Buttice, V. & Noonan, D. S. (Forthcoming). Active Backers, Product Commercialisation and Product Quality after a Crowdfunding Campaign: A Comparison between First-Time and Repeated Entrepreneurs. *International Small Business Journal*.
https://doi.org/10.1177%2F0266242619883984

Active backers, product commercialization, and product quality after a crowdfunding campaign: A comparison between first-time and repeated entrepreneurs

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Keywords: Crowdfunding, post-campaign outcomes, social obligation, social capital

Forthcoming at the International Small Business Journal

1. INTRODUCTION

In the context of reward-based crowdfunding, entrepreneurs often launch a campaign with the goal of financing the creation of a new product and introducing to the market (da Cruz, 2018). Despite product commercialisation identified as the main reason entrepreneurs launch a campaign (Thürridl and Kamleitner, 2016), our knowledge about whether and how products are commercialised after a crowdfunding campaign is, at best, limited.

The related extant literature has focused upon providing descriptive evidence on whether the product is actually delivered to backers (Mollick, 2014) and upon assessing the characteristics associated with a fraudulent campaign, in other words a campaign that does not deliver to backers (Cumming et al., 2016). Yet, the majority of these studies focus only upon the delivery of product to backers and do not identify whether the product is available on the market. da Cruz (2018) provides some evidence regarding product commercialisation after a

crowdfunding campaign. Her study, however, focuses on campaigns that did not attain funding. Thus, this leaves a gap in our knowledge regarding the extent of product commercialisation after successful crowdfunding campaigns.

In this article, we contribute by filling this gap and by developing hypotheses on two key entrepreneurial outcomes following a successful reward-based crowdfunding campaign: the likelihood of commercialising the product in the market, and the quality of this product. To this end, we argue that crowdfunding entails the involvement of a crowd of backers whose members repeatedly interact with the entrepreneur after the campaign (Butticè et al., 2017). While the majority of these backers is interested in receiving a reward and typically limit interactions to updates about the delivery (Skirnevskiy et al., 2017), a smaller number of backers, which we name *active backers,* actively participate in product co-design (Thürridl and Kamleitner, 2016). *Active backers*' involvement allows the entrepreneur to accumulate social capital, and ultimately affects the resulting entrepreneurial outcomes. Social capital, indeed, represents an important source of feedback and comments (Brown and Eisenhardt, 1997; Colombo et al., 2015) and can provide access to value-added resources (Davidsson and Honig, 2003) that facilitate product commercialisation (Shan et al., 1994; Maurer and Ebers, 2006). Given the nature of the interactions with *active backers*, who provide financial as well as in-kind support, however, entrepreneurs can develop a feeling of social obligation towards them. If so, entrepreneurs may attempt to include in the final product the suggestions made by *active backers*, even when product changes are suboptimal (Janis, 1982; Koka and Prescott, 2002) or detrimental to product final quality (Vilena et al., 2011).

We argue that the implications of attracting *active backers* depend on entrepreneurs' experience with crowdfunding before that particular campaign. Following prior studies on repeated crowdfunders (Butticè et al., 2017; Skirnevskiy et al., 2017), we note that some entrepreneurs – specifically those who launched crowdfunding campaigns in the past – already

had the opportunity to accumulate social capital by interacting with *active backers*. For these entrepreneurs, it is reasonable to expect that interaction with any new member of the active crowd will be comparatively more limited. Accordingly, it becomes less likely that the entrepreneur develops social obligation towards these backers. Moreover, through the interactions with active backers from previous campaigns, repeated crowdfunders may have learned how to effectively manage the collaboration with the *active backers* (e.g., to identify the most valuable suggestions from the *active backers*, to refuse to implement product changes when suggestions are useless or even damaging for the final product). Therefore, they could have learned how to limit the negative consequences related to attracting this share of the crowd. By contrast, first-time – *"novice"* – crowdfunders, who have not had the opportunity to learn from interaction with active backers in the past, and are more prone to the emergence of a feeling of social obligation towards active backers, may be comparatively more subject to the negative consequences of attracting these backers.

We test these hypotheses in the context of reward-based crowdfunding of board games, where entrepreneurs seek to raise the money for the production and commercialisation of a board game. A set of Craggit (Cragg, 1971) estimates on a sample of 1,406 successful board-game crowdfunding campaigns launched on Kickstarter in the period 2009-2014 shows that the association between active backers and the subsequent entrepreneurial outcomes varies depending on whether the entrepreneur has had prior experience with crowdfunding. Specifically, we show that having attracted a large crowd of active backers has a positive association with the likelihood of commercialising a product only for *novice crowdfunders* (i.e., only if they are running their first crowdfunding campaign). By contrast, no effect is detected for *repeated crowdfunders*. In addition, we show that having attracted a large crowd of active backers is negatively related to the quality of the product for novice crowdfunders. On the

contrary, when the entrepreneur already had prior experience running crowdfunding campaigns, the relationship is positive, although weakly significant.

This article unfolds as follows. In section 2, we review the literature on crowdfunding and post-campaign performances (section 2.1) and develop our theoretical arguments that lead to testable hypotheses (sections 2.2 and 2.3). In section 3, we describe the methodology used to test our hypotheses. Section 4 presents the results of our analyses, while section 5 discusses limitations. Last, section 6 concludes this work.

2. THEORETHICAL BACKGROUND

2.1 Crowdfunding and post-campaign performances: State of the art

An extensive body of studies has investigated the determinants of success of crowdfunding campaigns (see Butticè et al., 2018 for a comprehensive review), focusing on institutional (e.g., Calic and Mosakowski, 2016; Josefy et al., 2017), entrepreneur (e.g., Ahlers et al., 2015; Piva and Rossi-Lamastra, 2018) and campaign characteristics (e.g., Mollick, 2014) associated with higher probability of collecting money from the crowd. By contrast, fewer studies have advanced our understanding of the consequences of having launched a crowdfunding campaign (Vanacker, Vismara and Walthoff-Borm, 2019; Ahlstrom, Cumming and Vismara, 2018).

Signori and Vismara (2018) conduct one of the first studies in this field. They apply a finance perspective to investigate the performances of firms that obtained equity crowdfunding campaign. They found that the 18% of the ventures that raised crowdfunding between 2011 and 2015 were not active anymore. By contrast, 34.9% of the companies raised additional funding. Interestingly, firms that attracted during the first campaign a larger number of investors were less likely to issue further equity.

Walthoff-Borm, Vanacker and Collewaert (2018) compare the financial performances of firms that received equity crowdfunding with matched firms that did not receive any crowdfunding. They show that firms that received equity crowdfunding exhibit lower financial performances and have considerably higher failure rates. A similar result is shown by Hornuf, Schmitt and Stenzhorn (2018), who demonstrate that the hazard of firm failure increases with the valuation of the firm, while decreasing with the amount raised during the crowdfunding campaign. In this work the authors also show that firms that received equity crowdfunding register a higher chance of obtaining follow-up funding through business angels or venture capitalists.

The linkage between crowdfunding and follow-up financing has been relatively well investigated. These articles have often considered crowdfunding as an informational mechanism that reduces information asymmetries about the unknown quality of the start-up. In this respect, Drover et al. (2017) show that VC have a higher willingness to conduct a due diligence on reward-crowdfunded firms that attracted a higher number of backers. The positive association between reward-based crowdfunding and follow-up financing finds confirmation in a study by Roma et al. (2017). They show that if a firm has patents or a large network, the collection of a large amount of funding increases the likelihood of receiving VC-financing. The recent study by Cumming, Meoli and Vismara (2019) contributes to the debate on the linkage between crowdfunding and follow-up financing. They find that a higher separation between ownership and control rights lowers the likelihood of attracting professional investors.

