

MANAGEMENT AND INDUSTRIAL STRATEGY

MASTER'S FINAL WORK

DISSERTATION

DYNAMICS OF REWARD-BASED CROWDFUNDING'S
DEGREE OF SUCCESS: IMPACT OF PROJECT
DIMENSION

JOÃO PAULO MATIAS GUIADO

NOVEMBER - 2020

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ABSTRACT

In this dissertation we develop a better understanding of a relatively new phenomenon known as crowdfunding. We start by shedding some light on its roadmap, namely how it became a mix of the traditional financing methods and crowdsourcing. Having many specialized variations, sometimes crowdfunding leans toward more financially focused projects, rivaling banking, business angels, capital ventures, etc., while sometimes it focusses on the development and pre-selling of new products. The latter is known as reward-based crowdfunding, in which this study is focused. A creator presents a product or idea in development to the general public (the crowd). Then, any individual may support the project by giving money to the creator in exchange for a future reward, typically the product itself. What we try to accomplish with this study is to better understand the dynamics of this complex environment, by examining which variables contribute to the degree of success of campaigns in general, but also if the dimension of the project changes its dynamics and the variables contributing to their success. Based on the existent literature, we build four linear regression models to test our hypotheses, using data gathered from Kickstarter.com campaigns, where our dependent variable is the degree of success of a crowdfunding project. Our results suggest that indeed project dimensions affects the dynamics of what contributes to the degree of success of a campaign. Backer related variables are almost always significant, but in the case of the number of backers supporting the campaign at day 1, depending on the project dimension, the contribution changes from negative to positive. Structure, communication, creator, and popularity related variables are also sensitive to project dimensions, especially their significance. With this study we contribute to a better understanding of the crowdfunding phenomenon, with theoretical and managerial implications and leave suggestions for future research on the topic.

Keywords: Crowdfunding, Reward-Based, Project Dimension, Degree of Success, Kickstarter.

RESUMO

Com esta dissertação desenvolvemos uma melhor compreensão acerca de um fenômeno relativamente novo, conhecido como *crowdfunding*. Começamos por examinar o seu desenvolvimento, nomeadamente como se tornou uma mistura entre os métodos de financiamento tradicionais e o *crowdsourcing*. Por vezes o *crowdfunding* assemelha-se mais a projetos de foco financeiro, rivalizando o papel de bancos, *business angels*, capital de risco, etc., outras vezes foca-se mais no desenvolvimento e na pré-venda de novos produtos. Esta última tipologia é conhecida como *crowdfunding* baseado em recompensas, no qual este estudo se concentra. Um criador apresenta um produto ou ideia em desenvolvimento ao público em geral (a *crowd* ou multidão). Posteriormente, qualquer indivíduo pode apoiar o projeto doando dinheiro ao criador em troca de uma recompensa futura, normalmente o próprio produto. O que pretendemos com este estudo é compreender melhor a dinâmica deste ambiente complexo, examinando quais as variáveis que contribuem para o grau de sucesso das campanhas em geral, mas também se a dimensão do projeto muda a sua dinâmica e as variáveis que contribuem para seu sucesso. Com base na literatura existente, construímos quatro modelos de regressão linear para testar as nossas hipóteses, utilizando dados retirados de campanhas no Kickstarter.com, sendo a nossa variável dependente o grau de sucesso de um projeto de *crowdfunding*. Os nossos resultados sugerem que a dimensão dos projetos afeta a sua dinâmica e os fatores contributivos para o seu grau de sucesso. Variáveis relacionadas com os apoiantes das campanhas são quase sempre significativas, mas a contribuição do número de apoiantes que apoiam o projeto no primeiro dia da campanha muda de negativa para positiva, dependendo da dimensão do projeto. Variáveis relacionadas com a estrutura, comunicação, criador e popularidade são também sensíveis às dimensões do projeto, especialmente quanto à sua significância estatística. Com este estudo contribuímos assim para uma melhor compreensão do *crowdfunding*, com implicações teóricas e de gestão, deixando sugestões para investigação futura sobre o tema.

Palavras-Chave: Crowdfunding, Baseado em Recompensa, Dimensão de Projeto, Grau de Sucesso, Kickstarter.

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1. INTRODUCTION

The human being is a social creature. We humans have adapted and evolved to cooperate and work with each other, whether driven by selfless reasons (Bowles & Gintis, 2002; Boyd et al, 2003; Fehr & Fischbacher, 2003), by rational behavior or because of genetic evolution (Hamilton, 1964; Nowak & Sigmund, 1998; Trivers, 1971), we feel the urge to cooperate with each other. As civilizations emerged, the complexity of the human interactions increased, and we now live in a globalized economy (Giddens, 1991; Levitt, 1993), that broadens, deepens and accelerates the social interactions across the planet (Tomlinson, 1999), with cooperation between nations and international organizations.

We can buy in Portugal a product sold in France, produced in China, and designed in the USA. We can send money to help humanitarian organizations working in Africa. We can develop a vaccine in cooperation with the help of all these different labs around the world. None of this would be possible without the technological evolution we have had in the last few decades, especially with the appearance of the Internet and the web 2.0 (O'reilly, 2007, 2009). This technology connects us, makes distant cooperation and the exchange of information in a split second with anyone around the world possible (Paroutis & Al Saleh, 2009).

The Web 2.0 enabled companies to operate in a larger number of markets and reach new clients, but it also brought the opportunity to create new businesses and business models, who would not otherwise exist at all (Shuen, 2018). Activities which would normally be done only in smaller scales are now scalable at a cost that makes them profitable. Some activities and business models were transformed and adapted to capture the potential that this technology had to offer, especially in regards to marketing strategies and direct marketing (Constantinides & Fountain, 2008).

In this dissertation we are going to talk about *crowdfunding*, one of the many activities that emerged as a new business/funding model, and more specifically, about reward-based crowdfunding, which is one of the variations that the phenomenon can take. As we will see, besides being used to raise money, some authors also link crowdfunding to activities such as innovation, product development or selling and marketing strategies (Belleflamme, Lambert, & Schwienbacher, 2010, 2014; Mollick, 2014; Nocke, Peitz, &

Rosar, 2011; Schwienbacher & Larralde, 2010; Wei, 2018). These are activities that almost every company conducts, but through crowdfunding, they become more exposed to the general public, the “*crowd*”. Getting people to help us out with something, lend us money, invest in, or contribute to our ideas, is something that has always happened. When seeking help, individuals usually start with their closest friends and family, present their projects to a small number of potential investors, or simply ask their local community for help with a social cause. These are some of the bootstrapping strategies that startup companies usually use to fund themselves (Brush et al, 2006; Ebben & Johnson, 2006; Winborg & Landström, 2001). With crowdfunding, all of this happens in a much larger scale. Crowdfunding has the particularity of growing the pool of investors, customers, contributors, and project developers, not only in numbers but also in its diversity (Belleflamme et al., 2014; Mollick, 2014). They usually do it through specialized websites called “crowdfunding platforms”, which bring together those who need help, the “project creators”, with those who want to help or invest, the supporters or “backers”.

Some individuals and organizations run crowdfunding campaigns only to raise funds for a specific project, while others may have additional goals in mind, like raising product awareness, gauge market demand or interact and innovate through their supporters (Belleflamme et al., 2010; Brown, Boon, & Pitt, 2017; Gerber & Hui, 2013; Da Cruz, 2018). Some seek help without offering compensation for their investors, while others offer to pay back, with interest, what was lent to them, or give investors company shares (Ahlers et al., 2015). Some just offer the final product that is being developed (Belleflamme et al., 2010; Mollick, 2014; Wei, 2018). While there are more traditional ways of achieving what crowdfunding offers, many individuals and organizations opt to run crowdfunding campaigns anyway, and many individuals want to invest and support them. Both ends of the spectrum want the campaigns to be successful, for their own reasons. A relatively recent report from Massolution (2015) indicates a rapidly growing market for crowdfunding projects, having reached a total of 16.2 Billion US Dollars in volume in 2014, which represented an annual growth of 167%. The report forecasted this growth to become higher as the number of crowdfunding platforms increase and the size of the campaigns become greater. In October 2020, Kickstarter, which is a reward-based crowdfunding platform, reported a total of 4.81 Billion US Dollars successfully

raised on its platform alone, with more than 189 thousand successful projects and a success rate of 38.11% (Kickstarter, 2020).

1.1 Problem statement

With this rapid market development and growth, many researchers started to study the phenomenon, raising questions, theorizing about it, and trying to get a better understanding of it. Researchers such as Kuppuswamy & Bayus (2013), Belleflamme et al. (2014), Butticiè et al. (2017), Colombo et al. (2015), Cordova et al. (2015) and Mollick (2014), just to name a few. For entrepreneurs, the importance of understanding what can make their endeavors in crowdfunding a success is of extreme importance. Still, this is a relatively unknown topic of discussion and research. These and other authors have started to pave the path to its better understanding, but there is yet much to be explored. It seems though, that most research has been ignoring or overlooking the fact that the circumstances and characteristics of the project itself may affect what variables are in fact important to its success. Using a Hypothetico-Deductive scientific research strategy, we will try to shed some light on the matter, where the studied population is the reward-based crowdfunding projects aggregate. More specifically, we will try to better understand the dynamics within these projects, focusing on reward-based crowdfunding and trying to understand if the characteristics that make them successful are dependent on their dimension. We believe this study is important because it uncovers unknown facts about the behavior and outcome of the many variables that can affect the degree of success of a project.

