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Crowdfunding and Innovation in Times of Economic Crisis

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Abstract

The COVID-19 health crisis has caused a collapse in global economic activity, which is unprecedented since the Great Depression of the 1930s. In the same line of thought, the world economy will be durably marked. We wonder about the mutations it will undergo to recover rising indicators to address the challenges of the Circular Economy (CE). In this context, we note the impetus for alternative financing models for SMEs, particularly participatory financing or crowdfunding. This spurs an investigatory question in what way and how can crowdfunding drive innovation in the context of economic crisis? This study takes a mixed approach. We interviewed project leaders using an interview guide to better understand the reasons that motivated them to use crowdfunding and to gather their feelings about the democratization of start-up financing. Additionally, we collected 30 questionnaires from project leaders and collected data for the same campaigns on the participatory financing Kisskissbanbank platform. The responses were analyzed and compared with the conceptual framework and basis of prior studies. Results brought to light that crowdfunding certainly allows to finance start-ups that would not have had access to traditional financing. Also, the results of our survey postulate a role for crowdfunding in innovation. But this data remains fragile, due to the framework of the survey and the context of the crisis, which is still adjustable.

Keywords

Crowdfunding, Innovation, Economic Crisis, Circular Economy, Investment

1. Introduction

The starting point of this research was the COVID-19 health crisis, which has shaken the foundations of our modern societies, which is fundamentally based on the market, to such an extent that humanist values can take second place on the verge of Circular Economy (CE) challenges. For example, France's arms sales to countries engaged in conflict or brutal repression have been the subject of debate for many years. France has been singled out by the Office of the United Nations High Commissioner for Human Rights, which considers that its arms sales to the United Arab Emirates constitute "serious violations of international humanitarian law". In another example, labor law was amended by ordinance in September 2017 (Thuillier, 2017) to encourage foreign investors to set up in France. These orders authorize large foreign groups to lay off staff in their French subsidiaries even if their financial health is good. These two examples demonstrate for the development of CE no country is alone, so the primacy of the market economy over international ethics in the first case, and over employee rights in the other. So, with the emergence of COVID-19, our societies are faced with an unprecedented situation that affects people's foundations arguing how can the economy survive by finding new CE models, such as the participative economy. The contagiousness and severity of COVID-19 have prompted many countries to introduce containment procedures and even close their borders. This triggered a brutal stock market crash in March 2020 (Brown & Rocha, 2020; Brown et al., 2020).

These alternative financing methods include participative financing, also known as crowdfunding. This model brings together project owners and investors via online platforms, to exchange funds (Nigam et al., 2020). Crowdfunding has developed particularly in the field of financing medical and pharmaceutical research. Our thinking will therefore be guided by the following questions throughout our study: Can we therefore ask ourselves why project owners are favouring crowdfunding financing in the context of this economic crisis? Can we assume that crowdfunding as a means of financing businesses could offset the economic slowdown, we are experiencing in the context defined in this study? In what way and how can crowdfunding drive innovation in the context of an economic crisis?

This study objectifies the investigation of whether crowdfunding could be the engine of innovation in the context of the economic crisis in a way forward to CE. In so doing, we will be looking at the scale of the economic crisis unfolding in the context of this health crisis. Our findings showed that the number of funders and the news on the project page influenced the project's success, as suggested by Drover et al. (2016), Malaga et al. (2018), Mohammadi and Shafi (2017) and Nigam et al. (2020) for venture capital campaigns. We couldn't find a strong relation between gender, level of education, and campaign success.

This paper contributes to the literature in several ways. First, it examines the relevance of each crowdfunding model concerning the circular economy and fi-

nancing needs. Second, it provides a new insight into the diversity of possible uses of crowdfunding as an innovative means of financing projects. Thirdly, it provides a comparison between different crises and how companies deal with them in terms of financing to bridge the gap between the capital needed and the amounts raised for the circular economy sector.

The paper is divided into the following sections: in the second section, we present the theoretical framework and the hypotheses developed, in the third section, we present the empirical methodology (data collection, description of variables, and methodology), in the fourth section, we present the results and analysis and finally, in the fifth section, we conclude the paper.

2. Literature Review and Hypothesis Development

1) *Crowdfunding as an alternative business financing model*

Crowdfunding is not a recent phenomenon. In 1884, Joseph Pulitzer, the editor-in-chief of the New York World newspaper, used this financing model to build the Statue of Liberty in New York, for which he was unfortunately short of funds. The project raised no less than 125,000 people for 100,000 dollars (Hervé & Schwienbacher, 2018).