Fewer studies have focused on the actual reward delivered to backers after a reward-based crowdfunding campaign, which is directly related to our research question. One major contribution to this topic is brought by the research on frauds in crowdfunding. In this market, frauds are a secondary concern (Mollick, 2014; Cumming et al., 2016). However, these studies report that only about one product out of four is delivered on time, while one out of three had

yet to deliver two years after the end of the campaign (Mollick, 2014). Another relevant article related to our research question is by Da Cruz (2018). Her study investigates the association between performances during the crowdfunding campaign (e.g., the number of backers attracted, the capital amount pledged by backers) and the probability of releasing a product on the market. This study focuses on campaigns that did not received financing. Although consistent with the goal of the research, this raises some concern about the generalisability of the results. Indeed, the literature on crowdfunding has noted that apart from being an information mechanism, crowdfunding allows entrepreneurs to access resources needed to run their venture. Obviously, the first thought is to financial resources, yet resources accessible in crowdfunding can go beyond financing. Butticè et al. (2017) argue that through the launch of a successful crowdfunding campaign, entrepreneurs are able to develop social capital within the platform that ease the collection of funding during subsequent crowdfunding campaigns. This social capital is also conducive to knowledge about the product delivered, the strategy adopted and the market served by the firm (Di Pietro et al., 2018).

In our analysis, we borrow from prior literature the idea that through the launch of a successful crowdfunding campaign, entrepreneurs can develop social capital (Butticè et al., 2017). Moving from this intuition, in the following sections, we develop hypotheses about the association of social capital developed through crowdfunding campaigns and the ensuing entrepreneurial outcomes.

2.2. Implications of developing social capital through crowdfunding for subsequent entrepreneurial outcomes

Prior literature has stressed that crowdfunding platforms are privileged forums where entrepreneurs can interact with backers (Butticè et al., 2017). These interactions occur naturally in different forms (Gerber and Hui, 2013). Some backers of reward-based crowdfunding restrict

interaction to inquire about product delivery or even do not have any interaction with the entrepreneur after the campaign. Others offer feedback about the product (Belleflamme et al., 2014) that can allow proponents to anticipate problems and enhance future versions of the product (Colombo et al., 2015; Grell et al., 2015). Finally, recent studies highlighted that some other backers are intrinsically motivated to take an active role during the product design phase (e.g., Stanko and Henard, 2017). Supporting their knowledge contribution, some of these backers have even been granted advisory board positions in the crowdfunded firm (Walthoff-Borm et al., 2018). Occasionally, backers' involvement in product development is favoured by entrepreneurs themselves, who offer as a reward in their crowdfunding campaigns the possibility for backers to participate in product co-design (Lewis-Kraus, 2015; Thürridl and Kamleitner, 2016).

In this article, we focus on this latter group of backers that actively and directly participate in the product co-design. We label these backers as *active backers*, and we argue that their involvement is relevant for the entrepreneurial outcomes following the crowdfunding campaign, since it creates the conditions for entrepreneur to develop social capital (Skirnevskiy et al., 2017). Indeed, while interactions with *other backers* are often one-time and restricted to the provision of funding or some generic feedback about the delivery of the product, interactions with *active backers*, since they are involved in product co-design, occur repeatedly after the fundraising and before the product is commercialised (Di Pietro et al., 2018). These repeated interactions, through which active backers offer advice, design ideas and even criticism (Stanko and Hennard, 2017), facilitate the emergence of shared social norms (Nahaphiet and Ghosal, 1998), trust (Moran, 2005) and strong ties (Brown and Reingen, 1987), and ultimately allow entrepreneurs to accumulate social capital through the crowdfunding campaign (Butticè et al., 2017).

An extensive literature in entrepreneurship has highlighted that social capital crucially influences opportunity discovery, evaluation and exploitation (e.g. Casson and Giusta, 2007) and has multiple positive outcomes on ventures' growth (Gopalakrishnan et al., 2008) and performances (Maurer and Ebers, 2006). In the context of crowdfunding, social capital has been shown as a determinant of success of the funding campaign as it increases the likelihood of success of current (Mollick, 2014; Agrawal et al., 2015; Colombo et al., 2015) and subsequent campaigns (Butticè et al., 2017; Skirnevskiy et al., 2017). Prior literature on crowdfunding has also suggested that the social capital developed through the platform may serve as a source of feedback and suggestions that entrepreneurs can use to improve their projects (Colombo et al., 2015; Belleflamme et al., 2014) and to reduce risk of failure (Di Pietro et al., 2018).

We argue that aggregating a crowd of *active backers*, and thus ultimately developing social capital through crowdfunding, is also positively associated with product commercialisation. Consistent with the literature on social capital (see Kwon and Adler, 2014 for a review), active backers can contribute to product development by highlighting areas of improvements and solutions (Di Pietro et al., 2018; Colombo et al., 2015), by providing suggestions about production processes (Hsieh and Tsai, 2007) and by facilitating access to additional resources that the entrepreneur can use to produce (Packalen, 2007) and then commercialise the product (Maurer and Ebers, 2006). This argument finds support in the literature on innovation management (e.g., Joshi and Sharma, 2004; Gruner and Homburg, 2000; Prahalad and Ramaswamy, 2004; Mahr et al., 2014), which has noted that the association between crowd participation and product commercialisation appears particularly effective, when the crowd is involved from the product development stage (Chang and Taylor, 2016). In this case, indeed, the active crowd can provide technical advice or design skills that may help the entrepreneur to anticipate problems (Poetz and Schreier, 2012). Accordingly, crowd participation in co-design reduces the risk of failure during product development and, in turn,

increases the likelihood the product is commercialised (Carbonell, Rodríguez-Escudero and Pujari 2009).

The accumulation of social capital, through the aggregation of an active crowd, may also imply another dynamic that leads to an increase in the likelihood of commercialising the product. The nature of the interactions that generate this social capital, indeed, may engender strong feelings of social obligation (Blau, 1986; Coleman, 1988; Nahapiet and Ghoshal, 1998) from the entrepreneur to the active backers, in response to their commitment during product development. In compliance with such feeling, entrepreneurs who have attracted a crowd of active backers may be more likely to commercialise a product to avoid displeasing them.

The board-games category of Kickstarter projects provides an interesting context to observe how active backers influence the likelihood of commercialisation. In this market, the failure of 'successful' campaigns to commercialise tends to result from poorly conceived (target) budgets in the first place or from a dissolution of the creative team. Active backers have little direct role in this. Potential active backers, however, may be the first to detect project problems and thus avoid participating. Their active involvement also includes endorsing projects to their networks. We might expect more active backers to be associated with greater likelihood of commercialisation, especially for novice creators who are more sensitive to social pressure from active backers. Moreover, this well-developed category in Kickstarter has seen a rise in popularity of 'slacker-backer' campaigns (i.e., post-campaign fundraising outside of Kickstarter.com that captures revenue from late backers but misses the marketing or promotional advantages of being on Kickstarter). Active backers and their prominent social networking role can be vital in advancing these slacker-backer campaigns, and more post-campaign funds may make commercialisation more likely, although this effect is again likely more pronounced for novice creators as repeated creators have other mechanisms for promoting their post-campaigns efforts.

Both the direct role of the active crowd in product development and the social obligation towards the active crowd lead to a positive association between attracting active backers and the probability of commercialising a product. Therefore, we can expect that:

H1: *A larger crowd of active backers is associated with a higher probability of commercialising the product.*

However, attracting active backers and an emerging feeling of social obligation pose additional challenges to entrepreneurs, since active backers likely provide to the entrepreneur diverging feedback and suggestions about product development (Stanko and Hennard, 2017; Faems et al., 2010).

