

Crowdfunding Sustainable Enterprises as a Form of Collective Action

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10.1 INTRODUCTION

The necessity of transitioning to a low-carbon, sustainable economy has become more urgent in recent years (Andersen 2007; Ellen MacArthur Foundation 2012; Stern 2008). Existing or nascent enterprises are increasingly trying to change or set up their business in a sustainable manner to contribute to global sustainability goals. However, one of the main impediments of building a sustainable enterprise is finding external financiers willing to carry the risks of transitioning to doing business in a low-carbon, sustainable way (Campiglio 2016; Mont et al. 2006; Scholtens 2006; Tukker 2015). Different approaches can be taken to stimulate sustainable investments such as regulation, taxes and subsidies, and influencing consumer preferences. Many studies aim to find out whether sustainable investments deliver higher

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financial returns for the investor in comparison to non-sustainable investment, which would provide a straightforward argument to invest in sustainable enterprises. A recent study, based on established US firms, shows that sustainable companies attain better financial results compared to a comparable non-sustainable set of firms, but that it takes on average 5–7 years to achieve this (Eccles et al. 2011).

However, inevitable to any transition, many sustainable enterprises are early stage, innovative businesses, trying to change the way business is being done in a certain sector. These smaller, early stage sustainable enterprises arguably face a more difficult financing constraint than established firms moving towards sustainability. One part of the financing constraint of sustainable small and medium-sized enterprises is related to general innovation-specific issues such as lack of track record and collateral, high technological risk and risk of spillover of R&D investment to other firms (Brancati 2015; Cincera and Santos 2015; Giudici and Paleari 2000). The second part of the financing constraint is specific to sustainable enterprises and relates to their objective of creating societal impact (positive externalities) in their course of business. Rational choice theory predicts that financiers are not willing to invest in collective payoffs unless they can be fully appropriated, thus creating a ‘double externality problem’ (Faber and Frenken 2009; Rennings 2000). This means that the time horizons for small-scale sustainable enterprises to appropriate financial payoffs from their innovative, sustainable activity are generally long-term and uncertain. Nevertheless, sustainable innovation by small and mid-sized enterprises is crucial for transitioning toward a sustainable economy. Due to the small-scale and high-risk nature of these type of businesses, we believe that the ‘higher financial return’ argument, used as rationale for investment in established sustainable firms, cannot be the sole driver behind investments in these enterprises.

We argue that it is time to shift our focus away from monetary payoffs as the main driver for investors in sustainable investments and towards a more complex, behavioral reasoning on investment decisions for sustainable enterprises. In order to better understand how to move towards a sustainable financial system supportive for sustainable enterprises, we direct our focus towards crowdfunding, which has been argued to be especially well positioned to financing sustainable enterprises (Calic and Mosakowski 2016; Lehner 2013). This can be partly explained by the fact that crowdfunding is a particularly suitable financing tool for early ventures (Block et al. 2017; Bruton et al. 2015), addressing the innovation-related part of the financing constraint. On top of that, some authors suggest there is a particularly good match between crowdfunding and sustainable

enterprises, which has been mainly explained using legitimacy theory (Calic and Mosakowski 2016; Lehner 2013). This feeds back into the second—sustainability—part of the financing constraint, which we focus on in this chapter.

More work is needed to understand what may drive sustainable enterprise crowdfunding. Legitimacy theory argues that individual crowdfunders may be particularly willing to fund sustainable enterprises due to growing societal support for social/sustainable entrepreneurship (Calic and Mosakowski 2016). Although this explanation takes into account the decentralization of the financing decision to small, non-professional investors, it lacks a more structured analysis of crowdfunding as different institutional setting which leads to a decision-making that is different than that in traditional financial institutions.

In this chapter, we therefore use collective action theory (Olson 2009; Ostrom 2010) to analyze the institutional setting of crowdfunding to understand how this can be a potential successful way of funding sustainable enterprises. We believe collective action theory allows for a structured answer to the question of why crowdfunding can be a good fit with financing sustainable enterprises. This therefore leads to the core question of this chapter: how does collective action theory help us explain the potential success of crowdfunding for sustainable enterprises?

We continue this chapter as follows: first, we give an overview of the existing literature on crowdfunding for sustainable enterprises. Next, we give an overview of the findings of collective action theory in order to apply this to sustainable enterprise finance. We explain our methodological framework and undertake a rule-based analysis of crowdfunding to find matches and mechanisms that can drive successful collective action in crowdfunding. We conclude with recommendations for the design of financial decision-making for collective action based on our current analysis of crowdfunding.

10.2 WHY DO CROWDFUNDERS INVEST IN SUSTAINABLE ENTERPRISES?

In the past ten years, the development of crowdfunding markets has raised the question of whether crowdfunding is particularly well suited to finance sustainable enterprises, and if so, why? Current research suggests several

mechanisms that could explain why crowdfunders might be particularly willing to fund sustainable enterprises.