The advent of neo-liberal policies at the dawn of the twentieth century marked a new stage in entrepreneurship. These policies proposed solutions conducive to business creation. The emergence and rise to power of the Internet in the 2000s made it possible to raise funds without the intermediary of government institutions. In recent years, this financing model has gradually developed in terms of both form and funding. Regarding the latter, in 2017 in France, crowdfunding accounted for €336 million, which helped to finance 24,126 new projects. This represents an increase of 44% in 2016. In terms of models, there are three types of crowdfunding: reward, lending, and equity.

Cieply and Le Nadant (2016) conducted a study on the profile of the founders of these participatory financing platforms. The two authors highlight that more than 50% of platform founders have already had experience in the financial sector (banking or private equity) and nearly 80% have undergone training in the financial, legal, and economic fields. The crowdfunding platforms have the financial expertise that is essential for developing a project (Lukkarinen et al., 2016; Nigam et al., 2018, 2019). They also offer the same skills as many fintechs, but with a global vision of the project, from expertise in its foundations to financing. As far as conventional institutions are concerned, we can see that banks are increasingly interested in crowdfunding platforms. Indeed, the growing involvement of banking institutions in crowdfunding platforms enables them to broaden their range of services to their customers and to benefit from the good brand image of these platforms (Ahlstrom et al., 2018; Martha et al., 2023).

The 2008 financial crisis, which hit the world hard, was a catalyst for economic change, particularly in terms of access to finance. Eldridge et al. (2019) highlight the difference between the supply of finance and the demand for it. This

disparity is because financial institutions (commercial and investment banks) are more reluctant to offer financing to SMEs. The main reasons for this reluctance are weak business plans and insufficient equity capital (Block et al., 2017; Benetti et al., 2022). However, SMEs represent a major source of economic growth (Dunkley (2016). Goncalves and Imoniana (2022) observe that in Brazil, it is common for an SME to act as a producer of critical components. So, crowdfunding is emerging as an alternative financing model for SMEs that do not have access to traditional financing.

Italy is a particularly well-documented case in point. Crowdfunding has developed rapidly in Italy over the last few years, due in particular to a change in regulations that has opened up this method of financing to all types of SMEs, whereas previously it was reserved more for special cases such as very small start-ups and businesses. The growth of crowdfunding in Italy can be seen in the figures: Italian equity crowdfunding platforms raised €65.6 million in 2019 compared with €36 million in 2018, an increase of 82%. The average amount of funds raised rose from 320 in 2018 to 469 thousand euros in 2019. Also, in Italy, funds raised increased by 84% in the first quarter of 2020 and by 31% in the second quarter of 2020 compared with the same period in 2019, despite a dip in March 2020 (Battaglia et al., 2020)[1]. As a result, crowdfunding is democratizing access to capital, but on another level too.

We can see that crowdfunding is gradually moving from financing unconventional projects to financing projects linked to more conventional businesses. In this way, crowdfunding appears to be a financing model that enables generally innovative businesses to access capital (Nigam et al., 2018, 2019). Our first hypothesis supports the idea that crowdfunding is an alternative means of financing for companies that have not had access to traditional financing.

*H*1: *Crowdfunding finances start-ups that do not have access to traditional financing*.

2) *Participative financing to support the economy in times of economic crisis*

a) The challenges of crowdfunding during crises

A study by Rajwa et al. (2020) compares the funding needs of campaigns in the United States with campaigns in non-US countries on the GoFundMe.com platform. In 2016, the total amount raised on the GoFundMe platform was close to 2 billion dollars. Nearly 75% of this amount was raised in just 3 weeks during the pandemic. The campaigns were selected based on keywords relating to the COVID-19 pandemic over a period from 3 to 20 March 2020. Around 1579 crowdfunding campaigns were launched on the GoFundMe.com platform, with a fundraising target of $1,492,988,587 billion. Another point highlighted in this study concerns the nature of the projects that received funding. In the United

[1]The amount raised in the first quarter of 2020 was €24,189 K compared with €13,078 K in 2019 over the same period, an increase of 84%. As for the second quarter 2020, the amount of funds raised was 19,567 K, an increase of 31% compared to 2019 over the same period. The average amount raised was less than €3 million, and average funding fell below €300,000, despite an increase in average investment (Battaglia et al., 2020).