During the product development phase, tasks are highly interdependent and contextual, such that changing one component of the new product on the basis of active crowd input may accidentally affect other functions negatively or may not be appropriate in the firm's current production situation (Un and Asakawa 2015). Yet, because of social obligation towards active backers, entrepreneurs, rather than focusing on few value-adding suggestions, might attempt to include the maximum number of inputs provided by the active crowd, even when these are suboptimal (Janis, 1982; Koka and Prescott, 2002) or detrimental for product quality (Gulati and Sytch, 2007; Uzzi, 1997). In this scenario, it is likely that entrepreneurs try to include during product development as many suggestions by the active crowd as possible, at the expense of product quality (Villena et al., 2011). Evidence in support of suboptimal decision making because of social obligations has been documented in many contexts. In the context of the apparel industry, Uzzi (1997) shows that, when there is social obligation, a relationship might be detrimental to firm performances. Similarly, Malhotra (2004) proves in a lab experiment that obligations guide individuals' action regardless of the benefit provided.

The risk of receiving multiple inputs, which may be detrimental for the product, increases

with the size of the active crowd involved. Therefore, we advance:

H2: *A larger crowd of active backers is associated with a lower product quality.*

2.3. Interaction between active backers and entrepreneurs' crowdfunding experience

Prior literature has pointed out that entrepreneurs are heterogeneous in their experience on crowdfunding platforms. While some are newbies, other *repeated* crowdfunders (Butticè et al., 2017) have launched several campaigns over time (Skirnevskiy et al., 2017). As discussed by the literature, launching several crowdfunding campaigns is another way for entrepreneurs to develop social capital (Butticè et al., 2017). We expect it may affect the association between the active crowd attracted and the entrepreneurial outcomes after the campaign through a twofold mechanism. First, the literature has noted that these *repeated* crowdfunders have developed over time a community of supporters of their entrepreneurial initiatives, which moves from one campaign to the next (Butticè et al., 2017). Managing this community requires frequent interactions, which may reduce the available time and attention dedicated towards active backers (Maurer and Ebers, 2006). In turn, the limited interaction with active backers will make the emergence of social obligation towards them less likely. Accordingly, *repeated* crowdfunders suffer less from social obligation towards their active backers. Moreover, the *repeated* crowdfunders' larger community will likely already include members who actively participate in product co-design. Thus, they already aggregated an active crowd from previous campaigns. Because of the presence of these individuals, the contribution of each new active backer to co-designing the product is comparatively less relevant. Again, since the individual contributions of active backers to the product development are limited, it is less likely that a

repeated entrepreneur develops feelings of social obligation towards them. Second, we note that *repeated* entrepreneurs' greater capacity to manage the active backers has developed over time, through a process of learning by doing (Cope and Watts, 2000). Through prior experiences on crowdfunding platforms, *repeated* entrepreneurs inform their aptitude and develop a frame of reference (Huber, 1991), which they use in the decision-making process about the development of the product. Accordingly, *repeated* entrepreneurs are more likely able to identify and select the most valuable inputs, while neglecting the others. Similarly, they are more likely able to manage the pressure of the active backers and refuse to comply with their requests. Further, if active backers can adversely affect entrepreneurial outcomes, then we would expect a sorting mechanism wherein those entrepreneurs best able to manage active backers will be more likely to return as *repeated* entrepreneurs.

Overall, a limited feeling of social obligation towards active backers will likely reduce the active backers' push to product commercialisation. Similarly, increased capabilities to select the most valuable inputs while neglecting the others might be reflected in fewer quality-reducing product development decisions. Therefore, for *repeated* entrepreneurs, we expect that the associations hypothesised in the previous section weaken. We derive:

> ***H3a:*** *Compared with novice crowdfunders, for* repeated *entrepreneurs the positive association between active crowd and probability of commercialising the product is weaker.*
>
> ***H3b:*** *Compared with novice crowdfunders, for* repeated *entrepreneurs the negative association between active crowd and product quality is weaker.*

Figure 1 schematises our hypotheses.

/Insert figure 1 about here/

3. METHOD

3.1 Context of the study and sample

To test our hypotheses, we develop a dataset including 1,406 board games projects funded on Kickstarter.com since April 2009 and continuing to July 2014. Kickstarter.com is among the largest reward-crowdfunding platforms worldwide (Colombo et al., 2015).

The platform advises entrepreneurs to offer a range of rewards tied in with different levels of financial pledges to get more backers involved in the funding campaign. Occasionally, rewards offer the possibility for backers to participate in product co-design. Rewards that provide input into product design might involve naming a fictional book character or appearing as an extra in a film or could take a wide variety of other forms.

Kickstarter hosts projects coming from different industries. including: art, comics, crafts, dance, design, fashion, film, food, games, journalism, music, photo, publishing, technology and theatre. In this list, an indisputably prominent role is played by games and especially board games. In ten years, since April, 2009 to May, 2019, about 19,255 board games have been lunched on the platform, and of these about 8,905 have been successfully funded. This makes board games one of the largest categories on Kickstarter in terms of capital collected (~$700 million by April 2019) and backers (~3.2 million by April 2019). Specialised press claims that board games have benefited from Kickstarter more than any other industry (e.g. Valdes, 2019). Consistent with this view is also fact that among the top-10 most funded campaigns in Kickstarter history, three relate to board games, more than any other product category (Kickstarter.com).

Kickstarter has become an influential player in the commercial board game market.[i] Several websites and blogs constantly follow Kickstarter projects and provide updates about the new board games presented on the platform.[ii] One of the main advantages of this aspect is

that around Kickstarter board games, a community has developed that tracks board game performances after the end of the campaign and makes this information freely accessible online. Thus, board games offer a data-rich setting, which includes information about all campaigns on the dominant platform as well as their post-campaign performances. The importance of this category of project for Kickstarter together with the availability of data about board games post-campaign performances are two of the reasons to focus on this product category. In addition, the focus on board games allows us to study a fairly homogenous group of campaigns. All the campaigns in this category require the production and delivery of a physical product, hence exemplifying well the challenges an entrepreneur to arrange a mass production faces (e.g., organisation of manufacturing, logistics and operations). The same does not hold true for other product categories funded through Kickstarter, where also campaigns that do not entail any commercialisation of a product (e.g., financing a science lab in a school, organising a workshop about a specific topic, a one-time artistic performance) exist.

We collect additional data about post-campaign performances from BoardGameGeek.com, which is an easily accessible source of information for board games.[iii] By April, 2019, the website hosts reviews and articles for about 84,400 different games and 16,300 game designers. Particular attention is devoted to Kickstarter campaigns. The website features a bulletin board, named "*Crowdfunding: Kickstarter*", which keeps track of virtually all the projects launched on the crowdfunding platform. Interviews with board-game creators and BoardGameGeek.com users confirmed that the website records every relevant project posted on Kickstarter.[iv] If the board game is funded and then commercialised, it is included in the main database of BoardGameGeek.com and its performance is tracked over time. Conversely, board games which are not commercialised are not included in the main database.[v] The website keeps track of, among other things, the number of owners of the game and of an evaluation of the quality of the game on a 1.0-10.0 scale. Data collection from

BoardGameGeek.com was conducted in January-February 2016 and the matching of the information was based on the title of the board game. When multiple games had the same name, we crosschecked the information with those available in Kickstarter.com. We included in our sample all the board games successfully funded on Kickstarter in the period 2009-2014 (1,406 campaigns). Thus, all projects in our sample had at least two years to commercialise after successfully reaching their target capital. Our sample includes 864 projects that reached the market and have been included in the main database of BoardGameGeek.

