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SIGNALLING STRATEGY AND SUCCESS OF CROWDFUNDING CAMPAIGN

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ABSTRACT

Improving the funding results of crowdfunding campaigns is a pivotal point for entrepreneurs, investors, and platforms. Building upon previous research in the field of crowdfunding and signaling theory, we propose a logistic regression to identify the determinants of the success of 5228 KissKissBankBank crowdfunding. The main focus is on estimating the role of signalling opportunities provided to project initiators and funders in mitigating the harmful consequences of asymmetric information. Our main results reveal that, as expected, the success of crowdfunding campaigns is promoted by the signal of identity, patience, pointing, reciprocity, intention and interactivity. The ambition signal is a factor that hinders funding success. Contrary to our research hypotheses, the signal of reputation and social capital has a negative impact on the probability of crowdfunding projects' success. The findings provide not only empirical evidence to understanding the importance of the role of signals in determining the success of crowdfunding campaigns but also useful tools for stakeholders in developing their own crowdfunding strategies at an early stage.

Keywords: crowdfunding, success factors, signalling theory, information asymmetry

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1. INTRODUCTION

Online crowdfunding is a widespread and effective alternative for entrepreneurial investment to raise capital without having to seek out traditional sources (Block et al., 2020; Butticè & Vismara, 2021). Crowdfunding is defined as a collective effort of consumers or Internet users who gather as a community to support a project or new ideas invented by other people or organization (Laurell et al., 2019). This funding model offers to entrepreneurs the opportunity to transform their business idea into reality by directly involving a large number of people through an internet-mediated electronic platform (Kleinert et al., 2021). In recent years, as a new method of financing, crowdfunding has gained significant momentum, with nearly $ 29 billion in funding in 2016 associated with an evolution in the number of crowdfunding platforms concentrated mainly in Europe (60% of the number of total crowdfunding platforms). The impressive volume of funds invested provides key resources to the development of the early finance market when traditional funding channels are often unworkable. This is often the case as most of the innovation campaigns

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benefiting from crowdfunding are from entrepreneurs with no financial background who are generally victims of credit rationing due to the problem of information asymmetry (Stiglitz et Weiss, 1981). This paper tries to find out whether crowdfunding succeeds in reducing the usual barriers to funding access caused by information asymmetry by providing opportunities for the development of signaling strategies (Ross, 1977; Spence, 1974). In recent years, several studies have examined what factors influence the success of crowdfunding projects. Some factors are linked to the general project characteristics (Koch et al., 2019; Barbi and Bigelli, 2017; Colombo et al., 2015; Cordova et al., 2015; Mollick, 2014). Others are related to the project initiators (Koch & Siering, 2015; Mollick, 2014; Xiao et al., 2014; Zvilichovsky et al., 2013). Researchers suggest that crowdfunding is characterized by high uncertainty and ambiguity where information asymmetry exists between project initiators and investors (Zvilichovsky et al., 2013). They admit that signalling theory (Spence 1973; 2002) is the most widely used approach to study markets characterized by a high degree of asymmetric information (Bergh et al., 2014; Connelly et al., 2011, Colombo, O., 2021). In this study, we draw on existing literature in the field of crowdfunding and signalling theory to explain the role of signalling opportunities provided to project initiators and funders on the probability of success of the crowdfunding campaigns in the French context, which, to our knowledge, has not been used in several investigations. The analysis is based on hand-collected data of successfully and non-successfully funded projects conducted in 2016 through the French platform KissKissBankBank (KKBB).This study provide not only indicators to capture key signalling strategies aiming at reducing the barriers to credit access for project creators posed by the information asymmetry but also useful tools for entrepreneurs in the start-up phase in the development of their own crowdfunding strategies.

This paper proceeds as follows. Section 2 presents a literature review and hypotheses. Section 3 contains the data and methodology. The empirical results are discussed in Section 4 and the conclusion is provided in the final section.