The legitimacy theory perspective argues that the focus of crowdfunders on the mission and core values of an enterprise, as well as the ‘democracy’ of having many small funders, fits well to sustainable enterprise finance (Calic and Mosakowski 2016; Lehner 2013). In the case of renewable energy crowdfunding, a combination of normative, gain and hedonic motivations is found (Dóci et al. 2015; Vasileiadou et al. 2016). Also, the limited monetary motivations of social/sustainable entrepreneurs can be a strong signal that they are more outcome-focused, reducing the risks of moral hazard and increasing legitimacy of the investment as perceived by the crowdfunder (Lehner 2013).

Obtaining community benefits has also been proposed as a motivation for crowdfunders to invest in a crowdfunding project (Belleflamme et al. 2014). The utility of crowdfunders increases through the consumption/investment experience that they undergo as part of their funding decision (Ordanini et al. 2011). A prerequisite for this additional utility is that they become part of the community of the enterprise and are thus in some way connected to its social network (Belleflamme et al. 2014; Ordanini et al. 2011). Arguably, creating a community around an enterprise is easier if some collective benefit is expected to be created, which is implicitly the case for sustainable enterprises.

Contract failure theory predicts that non-profit-oriented sustainable enterprises are more focused on quality and outcomes and therefore are better at obtaining funds from the public (Belleflamme et al. 2014; Hörisch 2015). Rational choice theory, on the other hand, predicts that crowdfunders will not prefer sustainable enterprises to general enterprises except if they deliver competitive financial payoffs. From this perspective, enterprises that focus (partly) on providing or contributing to a common good that investors cannot capture in the form of individual financial return will be less successful in finding investors compared to purely for-profit enterprises.

Empirical evidence about the potential of crowdfunding to finance sustainable enterprises shows mixed results. Calic and Mosakowski (2016) find that technological and film/video crowdfunding projects on Kickstarter (www.kickstarter.com) with an environmental or social focus are funded more successfully than projects without such a focus, partly mediated by creativity and third-party endorsements. On the other hand, Hörisch (2015) finds no significant relationship between environmental focus and

funding success of projects on the crowdfunding website Indiegogo (www.indiegogo.com). Our current understanding of crowdfunding for sustainable enterprises is still in its infancy and begs refinement. With this study we aim to build on existing knowledge by analyzing the ‘crowdfunding’ route to sustainable enterprise finance through a collective action lens.

10.3 COLLECTIVE ACTION THEORY AS A LENS FOR SUSTAINABLE ENTERPRISE CROWDFUNDING

Collective action theory, based on work by Olson (2009) and Hardin (1971), departs from rational choice theory by empirically identifying three behavioral types (Levine and Prietula 2014; Vollan and Ostrom 2010): (1) cooperators, who will unconditionally add their share to provide a collective good; (2) conditional cooperators, who copy the (expected) behavior of others and (3) free or easy riders, who will contribute (next-to) nothing—behavior predicted by rational choice theory. Field and lab experiments show that the second type, conditional cooperators (also referred to as reciprocators), usually consists of around half of the population (Fischbacher et al. 2001; Frey and Meier 2004). Conditional cooperators play a crucial role in generating either low or high levels of collective action, since their behavior is conditional upon the behavior of others. The incidence, visibility and expectations of the share of cooperators and ‘free riders’ in the population will affect whether they cooperate or not (Vollan and Ostrom 2010).

Collective action theory has increased our understanding about institutional arrangements that improve our ability to organize collective action (Ansell and Torfing 2016; Ostrom 2014). In the area of natural resource management, for example, design principles have been identified that improve the ability of groups to successfully undertake collective action (Cox et al. 2010; Ostrom 2010, 2014; Vollan and Ostrom 2010). More generally, empirical studies have shown that some institutional arrangements, such as face-to-face communication between participants in a social dilemma, improve cooperative outcomes (Balliet 2010; Fehr and Gächter 1999; Fehr and Schmidt 1999; Fischbacher et al. 2001; Nowak 2006).

The willingness of crowdfunders to finance sustainable enterprises can be framed as a social dilemma. Collective payoffs created through the investment cannot be appropriated by the enterprise, nor by the individual investor. Nevertheless, funders seem willing to invest in sustainable

enterprises through crowdfunding. This fuels our hypothesis that crowdfunding is an institutional arrangement which fosters collective action, such as sustainable enterprise funding. Therefore, we structurally analyze what aspects of the institutional structure of crowdfunding could potentially drive successful collective action. If we find institutional arrangements for collective action in crowdfunding, this can be applied strategically in order to successfully obtain funding for sustainable enterprises.

We give an overview of the most important institutional arrangements that have been empirically shown to lead to increased collective action (Table 10.1). For each arrangement, we provide the most relevant (if available, meta-analytical) source.