3.2 Variables

Consistent with our hypotheses, we define two main dependent variables. First, we create a dummy variable (*d_market*) indicating if the board game has been included in the main database of BoardGameGeek (i.e., if the project has been commercialised). Second, we retrieved information about the user quality valuation of each board game (*user_rating*). This variable represents the user evaluation of the board game on a 1.0-10.0 scale as reported on the BoardGameGeek.com page of each game.

The main independent variable is the number of active backers participating in the campaign (*ln_active_crowd*). This has been computed for each campaign by summing the number of backers who selected a reward that offered participation in product co-design. These rewards include the possibility of creating an area of the terrain, participating in the design of the cards, setting the game rules, or other co-designing roles. Appendix A1 reports some examples of such rewards. If the campaign did not offer the possibility to participate in product co-design, the variable *ln_active_crowd* takes the value 0. To explicitly account for these instances in the regressions, we add a dummy variable (*d_codesign*), equal to 1 when the campaign offers the possibility to participate in product co-design, and 0 otherwise. We also gather information about the number of backers (*ln_backers*) and the nominal capital in US$

pledged (*ln_pledged*) during the crowdfunding campaign. Both variables have been normalised using a logarithmic transformation due to high skewness. These measures have been used to assess the reliability of our results, as discussed in the robustness checks section. A second independent variable is related to entrepreneur's prior experience. Specifically, we track the entrepreneur's prior campaigns launched on the crowdfunding platform by means of a dummy variable (*d_experience*) equal to 1 when the entrepreneur had launched at least one other successful crowdfunding campaign previous to the focal project (Butticè et al., 2017).

Several control variables about the crowdfunding campaign and the board game have been included in the model specification. We collected the number of visuals (videos plus images) contained within the Kickstarter.com project description (*ln_visuals*). Furthermore, we control for the quality of the campaign by means of a dummy variable (*d_staffpick*) equal to 1 if the campaign was selected by Kickstarter as a "project we love". We also considered the duration of the crowdfunding campaign (*duration*) in days, its target capital expressed in dollars (*ln_target*) and the number of links to external websites provided in the campaign web page (*more_*info). We also include a set of variables indicating the number of rewards offered in the campaign (*ln_reward_count*), the amount associated with the cheapest reward (*ln_min_reward*) and the amount associated with the most expensive one (*ln_max_reward*). In addition, we code whether the campaign was located in one of the ten biggest US cities (*d_bigcity*) by population, according to US census, or in another US city (*d_US*). We also add a dummy variable indicating whether the campaign had been launched by an already established firm (*d_firm*). In addition, we include two dummy variables indicating the entrepreneurs' backgrounds. First, we consider whether the entrepreneur has a bachelor or a master of science degree (*d_education*). Second, we note whether the entrepreneur had won an award for his/her prior work (*d_award*). We obtain information to create these variables from the biography posted by the entrepreneur on the campaign page. Finally, we include year dummies to control for the timing of the campaign

(*d_year*$_i$). We further include information about the board game's features. We code the game's expected average game duration (*ln_game_duration*). A further control relates to the number of fans of the board game (*ln_fans*), as counted in its BoardGameGeek page. We also considered the game mechanics by means of an array of dummy variables.[vi]

3.3. Descriptive statistics

Table 1 reports descriptive statistics of the variables in our models. Table 2 shows the correlation matrix. Our sample includes 1,406 projects that reached their funding goal. Board game projects on average sought only a limited amount of money (mean of $12,522, s.d. 20,010), although there is no shortage of projects that set a considerably higher target capital. Our sample includes 53 projects that sought to collect more than $50,000 each, while one project sought $500,000.

/ Table 1 and 2 about here /

Projects included in the sample were on average able to collect $47,236 (s.d. 132,436) and to attract 627 backers (s.d. 1,138). Thus, in our sample, the average contribution per backer is equal to $78. This value is aligned with prior literature (Bœuf et al., 2014; Hemer, 2011) and, in conjunction with the statistics on collected capital, suggests that the particularly positive fundraising results experienced in this category depend on a larger number of backers (rather than larger contributions per backer).

Approximately one campaign out of three (37.8%) offered the possibility to actively participate in the project. These projects were able to attract on average 5.81 (s.d. 15.95) backers willing to contribute in project co-design. This number shows that a limited number of crowdfunders select a reward that entails an active participation. This is in line with prior literature on crowdsourcing (e.g. Afuah and Tucci, 2012; Von Krogh and Von Hippel, 2003)

that shows that few members of the crowd provide insightful feedback and comments for the development of the product.

Among the projects included in our sample, 693 (49.3%) have been presented by entrepreneurs who already had a previous successful funding experience on Kickstarter. Only 31.3% of these entrepreneurs (190) have offered a reward that entails the possibility of actively participating in product co-design. This percentage is statistically significantly lower compared to the projects of *novice crowdfunders,* who offer a reward of actively participating in product co-design in 42.7% of the cases. Interestingly, no significant difference exists among *repeated* and *novice crowdfunders* in the share of backers who chose these rewards.

4. RESULTS

4.1 Main results

We estimate a set of Craggit models (Cragg, 1971) to test our hypotheses.[vii] The Craggit model, also known as double-hurdle estimation, allows for analysing cases in which two separate processes contribute to inform a certain phenomenon (Jones and Yen, 2000). A typical example is the modelling of individual cigarette consumption, where the participation in the process (being a smoker vs non-smoker) and the level of consumption are two separate individual choices (Atkinson et al., 1984). Craggit models are a powerful generalisation of two-stage models that permit using different econometric specifications in the two stages of the model (Jones and Yen, 2000). In this respect, it is easy to demonstrate that the Tobit estimator is a particular case nested in the more general Craggit estimator (Wooldridge, 2002). One of the advantages of the Craggit is that this model does not impose any constraint that variables' parameters have the same sign in both stages (Burke, 2009). This feature is particularly important for our design, since we expect from our hypotheses a change in the main independent variable parameter's sign.

In our specific case, the first stage of the model analyses whether the entrepreneur commercialises the product, while the second stage models the quality evaluation of the commercialised products. Table 3 reports first-stage estimations. Column 1 reports the model with control variables only. In column 2, we include the main independent variable *ln_active_crowd*. In column 3, we report the model with independent dummy variable *d_experience*. In column 4, we include the two main independent variables *ln_active_crowd* and *d_experience* in the model. Finally, to assess the nonlinear effect of 'active backer' anticipated in H3a and H3b, we add an interaction term between active backers and experience in our model specification in column 5.

/ Table 3 about here /

We first focus on the commercialisation stage (i.e., whether the entrepreneur reaches the market with their product given that it already has a successful Kickstarter campaign). The key independent variables exhibit significant relationships. As expected, successful board-game Kickstarter campaigns by repeated crowdfunders are more likely to reach the market than those by novice crowdfunders. Conversely, the size of the active crowd is generally not significantly related to likelihood of commercialising, as evident in columns 2, and 4 of Table 3. The number of active backers participating in the campaign has a positive and significant impact on the likelihood of reaching the market only for entrepreneurs at their first (successful) crowdfunding campaign (column 5). A one standard deviation increase in *ln_active_crowd* results in a 7.7% increase in the probability of commercialising a product (from 39.5% to 42.5%) when the *d_experience* variable is equal to 0. Thus, while we cannot reject the hypothesis that more active backers increase the probability of commercialisation (H1), we do not find very strong support for H1 alone.