2. LITERATURE REVIEW

2.1 Crowdfunding campaign success

The success factors “lead directly or indirectly to the success of the project or the company” (Cooke-Davies, 2002). In the context of project finance, the characteristics of the projects or the founders are potential factors of success. For crowdfunding, the crowdfunding success projects comes down to whether the funding goal is reached or not (Barbi and Bigelli, 2017; Koch and Siering, 2015; Mollick, 2014). Previous research has already examined whether the project characteristics influence the funding success. It has been found that projects with a high funding goal is less likely to be successful (koch et al., 2019; Barbi and Bigelli, 2017; Colombo et al., 2015; Cordova et al., 2015; Koch and Siering, 2015; Mollick, 2014; Xiao et al., 2014). In addition, the length of the funding period was shown to have a negative influence on crowdfunding success (Song et al., 2019; Barbi and Bigelli, 2017; Cordova et al., 2015; Mollick, 2014; Xiao et al. al., 2014; Zvilichovsky et al., 2013). Regarding to the project description, several studies have confirmed that the provision of images (Colombo et al., 2015; Koch & Siering, 2015; Xiao et al., 2014) and videos have a positive influence on the funding success (Barbi and Bigelli, 2017; Colombo et al., 2015; Cordova et al., 2015; Koch and Siering, 2015; Mollick, 2014; Zvilichovsky

et al., 2013). Early research focused on predictive analytics applying text mining techniques and predicting funding success based on the project characteristics specified and the language used (Xiao et al., 2014; Mitra and Gilbert, 2014). Communication with platform members and potential investors has also been shown to be important for the projects success (Cordova et al., 2015; Koch & Siering, 2015; Mollick, 2014; Xiao et al., 2014). Xu et al. (2014) focus on the content of updates to project descriptions. They claim that these updates are used to add additional content to help projects attract more investors and be successful as well.

For characteristics related to founders, research has shown that experienced project initiators tend to be more successful in subsequent projects (Koch et al., 2019; Davies et al., 2018). Previous activities of the project initiator could signal higher reliability compared to founders who were not active on the crowdfunding platform. Additionally, previous studies have found that the size of founders' social networks also promotes funding success (Koch and Siering, 2015; Mollick, 2014; Zvilichovsky et al., 2013).

2.2 Asymmetric information and signalling

The growing inability of credit markets to cover the financing needs of entrepreneurs, particularly in the early stages of launching projects characterized by significant uncertainty, is the consequence of the pervasive presence of asymmetric information between investors and innovators. An entrepreneur who seeks equity financing for his start-up is the best informed of its quality. External resource providers find it difficult to assess the quality of a start-up. In the context of crowdfunding as a novel source for funding new ventures, problems of information asymmetries are more severe than in other entrepreneurial finance markets (Cerpentier et al., 2021). Indeed, crowdfunding investors cannot do face to face due diligence and find sufficient, correct and easily accessible information (Baucus and Mitteness, 2016; Cumming et al., 2021). A problem of information asymmetry thus appears between the project initiators who hold information and the donors who could potentially make better decisions if they had it (Connelly et al., 2011). By focusing on this problem, Belleflamme et al. (2014) provide an analysis of the impact of asymmetric information on crowdfunding from an economic point of view. Ahlers et al. (2015) find through a literature review that this problem has an impact on the success of crowdfunding campaign from an entrepreneurship perspective. Signaling theory proposes one solution to overcome problems of asymmetric information (Spence, 1973; Colombo, O., 2021). Kromidha and Robson (2016) admit that fundraisers and backers can be signalling agents. By revealing characteristics of the unobserved underlying quality of a crowdfunding project, the better-informed party (the project creator) sends signals to the less informed party (potential investors) (Ross, 1977; Spence, 1974). Signals are not passive characteristics but signaler's activities which are positively correlated to an unobserved attribute that the receiver values. According to Spence (1973), an effective signal needs to be both observable for an uninformed receiver and costly for a signaler. The cost of a signal is the basis for a selection process used by receivers to select a sender from a set of flaggers. An effective signal results in a separation equilibrium, in which low-quality companies find it more difficult to profit from the signaling strategy due to significant signaling costs and risks than high-quality companies (Kirmani et Rao, 2000).The importance of the role of effective signals in eliminating the problem of information asymmetry is discussed in several areas of research,

including strategic management, organizational behavior, economics, entrepreneurship and finance (Connelly and al., 2011). In the context of corporate finance, research studies show that project initiators increase the probability of meeting their funding needs by signaling the innovative nature of their project through granted patents (Audretsch et al., 2012) and their knowledge by management teams (Cohen and Dean, 2005).