1.2 Research questions

Based on what we have said in the previous section, our research questions are: “What are the project characteristics that contribute for the success of a crowdfunding campaign?”. In the same vein, “What should project creators do to maximize the degree of success of their projects, with the aim of meeting and exceeding their financial goals?”. And finally, “Are these characteristics dependent on the dimension of the project?”. In this dissertation we will try to answer these questions.

1.3 Dissertation Outline

Primarily, we will review what the literature says about this relatively new concept, how it can be defined, analyze the existing variations of the phenomenon, and explore what makes them distinct from one another. We will then focus on a chosen variation of crowdfunding known as “reward-based crowdfunding”, analyzing it in detail. We will also look at the current state and the evolution of the reward-based crowdfunding industry. Then, we will focus on our research questions and the methodology used to achieve our empirical results. Finally, we will discuss the results and present our conclusions.

2. LITERATURE REVIEW

2.1 The path to crowdfunding

The development of the “Web 2.0”, which made interactions throughout the internet possible, meant that, as opposed to just consuming information, internet users could also interact with the content they were seeing on their computers, and create content themselves (Lee et al., 2008). Some companies began to use this interaction to their advantage. Besides using Internet to sell their products, they could use it to develop new business and product development models, such as “Open-Source” software development. This model can be considered the initial step towards crowdfunding.

The Open Source Initiative defines it as allowing access to the essential elements of a product to anyone, for the purpose of collaborative improvement to the existing product, with transparency and free distribution (The Open Source Initiative, n.d.). This means that anyone can contribute to the product development if they choose to do so, but cannot claim ownership of the end result, having to give it back to the community. As Brabham (2008) points out, the “open source” model is usually associated with software development, and companies don't have significant distribution or manufacturing costs, since software can be copied and downloaded through a website, occupies no shelf space, and is free for everyone to use. There is an incentive for the crowd to contribute to its development, either to gain recognition amongst their peers, or just to have the satisfaction of solving a puzzle. But when companies want to develop a product which they intend to sell for profit, it is harder to get the crowd to work for free. It loses the

sense of community and it becomes a more “capitalistic” endeavor. Companies understood this, but by providing a clear compensation to contributors, this barrier would eventually be overcome. And so, once more, they adapted their business models to accommodate this new way of developing projects and ventures (see: Bayus, B., 2013; Kleemann, F. et al, 2008).

This practice became known as crowdsourcing, a term that was first coined by Jeff Howe in the June 2006 issue of *Wired* magazine (Howe, 2006). This author defines crowdsourcing as the act of outsourcing the task of coming up with creative solutions for specific problems or challenges to the crowd, which sometimes are rewarded with prizes. Kleemann, *et al.*, (2008, p. 6) really captures the “corporate” aspect of crowdsourcing in their definition: “*Crowdsourcing (...) takes place when a profit oriented firm outsources specific tasks essential for the making or sale of its product to the general public (the crowd) in the form of an open call over the Internet, with the intention of animating individuals to make a contribution to the firm's production process for free or for significantly less than that contribution is worth to the firm.*”. As it is with Open Source, it has the advantage of harnessing the knowledge that the network of people generates, and not just the sum of the individual knowledge of each person (Howe, 2008).

Besides companies being able to reach a bigger and broader number of people to work on specific problems, they also started to take advantage of online communities and even promoting their existence, since these communities can contribute to the innovation process of the companies (Jeppesen & Frederiksen, 2006). These are small groups of people, sharing similar tastes, interests, and areas of knowledge, which makes them an important resource, or as Howe (2008) describes it, “*an irrevocable force*” that companies can use. Made up of individuals with specialized knowledge, these “lead users” are the first ones to buy, use and test products they are passionate about, thus knowing, sometimes better than the companies themselves, what problems existing products or services may have, and want to contribute to their development (von Hippel, E., 2006; Füller, J., 2010).

There is evidence that, under the right conditions, organizations find these individuals valuable to them (Kavadias, & Sommer, 2009; Magnusson, 2009; Girotra, K. *et al.*, 2010; Poetz & Schreier, 2012). Some companies, such as Dell (computer hardware) and

Netflix (content streaming) built and grow their own communities, in order to get suggestions, engage in discussions on relevant topics, give costumers voting rights on new products or services and innovate through the crowd (Bayus, 2013; Sullivan, 2010). Both models brought companies new ways of developing products and interacting with the public (the crowd) through the internet, and both are closely related to innovation, more specifically to the notion of Open Innovation, a relatively new approach to innovation management, introduced by Henry Chesbrough in 2003 (Chesbrough, 2003a, 2003b) in which “*Companies are increasingly rethinking the fundamental ways in which they generate ideas and bring them to market — harnessing external ideas while leveraging their in-house R&D outside their current operations.*” (Chesbrough, H., 2003b, p. 35).

These models served as inspiration for what crowdfunding would become. Instead of using the crowd just to get ideas, solve problems, innovate, and engage with customers and communities, the project creators started to take advantage of these crowds to also get funds for their ventures. Depending on the importance the project creators give to funding versus getting other inputs from the crowd, crowdfunding campaigns would then morph to be more closely related to either traditional methods of financing, such as selling equity to investors, getting loans from banks or fundraising through donations, or to be more closely related to traditional methods of product and brand development, such as using their internal resources of R&D and marketing or crowdsourcing. With such a wide range of crowdfunding variations, defining what crowdfunding is has become a topic of discussion within the literature, with many authors having different approaches to it.

2.2 What is Crowdfunding?

Depending on a number of factors, crowdfunding can be split into a few different variations of the concept. To capture all these variations in its definition, some authors opted to be more open-ended (Belleflamme et al., 2010, 2014; Schwienbacher & Larralde, 2010), while others prefer to use narrower definitions (Mollick, 2014), arguing that, for academic purposes, clearly defining the boundaries of the concept is of extreme importance. Still, these authors highlight the importance of discussing all the differences and variations crowdfunding can have.

Schwienbacher and Larralde (2010, p. 4) defined crowdfunding as “(...) *the financing of a project or a venture by a group of individuals instead of professional parties (like, for instance, banks, venture capitalists or business angels).*” While being a clear definition, it restricts crowdfunding as the act of raising funds for a project, which, as we will see, may not be applicable to all crowdfunding projects, since there are projects with additional goals besides fundraising, such as getting information from the crowd about the product that is being developed within the crowdfunding project itself (Belleflamme et al., 2010; Da Cruz, 2018) registering direct sales or generating product ideas (Brown et al., 2017), expand awareness, form connections or gain the crowd’s approval (Belleflamme et al., 2010; Gerber & Hui, 2013), gauge the market, innovate through the crowd, conduct mass customization or practice price discrimination (Belleflamme et al., 2010). It also fails to define how the funding process is done, namely through collecting small donations or investments from a large crowd. This later aspect is addressed on Belleflamme, *et al.*, (2010, p. 5) definition, which is based on the work of Kleemann. *et al.* (2008) about the concept of crowdsourcing. Belleflamme came up with the following definition for crowdfunding: “*Crowdfunding involves an open call, essentially through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of reward and/or voting rights*”. Later on, they refined the definition to: “*Crowdfunding 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, P. *et al.*, 2014, p. 5). This broader definition leaves space to capture the many variations crowdfunding can have. It leaves open the possibility that crowdfunding can be done through the internet but may also be done in some other forms. Acknowledges that it can be a petition for donations, or a call for investment in exchange for a reward that possibly is the product that is being developed. It also leaves the possibility that the reward can be something entirely different, although not mentioning what specifically. While being a broad definition, once again it still narrows down the intention of crowdfunding to the provision of financial resources. Mollick, (2014) talks about the fact that the use of a broader definition of crowdfunding can be elusive, since the phenomenon covers many uses across many disciplines, arguing that a narrower definition of the term is preferable, thus defining crowdfunding as: “(...) *the*

efforts by entrepreneurial individuals and groups – cultural, social, and for-profit – to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the internet, without standard financial intermediaries” (Mollick, 2014, p. 2). Once again, this definition implies that crowdfunding is used only for financial reasons, but Mollick (2014) does acknowledge that there are two aspects that are not addressed in it: the goals of the crowdfunding effort and the goals of the investors. In other words, he says that this definition leaves out what drives people to engage in crowdfunding instead of more traditional methods of financing, investing, and engaging with projects. Since these goals are subject to a lot of variation, before we give our definitive definition of crowdfunding, we will first analyze them in more detail. We will start by looking at the more traditional alternatives of financing and investing. We will then identify and analyze all the crowdfunding variations that can be used as alternatives to these traditional methods. Lastly, we will draw a comparison between all the different methods, looking at what might drive a project creator or a potential investor or supporter to engage with one instead of the others.