/Figure 2 about here/

When interpreting interaction effects in nonlinear models, looking only at the coefficient of the interaction term is not sufficient (Ai and Norton, 2003). Thus, we graph the relationships in Figure 2 using estimates from column 5 in Table 3. The vertical axis shows the marginal effect on commercialisation of the active crowd, while the horizontal axis corresponds to experience level. Figure 2 illustrates the average marginal effect (and 95% confidence interval) of *ln_active_crowd* when the variable *d_experience* assumes values 0 and 1. The marginal effect of *ln_active_crowd* is positive and significant when *d_experience* is equal to zero. By contrast, no significant effect is detected when this variable assumes value of 1. Thus, the active backers gathered by means of a crowdfunding campaign have no significant effect on the probability of commercialising the product for repeated crowdfunders. This is consistent with the hypothesis (H3a) that repeated crowdfunders are less sensitive to the role of active backers. The insignificant effect of active crowd size in models lacking the interaction term (e.g., column 4) points to this important role of experience in moderating the effect of the active crowd.

The control variables in the models in Table 3 show expected and relatively stable results. The year dummies have decreasing coefficients over time. The number of visuals included in the project description has a positive and significant effect on the likelihood of reaching the market. Projects with more images, which may have advanced further beyond the idea/design phase to possibly have prototypes to display, have a greater probability of reaching the market. Being located in the US is associated with greater likelihood of commercialising the product. Projects locating in major US cities do not have significantly different likelihoods of commercialisation than other US cities. The duration of the campaign is negatively and significantly associated with the dependent variable *d_market*. The target capital is positively associated with the probability of reaching the market. Also setting a high maximum pledge negatively and significantly impacts on the probability of reaching the market. By contrast,

there is no significant effect on the probability of commercialising the product associated with both the number of rewards offered and the amount associated with the minimum reward. Projects with rewards that allow backers' co-design opportunities are more likely to commercialise, even after controlling for the number of active backers for that project. This is consistent with projects that attempt to engage with the backer community having more capacity to or experiencing more pressure to successfully commercialise. Finally, our results show a positive association between the probability of commercialising a product and whether the campaign has been launched by a firm.

/ Table 4 about here /

The second stage of the Craggit model estimates the predictors of the perceived quality of the product, conditional on having commercialised. Columns 1 includes only control variables, with other columns adding key independent variables. In line with our hypothesis H2, the number of active backers attracted during a campaign is negatively related to the quality of the product when the entrepreneur is a novice crowdfunder. On the contrary, the variable *ln_active_crowd* is positively related to a higher quality evaluation when the entrepreneur already had prior experience with successful crowdfunding campaigns. This result is confirmed when looking at Figure 3, which illustrates the average marginal effect of *ln_active_crowd* when the variable *d_experience* assumes values of 0 and 1. Figure 3 for the second-stage interaction term is analogous to Figure 2 for the first-stage interaction. The marginal effect of *ln_active_crowd* is negative and significant when *d_experience* is equal to zero. A one standard deviation increase of *ln_active_crowd* results in a 3.3% decrease of the dependent variable (from 6.6 to 6.4), when the variable *d_experience* is equal to 0. By contrast, the marginal effect of *ln_active_crowd* is positive and weakly significant when *d_experience* assumes a value of 1. The hypothesised negative effect of active backers on product quality (H2) is only evident among projects by novice crowdfunders, consistent with H3b. Again, entrepreneur experience

is critical in moderating the effect of active backers. Our results suggest that active backers' association with commercialisation and with board-game rating is stronger for first-time crowdfunders, while it is not statistically significant for repeated crowdfunders.

/Figure 3 about here/

Control variables in Table 4 results provide much less explanatory power than in the first stage, although their effects are stable across models. Conditional on the first-stage model predicting whether the product reaches the market or not, user-evaluated quality is not significantly related to most of the variables related to the campaign, entrepreneur, or even game mechanic. A few exceptions include whether the board-game creator had previously won an award and the value of the lowest backer level during the campaign. Commercialised, crowdfunded board games tend to have lower quality scores when their creator has won an award, suggesting perhaps heightened customer expectations, regression to the mean, or perhaps more experimental or "vanity projects" undertaken via crowdfunding by previously successful creators. Successful projects with a higher *ln_min_reward* tend to receive higher quality ratings by users at BoardGameGeek. Setting a higher "low bar" for rewards, many of which may be effective pre-sale rewards, may reflect higher production costs and values or an ability to screen-in customers with strong prior beliefs about quality. Increasing game duration is also associated with higher quality evaluations. For the year dummies, no time effects on the perceived quality of the product are detected in our models.

4.2 Robustness checks

We perform several robustness checks.[viii] Evaluations may not be representative of the perceived quality of the product when provided by a limited number of evaluators. To consider this issue, we run our estimations on a subsample of projects that received, alternatively, at least

10, 20, and 50 evaluations. Results of the three checks are consistent with those reported from the main model.

To further investigate the reliability of our measure of product quality, we consider an alternative and independent measure. In the context of board games, winning an award, like the *Spiel des Jahres* or the *Mensa Select* is a certification of excellence in game design and quality. Therefore, we created a dummy variable taking value equal to 1 if the board game has received at least an award or recognition in an important international convention.[ix] Results of a Probit model, including this dummy as dependent variable, totally confirm our results.

In addition, to support our theoretical argument that the effect of a crowdfunding campaign on the ensuing entrepreneurial performance depends on the entrepreneur's social capital endowment accumulated in prior campaigns, we substitute the dummy variable *d_experience* with a measure of social capital traditionally used in the crowdfunding literature. Accordingly, following the approach of Butticè and colleagues (2017), we count the number of backers of each entrepreneur's previous successful campaigns. This lets us control for social capital accumulated through previously launched successful crowdfunding campaigns (*social capital from previous successful campaigns*). Results using alternatively this measure instead of the dummy variable *d_experience* are in line with those included in the main model in Table 3 and Table 4. Interestingly, for high values (above the 83rd percentile) of the variable *social capital from previous successful campaigns,* the association between the variable *ln_active_crowd* on the chances of commercialising the product is negative and significant.

We also assess the choice of using the variable *ln_active_crowd* rather than alternative measures. To this aim, we compute the capital collected, the total number of backers, and the number of backers who did not choose a reward that enable co-design (*ln_pledged_capital*, *ln_backers, ln_other_backers*). Correlation among these variables and *ln_active_crowd* is low (below 0.15 in absolute value), thus suggesting that the variables *ln_active_crowd* is the

operationalisation of a different underlying construct. We include these variables as controls in three alternative econometric specifications. Results are consistent with the main model, although the coefficient of the moderation term, when the dependent variable is the likelihood of commercialising the product (stage 1), is only weakly significant when *ln_backers* is included as a control.

Finally, to consider a possible bias due to the use of the delta method to approximate the probability distribution for a function of an asymptotically normal statistic to compute confidence intervals (King and Zeng, 2001), we follow the simulation-based procedure suggested by Zelner (2009). The results obtained by implementing this methodology are fully in line with those presented here.

5. LIMITATIONS

We acknowledge that this analysis has some limitations. Using data from a specific category of projects presented on Kickstarter raises some concerns about generalisability of our results. We believe that our findings can well be extended to other crowdfunding campaigns whose goal is the making of a low-tech physical product. The making of a board game presents manufacturing problems (e.g., selection of material for the miniatures, orchestrating different suppliers for different raw materials, coordinating artistic design and precision manufacturing of components) not different from, for instance, the production of a garment or a piece of furniture. Similarly, the storage and the shipping of the final products resembles that of other low-tech consumer goods. Yet, we cannot completely rule out the possibility that our findings are category-specific. Once information about product commercialisation also becomes available for products in other industries, we recommend future studies to assess whether our findings extend to other crowdfunding categories, platforms, and models.