2.3 The impact of signals on successful project funding: hypotheses development

Identity signal: Identity is defined as a set of characteristics that clearly describes an object or an actor. Referring to signal theory, Hasson (1997) asserts that recognition signals are used to expose or mask information relating to the identity or presence of signalers, rather than their qualities. In the context of crowdfunding, the identity signal is used to recognize the project initiator to the potential investors. It thus increases legitimacy and decreases the probability of signaler identity error (Hasson, 1997). Project initiators, by reporting their identities, can reduce the harmful consequences of information asymmetry, reassure potential investors and guide them to choose the right entrepreneurs (Bertoni et al.,2013). In this sense, Nikiema (2016) notes that the majority of projects with a strong identity signal intensity succeed their fundraising. This leads to the formulation of the first hypothesis

H1: identy signal has a positive impact on the probability of crowdfunding campaign success

Patience signal: In economics, Fisher (1930) points out that the impatience main role is the satisfaction of obtaining goods now rather than in the future. In the context of crowdfunding, the project initiator expresses his patience degree by specifying a well-defined deadline for fundraising.This duration must be long enough to reach the requested objective without taking too long, at the risk of reducing the community interest.Indeed, the entrepreneur's sense of urgency, often linked to the approach of project launching, will reinforce the enthusiasm of the project approach and does not leave the opportunity for contributors to postpone their participation (Hou et al., 2015).Throughout the fundraising, crowdfunding campaigns generally observe a trough. The beginning and the end are the best times for donations. By limiting the duration of fundraising, this period of trough decreases. Mollick (2014) justifies this by the fact that a longer duration is a sign of lack of confidence. Referring to signal theory, Davies et al. (2018) find that a long fundraising period dissipates the benefits of reputations linked to "word of mouth" and can send a bad signal about the project quality. This, therefore, disadvantages the crowdfunding campaigns success. These arguments lead to the second hypothesis.

H2: the patience signal has a negative impact on the probability of crowdfunding campaign success

Pointing signal: The pointing signal indicates characteristics which separate the signaller from his competitors. It is used to improve the perception of the different characteristics in order to make a choice (Hasson, 1997). In the context of crowdfunding, the project leader tries to present information which plays in favor of the outcome of the fundraising campaign. Indeed, in order to attract a large number of potential investors, he should create a kind of legitimacy and trust among the contributors and by signaling the quality of the project. Johan and Zhang (2020) support those entrepreneurs use data and textual information to signal startup quality. When sending a quality signal, the project initiator can improve the contributor’s participation rate. Mollick (2014) affirms

that only quality campaign can attract investors and therefore succeed in fundraising. The degree of preparation is estimated by the inclusion of a video, the publication of updates and by spelling mistakes. In this sense, Petitjean (2017) notes that the inclusion of websites in the project description has an effect on the success of the campaign. Media coverage (Scheaf et al, 2018) provides also project-specific information, which can affect the investment decision-making of contributors. In addition, Connelly et al. (2011) and Petitjean (2017) note that having an important number of contributors, visible to the platform consultants, constitutes a quality signal that reflects the project quality. Based on these arguments, we propose this hypothesis:

H3: the pointing signal has a positive impact on the probability of crowdfunding campaign success

Reputation signal: In a context characterized by asymmetric information, signaling is used as a strategy to shape reputation (Kreps and Wilson, 1982). By focusing on the content of reputation, signal theorists argue that reputation increases stakeholder confidence in the company's products and services. It also constitutes an informative signal which eliminates risks by bringing confidence and making the company legitimate. Confidence is particularly useful in conditions of asymmetric ex-post information to deal with the risk of moral hazard which essentially results from incomplete post-contractual control (Townsend, 1979). In crowdfunding as an online exchange, reputation is becoming increasingly important. Many unspoken aspects that characterize face-to-face relationships are absent in virtual interactions (Zhang et al, 2020). Reputation is therefore a key element in establishing relationships of trust in this context characterized by strong information asymmetries (Colombo et al., 2020). Potential investors can only see the presentation shared by the entrepreneur on the crowdfunding platform. However, the project initiator wants to strengthen his reputation as being a significant antecedent of online trust (Chen and Barnes, 2007). Most project leaders use their acquired experiences as a signage strategy to create a positive reputation and build online trust. In the online peer to peer context, Lin et al. (2013) by identifying the costs of reputation loss, show the relevance of the signals sent by the entrepreneur in order to increase the success of their financing. Analyzing trust factors in virtual communities, Abdul-Rahman and Hailes (2000) find that reputation information is important for generating trust. Thus, an experienced project initiator is more reliable and more competent than new members who create a project for the first time on the crowdfunding platform. This evidence contrasts with the conclusions of Colombo et al. (2015) in which the entrepreneur's experience does not affect the probability of campaign's success. The next hypothesis will focus on the impact of the reputation signal on project success:

H4: the reputation signal has a positive impact on the probability of crowdfunding campaign success

Reciprocity signal: In the context of crowdfunding, the project leader may want to strengthen his reputation as an investor. This positive reputation is a significant antecedent of initial trust online (Chen and Barnes, 2007). Indeed, the fact of publishing the experience of the project leader as an investor, constitutes a signal favoring his good reputation. In addition, reciprocity has an effect favoring the maintenance of social networks. It reinforces commitment to the community (Chan and Li, 2010) and confidence between members of the crowd (Nguyen et al., 2010). Users can thus increase the number of contributors when a reciprocity standard is established (Gu et al., 2009).

Therefore, a crowdfunding platform by sharing information on the number of projects supported, overcomes the potentially fatal consequences of asymmetric information, provides a key signaling tool and thus promotes the success of project funding. In this sense, Colombo et al. (2015) note that the crowdfunding platform, namely Kickstarter, promotes the success of a campaign by allowing the reciprocity signal, measured by the number of projects supported by the project leader. This observation is confirmed by Davies et al. (2018). This leads to the formulation of our hypothesis:

H5: the reciprocity signal has a positive impact on the probability of crowdfunding campaign success

Ambition signal: The ambition signal communicates the signaler's requirements for a certain number of resources (Hasson, 1997). It constitutes the legitimate will to reach its objectives in a reality where the rules are respected (according to the French philosopher Michel Onfray). In crowdfunding, ambition signals allow entrepreneur to express their expectation and ambition to contributors. Thus, the initiator of the project must express an ambitious objective that touches everyone's dream in order to increase the probability of its realization. This objective constitutes an indicator of the overall complexity and size of the project. A more ambitious funding goal can cause increased uncertainty and a higher reservation for potential investors. Projects requiring high funding are judged more risky and therefore less likely to be successful in fundraising. As part of the Kickstarter, Mollick (2014) specifies that the amount requested by the entrepreneur constitutes a signal of ambition. He finds that the entrepreneur’s goal is negatively correlated with the likelihood of successful fundraising. This finding is confirmed by Davies et al. (2018) and Koch and Siering (2019). Therefore, we hypothesize that:

H6: the ambition signal has a negative impact on the probability of crowdfunding campaignsuccess

Intentional signal: Connelly et al. (2011) present the signal of intention as being a future action which is strongly conditioned by the response of the recipient. They point out that certain signals of intention can affect the quality of a project. This voluntary communication of positive information allows to transmit the positive characteristics of the organization to external people (Connelly et al., 2011).In the context of crowdfunding, the project leaders, by sending signals to potential investors, disclose certain aspects promoting the good faith of the entrepreneur in addition to information on the quality of the project. Indeed, they inform contributors about their good intentions in order to create a feeling of transparency between the stakeholders. This transparency eliminates donor uncertainty about the capacities and intentions of the project creators (Moysidou, 2016). This undoubtedly affects the success of the projects by attracting an important number of investors. In this sense, Block et al. (2018) find a positive link between the intentional signal and the probability of success of crowdfunding projects. This observation is confirmed by Nikiema (2016). This leads to our seventh hypothesis:

H7: the intentionnel signal has a positive impact on the probability of crowdfunding campaign success

Social capital signal: The notion of social capital indicates the possibility of mobilizing resources through its social networks. Lin et al. (2013) identify the role of an external online network to

strengthen the social capital of those seeking funding in the field of peer-to-peer finance. In the context of crowdfunding, external social networks play a key role in the crowdfunding platform governance. In fact, entrepreneur uses his friends from the social network to point out the project characteristics in order to attract an important number of donors. Also, the potential investor can use his own social network to announce his support for a specific project. The project leader's network is a quality signal. It increases the project visibility among the crowd. By analyzing crowdfunding projects, several studies have found a positive link between the entrepreneur social capital and the probability of project success (Vismara, 2016; Kromidha and Robson, 2016; Mollick, 2014). Other studies contradict this observation by neglecting the impact of social capital on the probability of successful collections (Belleflamme et al., 2014; Petitjean, 2017). This leads to the formulation of this hypothesis:

H8: the social capital signal has a positive impact on the probability of crowdfunding campaign success

Interactivity signal: The interactivity concept is explained by the degree of establishment of an online dialogue between a company and its customers, through the information sharing (Fang, 2012). Mollen and Wilson (2010) insist on the importance of reciprocal or two-way communication role. This communication is manifested on websites, through email, live chat and comments (Fang, 2012). Referring to signal theory, Connelly et al. (2011) notes that entrepreneurial activities are linked to information shared by the parties and especially to the way they communicate and interpret this information. In crowdfunding, potential investors can indicate what they like and dislike, suggest changes, suggest ideas, promote or criticize. Entrepreneurs can partly respond to the contributors signals with their own signals (Kromidha and Robson, 2016). This dynamic allows fundraisers to recognize opportunities and to proactively contribute to the cognitive dimension of social capital in this online process. Bade and Walther (2021) find a positive relation between updates and the success of the crowdfunding campaign. In sum, the interactivity makes the project more competitive and attractive to potential investors. By studying the crowdfunding campaigns success, Kromidha and Robson (2016) affirm that the signals exchange between entrepreneur and contributors promote the project success. This link is confirmed by Block et al. (2018). Our last hypothesis is as follows:

H9: the interactivity signal has a positive impact on the probability of crowdfunding campaign success

3. METHODOLOGY

3.1 Sample and data collection

For our analysis, we collected publicly available crowdfunding projects from the KissKissBankBank's platform, which is one of the dominant crowdfunding platforms in France. This platform is specialized in non-monetary rewards. It follows the 'all-or-nothing'(AON) model. The project leader can only receive contributions if the project reaches or exceeds the set objective.

In total, we collected the information of 5228 projects, of which 3601 projects were successful and 1627 projects failed to generate targeted fund. Our sample includes all the projects of the KKBB platform from January 2016 to December 2016. The choice of the study period was not arbitrary. A reduced period of analysis (one year) was favored for reasons of consistency and practical reason. It promotes the uniformity of the sample by limiting cyclical changes (economic context, regulations).

Collected data is analysed by using Descriptive statistics which tests normality of data, Binary Logit Model which show signals that are more likely to contribute to success of Crowdfunding campaign. Logistic regression is a type of analysis where the dependent variable is binary. It is a nonlinear transformation of linear regression. This logistic regression approach can be used for both statistical analysis, classification and prediction of the binary dependent variable. In our study, logistic regression was used to analyze significant predictors of the success of crowdfunding campaigns. To evaluate the data Eviews version 11 software is used.

3.2 Variable operationalization

Dependent variable: The dependent variable, Success, is a dummy variable, equal to one if the amount of funds collected has reached or exceeded goal set by the project founder at the start of the project and zero atherwise. This measure of crowdfunding success is an appropriate measure for projects on the KissKissBankBank platform that uses an “all or nothing” approach. This measure has been adopted by several researchers including Mollick (2014); Cordova et al. (2015); Davies et al. (2018); Wang et al (2017) and Petitjean (2017).

Independent variables: The different independent variables are expressed by scores calculated through the items included in each signal.

- SG-IDENT: the identity signal is measured by the indication of the name, the identity photo and the European origin of the project initiator in the campaign presentation.
- SG-PAT: the patience signal is measured by the length campaign mentioned in the project presentation.
- SG-POINT: the pointing signal is measured by the indication of photos, videos, an internet link specific to the campaign, number of award levels, category success rate, number of contributors and average contribution.
- SG-REP: the reputation signal is measured by the previous experience of the project initiator.
- SG-RECIP: the reciprocity signal is measured by the support and following history of the project initiator on the same crowdfunding platform.
- SG-AMB: the ambition signal is measured by the funds requested by the project initiator.
- SG-INT: the intentional signal is measured by the operating plan of the funds collected.
- SG-INTERACT: the interactivity signal is measured by comments and updates exchanged between stakeholders.
- SG-SOC-CAP: the social capital signal is measured by the indication of the contractor's Facebook account.