States, the vast majority of campaigns raised funds for living expenses (clothing, transport, accommodation, etc.), compensation for lost wages, and food (88.0%). A minority financed medical supplies (8.7%) and provided funds for hospitals and healthcare workers (3.3%). As for the non-US campaigns, which were mainly directed at Italy (82.4%), the majority of funds were donated to hospitals and healthcare workers (54.6%) or for the purchase of medical supplies (26.9%). A minority of campaigns raised funds for living expenses, loss of earnings, and food (16.7%) or were directed toward research (1.9%). These figures show strikingly that the majority of campaigns in the United States focused on living expenses, lost wages, and food, with 88% in the United States compared with 16.7% for countries outside the United States (Himmelstein et al., 2009). Indeed, the American welfare system is the subject of much debate. If we take a closer look at the figures, 15.7% of the American population is uninsured, due to the high cost of health care and insurance premiums. Unlike France, the American social security system does not offer universal health coverage but is organized more around optional private insurance offered to employees by their employers (Galvis-Narinos & Montélimard, 2009).

Consider now the significant difference between the number of campaigns for hospitals and healthcare workers in the USA and in countries outside the USA: 3.3% for the former and 54.6% for the latter. The same gap can be seen for medical supplies: 8.7% in the USA and 26.9% for countries outside the USA.

b) Factors influencing the success of campaigns in times of crisis

Battaglia et al. (2021) analyzed 437 Italian equity crowdfunding campaigns from 2014 to 2020. They then identified a subsample of 79 projects launched during the pandemic to understand the impact of the pandemic on equity crowdfunding. Data on project initiators was collected directly from the platforms. This study measured the impact of the health crisis on the success of funding campaigns using 3 criteria: the number of investors, the amount raised, and the success of the campaign. In the same context, the analyses carried out allowed us to identify the factors that could have a significant impact on the success of the campaigns: gender, social capital, and social networks. Concerning gender, the presence of female project leaders seems to have a positive impact on the success of the campaign, as women seem to be more trustworthy than men in this tense context (Malaga et al., 2018; Mohammadi & Shafi, 2017; Nigam et al., 2020). It turns out that the most successful campaigns recruit a high number of connections in social networks (Vismara, 2016; Nigam et al., 2022). In the above sample, project owners have an average of 424 connections on the professional network Linkedin. Finally, concerning social capital, the results show that it has a positive and significant effect on campaign success and that this effect was accentuated during the COVID-19 period. Social capital appears as a positive signal that attracts investors and encourages them to invest (Ahlers et al., 2015; Battaglia et al., 2020; Nigam et al., 2020, 2022). This is reminiscent of the signal theory developed in economics, where a signal is a piece of information, a com-

munication, emitted by the project owner that encourages the investor to decide whether or not to commit to the project (Healy & Palepu, 2001; Verrecchia, 2001; Hoenig & Henkel, 2015).

Thus, according to signal theory, the amount of share capital is a key factor in the success of a fundraising campaign, as it attracts more funds from the public. In summary, factors related to gender, social networks, and social capital appear to have had an even greater impact during the COVID-19 period. The factors that influence the success or failure of the fundraising campaign were thus amplified during the health crisis. As a result, our second hypothesis supports the idea that the profile of the project leaders has an impact on the success of the campaign and that these factors are all the more crucial during the COVID-19 crisis.

H2: *The profile of the entrepreneurs influences the success of the campaign in times of crisis*.

3) *Crowdfunding Investors to Drive Innovation and Economic Growth amid Crises*

A study conducted by Elmer et al. (2020) looks at the profile of the various players behind fundraising campaigns. This research is based on campaigns linked to the mention "COVID", which enabled 1430 campaigns to be collected via the URL on the Gofundme platform, over the period from 27 March to 27 April 2020. Of the 1430 campaigns collected, 500 were analyzed using a random sample using Python software. This study and Nigam et al. (2019) identified the four main players behind the campaigns and the type of campaigns they fund:

- Friends/family => death/funeral, support for family friends.
- Third party => medical equipment, funerals, charities, arts and sports, food and supplies.
- Stakeholder => small businesses, funerals, charities, food and supplies.

The vast majority of campaigns were initiated by third parties (32%) and a member of the community (31%). 21% of campaigns were initiated by the parties concerned and 16% by friends/family members.

This shows that third parties are empathetic and sympathetic towards situations that affect them indirectly (Elmer et al., 2020). **Table 1** sets out the different types of campaigns undertaken by the four stakeholder groups defined in the study.