In addition, we identify active backers as those backers who selected a reward offering the participation in product co-design. Our data do not ensure that these backers really participated in product co-design after the crowdfunding campaign. Accordingly, we cannot completely exclude that active backers selected these rewards for reasons different from product co-design. Some may argue that the active backers are fundraisers' family and friends who select rewards offering the participation in product co-design just because these are associated with greater contribution levels. We are inclined to believe that there is a slim possibility that this occurs. Kickstarter allows backers to contribute to a project without redeeming their reward, thus, in our opinion, it is unlikely that fundraisers' family and friends choose rewards offering the participation in the co-design if not interested.

Finally, our data do not allow us to exclude selection processes in the formation of the active backers. Backers forming this segment of the crowd pay for participating in the co-design of the project, which is an activity that is typically rewarded by firms. In this scenario, we cannot exclude that mainly *"bad co-designers"* (i.e., low quality *co-designer*) constitute the crowd of active backers. If this is the case, we should expect negative effects of the active backers on the probability to commercialise a product and on its quality. Novice crowdfunders would suffer more the negative effect of the active backers, while repeated crowdfunders would more likely avoid considering the inputs provided by these backers. However, the results of our model substantially diverge from this interpretation. This makes us lean toward rejecting the hypothesis of low-quality co-designers. Alternatively, someone may argue that active backers might be drawn to creators with high human capital or with a large number of relationships within the industry. In this case, it may be the omitted variable (e.g. human capital), not the active crowd attracted, that leads our results. However, we believe that this is unlikely. Indeed, following this line of reasoning, the overall quality of the product should be higher for

entrepreneurs that managed to attract during the crowdfunding campaign a large crowd of active backers, while our results substantially diverge from this interpretation.[x]

6. CONCLUSION

In this article, we establish a linkage between the active backers gathered during a successful crowdfunding campaign (namely backers who actively participate in product development after the crowdfunding campaign) and two entrepreneurial performance outcomes: the likelihood of commercialising the product in the market and its perceived product quality. Econometric analyses of a sample of 1,406 board games show that the effects of the active backers on the following entrepreneurial performances vary depending on whether the entrepreneur has had prior experience with crowdfunding. Specifically, we show that having attracted a large number of active backers is positively associated to the likelihood of commercialising a product only if entrepreneurs are *novice crowdfunders* (i.e., they are running their first crowdfunding campaign). By contrast, no effect is detected for *repeated crowdfunders*. In addition, we show that having attracted a large number of active backers has a split effect on product quality. In particular, the number of active backers attracted during a campaign is negatively related to perceived product quality when entrepreneurs are *novice crowdfunders*. On the contrary, the number of active backers is weakly positively related to a higher-quality evaluations when entrepreneurs already had prior experience with crowdfunding campaigns.

This article helps shed light on entrepreneurial performances following a crowdfunding campaign. We show first that allowing opportunities for backers to participate in co-designing products can actually improve the chances for commercialisation, an effect that, for novice crowdfunders, grows with 'active crowd' size. We next show that attracting a large number of active backers has a negative effect for novice crowdfunders in the form of lowering the quality

of the product once produced. Active backers who engage in co-design may have negative consequences for the venture afterwards. Given this result, in line with prior studies (Belleflamme et al., 2014; Gutierrez-Urtiaga and Saez-Lacave, 2018), our work raises the need for modelling crowdfunding as a two-period process where the first step refers to funding collection and the second describes the entrepreneurial stage. This approach would help to consider crowdfunding side effects on following entrepreneurial performance. Moreover, this article highlights the importance of a specific segment of the crowd: active backers. We show in the robustness checks that these individuals are different from to the other members of the crowd. These backers are a source of feedback and knowledge and are also involved in the entrepreneurial activities after the end of the campaign. Active backers may support commercialisation for some entrepreneurs, but their involvement may lead products to diverge from what appeals to broader market tastes. To the best of our knowledge, this is the first empirical article that attempt to highlight the existence of such backers. Future studies on crowdfunding should consider this heterogeneity when modelling the phenomenon.

Highlighting that crowdfunding may have drawbacks for some entrepreneurs is of primary importance for individuals who use this funding means. Our study suggests that active backers increase the likelihood of commercialising a product; however, they are also associated with a lower overall quality once commercialised. These entrepreneurs should consider this dual effect and design their campaigns accordingly. Incidentally, this study is relevant also for platform managers, as it indicates a possible value in supporting entrepreneurs after the end of their campaign. Crowdfunding platforms should consider modifying their information or business model to take into in account this result (e.g., including tutorials and face-to-face support for entrepreneurs). Considering the above arguments, we believe that our results have clear implications for policymakers and should inform the policy agenda on the topic. Governments interested in leveraging on crowdfunding as an engine for entrepreneurial

diffusion should consider that using crowdfunding to collect financial resources has potentially negative implications for entrepreneurs and backers. In a robustness check, we show that when entrepreneurs have gathered a particularly large crowd of backers from previous campaigns, the effect of the active crowd attracted on the chances of commercialising the product is negative and significant. This result seems to suggest a possible drawback of having attracted a large crowd of active backers. Our results raise the concern about developing policies to support the entrepreneurs and encourage successful commercialisation. Defining an upper bound to the funding collection, linking platform revenues to downstream success, or providing support to entrepreneurs are just a few examples of interventions to protect backers from poor quality products.

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TABLES

TABLE 1- Descriptive statistics and variable definition

Variable	*Mean*	*Std. Dev.*	*Min*	*Max*	*Description*
d_market	0.38	0.48	0	1	Dummy variable assuming value of 1 if the board game has been commercialized
user_rating	6.61	0.95	0.56	9.23	Game rating
ln_active_crowd	0.46	0.87	0	5.46	Ln(number of backers selecting a reward which offer the participation in the co-design of the game+1)
d_experience	0.46	0.49	0	1	Dummy variable assuming value of 1 if the entrepreneur had launched in the past another successful crowdfunding campaign on Kickstarter
ln_pledge	8.66	2.29	0	14.96	Ln(capital pledged+1)
ln_backers	4.86	1.77	0	9.61	Ln(number of backers+1)
d_staffpick	0.15	0.12	0	1	Dummy variable assuming value of 1 if the campaign selected as a "project we love" by Kickstarter staff
ln_target	8.72	1.25	1.31	2.39	Ln(campaign target capital)
ln_visual	2.56	0.98	0.69	5.04	Ln(number of videos and images +1)
duration	33.8	11.1	28	90	Duration of the campaign in days
more_info	2.63	1.61	0	14	Number of links to external information
ln_reward_count	2.36	0.51	0.69	4.01	Ln(number of rewards offered in the campaign)
ln_max_reward	6.03	1.41	1.94	9.21	Ln(amount requested for the most expensive reward)
ln_min_reward	1.50	0.95	0.69	5.65	Ln(amount requested for the cheapest reward)
d_codesign	0.38	0.48	0	1	Dummy variable assuming value of 1 if the campaign offer a co-design reward
d_bigcity	0.12	0.32	0	1	Dummy variable assuming value of 1 if the project is located in one of the ten largest US cities
d_US	0.86	0.34	0	1	Dummy variable assuming value of 1 if the project is located in another US city
d_firm	0.07	0.26	0	1	Dummy variable assuming value of 1 if the campaign is launched by an already established firm
d_education	0.03	0.16	0	1	Dummy variable assuming value of 1 if the entrepreneur has a bachelor or a master of science degree
d_award	0.04	0.19	0	1	Dummy variable assuming value of 1 if the entrepreneur has received an award for prior board game projects
ln_game_duration	3.65	0.90	0.69	7.96	Ln(expected duration of the game+1)
ln_fans	3.21	1.45	0	7.07	Ln(number game fans+1)
Game_mechanich dummies					We keept track by mean of dummy variable of the following game mechnics: Action Point Allowance, Area Control, Auction, Card Game, Cooperative, Dice Rolling, Hand Management, Modular Board, Party Game