Control variables: We propose the project category as a control variable in order to verify that this variable does not affect the results (Allisson et al., 2017; Koch and Siering, 2015). In order to avoid multicollinearity problem and minimize the number of categories proposed in the KissKissBankBank platform, similar categories were combined into five sectors: the leisure sector (LEISURE), the educational sector (EDUC), the innovative activity sector (INNOV), the catering sector (CATERING) and solidarity (SOLID).

4. RESULTS

To explain the dependent variable « Success », which is a binary dummy variable that equal to one if project funding was successful and zero if project funding was not successful, we performed a logit regression (Wooldridge, 2013). As a first step, to detect whether there might be a problem of multicollinearity among the variables identified, we calculate the correlation matrix for the explanatory and control variables. From the variable correlations in Table 1, we conclude that correlations are in general low. In a second step, based on the dataset of the collected projects, we approach the main hypotheses developed previously, by performing a logit regression to estimate the effects of the signals on the probability that a project succeeds in raising the funds necessary to reach its funding objective.

Results from Table 2 show that our econometric model has good predictive power: it can correctly predict 1009 campaigns among 1627 which failed (62%), and 3239 campaigns among the 3601 which succeeded (89.9%). Overall, the model's predicting ability given by the sum of correctly predicted successes and the correctly predicted failures, equals 81.2%. We discuss in the following (Table 3) the specific effects of each of the main predictors on the probability of crowdfunding project's success.

Identity signal: According to our first hypothesis (H1) related to the effect of identity signal on the probability of crowdfunding campaign success, the results reported in Table 3 show that the coefficient of identity signal is significant and positive. More specifically, the project creator, by presenting himself with his name, his identity photo and his origin, reduces the probability of an identity error. The identity signal thus helps build trust between the signaler and potential investors. This framework of trust obviously motivates donors to contribute to the project and to select the right entrepreneurs. The positive impact confirms the finding of Nikiema (2016).

Patience signal: Concerning the second hypothesis on the impact of project initiators' patience (H2), our results show that the patience signal have a positive effect on the probability of success. This led to the rejection of hypothesis 2 which assume a negative effect. This result can be interpreted by the fact that projects that offer a longer collection period (the measurement of the patience signal) are more likely to be exposed to a larger number of potential investors and therefore have more probability of raising the requested capital. This finding does not agree with the results of Davies et al. (2018) who affirm that the patience signal dissipates the benefits of reputations linked to "word of mouth" and can send a bad signal on the quality of the project.

Pointing signal: Our results are in line with our theoretical arguments H3: the pointing signal has a positive impact on the probability of crowdfunding campaign success. More explicitly, the intensity of this signal reduces the probability of project failure. Indeed, by exposing information which plays in favor of the outcome of the project, including in particular quality signals, the signaler creates a kind of legitimacy and trust among potential investors. This obviously improves the participation rate of donors in the funding of crowdfunding campaigns since trust is an element of the decision-making process (Rehman et al., 2017).

Reputation signal: Contrary to what we expected in our hypothesis H4: the reputation signal has a positive impact on the probability of crowdfunding campaign success, our results reveal that the reputation signal seems to be a disadvantageous determinant of the campaign's success. More specifically, the experience of the project initiator, as a signaling strategy to increase its reputation, has a significant and negative impact on the probability of success of the projects. This result isn't in line with study of Colombo et al. (2015) in which the number of previously created campaigns was not significant in predicting the project's success. Moreover, our result does not match that of Davies et al. (2018) who emphasize the positive impact of the reputation signal on crowdfunding campaign's success.

Reciprocity signal: The results reported in Tabl 3 show that the fifth hypothesis (H5) is confirmed. The public display of the project initiator experience as an investor through the projects supported and monitored is a signal promoting his good reputation. By admitting that the one who gives is considered more trustworthy than the one who only takes from others (Johnson et al., 2014), donors tend to support entrepreneurs who have experience as an investor. So, project initiators who follow and support other projects in the crowdfunding platform are more likely to attract investors and collect the funds necessary to carry out their projects. This statement is consistent with the results of Colombo et al. (2015) and Davies et al. (2018).