2.3 Traditional methods of external financing and investing

Before the appearance of crowdfunding, companies and individuals would have to resort to the traditional methods of financing their ventures, many through internal sources of finance, also known as bootstrapping technics (Bhide, 1992; Brush et al., 2006; Ebben & Johnson, 2006; Winborg & Landström, 2001), but also through external financing, such as getting loans from banks or by selling company shares to investors and business angels (Cosh et al., 2009). Since most bootstrapping technics can actually be used along with external sources of financing, we will focus on these external methods, since these are the ones that can more easily be compared and replaced by crowdfunding alternatives. Schwienbacher & Larralde (2010) point out that sources of financing can be divided into two main categories: equity and debt. Financing through equity is usually done by selling shares on stock markets, by getting professional investors, business angels and venture capitalists to buy company shares or to have friends and family to do it (Cosh et al., 2009). One of the potential disadvantages of using this type of financing is that the investors take control of a portion of the company, although it also means that they also bear the risks associated with the equity acquisition, while a potential advantage of using this financing method is that besides

the funds, these types of investors usually bring knowledge, governance, and prestige to the company (Schwienbacher & Larralde, 2010). Financing through debt is typically done by getting loans, mainly from banks, leasing companies, government agencies, customers and suppliers (Cosh et al., 2009). The third parties do not take control of the company, which can be an advantage for the creators, but they also bear a lower risk, since these operations are linked to contractual agreements that have collaterals and seniority over equity owner claims (Schwienbacher & Larralde, 2010). A big disadvantage for both of these types of financing is that if a company or individual does not already have a portfolio of successful ventures, or does not have assets that might be used as collateral, it may have a hard time getting the traditional investor or financial institutions to believe and invest in their projects (Cosh et al., 2009).

2.4 “*Through-the-crowd*” projects

Upon revision of the literature on the subject, we have identified three different classes of “*through-the-crowd*” projects that come as alternatives to the more traditional methods of financing, investing and product and brand development. These alternatives share similarities with their traditional method counterparts but instead of concentrating in internal resources or in a limited number of contributors, they take advantage of the crowd. The three classes are: **Financial**, **Non-Financial** and **Mixed**. In each class, we have allocated projects based on their main goal, from the perspective of the creators. While in financial “*through-the-crowd*” projects the main goal is to raise money, non-financial projects only seek non-financial inputs from the crowd. When both financial and non-financial goals play an important role on the project, we consider them as mixed. As we will see, different types of crowdfunding are used both in financial and mixed “*through-the-crowd*” projects, while with non-financial projects, the alternative is crowdsourcing.

2.4.1 Financial

When Howe (2008) stated that crowdfunding does not rely on the crowd’s knowledge input, but instead on the amount of money the crowd is willing to give to a project creator, his intention was to draw a clear line between crowdfunding and crowdsourcing. This point of view is consistent with our classification of financial “*through-the-crowd*” projects in the sense that their main focus is to raise money. We

have identified 3 types of crowdfunding that we classified as financial “through-the-crowd” projects: **Equity-Crowdfunding**, **Lending-Crowdfunding** and **Donation-Based Crowdfunding**. In all three, the main goal, from the perspective of the project creators, is to raise funds for the project, although secondary goals may also be present. The main differences between these three types of crowdfunding are related to company control and financing costs.

Equity-crowdfunding was defined by Ahlers *et al.* (2015, p. 8) as “(...)a method of financing whereby an entrepreneur sells equity or equity-like shares in a company to a group of (small) investors through an open call for funding on Internet-based platforms”. Since this can be a direct alternative to the traditional methods of financing that also require selling company shares, we are led to question why would project creators opt for one instead of the other. As Agrawal *et al.* (2014) points out, from the creators perspective, there are two main incentives for doing equity-crowdfunding instead of more traditional methods of financing: lower cost of capital and more information. They argue that by using crowdfunding, project creators can match with individuals that have a higher willingness to pay for equity in a (more) global basis than only with a local pool of investors. This is consistent with Agrawal *et al.* (2011) study that suggests that in crowdfunding the influence of the creator’s location becomes less important. Agrawal *et al.* (2014) also argues that by being able to bundle equity selling with other types of rewards, and with the generation of more information through crowdfunding campaigns, the total cost of capital may become lower, although in certain cases where the information generated is negative in relation to investors’ expectations, the cost may instead rise. Hsu (2004) have shown that startup companies are willing to pay a higher cost of capital, essentially giving a discount on the valuation of the company in exchange of venture capitalists with higher reputation. Since in equity-crowdfunding the investments come from a crowd that do not have the expertise professional investors have, we may also argue that project creators that use equity-crowdfunding value access to lower cost of capital over investors expertise, prestige, and governance. The lack of these characteristics on the investors is also mentioned by Agrawal *et al.* (2014) as a potential downside of equity-crowdfunding. They also mention that since crowdfunding campaigns are open to the general public, competitors can get information on the project that is being developed early on, possibly creating

imitations that will compete with the product/service being developed. This can make first mover advantages obsolete. Nonetheless, there are usually limitations and constraints in terms of the amount equity-crowdfunding campaigns can raise. For instance, in Europe crowdfunding is usually limited to €100.000 (De Buysere et al., 2012).

Lending-Crowdfunding can be viewed as a direct alternative to getting loans from banks or other financial institutions. Ahlers *et al.* (2015, p. 6) defines it as a model “(...) *where funders receive fixed periodic income and expect repayment of principal.*”. Project creators do not lose any portion of their companies' shares, instead they borrow from backers, with the intention of paying back in the future, possibly with interest. On a study of microlending, which can be considered as a sub-form of Lending-Crowdfunding, done by Galak *et al.* (2011) the authors found evidence that individuals lending money to borrowers incorporate not only aspects of traditional investment decision making but also psychological aspects that are related to decisions of altruism. This may explain why in many cases of lending-crowdfunding, lenders do not require any collaterals from the borrowers, which can be viewed as an advantage of this type of crowdfunding, when compared to traditional methods of financing. On the other hand, the work of Bretschneider & Leimeister (2017) has given different results on the topic. On their study, they have found evidence that in incentive-based forms of crowdfunding, where lending-crowdfunding can be included, backers have no altruistic motives. But they mention that this contradiction may be explained by the fact that microfinancing is usually done through small donations, mainly to small business and entrepreneurs, in developing countries, where altruistic motives may have higher importance for lenders. One of the main reasons companies may seek this type of financial “through-the-crowd” funding mechanism, is the fact that young and small firms may have difficulty accessing capital from banks or venture capital, since they usually do not have the necessary assets or profits to use as collateral (Cosh et al., 2009).

The last financial “Through-the-crowd” type of project is the Donation-Based Crowdfunding. As the name suggests, this type of crowdfunding is done with the objective of raising funds without any kind of compensation to backers, besides the eventual symbolic rewards that usually come at no cost for the project creators. As we

have mentioned, there is not a consensus on the literature about whether backers have altruistic motivations when considering supporting a project, but in the study of Belleflamme *et al.* (2013) regarding individual crowdfunding practices, they have found evidence that nonprofit organizations tend to be significantly more successful in achieving their fundraising targets than other organizational forms. There are cases of successful crowdfunding projects based on donations that might indicate that this is true, such as the case of the former president of the United States of America, Barack Obama's 2008 election campaign, which raised most of its funds from small donations over the Web (Hemer, 2011).

2.4.2 Non-Financial

We have already discussed non-financially focused “through-the-crowd” projects in section 2.1. These projects are known as crowdsourcing projects and their focus is to engage with the crowd and generate new ideas, solve problems, and get feedback on products and services (Howe, 2006, 2008; Kleemann *et al.*, 2008). As we have seen, they are strongly related to innovation, research and development and user-based interactions (Füller, 2010; Jeppesen & Frederiksen, 2006; Von Hippel, 2006). Money has no role on this type of projects, besides the potential pecuniary rewards that might be given to contributors. The real value for the project creators come from the crowd's knowledge and insights (Girotra *et al.*, 2010; Kavadias & Sommer, 2009; Magnusson, 2009; Poetz & Schreier, 2012) which companies can then combine with their internal R&D capabilities in a manner of open innovation (Chesbrough, 2003a, 2003b). These projects are essentially “through-the-crowd” alternatives to traditional methods of R&D or product development.

2.4.3 Mixed

We classified projects that focus not only on financial resources generated through the crowd, but also on non-financial resources, as mixed projects. The “through-the-crowd” alternative to more traditional methods of product development and pre-selling is a type of crowdfunding known as reward-based Crowdfunding, sometimes also identified as Product-Based Crowdfunding. These projects are usually built around the development and (pre) selling of a product, which is one of the key aspects that differentiates it from the financially focused types of crowdfunding, as the rewards given in exchange for the

backer's support are usually not pecuniary, but instead the product itself, along with other minor perks, such as being credited, having the opportunity to meet the creators or having input on the product development itself (Mollick, 2014; Wei, 2018). Belleflamm's *et al.* (2010) point of view that crowdfunding is not only a source of money but also of information is more pronounced on this type of crowdfunding. From their perspective, crowdfunding is not just an alternative to traditional external sources of finance (bank loans, angel and venture capital, etc.) because it brings a new set of advantages to companies, mainly through the sharing of information between the project creators and backers. It can be used as a marketing tool, to obtain supporter's feedback, as a way of mass-customizing products and to innovate through user interactions. As Mollick (2014) points out, on reward-based crowdfunding, the supporters are treated as early customers, usually with early access to the product being developed, better prices or other benefits. He also mentions that there are risks related to this type of crowdfunding which are not present when companies do traditional pre-selling of their products, such as the absence of any clear legal obligations from the project creators to deliver the promised rewards to supporters. Besides the access to capital without having to sell equity or to accumulate debt, reward-based crowdfunding enables project creators to validate the market and the product, gather feedback from potential customers, build trust and create a community of loyal customers (Wei, 2018). Thus, reward-based crowdfunding could be considered a variation of pre-selling a product/service, where firms use crowdfunding as a self-select device to sort consumers by their willingness to pay, becoming a tool to practice price discrimination and for companies to take a bigger slice of the consumer surplus (Belleflamme *et al.*, 2010; Nocke *et al.*, 2011).