TABLE 2- Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.d_market	1																		
2.user_rating	-0.0183	1																	
3.ln_active_crowd	0.0745*	0.0329	1																
4.d_experience	0.1620*	0.0615	-0.0273	1															
5.ln_visual	0.2185*	0.1830*	0.0767*	0.1678*	1														
6.duration	-0.0227	-0.0225	0.0544*	-0.1391*	-0.1728*	1													
7.d_staffpick	-0.0715*	0.0147	-0.0108	-0.0021	-0.0235	0.0052	1												
8.ln_target	0.1846*	0.1904*	0.1076*	-0.0376	0.2776*	0.1747*	0.0978*	1											
9.moreinfo	0.1685*	0.0149	0.0541*	0.2092*	0.2510*	-0.0607*	-0.0167	0.0982*	1										
10.ln_reward_count	-0.0073	0.0676	0.1178*	0.0169	0.3195*	0.0623*	-0.0472*	0.2468*	0.1568*	1									
11.ln_max_reward	-0.0015	0.0642	0.1455*	-0.0938*	0.1553*	0.1661*	-0.0079	0.4088*	0.1090*	0.5678*	1								
12.ln_min_reward	0.0808*	0.1352*	-0.0352	0.1358*	-0.0306	-0.0467*	-0.0071	0.0741*	-0.0403*	-0.2918*	-0.0752*	1							
13.d_codesign	-0.1350*	0.0360	-0.3873*	0.0089	-0.0202	-0.0584*	0.0030	-0.1005*	-0.0440*	0.0486*	-0.0372	-0.0069	1						
14.d_US	0.0503*	-0.0796*	-0.0084	0.0999*	-0.1101*	0.0381	-0.0050	-0.0007	0.0247	-0.0068	0.0450*	0.0535*	0.0021	1					
15.d_bigcity	0.0619*	-0.0435	-0.0340	-0.0111	0.0027	0.0389	-0.0041	0.0442*	0.0725*	-0.0176	0.0434*	0.0349	-0.0025	0.1553*	1				
16.d_firm	0.0034	0.0303	0.0458*	-0.0517*	0.0528*	-0.0085	0.0012	0.0494*	0.0321	0.0516*	0.0881*	-0.0332	-0.0192	-0.0230	0.0116	1			
17.d_education	-0.0450*	0.0143	0.0042	-0.0559*	-0.0690*	0.0202	-0.0213	-0.0510*	-0.0102	-0.0141	0.0204	-0.0301	0.0060	0.0312	0.0017	-0.0053	1		
18.d_award	0.0084	0.0086	0.0346	0.1107*	-0.0018	-0.0066	-0.0239	0.0212	0.0215	0.0378	0.0370	-0.0059	-0.0085	0.0334	-0.0348	0.0217	-0.0336	1	
19.ln_game_duration	0.1985*	0.4025*	0.0621	0.2543*	0.2487*	0.0152	-0.0688	0.3430*	0.1010*	0.1059*	0.1078*	0.1540*	-0.0399	0.0486	0.0064	-0.0178	-0.0455	0.0749*	1
20.ln_fans	0.0093	0.3095*	0.0541	0.0179	0.0880*	0.1046*	0.0099	0.2771*	0.0497	0.0745*	0.1520*	0.0759*	-0.0149	-0.0408	0.0522	-0.0488	0.0141	0.0353	0.3501*

TABLE 3- Main model: Stage 1 of the Craggit model, dependent variable likelihood of commercializing the product in the market

	I	II	III	IV	V
ln_active_crowd		0.119		0.128	0.344**
		(0.10)		(0.11)	(0.13)
d_experience			0.594***	0.597***	0.737***
			(0.10)	(0.10)	(0.15)
d_experience*ln_active_crowd					-0.413**
					(0.15)
ln_visual	0.732***	0.732***	0.678***	0.678***	0.687***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
duration	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d_staffpick	-16.28***	-16.29***	-16.89***	-16.91***	-16.61***
	(0.58)	(0.58)	(0.56)	(0.57)	(0.58)
ln_target	0.190*	0.189*	0.199*	0.198*	0.197*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
moreinfo	0.381**	0.379***	0.248**	0.246**	0.227
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
ln_reward_count	-0.114	-0.138	-0.136	-0.162	-0.150
	(0.31)	(0.31)	(0.31)	(0.31)	(0.30)
ln_max_reward	-0.229**	-0.238**	-0.209**	-0.211**	-0.214*
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
ln_min_reward	0.105	0.106	0.055	0.055	0.057
	(0.07)	(0.12)	(0.07)	(0.07)	(0.07)
d_codesign	2.549**	2.598**	2.576**	2.628**	2.662**
	(0.87)	(0.83)	(0.87)	(0.84)	(0.86)
d_US	0.453**	0.456***	0.375**	0.379**	0.350**
	(0.13)	(0.12)	(0.13)	(0.13)	(0.14)
d_bigcity	0.353	0.371**	0.327	0.345*	0.367*
	(0.19)	(0.18)	(0.20)	(0.19)	(0.20)
d_firm	0.192	0.184	0.300**	0.291**	0.268**
	(0.16)	(0.16)	(0.12)	(0.12)	(0.13)
d_education	-0.238	-0.245	-0.163	-0.172	-0.145
	(0.40)	(0.40)	(0.38)	(0.39)	(0.38)
d_award	0.019	0.017	0.015	-0.010	0.024
	(0.32)	(0.32)	(0.32)	(0.32)	(0.31)
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
constant	-4.037***	-3.959***	-4.132***	-4.047***	-4.143***

	(1.13)	(1.17)	(1.16)	(1.21)	(1.23)
R-sqr	0.3192	0.3199	0.3274	0.3286	0.3305
Observation	1406	1406	1406	1406	1406

TABLE 4- Main model: Stage 2 of the Craggit model, dependent variable quality of the product commercialized

	I	II	III	IV	V
ln_active_crowd		0.008		0.008	-0.147**
		(0.06)		(0.06)	(0.04)
d_experience			-0.016	-0.016	-0.038
			(0.05)	(0.05)	(0.06)
d_experience*ln_active_crowd					0.255***
					(0.07)
ln_visual	-0.019	-0.017	-0.019	-0.019	-0.021
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
duration	0.001	0.001	0.001	0.001	0.001
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
d_staffpick	0.391	0.394	0.387	0.388	0.381
	(0.47)	(0.47)	(0.46)	(0.46)	(0.47)
ln_target	-0.007	-0.003	-0.003	-0.003	-0.005
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
moreinfo	-0.019	-0.019	-0.021	-0.021	-0.011
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
ln_reward_count	0.133	0.125	0.126	0.125	0.136
	(0.12)	(0.11)	(0.11)	(0.11)	(0.11)
ln_max_reward	0.016	0.017	0.018	0.018	0.019
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ln_min_reward	0.082**	0.080**	0.078**	0.078**	0.081**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
d_codesign	0.091	0.094	0.091	0.095	0.090
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
d_US	-0.150	-0.149	-0.152	-0.152	-0.139
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
d_bigcity	-0.127	-0.132	-0.133	-0.133	-0.125
	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)
d_firm	0.117	0.122	0.125	0.124	0.119
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
d_education	0.246	0.239	0.245	0.243	0.250
	(0.31)	(0.32)	(0.31)	(0.31)	(0.31)
d_award	-0.149**	-0.149**	-0.151**	-0.151**	-0.139*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
ln_fans	0.210***	0.210***	0.209***	0.209***	0.207***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
ln_game_duration	0.194***	0.193***	0.194***	0.194***	0.222***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Game Mechanic dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
constant	-4.700***	-3.959***	-4.132***	-4.047***	-4.143***
	(0.17)	(1.17)	(1.16)	(1.21)	(1.23)