Ambition signal: In accordance with hypothesis H6: the ambition signal has a negative impact on the probability of crowdfunding campaign success, our results show that the predictor for ambition, provided by a campaign's funding goal has a negative and significant effect on the probability of project success. In fact, entrepreneurs who demand high goals may not succeed their funding collect in time. This can be explained by the fact that the project's funding goal is an indirect indicator of the feasibility and complexity of the campaign. The negative link between the ambition signal and the campaign's success is confirmed by Davies et al. (2018) and Mollick (2014).

Intentional signal: In accordance with hypothesis H7: the intentionnel signal has a positive impact on the probability of crowdfunding campaign success, our results show that the intentional signal seems to be a determining factor favoring the success of crowdfunding project. Information disclosure on fund allocation details builds trust among stakeholders. This transparency eliminates donor uncertainty about the capacities and intentions of the project creators and thus motivates them to invest their money. This observation is in line with the results of Block et al. (2014) who find a positive link between the intentional signal and the crowdfunding project's success.

Social capital signal: The model's estimates in Table 3 show that our hypothesis, which addressed the role played by external social capital in crowdfunding (H8), is not confirmed. This predictor

has a significative and negative effect on the success of the crowdfunding campaigns. The project creator, by sending a social capital signal through the link of the project's presentation to his facebook account, reduces the chances of his campaign's success. This result contradicts previous research (Kromidha and Robson, 2016; Davies et al., 2018) who affirm that the size of the network of online friends of the project initiator is the key to its success.

Interactivity signal: Our results reveal that the effect of the interactivity signal is in line with our hypothesis H9: the interactivity signal has a positive impact on the probability of crowdfunding campaign success. More specifically, by sharing updates and exchanging comments with potential investors, the project initiator can offer additional information on the quality of his project, the progress of its financing, preliminary results… This news influences the financing decision of potential donors and make them convinced by the fact that the project leader is very motivated and his project therefore deserves to be funded. This finding is in line with previous research insisting on the importance of interactivity signal as a determinant of crowdfunding campaigns success (Block et al., 2018; Kromidha and Robson, 2016; Bade and Walther, 2021).

In the context of control variables, our results (Table 3) found evidence of differences in the impact of category dummy variables on the likelihood of project success. Indeed, the projects proposed in the leisure, education and solidarity categories are more likely to succeed in their crowdfunding campaigns. This additional evidence is consistent with the results of Kromidha and Robson (2016) and Davies et al. (2018) who classified the projects and found that certain sectors were important.

We performed an additional estimate to assess the robustness of our results. We analyzed the possible evolution of the effect of signals sent to potential investors on the crowdfunding campaign's success from one period to another. We therefore reestimated the model based on a sample of 315 projects submitted on the French platform KissKissBankBank during 2017. Results presented in Table 4 reveal that, as expected, the significance levels of our explanatory variables in this analysis did not differ from those of our primary analysis. However, the project's category, proposed as control variables, does not seem to have any effect on the the campaign success.

Table 1: Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1 SG-IDENT	1.00												
2 SG-PAT	0.00	1.00											
3 SG-POINT	0.10	0.09	1.00										
4 SG-REP	0.00	0.00	0.09	1.00									
5 SG-RECIP	0.02	0.04	0.16	0.18	1.00								
6 SG-AMB	0.01	0.10	0.39	-0.04	0.07	1.00							
7 SG-INT	0.04	-0.01	0.09	0.03	0.04	-0.01	1.00						
8 SG-INTERACT	0.11	0.09	0.44	-0.01	0.19	0.27	0.14	1.00					
9 SG-SOC-CAP	0.04	0.02	0.25	0.05	0.03	0.10	0.01	0.10	1.00				
10 CATERING	0.01	-0.02	-0.02	-0.05	0.03	0.19	-0.02	0.07	0.01	1.00			
11 LEISURE	0.07	-0.03	0.23	0.07	0.00	-0.06	0.01	-0.01	0.05	-0.40	1.00		
12 EDUC	-0.00	-0.01	-0.07	0.00	0.01 -	0.00	-0.00	0.01	-0.02	-0.11	-0.36	1.00	
13 SOLID	-0.12	0.08	-0.22	-0.03	0.04	-0.13	0.01	-0.07	-0.08	-0.15	-0.47	-0.13	1.00

Table 2: Predictive success

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1) <=C	1009	362	1371	0	0	0
P(Dep=1)>C	618	3239	3857	1627	3601	5228
Total	1627	3601	5228	1627	3601	5228
Correct	1009	3239	4248	0	3601	3601
% Correct	62.02	89.95	81.25	0.00	100.00	68.88
% Incorrect	37.98	10.05	18.75	100.00	0.00	31.12
Total Gain*	62.02	-10.05	12.38			
Percent Gain**	62.02	NA	39.77			

Table 3: Estimation results

Binary Dependent variable : Project's success or failure.