2.5 Comparison between traditional and “Through-the-crowd” projects

Based on the literature we reviewed, we came up with a summary of the different approaches project creators can take towards their ventures, depending on their main goals and the use of traditional or “Through-the-crowd” methods of getting the resources they seek. This summary, in **Figure 1**, also addresses the importance of the different types of resources for each specific type of project.

Figure 1 – Classification & comparison: traditional & “through-the-crowd” projects

Main Goal	Financial			Mixed	Non Financial
Reward	Equity	Payment	None/Symbolic	Product	Variable
Traditional Methods	Investors ¹	Financial Institutions ²	Fundraising	Pre-Sales	R&D
Through-the-crowd	Equity CF	Lending CF	Donation-Based CF	Reward-Based CF	Crowdsourcing
Financial Input	Very Important			Important	Not Important
Non-Financial Input	Less Important			Important	Very Important

¹ Investors: Entrepreneurs, Friends and Family, Business Angels, Venture Capitalists, Stock Markets

² Financial Institutions: Banks, Leasing Companies, Government agencies, Customers, Suppliers

Source: Developed by the author

Based on this analysis and comparison and on the literature on crowdfunding, we have formulated a general definition that we believe is broad enough to capture all the possible variations that crowdfunding can have, while being specific enough to identify and characterize the phenomenon:

Crowdfunding is a tool that individuals and organizations may use for financial, operational and/or product development and pre-selling reasons, by addressing a large crowd of potential investors, donors and/or contributors, mostly through the internet, with the goal of generating resources for a project, such as, but not limited to, money, market information, awareness, sales, feedback, and product ideas, in exchange for financial or non-financial rewards, or for free.

Since we are going to focus on reward-based crowdfunding, and, to the best of our knowledge, there is not a specific definition for reward-based crowdfunding within the literature, we have also formulated a definition for the phenomenon:

Reward-based crowdfunding is a sub-type of crowdfunding, focused on the development and pre-selling of a product, through the crowd, where project creators engage with potential supporters and customers, usually through the internet, offering the product being developed as the main reward for those who give their financial support, along with the possibility of having other inputs on the development of the product itself.

2.6 Reward-based crowdfunding - Industry outlook

Before we go through our research framework and hypothesis, we will first do an industry outlook on of type of crowdfunding we are analyzing. There is a general lack of available information about the crowdfunding industry as a whole or even by type of

crowdfunding or region. The more recent and available report we were able to find was the 2015CF - The Crowdfunding Industry Report, from Massolution (2015). Based on this report, the reward-based crowdfunding industry has been growing throughout the years, having registered an annual growth of 84% in 2014, reaching a worldwide funding volume of 1.33 Billion in US Dollars. Geographically, the American market registered an annual growth of 80.5% in 2014, while in Europe the growth was 166%. Although reward-based crowdfunding projects only accounted for 8.2% of the total funding volume of all types of crowdfunding, these are still remarkable numbers. Regarding the number of online crowdfunding platforms, although we were not able to find numbers specific to reward-based crowdfunding, we can look at the evolution of the total number of crowdfunding platforms. From 2007 to 2014, the number grew from 100 to 1250. And despite reward-based crowdfunding having had a limited market share, there were 2 reward-based crowdfunding platforms on the top 10, in terms of funding volume: Kickstarter and GoFundMe. GoFundMe does not actually have accurate statistics available in its website, but by looking at Kickstarter statistics of October 2020, we can see that the total volume of funding is 4.82 Billion US Dollars, with more than 180 thousand projects successfully funded (Kickstarter, 2020). This represents almost 4 times the worldwide funding volume of all types of crowdfunding of 2014 in just one platform, indicating that the market grew exponentially.

3. RESEARCH FRAMEWORK AND HYPOTHESES

In this section we discuss the theoretical and research framework that will guide our empirical study and suggest the hypotheses to be tested. Our focus is on reward-based crowdfunding. More specifically, we want to explore if the degree of success or failure of projects with different dimensions is explained differently, which might be a step towards understanding why some studies in the literature are sometimes contradictory in what is significant. Using a Hypothetico-Deductive scientific research method, we start by looking at the studies developed by other authors and identify which variables they have theorized and tested as potential contributors to the success or failure of crowdfunding campaigns. From there, we formulate our hypotheses and select our independent variables for our regression model. Then, through the direct observation of the collected data, we verify or disprove our initial hypothesis. The data is composed of

a total of 364 Kickstarter projects, with 196 successful projects, and 168 failed projects, 141 with a success goal between 3 and 10 thousand US\$, 107 with a goal between 10 to 20 thousand US\$ and 116 projects with a goal between 20 to 100 thousand US\$.

Many authors have theorized and studied the factors that may influence the probability of success of crowdfunding campaigns, namely Kuppuswamy & Bayus (2013), Belleflamme et al. (2014). Colombo et al. (2015), Cordova et al. (2015) Hou et al., (2020), Mollick (2014), Ye et al. (2017). Some studies divide project characteristics that may have influence on the outcome of the crowdfunding campaign into two categories: time-variant and quality characteristics (Kuppuswamy & Bayus, 2013; Hou et al., 2020). Time-variant characteristics are directly linked to timing within the campaign, while quality characteristics are seen as potential indicators of the quality of the project. For instance, having a video on the campaign page is seen has a signal of quality and is associated with greater success of the project: Mollick (2014) study indicates that not having a video on the project decreases its probability of success in 26%. In Kuppuswamy & Bayus (2013) study, the likelihood of an additional backer supporting the campaign is found to be significantly related to having a video on the campaign page. Similarly, Ye et al. (2017) also found the existence of a video as significantly associated with the success of crowdfunding projects. However, both Colombo et al. (2015) and Cordova et al. (2015) studies concluded otherwise, having found evidence that investors appear to be indifferent to the existence of a video on the campaign page. Based on the above, we formulate our first hypotheses:

Hypothesis 1 – The presence of a video on the campaign page positively contributes to its degree of success.

Another characteristic that can be a signal of quality (or lack thereof) of projects is the number of pledge tiers it has. Some theoretical studies suggest that crowdfunding allows for price discrimination techniques (Belleflamme et al., 2014; Nocke et al., 2011) but these studies compare “*crowdfunders*”, with a high expected valuation of the product, against the normal buyer, with a lower expected valuation of the product. What these studies argue is that a good pricing technique can contribute to the appropriation of a higher slice of the consumer surplus by the investors. However, this does not necessarily have any impact on the degree of success or failure of the crowdfunding

project itself. Nonetheless, it opened the discussion for the topic of price discrimination “within” the crowdfunding projects themselves. Since projects can have pledge tiers with different prices selling the same product, these can be used for price discrimination techniques. They can also be used to make cross-selling, i.e. (pre) selling the product along with adjacent products or features, for a different (higher) price. Some authors did research on the topic, but the results are not always consistent with each other. Kuppuswamy & Bayus (2013) have used the number of tiers (reward categories) as a control variable in their study. They found that successful projects are more likely to have a greater number of tiers. With a different result, Du et al. (2019) found an inverted U-shaped impact for the number of options on crowdfunding projects success. Scheibehenne et al. (2010) study also mentions that a higher number of options may lead to “choice overload” for the potential supporters, possibly hurting the campaign’s success. Based on the literature above, we present our second hypothesis:

Hypothesis 2 – The number of tiers on a campaign is positively related to its degree of success.

Still related to the options presented to potential supporters, but with a time constraint linked to it, the use of limitations on specific pledge tiers have been recently studied by a few authors (Chen et al., 2019; Hou et al., 2020; Thies et al., 2018; Wei, 2018). The literature suggests that limiting the freedom to purchase a product, increases the probability of the product being bought (Lessne & Notarantonio, 1988). This limitation can also contribute to the exclusivity of the product and signal a better (good) deal (Barone & Roy, 2010; Inman et al., 1997; Verhallen & Robben, 1994). The study of Wei (2018) focused on the “tier attraction” of each tier on crowdfunding campaigns and found that limited offers elicits a higher response from consumers, suggesting that this type of limited tiers positively contributes to a higher number of supporters, but also found that this effect is actually negative on tiers that are relatively more expensive than the remaining tiers. A different study found that limiting tiers by quantity may also have a significant impact on crowdfunding campaigns (Adam et al., 2019). In this study, evidence that sold out tiers influence potential supporters to pledge for a tier with the same content at a higher price were found. However, if the price difference is too high, it might crowd out new supporters. Although being a quantity limit in its nature, we

consider this characteristic as time-variant, since potential supporters can only pledge on those tiers as long as there are pledges left, and, as time passes, the amount left tends to get smaller until it is sold out, thus representing a time pressure characteristic of the project. A similar study also found evidence that using different prices for the same product is beneficial for the success of crowdfunding campaigns, except when there is a low heterogeneity of backer groups (Chen et al., 2019). This price discrimination is only possible by limiting the discounted prices in some tiers to a certain quantity or by making them available only during a certain time-window, thus making this type of price discrimination technique a time-variant characteristic of the projects. With a different perspective on the matter, Hou et al. (2020) suggests that, because of herding and diffusion of responsibility effects, it is beneficial for projects to have a bigger number of supporters as early as possible, and that the limitation of tiers is a possible way of achieving this, more specifically, suggests that having some special tiers only available at the beginning of the campaign may contribute to its success. Based on the above literature, we present our next hypothesis:

Hypothesis 3 – The presence of limited offers on a campaign positively contributes to its degree of success.