It should be noted, according to Elmer et al. (2020), that having a patent (medical equipment) has a positive impact on the investor's decision to finance a project and the size of the amount raised. An indicator also influences the success of a campaign. A trend that has intensified during the COVID-19 crisis, as it appears that funders are more likely to invest in start-ups with a higher level of R&D spending and are more willing to finance digital and high-tech projects.

It suggests that research and development play a crucial role in times of crisis, and in particular in the resilience process because it contributes to a more sustainable recovery and mitigates the effects of the crisis. Young innovative companies would be the driving force in relaunching the economy. In addition, it is

Table 1. Data of funded campaigns by type of stakeholder.

Funded campaigns	Types of causes according to the actors			
Areas	**Third-party**	**Community**	**Friends/family**	**Concerned part**
Medical equipment	**29%**	**29%**	1%	/
Global charities	**27%**	/	/	/
Food and supplies	14%	22%	/	1%
Community charities	**18%**	**26%**	/	7%
Fundraising for	6%	15%	/	/
The hospital	2%	3%	/	3%
Arts and sports	4%	5%	1%	**70%**
Small enterprises	/	/	35%	13%
Funeral	/	/	/	5%
Animal wellbeing	/	/	**63%**	1%
TOTAL	**100%**	**100%**	**100%**	**100%**

Source: Elmer et al. (2020).

important to highlight the role of crowdfunding in the innovation process (Assadi, 2018; Nigam et al., 2018).

Our third hypothesis supports the idea that crowdfunding is a driving force in the innovation process.

H3: *Crowdfunding influences innovation in times of crisis*.

3. Methodology

We, therefore, decided to address the impact of crises on crowdfunding, to understand the reasons that push project leaders to approach this new financing model, to address the factors that can contribute to the success of the campaign, and finally to highlight the role of crowdfunding in relaunching the economy by promoting innovation. Thus, our literature review allowed us to identify 3 factors that could influence the recovery of the economy in times of crisis through crowdfunding (see **Figure 1**):

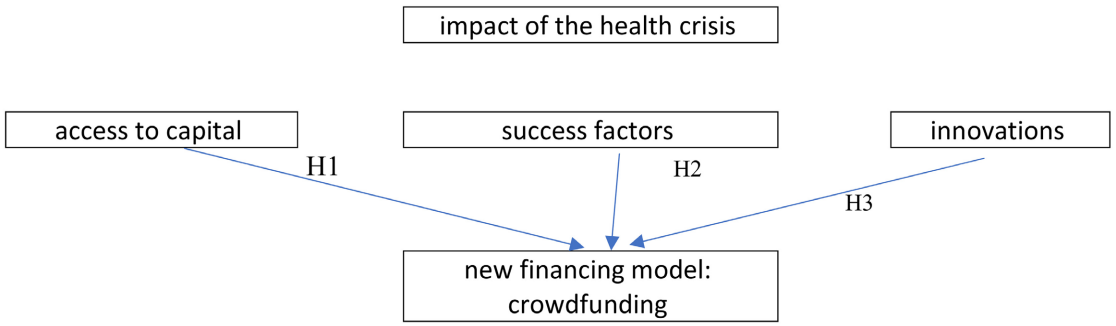

Figure 1. Factors that affect crowdfunding model. Note: H1: Crowdfunding finances start-ups who do not have access to traditional financing. H2: The profile of project leaders influences the success of the campaign in times of crisis. H3: Crowdfunding influences innovation in times of crisis.

1) Access to capital (capital contributions from donors).

2) The characteristics of the project leaders (sex, level of education).

3) Financing innovative projects (capital contribution to projects using research and development).

3.1. Data Collection

Data collection was carried out directly on the Kisskissbankbank (2024) crowdfunding platform and through a questionnaire with project leaders. Our choice fell on the French crowdfunding platform Kisskissbankbank. We chose this platform because the Kisskissbankbank donation platform has 2,096,259 registered, 23,527 projects financed, and €120,524,033 funds collected. It is easy to find old campaigns on the platform and the presence of a contact link reassured us in our choice of platform to administer our questionnaire. The fact is that the platform offers 3 different types of financing including pre-ordering products. Concerning our initial question, which highlights the democratization of financing, pre-ordering, through the possibility it offers investors to intervene on the product itself (improvement of the product for example) goes in the direction of democratization of innovation. The platform is quite old, it was created in 2010, therefore after the 2008 crisis which was a springboard for the development of innovative financing methods. The age of the platform will provide access to a wealth of data. The fact that it is a French platform will make it easier to make links for each campaign selected between the data collected and the responses to the quantitative survey in a coherent cultural context.