Not all of these arrangements will be applicable to crowdfunding. We use this overview of design principles for collective action as a starting point for an institutional analysis of crowdfunding.

10.4 METHODOLOGY: RULE CLASSIFICATION OF CROWDFUNDING

Following literature on cooperation for the commons (Kitsing and Schweik 2010; Vollan and Ostrom 2010), we apply the rule classification approach to crowdfunding. The rule classification method was developed by Ostrom and Crawford (2005) as part of the Institutional Analysis and Development framework (Ostrom 2010). Rule classification allows for a structured analysis of an institutional setting. Rules are defined as ‘shared understandings among those involved about what actions are required, prohibited or permitted’ (Ostrom 2010). Ostrom and Crawford (2005) distinguish seven types of rules that can be used to describe the institutional arrangements of any type of action situation:

1. Position rules: what positions can be taken by participants?
2. Boundary rules: how can participants enter or exit positions?
3. Choice rules: who has the authority to make decisions?
4. Aggregation rules: are there any joint decisions in the decision process?
5. Information rules: what information flows between participants?
6. Payoff rules: what rewards exist for different actions?
7. Scope rules: what outcomes are accepted?

Table 10.1 Overview institutional arrangements for collective action

<i>Institutional arrangement</i>	<i>Design principle or mechanism</i>	<i>Main source(s)</i>
Clear boundaries for users and resources	Clear and locally understood boundaries between legitimate users and nonusers. Boundaries separate a specific common-pool resource from a larger social-ecological system	Ostrom (2010)
Balanced provision and appropriation	Appropriation rules are congruent with provision rules; the distribution of costs is proportional to the distribution of benefits. Appropriation and provision rules are congruent with local social and environmental conditions	Ostrom (2010)
Collective choice arrangements	Most individuals affected by a resource regime are authorized to participate in making and modifying its rules	Ostrom (2010)
Monitoring (users and resources)	Individuals who are accountable to or are the users monitor the appropriation and provision levels of the users and the condition of the resource	Ostrom (2010)
Graduated sanctions	Sanctions for rule violations start very low but become stronger if a user repeatedly violates a rule	Ostrom (2010)
Conflict resolution mechanisms	Rapid, low cost, local arenas exist for resolving conflicts among users or with officials	Ostrom (2010)
Minimal recognition of rights	The rights of local users to make their own rules are recognized by the government	Ostrom (2010)
Nested enterprises	When a common-pool resource is closely connected to a larger social-ecological system, governance activities are organized in multiple nested layers	Ostrom (2010)
Group size	In smaller groups/communities, more frequent interaction allows for increased trust through reputation building and mutual monitoring, and participants are more likely to believe their contribution will make a difference. At the same time, group size needs to be large enough to enable provision of the natural resource even if only a subset of the group participates	Poteete and Ostrom (2004)
Group heterogeneity	Shared social, cultural or economic characteristics increase predictability of behavior and imply common interest and/or higher trust levels which can improve collective action. However, resource and interest heterogeneity can also lead to better collective action by a subset of the population when some participants have higher benefits from cooperating and/or more resources to share	Oliver et al. (1985), Poteete and Ostrom (2004)

(continued)

Table 10.1 (continued)

<i>Institutional arrangement</i>	<i>Design principle or mechanism</i>	<i>Main source(s)</i>
Communication	Communication prior to and during social dilemmas increase cooperation levels between participants, in particular for larger group sizes and for face-to-face (versus written) communication	Balliet (2010)
Sequential decision-making	Participants take account of whether and how much others have contributed to determine their own contribution to a collective action	Granovetter (1978), Oliver et al. (1985)
Contribution size	For smaller endowments/effort sizes, contributing to collective action is more likely	Ostrom (2014)
Activation thresholds	All-or-nothing mechanism ensures risk-free commitment; a contribution is only activated if the minimally needed commitment is pledged	Cheng and Bernstein (2014)

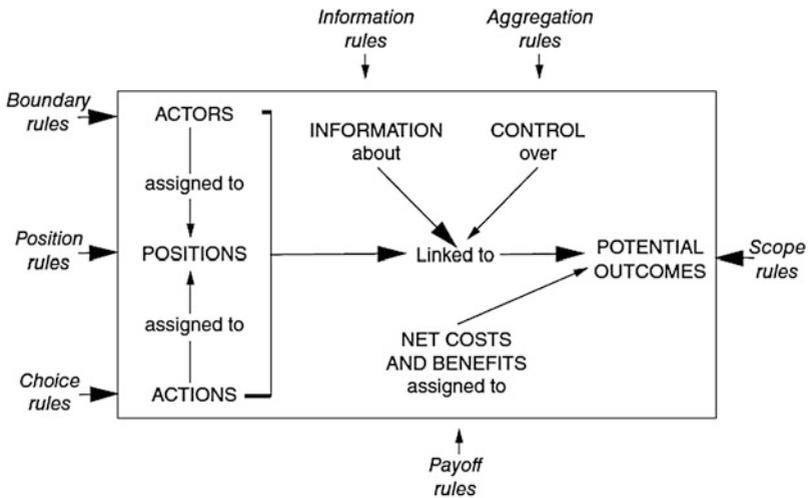


Fig. 10.1 Rules as exogenous variables affecting the elements of an action situation (Ostrom 2010)