The herding behavior can be defined as “*everyone doing what everyone else is doing, even when their private information suggests doing something quite different*” (Banerjee, 1992, p. 798). This herding effect is countered by a different phenomenon, known as the diffusion of responsibility effect, which can be defined as the tendency for an individual to feel less responsible for helping others, as the number of other helpers get bigger (Fischer et al., 2011). We again consider this as another time-variant project characteristic. Essentially it means that when projects have already met their goals, it is harder to get more support from potential backers. A way in which project creators can work around this issue is by having additional goals after the main financial goal is met, which project creators typically call “stretch goals”. When these new goals are met, they usually unlock new product features, additional content or some kind of upgrade to the rewards backers will receive, which might be a strong enough motivation to overcome the diffusion of responsibility effect. However, as far as we know, there has not been made any study on this type of characteristic in crowdfunding and its implications to the

degree of success or failure of projects. Thus, we will also include the following as one of our hypothesis:

Hypothesis 4 – The presence of stretch goals on a campaign positively contributes to its degree of success.

Another time-variant characteristic is the campaign duration. Kickstarter itself mentions that there is a tendency for shorter projects to be more successful (Kickstarter, n.d.). This is consistent with Kuppuswamy & Bayus (2013), Mollick (2014) and Ye et al. (2017) studies. They suggest that projects with a bigger duration have their probability of success and the number of additional backers decrease. However, in Cordova et al. (2015), a bigger duration of a project was found to increase its probability of success, and, in successful campaigns, to increase the rate (degree) of success. On the other hand, Colombo et al. (2015) found no relation between the probability of success of a project and its duration. Based on the literature above, we formulated the following hypothesis to be tested:

Hypothesis 5 – The number of days in a campaign is negatively related to its degree of success.

The fact that with each supporter, the total amount of financial support raises, we also formulate the following hypothesis to be tested:

Hypothesis 6 – The total number of backers on a campaign is positively related to its degree of success.

The herding phenomenon we previously mentioned was also studied by Herzenstein et al., (2011) and Liu et al., (2015) in peer-to-peer loan auctions. Since backers have limited information about the projects, they assume herding behaviors (Herzenstein et al., 2011). In other words, if a potential backer sees a project being supported by many other backers at the beginning of the campaign, it tends to follow the trend and support the project as well. Bretschneider & Leimeister (2017) also mentions that backer's reward motivations are enhanced by this herding behavior. Thus, some authors have also used some control variables on their models related to this phenomenon, namely variables that control for the number of backers at early or different stages of the

campaign (Bretschneider & Leimeister, 2017; Colombo et al., 2015; Hou et al., 2020), and, as we have mentioned early, Hou et al. (2020) suggested that having a bigger number of supporters as early as possible is beneficial for the campaign success. Based on this, we also argue that new and unexperienced backers would be more susceptible to herding behaviors, thus, we present our seventh and eighth hypotheses:

Hypothesis 7 – The number of backers on the first day of the campaign is positively related to its degree of success.

Hypothesis 8 – The number of new backers supporting a campaign is positively related to its degree of success.

A variable related to communication between the project creators and supporters or potential supporters that is used in some studies is the number of updates made during the campaign (Kuppuswamy & Bayus, 2013; Cordova et al., 2015; Mollick, 2014). It is considered as a quality characteristic of the project, since it represents the effort by the project creators to communicate and inform supporters and potential supporters (Mollick, 2014). Mollick (2014) found evidence that signals like frequent updates are associated with greater success. Kuppuswamy & Bayus (2013) suggest that successful projects are more likely to communicate with their supporters through these updates. They found strong evidence that on successful projects, there is a tendency to do more updates by the project creators, in a possible attempt to counter the diffusion of responsibility effects and encouraging potential backers to support the project. However, Cordova et al. (2015) found no relation between the number of updates and the probability of success nor the rate of success of crowdfunding campaigns. Based on the above, we present our ninth and tenth hypotheses:

Hypothesis 9 – The number of updates made during a campaign is positively related to its degree of success.

Hypothesis 10 – The presence of collaborators on a campaign positively contributes to its degree of success.

The literature also mentions that one of the potential problems crowdfunding can have is fraud, especially in reward-based crowdfunding, since there's a commitment from

supporters, by giving their money upfront without any legal binding, in the hopes of receiving a reward (product) later on (Macht, 2014; Roma et al., 2017). Although Mollick (2014) suggests that fraud is rare within crowdfunding campaigns, 3.6% in his study, one of the deterrents Gerber & Hui (2013) found for potential backers to support projects is the distrust of creators' use of funds. Thus, we find that having a dedicated presentation of the creators, on the campaign page, might be impactful for the success of the campaign, since backers might feel more secure to support campaigns with more information about the creators. Based on this assumption we formulate the following hypothesis:

Hypothesis 11 – Having a dedicated creator's presentation on the campaign page positively contributes to the campaign's degree of success.

The experience of the project creators is another signal of quality that some authors linked to the success of crowdfunding projects (Kuppuswamy & Bayus, 2013; Buttice et al., 2017; Ye et al., 2017). This is consistent with the literature on serial entrepreneurs (Ucbasaran et al., 2003), which Buttice et al. (2017) argues that it can be applied to serial crowdfunders. The reasoning is that project creators draw knowledge from previous experiences and improve their future projects. Thus, we present yet another hypothesis:

Hypothesis 12 – Creators with at least 1 previously successful campaign positively contribute to the degree of success of a campaign.

Popularity can also be a relevant quality signal since potential supporters can often sort projects by its rank on crowdfunding platforms. For instance, Kuppuswamy & Bayus (2013) suggest that projects that are featured on Kickstarter (Most popular, Ending Soon, etc.) are more likely to receive additional support. Based on this, we present our eleventh hypothesis:

Hypothesis 13 – Being in the top 100 of the crowdfunding platform at day 1 positively contributes to its degree of success.

Finally, we also argue that, since there is some lack of consistency on previous studies on whether some project characteristics contribute to the success of campaigns, the

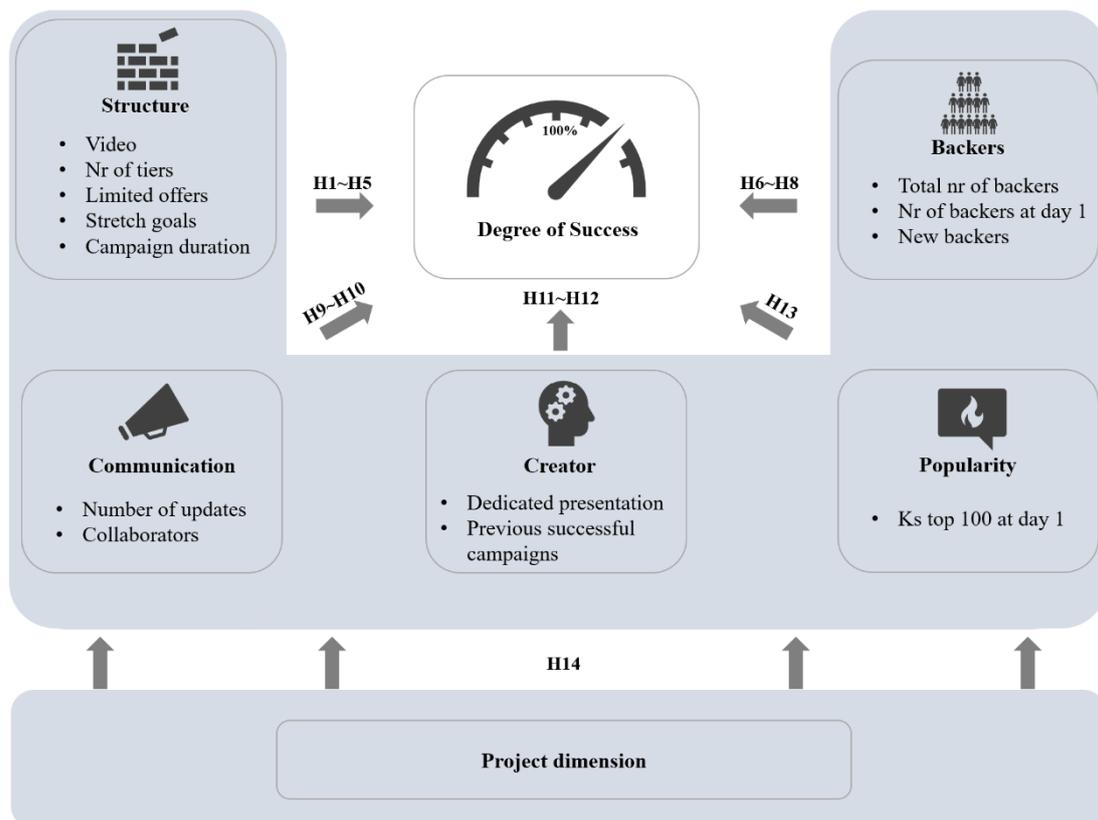
project dimension may affect the importance of each characteristic, thus potentially explaining those inconsistencies. Based on that, we present our final hypothesis:

Hypothesis 14 – The determinants that explain the degree of success of a crowdfunding project differs with the dimension of the project.

Based on this research framework, we have developed a model, depicted in **Figure 2**, to test our hypotheses, with the degree of success being our dependent variable, i.e. the amount of funding achieved through the campaign in relation to the initial financial goal that was set by the creators.

