and expansion-stage finance in terms of stage of development.

Still, crowdfunding needs to fill a funding gap to be a viable source of funding (for a general discussion on funding gaps in the context of entrepreneurial finance, see Cressy 2002). If it only substitutes for another source such that it merely crowds out the existing source without offering some specific benefits (either lower transaction costs or reduced contractual inefficiency), its economic value is limited. Research, however, suggests that this is not the case. While crowdfunding may generate its own transaction costs and risks (Griffin 2013; Hazen 2012; Hildebrand et al. 2016; Mollick 2013), it may provide efficient funding for some types of entrepreneurial initiatives. One possible source of gains is the extra information obtained in reward-based crowdfunding campaigns on possible demand for the product (Chemla and Tinn 2016; Schwienbacher 2014). In this type of crowdfunding, the entrepreneur typically produces the product as a reward so that it resembles "prepurchasing." Then, the crowdfunding campaign gives a better view of market demand, similar to a market analysis—except that, here, individuals do not simply claim to be willing to buy the product but already prepurchase it, making it a more credible source of information than a simple market analysis. Moreover, under an all-or-nothing funding model, risk may be reduced for the entrepreneur, because the threshold level for undertaking the project provides a call option to the entrepreneur, who will then not undertake the project if demand does not cover costs (Cumming et al. 2016). This model reduces operational risk of the project because no financial resources have been engaged yet; they are only engaged if enough demand is secured during the reward-based crowdfunding campaign. Relatedly, Hakenes and Schlegel (2014) show that in equity-based crowdfunding, investors are willing to reveal private information about their interest to invest if the campaign is run under the all-or-nothing funding model, as then they are guaranteed that their commitment will be canceled in case of lack of sufficient interest by other potential investors. The generation of valuable

information through the aggregation of individual preferences is often referred to as a manifestation of "wisdom of crowds," which leads to information that cannot become available with traditional sources of finance.

Crowdfunding may further help entrepreneurs access venture capital funds. Recent studies show that successful crowdfunding campaigns tend to attract follow-up funding more easily in the form of venture capital. In the subsample of projects that raised more than USD 100,000 on Kickstarter or Indiegogo, Shafi and Colombo (2016) find that these entrepreneurs were significantly more likely to raise venture capital. This means that crowdfunding is a valuable first step in attracting the attention of larger investors, if necessary.

A final reason for the possible viability of crowdfunding as a distinct source of entrepreneurial funding involves the lack of seed capital available in the economy, as often argued in Europe, due to the lack of angel finance. In this case, crowdfunding may help reduce the gap between available seed capital and availability of valuable investment opportunities. Hornuf and Schwienbacher (2017) argue that this point makes equity-based crowdfunding even more important in Europe than in the United States. Considering these different arguments, it seems plausible that crowdfunding is helping fill a funding gap.

2.3 The Crowd as Financier

In this section, we take a closer look at the crowd as fund provider. The crowd represents a pool of potential funders, each with a different profile and expectations but sharing the same willingness to finance a project or an entrepreneur. While some members may be part of a specific community of fans sharing common interests and preferences (especially for art and music projects), most often these individuals do not know one another. In what follows, we discuss some profiles of crowdfunders for the different crowdfunding types (donation-/reward-based crowdfunding, crowdinvesting, and crowdlending) and their motivation to participate in crowdfunding campaigns. Then, we discuss mechanisms offered by crowdfunding to investors to evaluate their decision to back a project or a proposed investment opportunity, including risk sharing, herding behavior, and informational cascade.