The responses collected by questionnaires present the perceptions of project leaders and their experience with crowdfunding. The authors Moscarola (2018) and Alencar Abaide Balbinotti et al. (2007), propose to define the questionnaire as a list of questions. The questions can be closed and offer predefined response methods or open, which leaves the respondents free to express themselves.

The design of the questionnaire is a decisive step (Alencar Abaide Balbinotti et al., 2007). Indeed, the questions stated in the questionnaire must be precise, concise, and understood by the respondent but also shed light on our research question and our theories. Moscarola (2018) even defines the design of the questionnaire "as an articulation between the world of phenomena and that of ideas".

We chose to carry out our questionnaire online and built it using the Google Form application. This form of questionnaire promotes the interactivity and receptivity of respondents by making the following questions depend on the answers given to the previous questions. According to Alencar Abaide Balbinotti et al. (2007), this type of questionnaire would have a positive impact on the response rate and their quality.

We want to highlight the importance of crowdfunding during the COVID-19 health crisis, we will collect data for the period from March 17, 2020 to May 1, 2021 (March 17, 2020 is the government's announcement of the first confinement in France).

We note that the economic indicators are of the same order of magnitude over the two periods and are even more severely impacted in 2020. In France, GDP fell by 13.8% in the second quarter of 2020. It was therefore 19% lower than in the second quarter of 2019. As for the unemployment rate, it jumped by 1.9 points in the third quarter of 2020, reaching 9% of the working population. At a press conference on Tuesday 24 March 2020, the French Minister for the Economy, Bruno Le Maire, said that the economic crisis we are experiencing "has no comparison with the Great Depression of 1929". So, we see that the COVID-19 health crisis is intrinsically affecting all countries. The phenomenon is exacerbated by the interdependence of economies, leading to complex situations. The economic crisis has led to the development of alternative financing models for SME start-ups (Brown & Rocha, 2020; Brown et al., 2020).

3.2. The Instrument

The research itself relied on the voluntary support of four financial experts, both academics and practitioners. Participants were assured that any information they provided would remain confidential and would only be used for scientific purposes. Furthermore, any information published would be anonymous and in the context of other participants' responses. Finally, participants were assured that they would be exempt from any responsibility for the opinions expressed in any publication resulting from this research.

According to Hoppen et al. (1997), there are two techniques that can be used to assess the content validity of a questionnaire: pretesting with a sample of subjects or judging by a panel of judges. With the aim of making the instrument as clear as possible, we chose to evaluate the content validity of the instrument using a panel of 4 judges. Each judge was given an evaluation sheet that included three criteria: clarity of language, practical relevance and theoretical dimension, as suggested by Alencar Abaide Balbinotti et al. (2007).

The research instrument consisted of a list of 16 questions. Of these, 4 questions were related to the demographic characteristics of the respondents, and 12 questions were related to their perceptions of the crowdfunding process. All questions related to crowdfunding were developed based on the literature review.

3.3. Sample

We chose to determine our population using quantitative sampling. This sampling method is constructed from the sample size. In statistics, the sample size is denoted n. To carry out a study of this type, it must be greater than or equal to 30; below this threshold, the conditions relating to the theory of surveys are not respected and not representative (Cochran, 1965).

Respondents were selected directly on the Kisskissbankbank (2024) crowdfunding platform. We could find available information on 49 projects. Then, we sent our questionnaire to these 49 project leaders from various socio-professional

categories represented by both men and women. We chose to first collect the consent of the person to participate in the quantitative survey, as suggested by Alencar Abaide Balbinotti et al. (2007), using a standard email sent via a contact link provided in each campaign.

In his work, Moscarola (2018) addresses the 3 documentary sources that we can exploit: Internal sources such as private information present within a company; External sources made freely available: press articles, and economic data (e.g. Insee); sources that it describes as digital and which are available on the web such as forums, websites, and social networks.

These are secondary sources because they were created independently of the research theory. We have chosen to collect directly on the web and more particularly on the platform www.kisskissbankbank.fr, information relating to financing campaigns for the 49 campaigns that responded to our questionnaire. For each campaign, we collected 9 variables, such as the activity industry, the name, launch date, financing objective set, the amount collected at the end, the average amount collected, the number of investors, the percentage of achievement of the set objective, the quantity of news on the crowdfunding campaign page.