We included all the relevant independent variables based on our research, and divided them into 5 categories: Structure, Backers, Communication, Creator and Popularity. Structure variables are directly related to how the project campaign is structured and presented. Backer variables are related to backer statistics and qualities. Communication variables are related to the efforts made to communicate with backers and potential backers. Creator variables directly relate to Creator qualities and information. Finally, Popularity variables are related to the project popularity. We also added the project dimension as a potential external variable.

Figure 2– Research Model - Degree of success and independent variables.



Source: Developed by the author

4. METHODOLOGY

4.1 Data

Our source of data for the empirical analysis is Kickstarter, which is considered one of the main reward-based crowdfunding platforms worldwide. Up to October 2020, more than 5 billion US dollars have been pledged to projects on this platform, with more than 189 thousand successfully funded projects and a total number of more than 18 million backers. We have collected data from the three main Kickstarter categories in terms of successfully raised dollars, which, based on the Kickstarter website, are: Games, Design and Technology. These three categories represent together about 68% of the total amount of successfully raised dollars on the platform. To build our sample, we collected data from all the Kickstarter projects of these three categories, that launched between June 1st and June 15th of 2019, excluding projects not written in English, canceled projects and suspended projects. Similarly to other authors (Mollick, 2014) we have also excluded projects with small goals (under 3.000 US Dollars) since these might not be considered as real efforts of crowdfunding, and projects with unrealistically high goals (equal to or above 100.000 US Dollars).

In appendix A we present the layout of a typical Kickstarter Campaign, where we identify each present feature: In our sample, each observation corresponds to a unique project, with its own page (1), a unique name (2), a cover (3), and 5 different menus (4) – Campaign, Frequently Asked Questions (FAQ), Updates, Comments and Community. On the cover of the campaign, we find either an image or a video, as well as general information about the campaign, such as the campaign financial goal, the number of backers that are supporting or have supported the campaign, the total amount of money raised, the sub-category of the project, and the project's geographic location. Creators must define a financial goal that must be met or surpassed for the project to be considered successful. Kickstarter only allows an “all-or-nothing” funding mechanism, which essentially means that if the project does not reach its financial goal, the money is not collected from backers and the project is considered “Failed”.

A recent study of Cumming et al. (2020) suggests that projects using this mechanism are much more likely to be successful at achieving their goals, offering a guarantee to supporters that the project creators do not start projects with unrealistically low funding,

which may happen on projects that uses a “keep-it-all” mechanism, where even if the goal is not met, the project creators can collect the total amount of money they have raised. On the menu “Campaign”, project creators may present their project on the “story” space, where they can write about anything they find important, such as their ideas, the nature of the project, what is being developed, the structure of the campaign, the team behind it and any other kind of information they find important to disclose to potential supporters. They can also upload images as well as videos to help them pass their ideas, show prototypes, etc. Kickstarter itself does not have any input on what creators write on the campaign page, except it requires a section where project creators must disclose potential Risks and Challenges of the campaign. It is also on the “Campaign” menu that project creators assign “pledge levels”. Backers can support the project by donating any amount of money to the project, essentially pledging without a reward, but project creators may design specific pledge levels for backers to pledge on, known as pledge tiers. Each pledge tier has a specific amount of money that must be donated to the project, as well as the specific reward or rewards that the backers will receive in return when pledging on that specific pledge level. On the FAQ menu, project creators have the opportunity to answer questions that their supporters ask frequently. The Updates section is where project creators may give updates about the campaign. The Comment menu is where both backers and project creators can interact with each other, through comments. Finally, on the Community section, we can find some general information about the backers of the campaign, such as the top cities and countries from where they come from, and the number of new and returning backers, i.e. the number of backers that are pledging on a campaign for the first time on Kickstarter and the number of backers that have pledge on at least one previous campaign on Kickstarter, respectively.

Kickstarter allows campaigns to be active from 1 to 60 days. It allows project creators to cancel projects at any time. Canceling a project means that, regardless of the amount of money raised at the moment of the cancelation, including the cases where the financial goal was met or surpassed, project creators won't receive any money from backers, and backers don't lose any money at all. Sometimes, projects are also suspended. Usually, this happens when there is a suspicion by Kickstarter that the campaign might be fraudulent or might be infringing copyright laws. By default, the currency displayed on

projects is determined by its country of origin and project creators cannot change this (Kickstarter, n.d.).

4.2 Measures

In **Table I** we present the description of the dependent and independent variables and how they were measured upon collecting the data.

Table I – Variables: measure description

Variable	Description
Degree of success (dependent variable)	Ratio between the amount of US Dollars pledged and the Financial Goal of the campaign
Structure	
Video	= 1 if the project has at least one video on the project page
Nr of tiers	Number of dedicated pledge tiers that backers can opt from
Limited offers	= 1 if at least one pledge tier is limited either by number of pledges, or by time
Stretch goals	= 1 if the project has stretch goals
Campaign duration	Duration of the campaign, in days
Backers	
Total nr of backers	Total number of backers that pledged on the campaign
Nr of backers at day 1	Number of backers who pledged on the first day of the campaign
New backers	Total number of backers that pledged on the project, having never pledged before on Kickstarter
Communication	
Nr of updates	Total number of comments on the campaign
Collaborators	= 1 if the project has collaborators
Creator	
Dedicated presentation	= 1 if there is a dedicated section on the campaign page for the creator(s), team or company's presentation
Previous successful campaign	= 1 if the creator has at least 1 previous successful campaign on Kickstarter
Popularity	
Ks Top 100 D1	= 1 if the project reached the top 100 of all Kickstarter projects at day 1 of the project

Source: Developed by the author

4.3 Method

Our dependent variable is the degree of success of a project which is given by the ratio between the initial financial goal set by the project creators and the amount pledged by supporters at the end of the campaign. Thus, the dependent variable is the set of positive real numbers. Based on this, we have used linear regression models for our analyses. We have developed a general model using all the observations (**Model I**) and three

models where we control for project dimensions, based on the project initial financial goal (**Model II, III and IV**). For the control of project dimensions we have used the initial financial goal, set by the creators, and divided the data into three sections: Projects with goals between 3.000 US\$ and 10.000 US\$, between 10.000 US\$ and 20.000 US\$ and between 20.000 US\$ and 100.000 US\$, including the lower limit and excluding the top limit of each dimension range. We have tested all models for potential problems of multicollinearity and results show that there is no strong evidence of problems of this nature. The correlation matrix and the variance inflation factors (VIFs) for the **model I** are reported in appendix B. The average VIF registered was 1.69 and the maximum VIF registered was 3.55, both below the threshold of 10, mentioned by some authors as the threshold that when surpassed indicates the presence of multicollinearity (Chatterjee & Hadi, 2015; Midi & Bagheri, 2010). The model has also a considerable high R^2 value of 0.73.

For the **model II, III and IV**, the average VIF registered was 1.87, 2.76 and 2.23 respectively, and the maximum VIF registered was 4.55, 9.52 and 5.69 respectively (please see Table II), and, therefore, there are no multicollinearity problems. All three models also have a considerable high R^2 value of 0.84, 0.90 and 0.76, respectively.

5. EMPIRICAL RESULTS

5.1 Sample Analysis

In this section we provide the summary statistics of our sample. In appendix C and D we find summary statistics for our four models. From the 364 projects observed, 196 have met or surpassed their initial financial goal, representing a success rate of 53.85%. When controlling for dimension, smaller projects show a higher average success rate (62.41%) followed by medium sized projects (49.53%) and bigger projects (47.41%). The average degree of success of all the projects is 317.34%. When controlling for project dimension, the average degree of success is higher on smaller projects (406.26%), but lower in medium (296.62%) and bigger (228.38%) projects. The average number of backers of all projects is 502.73. However, when controlling for project dimensions, the average number of backers is lower on projects with smaller

dimensions (433.48), about the same in medium sized projects (505.63) and higher in bigger projects (548.23).

In **Table II** we report the results of our estimates for our four models.

As we have mention in section 4.5, in **Model I** we consider all the observations in our sample (364), without making any discrimination when it comes to project dimension while in **Models II** through **IV** we explore the differences between projects with different dimensions. We test our hypotheses 1 through 13 using **Model I**, since we are testing the significance of each variable in general cases and not in campaigns with a particular dimension.