We apply rule classification to crowdfunding, describing the different rules for crowdfunding to understand how crowdfunding may facilitate sustainable enterprise finance through collective action. Figure 10.1 (below) indicates how the different rules influence different aspects of any action situation. A classification of rules allows us to analyze the playing field for collective action in crowdfunding. We analyze the seven different types of rules for crowdfunding in turn (Ostrom and Crawford 2005). We base our rule description on international peer-reviewed academic literature about crowdfunding (Belleflamme et al. 2015; Mollick 2014; Moritz and Block 2016; Polzin et al. 2017).

10.5 ANALYSIS: RULE CLASSIFICATION AND POTENTIAL FOR COLLECTIVE ACTION

Our analysis consists out of two steps. First, we carry out a rule classification of crowdfunding. Second, we match existing findings from collective action theory to the rules found in crowdfunding to understand the potential of crowdfunding for bringing about collective action in finance.

10.5.1 *Description of Rules in Crowdfunding*

There are three types of positions that can be taken by participants in crowdfunding (**position rules**). The first position is that of the entrepreneur looking for funds. The second position is that of the funders who pledge money. The third position belongs to the crowdfunding platform who acts a financial intermediary by brokering the relationships between entrepreneurs and funders.

The entry requirements (**boundary rules**) for each position are similar or lower compared to other financial intermediaries (such as banks). Entrepreneurs are screened by the crowdfunding platform before being permitted to attract funds via their website. For crowdfunding platforms, there are national legal requirements, but these are generally less stringent than for other financial intermediaries and depend on jurisdiction, the type of crowdfunding and the size of the funds being attracted. For funders, the most important entry requirement is that of having a minimum amount of funds available to pledge.

The authority to make decisions (**choice rules**) which generate the final funding decision is divided between the three types of participants in

crowdfunding. Platforms decide which entrepreneurs get to present their enterprise on their website, based on pre-screening on aspects such as risk/return profile and scope of the enterprise. Entrepreneurs choose which platform they want to fund on for which amount and what they want to offer their funders in return (i.e. interest rate, size of equity stake, type of reward). Crowdfunders decide per enterprise whether they want to invest and what amount (based on the proposed payoff).

Crowdfunding is a typical case of joint decision-making (**aggregation rules**) since crowdfunders invest sequentially and in the aggregate decide whether an enterprise obtains funds and how much. Most platforms employ a threshold (all-or-nothing) mechanism for campaigns. Only if a group of funders jointly commits enough funds to reach the minimum amount that the enterprise needs is a positive funding decision reached, usually within a timeslot (i.e. 30 days). If this threshold is not reached, the enterprise receives no funds, not even those that were pledged.

Information rules in crowdfunding affect this aggregation process, since potential crowdfunders have real-time publicly available information about how many funders have pledged what amounts up to that moment (per person and in total). This information often includes the identity of funders who have already pledged to participate, depending on whether funders choose to be anonymous or not. Furthermore, funders are able to ask questions in public to the entrepreneur; these Q&As become publicly available information on the crowdfunding website and/or social media. Furthermore, entrepreneurs provide potential funders with information about the enterprise and the project to be funded using a project description including information about the entrepreneurs, an investment sheet, a video and information about the payoff offered per amount pledged.

The costs and benefits for each of the three participants (**payoff rules**) depend on the type of crowdfunding that the entrepreneur chooses to employ: donation, reward, debt or equity. In general, platforms obtain a success fee for each funded enterprise, framed as a percentage of the amount pledged, in exchange for the cost they make in screening the enterprise and marketing it to their crowd. Entrepreneurs incur costs to be screened by the crowdfunding platform, to market themselves to the crowd and to answer questions from potential funders. Also, they pay for the brokering services of the platform and commit a certain return to the crowd. Crowdfunder payoff is heterogeneous and can consist of both tangible and intangible benefits. Tangible benefits can include a product or service, a fixed interest payment, profit sharing or buy-out as well as provision of a collective/public good.

Intangible benefits include warm glow (Andreoni 1990), community benefits, such as feeling part of a group or being allowed to give input to production decisions (Belleflamme et al. 2014), and build-up of social capital (Colombo et al. 2015).

Finally, **scope rules** in crowdfunding define what types of enterprises or projects can be funded on certain platforms, which often have platform-specific criteria based on type of crowdfunding, amount funded, sector or risk level. Based on their funding scope, such as reward-crowdfunding (www.kickstarter.com) or societal impact-focus (www.oneplanetcrowd.com), we find many different types of crowdfunding platforms where each facilitates different types of investment decisions.