We chose to contact the project leaders via the professional social network LinkedIn and Facebook after having identified them on the crowdfunding platform. Their campaigns were still ongoing or barely closed. We collected 30 completed questionnaires.

For regression equations with six or more predictors, an absolute minimum of 10 participants per predictor variable is appropriate. However, if circumstances allow, for example with very low variance, a researcher can use $n > 8$ can be informative. If there are some variances, a better power to detect a small effect size with about 25 participants (Jenkins & Quintana-Ascencio, 2020).

3.4. Data Analysis and Descriptive Analysis

The data collected through the administration of questionnaires are of 3 different types: scale or ordinary variables (e.g. age of the respondents), nominal variables (qualitative variables such as socio-professional category or gender), and text variables (such as opinions or perceptions). For text variables, we used lexicometric analysis which is a method allowing us to bring out the "essence" of a text, its main information (Ratinaud & Marchand, 2012). We analyzed most of our answers through simple and multiple linear regressions in order to establish correlations and dependence relationships between the explained variable denoted Y and the explanatory variable denoted X.

Our descriptive analysis brings information about our respondents as age, gender, education, and socio-professional category (see **Table 2**). The majority of respondents are young (84%), they are between 20 and 39 years old. The majority of project leaders are represented by men (60%). The L3 promotion, which initiated the "Solidarity of Brest" campaign, is represented by both men and women. The vast majority of respondents (90%) have a minimum level of Bac + 2 education

with a large proportion having a long higher education diploma (77%). It turns out that the majority of project leaders originally had a business or entrepreneurial activity (40%). They are followed closely at 34% by executives and higher intellectual professions. Most project leaders, like crowdfunding platform creators, have experience in business creation and management.

Table 2. Sample's demographics characteristics.

Age	Less than 40 years old	26
	More than 40 years old	4
Gender	Femme	11
	Homme	19
Education	Undergraduate or less	6
	Graduate and more	24
Activity	Employee and project owner	18
	Business and project owner	12

Note: Sample with 30 respondents.

4. Findings

This chapter presents the key findings from our investigation into the factors influencing success in crowdfunding campaigns. We employed a mixed-methods approach, utilizing a survey of crowdfunding backers and collecting data directly from the crowdfunding platform's websites. Our analysis revealed several key insights related to project characteristics, promotional strategies, and backer motivations. Then, we asked to our respondents "Why did you use crowdfunding?".

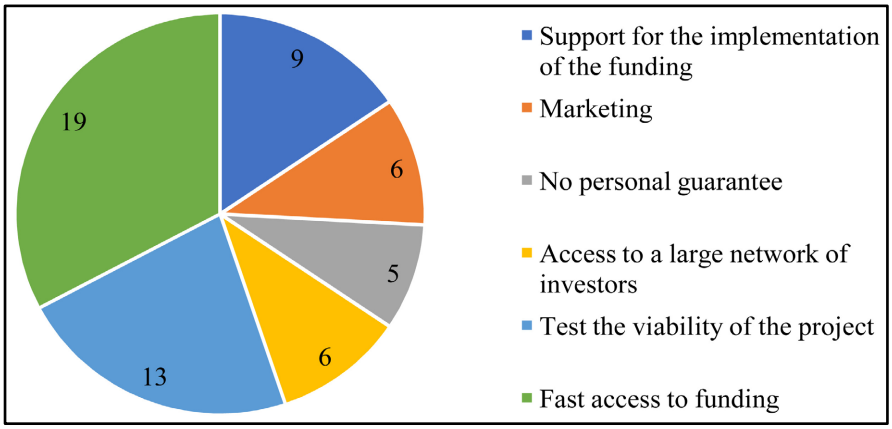

Figure 2. Why did you use crowdfunding? Note: It was possible for respondents to choose more than one option. Source: Authors.

As can be observed in **Figure 2**, the majority of project leaders say they have used crowdfunding for the sake of rapid access to financing. Indeed, the cam-

paigns are carried out over a period ranging from 1 to 60 days. In the second place, project leaders saw crowdfunding as a way to measure the viability of their project. They view crowdfunding as a "barometer" of the success of their business. It should be noted that project leaders recognize the supporting value of crowdfunding in carrying out the financing project. An "Other" proposition was inserted in this question to leave the respondent free to add one or more other motivation(s) for using crowdfunding. The responses to the "other" (open question) item reveal 2 main motivations:

1) For the most part, crowdfunding is a way of communicating and making the project visible. It would be a sort of showcase "First communication campaign", suitable for attracting capital "To increase our visibility and reputation" on the one hand and testing its viability.