Table II– Estimates results by model

	Model I	Model II	Model III	Model IV
	[All cases]	[\$3K-\$10K]	[\$10K-\$20K]	[\$20K-\$100K]
Degree of Success (Constant)		β		
Structure				
Video	-0.01	0.00	0.03	-0.00
Nr of tiers	0.03	0.14***	-0.01	-0.09
Limited offers	0.07**	0.02	0.05	0.09*
Stretch goals	-0.1***	-0.1**	-0.07*	-0.12*
Campaign duration	0.04	0.03	-0.01	0.09
Backers				
Total nr of backers	0.83***	0.74***	0.43***	0.04
Nr of backers at day 1	-0.16***	-0.15**	0.16***	0.39***
New backers	0.11***	0.24***	0.42***	0.42***
Communication				
Nr of updates	-0.05	-0.05	0.02	0.08
Collaborators	0.05*	0.00	0.04	0.21***
Creator				
Dedicated presentation	0.01	0.08**	0.01	-0.09
Previous successful campaign	0.08***	0.05	0.04	0.09
Popularity				
Ks top 100 at day 1	0.07*	0.12**	-0.05	0.10
Observations	364	141	106	119
Maximum VIF	3.55	4.55	9.52	5.69
Mean VIF	1.69	1.87	2.76	2.23
R ²	0.73	0.84	0.90	0.76

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note : Dependent variable: Degree of success

Source: Developed by the author

Results suggest that from structure variables only “Limited offers” ($\beta=0.07$; $p<0.05$) and “Stretch goals” ($\beta=-0.1$; $p<0.01$) are significant, with the first variable being positively related to the degree of success, and the second one with a negative relation, which support **H3** and **H4**, respectively. We found no evidence to support **H1**, **H2** and **H5**, since “Video”, “Nr of tiers” and “Campaign duration” are not significant to the model. All backer related variables are found to be significant. Both the “Total nr of backers” ($\beta=0.83$; $p<0.01$) and the “Nr of new backers” ($\beta=0.11$; $p<0.01$) are positively related to the degree of success, thus supporting **H6** and **H8**. The “Nr of backers at day 1” of the campaign ($\beta=-0.16$; $p<0.01$) is found to be negatively related to the degree of success of campaigns, which contradicts the hypothesized positive relation, and therefore **H7** is rejected. Regarding communication variables, only “Collaborators” was found to be significant and positively related to the degree of success, but only when considering a higher p-value of 10% ($\beta=0.05$; $p<0.10$), thus we have a somewhat weaker supporting evidence for **H10**. Since “Nr of updates” is not significant to the model, we found no evidence to support **H9**. When it comes to variables related to the creator, results show that “Previous successful campaign” is significant and positively related to the degree of success of a campaign ($\beta=0.08$; $p<0.01$), supporting **H12**, although we have not found evidence to support **H11**, since “Dedicated presentation” is not significant to the model. Finally, results show that the variable “Ks top 100 at day 1” related to popularity is only significant when considering a higher p-value of 10% and it is positively related to the degree of success ($\beta=0.07$; $p<0.10$), thus we have again a weaker supporting evidence for **H13**.

In order to test for **H14**, we developed **Models II**, **III** and **IV**. Results show that “Nr of tiers” is significant in **Model II** ($\beta=0.14$; $p<0.01$), but not in **III** and **IV**. “Limited offers” is only significant in **Model IV** ($\beta=0.09$; $p<0.10$), although only when considering a p-value of 10%. In backer related variables, only “Total number of backers” is not significant in **Model IV**, but also “Nr of backers at day 1” has a different effect on the degree of success when comparing smaller with medium and bigger projects, since in **Model II** this variable is negatively related to the degree of success ($\beta=-0.15$; $p<0.05$), but in **Model III** ($\beta=0.16$; $p<0.01$) and **IV** ($\beta=0.39$; $p<0.01$) the relation is positive. “Collaborators” is only significant in **Model IV** ($\beta=0.21$; $p<0.01$), while “Dedicated presentation” ($\beta=0.08$; $p<0.05$) and “Ks top 100 at day 1” ($\beta=0.12$;

$p < 0.05$) are found to be significant only for **Model II**. From these results, we find evidence that supports our **Hypothesis 14** that the dimension of projects might dictate a different set of variables which can explain the degree of success of crowdfunding campaigns, at least partially.

It is worth noting that our results are in line with some papers in the literature, while contrasting with the results from others. However, this was expected, since, as we have discussed in section 3, many of the studies already conducted were already in contrast with each other. The discussion of the results will be done in the next section.

6. DISCUSSION AND CONCLUSION

6.1 Discussion of the results

Our results suggest that having a video on a campaign is not a significant variable to explain its degree of success. This contrasts with some studies (Kuppuswamy & Bayus, 2013; Mollick, 2014; Ye et al., 2017) but it is in line with others (Colombo et al., 2015; Cordova et al., 2015). A possible explanation for this result might be the fact that with the evolution and development of the industry, having a video no longer differentiates campaigns from one another, since almost every campaign has one (about 83% in our sample). The quality of the video itself, however, might be more relevant for the degree of success of the campaigns.

The number of tiers was also found to not be relevant in our study, except for smaller projects, where it is found to be a positive contribution. This indicates that the ecosystem in these types of projects might be different, suggesting that in smaller projects, backers might enjoy having a bigger range of choices and be more persuaded to support these types of projects. In those cases, this result is in line with the assumption that project creators might use crowdfunding as a price discrimination tool, enabling them to absorb a bigger slice of the consumer surplus, even within the project itself, or enabling them to customize the product to be able to reach more costumers and supporters. The presence of limited tiers is also found to be significant in general, but when looking by project dimension, it is only significant for bigger projects. In both cases, the contribution is positive, which is in line with previous studies (Adam et al., 2019; Chen et al., 2019), although they mention that there are instances where having this type of tiers might hurt

the campaign. Our assumption is that limited tiers might incentivize backers through some psychological effects, such as the “fear of missing out”, i.e. backers might be more inclined to support the campaign through the limited tier because they fear they might lose the opportunity to pledge for the limited reward later on. Since, as we have mentioned, herding behaviors and diffusion of responsibility effects appear to have an impact on potential supporters, these results are not surprising, given that they help mitigate and take advantage of these phenomena. The presence of stretch goals appears to have a negative impact, regardless of project dimension. This result contradicts our initial assumption that they could mitigate the diffusion of responsibility effect. Unlike Kickstarter statement and some other studies (Kuppuswamy & Bayus, 2013; Cordova et al., 2015; Mollick, 2014; Ye et al., 2017) the campaign duration of the projects seem to be irrelevant for its degree of success, but even these studies did not agree whether the contribution is positive or negative and there is at least one other study in line with our results (Colombo et al., 2015).

Unsurprisingly, the total number of backers positively contributes to the degree of success of campaigns. This contribution can be due to the fact that with each supporter, the total amount raised grows, but also because there might be other effects, such as word-of-mouth marketing that might take place and help the campaign to get even more supporters. Nevertheless, it is worth mentioning that in the case of bigger projects, this variable was not significant.

The results we obtained from the number of backers at day one are interesting, since in general and for smaller projects it has a negative relation with the campaign success, but in medium and bigger projects it has a positive relation. Once again, these results suggest that the dynamics of the projects might differ with project dimension. The number of new backers in the campaign is also significant in all the cases, indicating that it is important for project creators to make efforts to seek new supporters. While the number of updates was not significant regardless of project dimension, which is in line with Cordova et al., (2015) but contrasts with Mollick, (2014), the presence of collaborators seems to be a positive contribute, although, when looking by project dimension, it is only significant in bigger projects.

Regarding the presence of a dedicated creator's presentation section in campaigns, at first the results suggest that this is not significant for the degree of success of

campaigns, but the examination by project dimension suggests that having one positively contributes to its success but only in smaller projects. We could make the assumption that in smaller projects, the creators are less known than in bigger projects, presumably run by companies or individuals with more experience and reputation, thus having this information might have a bigger important in smaller projects. Whatever the case, it is an additional evidence that the dynamic of the campaign might change due to the project dimension. On the other hand, having creators with at least on previous successful campaign, appears to contribute to the degree of success of campaigns, which is in line with previous studies (Kuppuswamy & Bayus, 2013; Buttice et al., 2017; Ye et al., 2017). Even so, interestingly, the results by project dimension suggest that it is not significant. Finally, our results suggest that being featured on the top 100 of Kickstarter at day 1 of the campaign positively contributes to its degree of success, which was expected and in line with Kuppuswamy & Bayus, (2013), although, once more, this contribution seems to be relevant only to smaller projects.

6.2 Conclusions

One of the mains objectives of this research was to identify the project characteristics that contribute for the success of a crowdfunding campaign. The results of the model that include the projects from all dimensions show that the relevant characteristics are: the existence of limited offer, the stretch goals, the total number of backers, the number of backers at day 1, and the number of new backers, the presence of collaborators in campaigns, the existence of creators previous campaigns and being featured in the top 100 of the platforms at day 1.

In relation to the other objective of the research, which was to understand if the dimension of the projects had an impact on the characteristics that determined the success of the campaigns, we can conclude that the dynamics of crowdfunding campaigns, and more specifically reward-based crowdfunding campaigns, might change and be affected by its dimension. It seems that, while almost all backer related variables are relevant regardless of project dimension, structural, communication related, creator related and popularity related variables are subjected and perhaps more sensitive to project dimension, when it comes to their significance to the degree of success of the campaigns. Even when looking at the backer related variables, although its significance

is always present regardless of project dimension, with the exception of the total number of backers in one of the cases, the relationship changes from negative to positive in the case of the number of backers at day one of the campaign, when taking project dimension into account.

6.3 Theoretical and Managerial Implications

From a theoretical point of view, our biggest contribution comes from the results supporting the hypothesis that project dimension is an important project characteristic to take into consideration when studying the contributing factors for a successful crowdfunding project. It opens a path for future studies on the effect that this specific characteristic takes on the dynamics of crowdfunding project, specifically in reward-based crowdfunding, and its degree of success.

From a managerial point of view, this study contributes by giving information to potential project creators on what project characteristics they should have in mind and prioritize when running a crowdfunding campaign, given the size of their projects. In response to one of the research aims, project creators cannot pay attention to the same variables without taking into consideration the dimension of the project itself. Depending on their financial goals, the creators need to focus on specific characteristics of the projects, in order to meet or exceed their objectives.

6.4 Limitations and Future Research

One limitation of our analysis is the fact that our data sample was collected from a single online crowdfunding platform, Kickstarter. This limitation is further heightened by the fact that Kickstarter only allows an all-or-nothing funding mechanism for projects, and the projects focus on reward-based crowdfunding only. Future research should be done using different combinations of data, namely other types of funding mechanisms, other types of crowdfunding and different combinations of crowdfunding platforms.