10.5.2 *Matching Collective Action Theory to Crowdfunding Rules*

Although rule classification applied to a new institutional setting in itself is insightful (Kitsing and Schweik 2010), our goal in this chapter is to use this rule classification to find overlap between crowdfunding rules on the one hand and institutional arrangements which improve collective action, on the other. Through a literature search on collective action and social dilemmas, we create an overview of arrangements that are found to increase collective action or cooperation between actors (Table 10.1). We match the collective action—enhancing institutional arrangements with crowdfunding rules (see Table 10.2).

From this full overview of ‘matches’ between crowdfunding and institutional arrangements that foster collective action, we find quite some overlap and combinations to be made between the different aspects of the institutional arrangements. Many matches between crowdfunding rules and collective action arrangements are partly driven by the same underlying rules. In particular, the low *boundary rules* for becoming a crowdfunder (low amount of funds needed per investment decision) in combination with a funder’s ability to make enterprise-specific funding decisions (*choice rules*) seem to create ample opportunity for collective action, simply because direct provision of finance for enterprises is opened to more individual participants than before.

For a comprehensive overview of our findings as described in Table 10.2, we combine them into three mechanisms through which crowdfunding can foster collective action for sustainable enterprise finance: (1) use of social networks (2) heterogeneous contributions and payoffs and (3) aggregation

Table 10.2 Overview arrangement for collective action matched to rules in crowdfunding

	<i>Matching rules in crowdfunding to collective action mechanisms</i>
Clear boundaries for users and resources	Enterprise-specific crowdfunding campaigns make it very clear what money is pledged for (and which sustainability goal is addressed) Boundaries to enter as crowdfunder are low due to small starting amounts Boundaries to become a crowdfunding platform are relatively low, leading to a heterogeneous crowdfunding market (however, could be due to the start-up phase of this market)
Balanced provision and appropriation	A large crowd of potential funders (low entry boundaries) allows for selection of funders who have a higher payoff/preference from a certain type of collective action based on region, network, sector or interest which can improve willingness to fund Different types of payoff can be formulated in order to best address the preferences of potential funders and investment sizes
Collective choice arrangements	Low boundaries to fund 'democratizes' the funding decision compared to other financial decisions Spread of information in regional or thematic networks involves a large group of potential funders
Monitoring (users and resources)	The inclusion of an entrepreneur's social networks and/or users in the funding community allows for informal monitoring through repeated interaction
Graduated sanctions	Not applicable
Conflict resolution mechanisms	Crowdfunding platform provides legal contracts defining agreements made regarding the use of money and payback period or profit sharing but not regarding sustainability milestones
Minimal recognition of rights	Most jurisdictions have officially created laws for crowdfunding as a financial tool
Nested enterprises	Sustainable enterprises often address one specific sustainability need, located within a sector or business lines (creating a sustainable version of an existing product). This enterprise-specific approach leads to multiple governance layers each addressing a subset of existing sustainable goals
Group size	The low entry boundaries for crowdfunders in general allow for a large potential group of funders, of which only a small part needs to participate to provide enough funding for the enterprise When a crowdfunding campaign targets a specific crowd (i.e. local neighborhood or client group), repeated interaction

(continued)

Table 10.2 (continued)

<i>Matching rules in crowdfunding to collective action mechanisms</i>	
Group heterogeneity	can increase reputation building, trust and/or mutual monitoring; furthermore participants are more likely to believe their contribution will make a difference Low boundaries to entry and heterogeneous potential funding participants mean that funders can self-select into a sustainable enterprise funding campaign that best fits their preferences Network or interest-based crowdfunding around a common sustainability goal addressed by an enterprise can increase predictability of behavior and therefore mutual trust through homogeneity <i>within</i> the funding community
Communication	Cheap talk can occur both face-to-face in social networks surrounding the sustainable enterprise as well as online on social media and on the crowdfunding page of the enterprise, where crowdfunders can communicate their (intent to) pledge and reasons for doing so to other potential funders
Sequential decision-making	Crowdfunding makes it transparent in real-time how many other funders have already contributed, the amounts and in which time period. Furthermore, identities of previous funders are often made known
Contribution size	Crowdfunding allows for contributions to specific enterprises starting at small amounts (for enterprises usually between 100 and 250 Euro)
Activation thresholds	All-or-nothing mechanism means a pledge is only activated if a minimum amount of funding has been reached, lowering the risk that the money will not be spent well. A timeslot (i.e. 30 days) increases the urgency to contribute within a fixed time period (deadline)

Table 10.3 Three main mechanisms for collective action in crowdfunding

<i>Relevant rules per collective action mechanism</i>	<i>Network-based funding</i>	<i>Heterogeneous contribution and payoffs</i>	<i>Aggregation in thresholds</i>
Position rules			
Boundary rules	●	●	●
Choice rules	●	●	●
Aggregation rules			●
Information rules	●		●
Payoff rules		●	
Scope rules		●	

within thresholds. Also, we indicate which rules are driving each mechanism (Table 10.3).