R-sqr	0.1575	0.3199	0.3274	0.3286	0.3305
Observation	864	1406	1406	1406	1406

FIGURES

Figure 1. Hypotheses

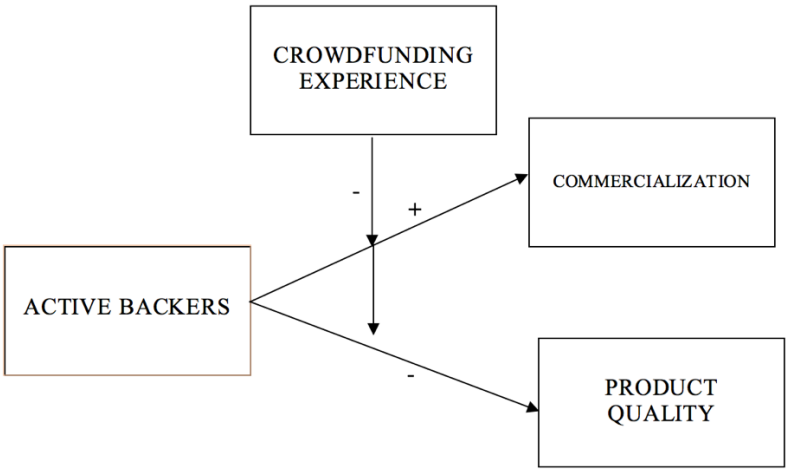


Figure 2. Average marginal effect of *ln_active_crowd* when the variable *d_experience* assumes value 0 and 1 (DV: d_market)

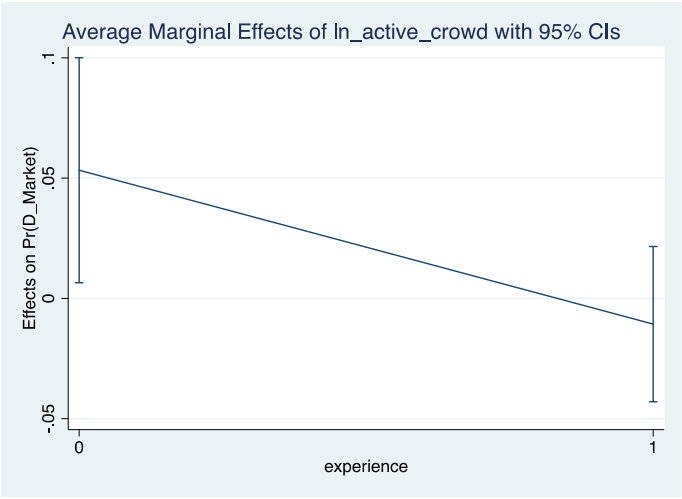
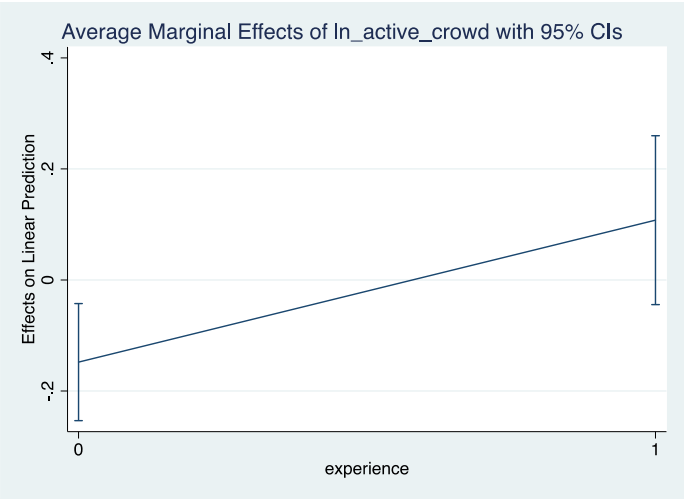


Figure 3. Average marginal effect of *ln_active_crowd* when the variable *d_experience* assumes value 0 and 1 (DV: User_rating)


Average Marginal Effects of ln_active_crowd with 95% CIs
Effects on Linear Prediction
-.2
0
.2
.4
0
1
experience

APPENDIX A1

Reward example 1

"Work with the designer to design a new Effect Card […]"

Reward example 2

"Play the game with the game designers and developers, before backers get their copies of the game! We will play the game with you and a friend for an evening. While you're there, we can talk about the design process, cards that did and didn't make it, expansions we are considering (giving you a chance to help design cards) and more […]"

Reward example 3

"This level comes with the opportunity to help shape the upcoming RPG. Meet for at least four Monday night session starting in June or July with the game developers. […]"

Reward example 4

"This reward gets an unprecedented full day of collaborating with us on designing an interactive version of the game. What exactly will we do together? What Processing or Arduino libraries will be most useful? Will we need a Raspberry-Pi to help out? Shall we integrate Internet of Things, Kinect, Open Frameworks, PureData? We don't know the details, but we'll set out on a mission with you to create an electronically enhanced form of the game, reborn into a programmable, physical electronics game of our own making. We will provide the hardware (electronic components, physical sensors, capacitors, resistors, diodes, wires, etc), lots of cool and easy-to-manipulate building materials (such as laser-cut cardboard, shrink plastic, different types and thicknesses of acrylic, Sugru, aluminum and copper tape, etc), and we'll be ready to bring the noise for some on-the-spot mad-science inventions of gamified physical computing. Participants don't need previous experience with computers, only have an open mind, enthusiasm for building, and a readiness to start Making Things See, Speak and Listen. Let's add to "the hundred words" with a 21st Century Maker-culture twist, and set out to bring to life some unseen, unheard of awesomeness!"

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[i] Interviews with industry insiders confirm that Kickstarter is among the first information sources for board game aficionados when they are willing to buy a new game.

[ii] See e.g. http://www.tabletopgamingnews.com/tag/kickstarter/ or http://indiegamemag.com/tag/kickstarter/

[iii] The website was founded in January 2000 by Scott Alden and Derk Solko as a resource for board gaming hobbyists and is now acknowledged as a reference point in the sector. In 2010, Board Game Geek received the Diana Jones Award, which recognised it as "a resource without peer for board and card gamers, the recognised authority of this online community."

[iv] Interviews have been performed in early 2016 via Email.

[v] We further asses the validity of this statement by performing a search by title on Amazon.com, in line with previous studies (da Cruz, 2018). Specifically, for funded projects not included in the BoardGameGeek.com

database, we searched on Amazon.com to verify if the game was available for sale. This check resulted in a 100% accuracy of BoardGameGeek.com data.

[vi] BoardGameGeek keeps track of the main mechanics of each board game. These include action-point allowance games, area-control games, auction games, dice-rolling games, hand-management games, cooperative games, modular board games and party games.

[vii] Standard errors are clustered over game mechanics.

[viii] Tables of results for the robustness checks are available from the author upon request.

[ix] We used the list of awards included on BoardGameGeek.com.

[x] Another possibility is that the size of the active backer community for a campaign is more reflective of the nature of the game than it is a causal factor in market outcomes. Perhaps certain types of games that "sell out" to the crowd of active backers are both more likely to become commercialised (i.e., easier projects to complete and deliver) and more likely rated as mediocre games. The possibility that this unobserved game 'type' is what drives commercialisation rates as well as low quality, rather than the correlated active backer community itself, presents an alternative interpretation. Why this alternative story would apply to only to inexperienced entrepreneurs, however, is not obvious. Experienced game designers avoid these sorts of game types, suggesting perhaps a dynamic whereby some entrepreneurs' design low-risk-but-low-quality games for their initial crowdfunding campaign – thereby building capital and establishing a successful track record in delivery – before venturing into more high-quality designs in subsequent campaigns.