Hyp	**Variable**	**Coef.**	**P-val.**
H1	SG_IDENT	1.766	0.000***
H2	SG_PAT	0.178	0.023**
H3	SG_POINT	3.189	0.000***
H4	SG_REP	-0.348	0.009***
H5	SG_RECIP	1.286	0.000***
H6	SG_AMB	-1.959	0.000***
H7	SG_INT	1.604	0.000***
H8	SG_SOC_CAP	-0.338	0.001***
H9	SG_INTERACT	2.983	0.000***
	EDUC	0.450	0.014**
	LEISURE	0.580	0.000***
	SOLID	1.122	0.000***
	CONSTANT	-4.435	0.000***
	Observations	5229	
	Prob > chi2	0.000	
	Pseudo R2 (McFadden)	0.35530	

***** : p<0.01, ** : p<0.05**

Table 4: Robustness test

Binary Dependent variable: Project's success or failure.

Hyp	Variable	Coef.	P-val.
H1	SG_IDENT	2.743	0.003***
H2	SG_PAT	1.028	0.019**
H3	SG_POINT	4.775	0.000***
H4	SG_REP	-2.183	0.002***
H5	SG_RECIP	3.007	0.000***
H6	SG_AMB	-2.829	0.000***
H7	SG_INT	2.116	0.000***
H8	SG_SOC_CAP	-3.338	0.000***
H9	SG_INTERACT	3.866	0.000***
	EDUC	0.251	0.760
	LEISURE	0.633	0.270
	SOLID	0.722	0.325
	CONSTANT	-4.549	0.000***
	Observations	315	
	Prob > chi2	0.000	
	Pseudo R2 (McFadden)	0.574	

*** : p<0.01, ** : p<0.05

5. CONCLUSION

Our paper provides evidence on a set of hypotheses developed to identify key predictors for the success of crowdfunding projects by referring to the signaling theory (Spence 1973; 2002) which represents the most used approach for study markets containing incomplete and asymmetric information (Bergh et al.,2014; Connelly et al. 2011). In this study, we show that the success of crowdfunding projects depends on different signals. In more detail, this article explored how project initiators can signal their identity, their investment in reciprocity, their patience, their quality campaign (pointing signal), their interactivity as well as their intention to use the funds raised in order to counterbalance the negative effects of adverse selection and moral hazard, and thus fostering the success of the crowdfunding campaigns. This article also identifies how signals of reputation, ambition and social capital can endanger an otherwise successful campaign.

In sum, this paper provides not only empirical evidence essential in understanding the key role of signals in determining the success of crowdfunding campaigns but also useful tools in the hands of project initiators and potential investors in shaping their own crowdfunding strategies for early-stage. Project leaders can use the results to identify the most relevant signals to increase the chances of success of their projects. For Crowdfunding platforms, they could use our study to choose projects that deserve to be shared. In addition, platform operators could also suggest changes to entrepreneurs whose project descriptions were assessed as potentially less successful. In addition, investors could use our studies to make an optimal investment choice.

For crowdfunding intermediaries and policymakers, the implications are also clear. Lack of meaningful external verification of projects can cause fraud problems. The diffusion of quality signals through rich descriptions obviously plays a key role in reducing the information asymmetry problem between stakeholders and the problem of fraud. The lack of certain signals can reduce the ability of communities to identify projects that deserve funding and increase the risk of fraud. As any other studies, this paper has limitations that open up avenues for future research. The short period of our analysis of a single type of crowdfunding prevented us from analyzing donor behavior and determining whether crowdfunding was more or less effective at different times. Future studies may enrich our study by focusing on other types of crowdfunding created in other countries and on entrepreneurs that launched the campaigns to finance their projects in different stages of evolution of the equity crowdfunding phenomenon.

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