10.5.2.1 *Mechanism 1: Collective Action Through Social Networks*

Since crowdfunding is often network-based, collective action can be enhanced in several ways. Information distributed about the enterprise, especially for early backers, often comes from the entrepreneur who mobilizes existing strong and weak ties (family, friends, clients, previous investors or business relations). First, knowing the person(s) behind the enterprise has been shown to affect the information used for the decision-making and can decrease fears of moral hazard (Granovetter 2005; Polzin et al. 2017). Secondly, the homogeneity of actors within a social network may be larger, which increases trust about expected behavior and can therefore facilitate collective action, if participants fund based on the expectation that others will put in a share of the funds as well (Poteete and Ostrom 2004). Third, smaller, well-defined group size can be conducive to collective action because a single contribution is expected to make a real difference (Olson 2009; Ostrom 2010). Also, opportunities for frequent interaction rise as group size decreases, which leads to a higher importance of reputation (Poteete and Ostrom 2004). However, the group size of the potential funding community still needs to be large enough to include enough contributors and to allow for self-selection of funders who receive the highest payoff from contribution to collective action, that is, due to preferences or reputation (Oliver et al. 1985). Furthermore, resource heterogeneity within a potential funding network can be useful since higher resource endowments make it easier to pledge funds (Oliver et al. 1985).

10.5.2.2 *Mechanism 2: Collective Action Through Heterogeneous Contributions and Payoffs*

Heterogeneity of choice and payoff rules in crowdfunding may improve collective action for sustainable crowdfunding by allowing for fine-grained matching of investor contribution and payoff preferences in line with enterprise characteristics. By designing the contribution and/or payoff structure of a crowdfunding campaign based on specifically targeted funders such as users, clients, believers or local citizens, the benefit for a funder of joining a campaign can be maximized, enhancing collective action. Bringing *appropriation* (benefits) and *provision* (costs), in line with each other by locating costs within the community that will profit from shared benefits, is one of Ostrom's design principles for governing natural resources (Ostrom 2010)

and may also facilitate collective action in crowdfunding. For example, consumers or players in a certain value chain that wish to use a sustainable product or want to be part of an inspiring community may be willing to invest in or pre-purchase the product since they are motivated to bring it to market. Crowdfunding platforms are able to offer multiple types of payoff (i.e. products) to create niche markets targeted at specific segments (such as users). Furthermore, size of contributions to a crowdfunding campaign may vary considerably, depending on a participant's financial endowment and also willingness to contribute. In general, more people are willing to make smaller contributions (Ostrom 2014); therefore, the option to pledge heterogeneous amounts is likely to facilitate collective action in crowdfunding.

Also, crowdfunding platforms can define their scope by selecting enterprises that fit the preferences of a specific crowd, making it easier to match funders to sustainable enterprises based on their preferences and payoff expectations. As an example, Oneplanetcrowd, a Dutch sustainable crowdfunding platform, invited all funders of a car sharing initiative (Snappcar) to invest in a tool sharing platform (Peerby) based on their previously revealed funding preferences (type of enterprise and type of payoff).

This payoff-mechanism is likely to interact with the first network-mechanism, since increasing individual payoffs through niches can mean that individuals who benefit most from a collective cause are already part of an enterprise's existing social network as members, clients, believers or local citizens. However, we need to distinguish between them because the underlying rules driving the two mechanisms are different. The network-mechanism is relationship-driven, conveying information, trust and reputation to stimulate collective action; the payoff-mechanism is driven by heterogeneous payoff (cost and benefit) rules that can positively affect the willingness to contribute.

10.5.2.3 Mechanism 3: Collective Action Through Aggregation Within Thresholds

The sequential, online and transparent aggregation and information rules of crowdfunding in a threshold model may improve collective action due to conditional cooperation between individual crowdfunders (Cheng and Bernstein 2014; Frey and Meier 2004; Keser and Van Winden 2000). Crowdfunders who observe the investment of others may decide to add their funds to contribute to societal impact in a similar way as communication between actors can lead to cooperation in common-pool resource

dilemmas (Vollan and Ostrom 2010). Within this mechanism, the legitimacy argument can play a role: if others choose to invest, this creates a quality signal that the enterprise may be effective in reaching its goal (Lehner 2013).

Furthermore, information about previous funder decisions is skewed. Potential funders see only the ‘cooperating’ funders who decided to invest, but have no information about funders who considered funding but opted out. There is therefore a larger chance that conditional cooperators will follow the example of the previous funders if their perception is that many funders joined within a short time frame (proxying for a high percentage of positive funding decisions), even though they do not know how many funders decided *not* to fund. This skewed information provision can help collective action come about based on the behavior of the unconditional cooperators (early backers). Mirroring this process, low numbers of funders during the first time period of a crowdfunding campaign mean collective action will probably not come about, since conditional cooperators will gauge there to be too little cooperation going on and may therefore opt out, as well.