2) The search for a financial base "Obtaining pre-sales, i.e. a pool of customers right from the opening"; "To complete the financing of our project"; "Reassure the banks that customers expect our project to be successful".

As far as communication is concerned, the vocabulary used is similar: "communication", "visibility", and "notoriety". The answers relating to funding are more nuanced. Two responses were directly related to obtaining financing (pre-sales and additional financing). The final response saw crowdfunding as a way of reassuring banks.

Then, we asked, "Have you used other methods of financing?" and "If yes, which ones?". We noted that a large proportion of project leaders have used another method of financing in addition to crowdfunding. For a very large part (49%), it is self-financing. It suggests that crowdfunding is used as additional financing when self-financing proves insufficient.

An "Other" proposition was inserted in this question (open answer) in order to leave the respondent free to add funding other than those proposed. The answers were "Partnerships", "0 rate loan from loved ones", "Have mentors on the crowdfunding page", "share subscription", "Honor loan", "Participatory loan (France Active)", and "partnership and sponsorship". As modes of communication have evolved and diversified, project leaders have access to a lot of information and a wide range of financing which allows them to gradually move off the beaten track of bank loans alone.

With Question 5 "Why did you use these other methods of financing?", we tried to understand the motivation of entrepreneurs to use crowdfunding platforms. As presented before, self-financing represents a large share at 49% (Question 4). For almost half of project leaders, it is important to have financial independence. These results support our Hypothesis 1 according to which crowdfunding finances start-ups that do not have access to traditional financing. Indeed, project leaders favor self-financing, supplemented by crowdfunding to ensure their financial independence.

Using answers from Q1, we tested our second hypothesis "H2: The profile of project leaders influences the success of the campaign in times of crisis". We car-

ried out simple and multiple linear regressions to confirm or not our hypothesis. Firstly, we chose to compare the data relating to the gender of the project leaders and those concerning the success or otherwise of the financing campaign. We reprocessed the text data into binary data.

Table 3. Linear regression statistics.

Linear regression statistics	
Multiple coefficients of determination	0.0909090909090896
Coefficient of determination R^2	0.00826446280991711
Coefficient of determination R^2	−0.0271546635183001
Standard error	0.496742636335202
N	30

As we can see in Table 3 (see also **Appendix 1**), there is almost no correlation between the variables studied. It suggests that the gender of the project leaders would not influence the success or otherwise of the financing campaign. After we also add the educational level of the project leaders, we would like to determine whether or not the success of the fundraising campaign may depend on the gender and level of education of the project leaders. We could observe that education level has no significant effect on the success of the financing campaign when combined with gender (see Table 4 and **Appendix 2**).

Table 4. Relation between gender and level of education.

Regression statistics	
Multiple coefficients of determination	0.2969787
Coefficient of determination R^2	0.08819635
Coefficient of determination R^2	0.02065534
Standard error	0.99754911
N	30

Thus, the gender and level of education of the project leaders cannot predict the success or otherwise of the financing campaign. We decided to broaden our Hypothesis 2 and analyze other factors that could influence or not the success of the campaign through the % of achievement of the set objective. We chose to focus on the number of news items present on the fundraising campaign web page.

This analysis is based on data collected on the Kisskissbankbank crowdfunding platform.

Based on the results obtained in Table 5 (see also **Appendix 3**), we can see that 40% of the variation observed in this model can be explained by the news in the web page campaign. This result corroborates with the one found by Nigam et

al. (2020).

Table 5. Fundraising campaign web page.

Regression statistics	
Multiple coefficients of determination	0.637635626
Coefficient of determination R^2	0.406579191
Coefficient of determination R^2	0.385385591
Standard error	4.01724037
N	30