A second limitation of our analysis is the fact that our sample is composed only by projects from the three top Kickstarter categories. The type of categories might also have an impact on the project or be affected by project dimension as well. Since our sample was collected in a brief time-window of only 15 days of campaigns, possible

seasonal effects might not have been captured or might be affecting our results, thus, future research should be conducted taking these factors into consideration.

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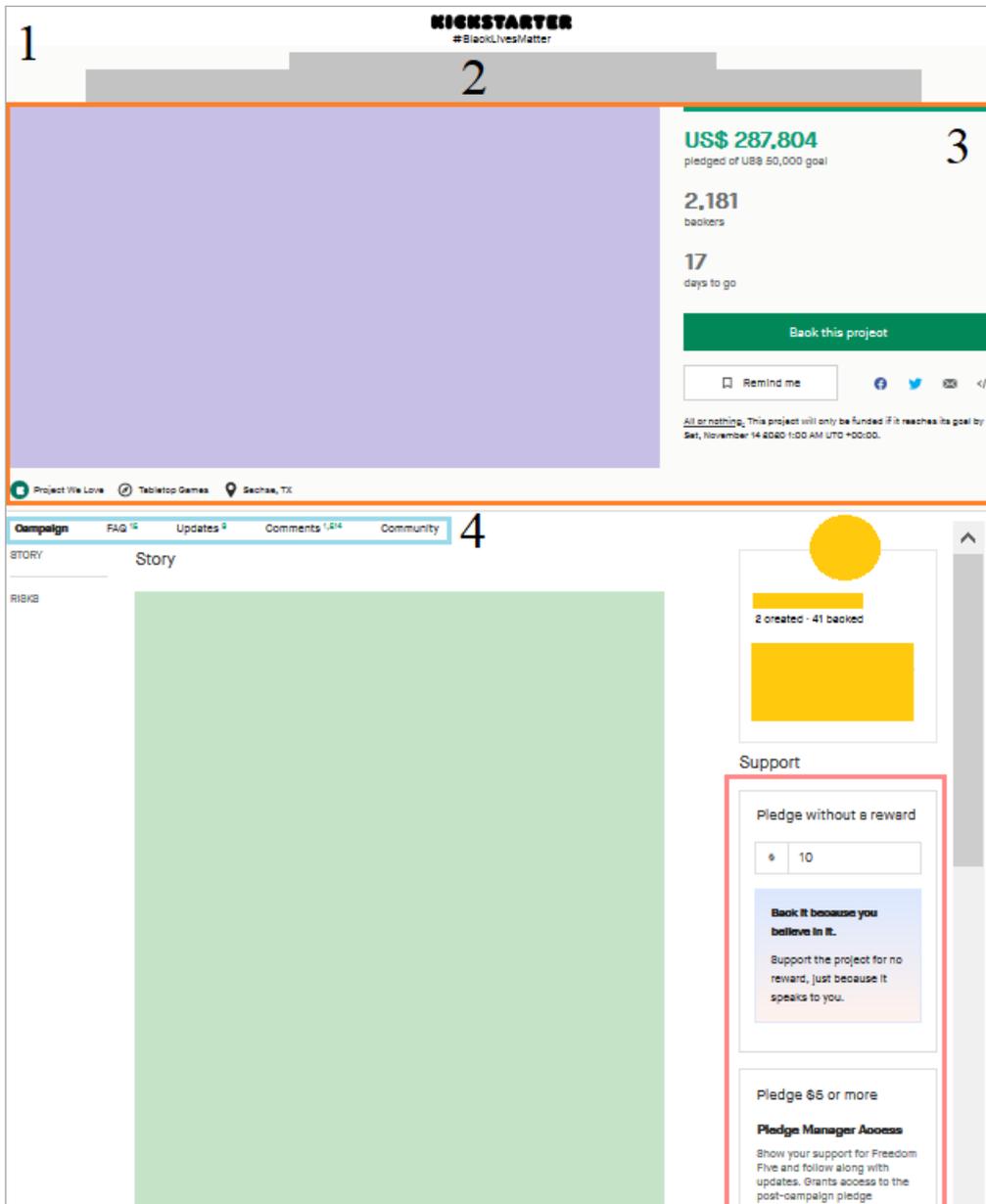
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APPENDICES

Appendix A – Kickstarter project page layout



Source: Developed by the author based on Kickstarter website.

Appendix B – Correlation Matrix and VIF Scores

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	VIF
Ratio	1															1.13
Video	.119*	1														1.29
Nr of tiers	.163**	.194**	1													1.22
Limited offers	.078	.152**	.328**	1												1.48
Stretch goals	-0.004	.123*	.215**	.014	1											3.55
Total nr of Backers	.823**	.132*	.137**	-.012	.126*	1										2.81
Nr of backers at day 1	.550**	.128*	.060	-.014	.172**	.751**	1									1.92
New Backers	.625**	.091	.129*	.088	-.013	.651**	.423**	1								1.24
Campaign Duration	-.075	-.088	-.130*	-.157**	-.282**	-.153**	-.255**	-.062	1							1.72
Nr of updates	.203**	.148**	.235**	.073	.487**	.326**	.317**	.124*	-.203**	1						1.21
Creator	.154**	.153**	.159**	.133*	.078	.133*	.084	.142**	-.122*	.250**	1					1.20
Dedicated C Pres.	.104*	.218**	.207**	.122*	.086	.109*	.117*	.061	-.165**	.217**	.270**	1				1.39
Pr. Successful Camp.	.260**	.096	.133*	.032	.159**	.254**	.322**	.068	-.205**	.203**	.101	.065	1			2.20
Ks Top 100 D1	.471**	.157**	.110*	-.023	.318**	.566**	.620**	.377**	-.276**	.397**	.174**	.174**	.437**	1		1.71
Ks C Top 100 D1	.301**	.133*	.257**	.168**	.245**	.325**	.325**	.228**	-.307**	.431**	.318**	.231**	.406**	.448**	1	1.30
Collaborators	.290**	.210**	.158**	.158**	.159**	.303**	.304**	.189**	-.138**	.338**	.183**	.223**	.191**	.286**	.348**	1.30

Source: Developed by the author

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Appendix C - Summary statistics: variables

Project Dimension (Goal) in US\$ (thousands)	[3-100]			[3-10]			[10-20]			[20-100]						
	Mean	Std. Var.	Max	Mean	Std. Var.	Max	Mean	Std. Var.	Max	Mean	Std. Var.	Max				
Ratio	317.34%	8.04	0.00%	8876.53%	406.26%	9.83	0.00%	8876.53%	296.62%	8.25	0.01%	7483.33%	228.38%	4.58	0.00%	2621.15%
Video	0.83	0.38	0.00	1.00	0.77	0.42	0.00	1.00	0.85	0.36	0.00	1.00	0.88	0.33	0.00	1.00
Nr of tiers	7.93	5.32	1.00	43.00	7.61	4.69	1.00	33.00	7.70	4.68	1.00	25.00	8.54	6.42	1.00	43.00
Limited offers	0.75	0.43	0.00	1.00	0.75	0.43	0.00	1.00	0.78	0.42	0.00	1.00	0.72	0.45	0.00	1.00
Stretch goals	0.32	0.46	0.00	1.00	0.36	0.48	0.00	1.00	0.32	0.47	0.00	1.00	0.26	0.44	0.00	1.00
Campaign duration	34.25	11.43	10.00	60.00	31.96	9.66	10.00	60.00	35.10	12.10	16.00	60.00	36.25	12.27	10.00	60.00
Total nr of backers	502.73	1211.57	1.00	11287.00	433.48	1222.54	1.00	10125.00	505.63	1300.41	1.00	11287.00	584.23	1103.23	1.00	6072.00
Nr of backers at day 1	96.46	236.41	0.00	2727.00	71.67	181.77	0.00	1142.00	80.93	158.70	0.00	1128.00	140.91	330.20	0.00	2727.00
New backers	72.29	225.82	0.00	2859.00	39.99	100.29	0.00	955.00	73.08	290.54	0.00	2859.00	110.83	259.18	0.00	1975.00
Nr of updates	5.47	6.57	0.00	38.00	5.42	6.01	0.00	33.00	5.26	6.84	0.00	38.00	5.73	6.95	0.00	38.00
Collaborators	0.38	0.49	0.00	1.00	0.33	0.47	0.00	1.00	0.39	0.49	0.00	1.00	0.44	0.50	0.00	1.00
Dedicated presentation	0.37	0.48	0.00	1.00	0.33	0.47	0.00	1.00	0.32	0.47	0.00	1.00	0.47	0.50	0.00	1.00
Previous successful campaigns	0.29	0.45	0.00	1.00	0.33	0.47	0.00	1.00	0.29	0.45	0.00	1.00	0.22	0.42	0.00	1.00
Ks Top 100 DI	0.22	0.42	0.00	1.00	0.18	0.38	0.00	1.00	0.22	0.42	0.00	1.00	0.28	0.45	0.00	1.00

Source: Developed by the author

Appendix D – Summary Statistics: success rate

Project Dimension (Goal) in US\$ (thousands)	[3-100[[3-10[[10-20[[20-100[
	N	%	N	%	N	%	N	%
Successful	196	53.85	88	62.41	53	49.53	55	47.41
Unsuccessful	168	46.15	53	37.59	54	50.47	61	52.59
Total	364	100.00	141	100	107	100	116	100

Source: Developed by the author