10.6 DISCUSSION: WHAT RULES LEAD TO COLLECTIVE ACTION IN CROWDFUNDING?

In this chapter, we apply findings from collective action theory to the institutional arrangements of crowdfunding in order to explain why and under what circumstances sustainable enterprises are more likely to be successfully funded than mainstream enterprises. Previous work on sustainable enterprise crowdfunding uses (mainly) legitimacy theory to explain why sustainable, social or environmental enterprises could be more successful than mainstream enterprises at crowdfunding, despite predictions from rational choice theory (Calic and Mosakowski 2016; Hörisch 2015; Lehner 2013). Empirical evidence on this question is scarce and mixed.

We apply collective action theory to understand the potential contribution of crowdfunding to sustainable finance. We discuss what institutional arrangements within a crowdfunding campaign can lead to successful funding based on institutional arrangements that foster collective action. Our analysis results in three main mechanisms that can explain why sustainable enterprises may be crowdfunded easier than mainstream enterprises.

Each mechanism consists of several rules embedded in crowdfunding. Here, we briefly discuss our findings and their implications.

The easy access to crowdfunding for individual participants, due to the small starting amounts, creates a large diversity of potential crowdfunders. We find that the boundary and choice rule architecture of crowdfunding is a key institutional driver behind all three mechanisms for collective action in this type of finance. Increased access to financial decision-making, starting at small amounts, has been framed as ‘democratization of finance’ by some (Shiller 2013), although it diverts from real democracy since participation depends on individual resources (Hörisch 2015). Nevertheless, investment decision-making is opened to a much larger ‘crowd’ compared to when this was restricted to traditional financial players. This in itself is likely to influence which enterprise gets funded.

The first mechanism, network-based funding, builds on this increased funding access to stimulate collective action. Information about the crowdfunding campaign is distributed through existing ties/relationships, which changes the incentive structure of the financing decision and increases trust levels. We are not the first to conclude that crowdfunding is network-based. On the contrary, it has been brought forward as a defining aspect of crowdfunding (Moritz and Block 2016; Wal et al. 2016). However, the link between crowdfunding being network-based and its potential for organizing collective action/sustainable finance is novel.

The second mechanism, collective action through heterogeneous contributions and payoffs, links back to balanced provision and appropriation, one of the design principles for successful collective action in natural resource management (Ostrom 2010). It is also in line with the concept of ‘fairness’, which has been studied empirically in the cooperation literature (Fehr and Schmidt 1999). The larger flexibility to create niche matches between entrepreneurs and specific funder types creates an opportunity to increase individual payoffs to a funder who values a particular mix of (non-financial) payoffs (Geobey et al. 2012). Renewable energy projects are an example of sustainable entrepreneurial projects that can generate financial payoff, climate change mitigation and community benefits for its crowdfunders (Dóci et al. 2015).

Finally, the third mechanism, collective action through aggregation in thresholds, is dependent on the aggregation and scope rules in crowdfunding. This mechanism can be traced back to research carried out on critical mass (Oliver et al. 1985) and to findings on conditional cooperation (Levine and Prietula 2014; Ostrom 2014; Volland and Ostrom 2010).

Furthermore, aggregation in thresholds has been pinpointed as a successful strategy in the context of crowdfunding (Cheng and Bernstein 2014). The tendency of crowdfunding campaigns to either succeed in bringing together the money or fail to do so with a wide gap is generally attributed to information cascades and increased trust through signaling by early backers (Colombo et al. 2015; Vismara 2015). Signaling by early backers, influencing the investment decision of subsequent funders, is also commonplace outside sustainable enterprise funding. However, if we find that sustainable enterprises are more successful at bringing together funds than mainstream enterprises—all else being equal—our hypothesis is that an additional part of this ‘herding’ behavior in crowdfunding can be attributed to collective action surrounding sustainable goals. Empirical evidence is needed to unravel these two different mechanisms.

Another aspect that needs further attention is distinguishing between collective action for innovative entrepreneurship, in general, and sustainable innovative entrepreneurship specifically. The provision of innovation to a society can also be framed as collective action, since more people benefit than just the investors, and the high-risk levels of innovation finance are often not compensated by its returns (Faber and Frenken, 2009). In particular for a transition toward a sustainable economy, which needs a lot of product and service innovation, an argument can be made that collective action targets both sustainability and innovation. This links back to the argument made by Calic and Mosakowski (2016) that willingness of funders to invest in social enterprises is partly mediated by creativity levels, and this is also pinpointed in the double externality problem (Faber and Frenken 2009).

One important practical finding from our analysis is that collective action for sustainable enterprise finance does not happen automatically by opening a project page on a crowdfunding platform. In order to ‘put to work’ the rules and mechanisms in crowdfunding for a sustainable enterprise, a campaign strategy needs to be well thought through and targeted towards a specific audience. Also, some sustainable enterprises will be better suited for crowdfunding than others. Building up a community that is committed to the sustainable enterprise for idealistic or practical reasons, such as users or fans, is a key ingredient. Building up a social network is important in general, since the entrepreneur can inform individuals personally about their campaign which improves collective action both from a network-based and payoff perspective. Getting early backers within this community to commit, preferably with their identity revealed, will stimulate conditional

cooperators to follow. The bigger an entrepreneur's community or network is, the easier it is to get at least a small part of them to participate. Also, crowdfunding of a sustainable consumer product or service is likely to be easier than a business-to-business product or service, since individuals are more likely to become involved if they see themselves as potential consumers and therefore understand/support the value proposition (Ordanini et al. 2011).

10.7 CONCLUSION

This chapter is a conceptual exercise to better understand potential mechanisms that enhance sustainable finance by applying collective action theory to crowdfunding. We use a rule classification framework to indicate which institutional arrangements in crowdfunding appear conducive to organizing collective action. By combining collective action theory with the growing body of academic literature on crowdfunding, we argue that understanding the application of rules embedded in crowdfunding can foster increased investments in sustainable entrepreneurship through network-based funding, heterogeneous contribution and payoff and aggregation in thresholds. Below, we provide limitations and future directions of our research.

10.7.1 *Limitations*

Our study has some important limitations. For one, the conceptual analysis is conducted for crowdfunding in general, whereas in practice, rules between platforms can differ. Additionally, since this is an industry that still needs to mature, rules may evolve. Furthermore, we focus on crowdfunding via intermediary platforms, whereas not all projects are mediated, leading to different funding incentives (and lack of screening) if there is no platform involved.

Secondly, by undertaking a rule classification of crowdfunding, we leave out other external variables that strongly affect the ability of an institutional setting to create collective action, such as biophysical conditions and attributes of the community (Ostrom 2010). These variables need to be taken into account in further research.

Third, we lean strongly on theory and evidence from common-pool resource research—notably the work of Elinor Ostrom—whereas collective action for crowdfunding sustainable enterprises concerns many different types of social or environmental payoffs that are not as clearly defined as

many common-pool resource dilemmas. Although we limit ourselves to analyzing collective action (which can involve commons), more work needs to be done to understand how the specific social and environmental payoffs produced by sustainable enterprises affect the ability to create collective action. A further step is to improve our understanding regarding what type of sustainable enterprises and business models are well suited for crowdfunding using collective action dynamics.

10.7.2 Future Directions

Conceptually applying existing insights from collective action to finance is just a first step. We briefly state three main research directions from which to continue from here.

First, empirical evidence is needed to test the hypothesis that collective action is indeed taking place in sustainable enterprise crowdfunding. It is particularly important to be able to distinguish collective action from other dynamics in crowdfunding such as herding, since early backers also play other important signaling roles (Colombo et al. 2015; Vismara 2015). One way to do this is through a field or lab experiment with two versions of a project: one framed as ‘sustainable’ and one with no mention of sustainability at all and analyzing participation rates of funders.

Second, existing insights about collective action should not only be applied but also further developed in new innovative institutional settings. As technological advancements increase the speed and ease of information transmission and lower transaction costs, crowdfunding (and other financial innovations) can improve and develop as new institutional settings for collective action that were previously not possible in an offline environment. If designed smartly, financial innovation could pave the way for intelligent collective action for sustainable enterprise finance. Crowdfunding and other types of decentralized financial innovation can be used to empirically test and improve upon collective action mechanisms. The next step is to collect and create empirical evidence that can give more insight into how we can improve collective action in finance in order to speed up a transition towards a sustainable economy. This goes beyond collective action in crowdfunding, which will not suffice as a solution to creating sustainable finance but is an important step, in particular for understanding increased decentralization in financial decision-making. Smart use of technology to improve collective action should not only be understood through crowdfunding but also through other types of ‘fintech’, such as development of local and/or

blockchain-based currencies and innovation by traditional players like banks and pension funds.

Furthermore, there is a diversity of sustainable enterprises that will have different abilities to fund themselves using collective action dynamics in crowdfunding. We need to improve our understanding of how different mechanisms to obtain finance for sustainable entrepreneurship can be best applied in practice, including these collective action mechanisms. This can relate to the type of business model that the enterprise is setting up, its stage of growth and the level of customer involvement. A better understanding for sustainable enterprises of when to search for what type of finance will increase the number that make it to the market.

Finally, the ultimate goal of more sustainable finance is the actual societal impact of the enterprises and projects being financed. More research is needed to reach a better prior understanding of whether a decision to finance a sustainable enterprise is likely to lead to a positive societal impact so that this can be included as a criterion in the investment decision (Maas and Liket 2010; Toxopeus et al. 2015).

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