Our third hypothesis tested whether Crowdfunding influences innovation. For this, five questions were used. Question 8 asked about ways of financing have they used. The crowdfunding donation was the most used the pre-order of a product in the second place. We highlighted in the literature review the role of reward-based crowdfunding in the innovation process. Indeed, pre-ordering not only makes it possible to raise awareness of the product and measure its potential market, it is also a source of information by allowing donors to participate in the development of the product throughout the campaign. Question 9 asked about the reasons to pre-order a product. Project leaders particularly recognize the virtue of pre-ordering in making their product known to consumers, as soon as their project is launched. Q8 and Q9 converge and explain that pre-ordering allows for testing the feasibility and viability of the product. Therefore, project leaders can assess, based on the positioning of consumers regarding the proposed product, whether or not it will have a good chance of having a commercial future. It should be noted that project leaders also recognize the advantage of pre-ordering in obtaining feedback from funders on improving the product. In Question 10, we asked if they received any suggestions from funders, in the case of pre-order products. A quarter of financiers are committed to improving the product. It reinforces the idea that crowdfunding in general and pre-ordering, in particular, are not limited to a contribution of funds but also to the involvement of financiers in the rise of the product and the campaign. After we asked in Question 11, types of suggestions were received from funders. Nearly half of the suggestions made by funders concern the characteristics of the product, followed by 36% by proposals concerning the communication of the product. The answers to this question support the idea that funders get involved in campaigns that arouse their interest. Question 12 asked about patents. Only 4% of project leaders filed a patent. This question also presents an open-answer question. Answers converge towards the overall result, namely that no patent has been filed. The two people speaking above have developed an intellectual product for which strict patent filing is not planned.

We decided to broaden our Hypothesis 3 by objectifying innovation using the following 3 criteria:

1) Campaigns including the key phrase: research and development.

2) Campaigns announcing: first to market.

3) Campaigns proposing a notable improvement of a product in the sense of respect for the environment. The keyword chosen is sustainable.

Based on these criteria, we carried out simple linear regressions to determine a correlation between these criteria and the success of the campaign in terms of the number of contributors and amount collected (see Table 6).

Table 6. Data table (criteria based on innovation and amount collected at campaign close).

Regression statistics	
Multiple coefficients of determination	0.689097716
Coefficient of determination R^2	0.474855662
Coefficient of determination R^2	0.452974648
Standard error	0.272137496
N	26

Note: We collected data for 30 campaigns. However, 4 campaigns used product pre-orders. We decided remove these ones because the amounts collected at the end of the period were expressed in number of pre-sales and not in currency as the other ones.

Table 7. Data table (criteria based on innovation and number of contributors).

Regression statistics	
Multiple coefficients of determination	0.731083312
Coefficient of determination R^2	0.53448281
Coefficient of determination R^2	0.51508626
Standard error	0.256222287
N	26

Note: We collected data for 30 campaigns. However, 4 campaigns used product pre-orders. We decided to remove these ones because the amounts collected at the end of the period were expressed in number of pre-sales and not in currency as the other ones.

As we can see, the coefficient of determination R^2 is 0.47 for the amount and 0.53 for the number of contributors (Table 6 and Table 7). This means that 47% on the one hand and 53% on the other hand of the variation observed in these models can be explained by the points. Even if the coefficients of determination are not strong, there is still a link between innovation and the success of the campaign in terms of the amount collected and number of contributors.

5. Discussion

This study objectifies the investigation of whether crowdfunding could be the engine of innovation in the context of the economic crisis in a way forward to

CE. In so doing, we will be looking at the scale of the economic crisis unfolding in the context of this health crisis. Our literature review allowed us to identify three hypotheses. To validate or refute these hypotheses, we carried out a quantitative survey with 30 project leaders and collected data for these same campaigns on the Kisskissbanbank crowdfunding platform.

1) Hypothesis 1: Crowdfunding finances start-ups that do not have access to traditional financing.

In the literature review, we discussed the importance of crowdfunding in democratizing access to financing for young start-ups. Many authors such as Eldridge et al. (2019) and Martha et al. (2023) have highlighted the difficulty of SMEs in finding financing. Indeed, with the demand for financing being far greater than the supply, financial institutions (commercial and investment banks) were more reluctant to offer financing linked to insufficient equity capital and an investment plan poorly defined business on the part of SMEs.

Thus, we asked the project leaders the reasons that pushed them to use this financing model. We also wondered about the other types of financing they had used in addition to crowdfunding. The results obtained following the administration of our questionnaire tend to validate this first hypothesis. Indeed, we understand that project leaders have favored crowdfunding for the sake of speed of access to funding. Using financial institutions is a more complex process and requires building a solid business plan to obtain the necessary funds, not evident for start-ups. Furthermore, almost 80% of project leaders requested another method of financing, and almost half of them were self-financing. We understand that self-financing is a way to ensure financial independence by bypassing traditional financial institutions.

2) Hypothesis 2: The profile of project leaders influences the success of the campaign in times of crisis.

In this second hypothesis, we wanted to understand the importance of gender or level of education on the success of the campaign in times of crisis. Battaglia et al. (2020) and Nigam et al. (2022) mentioned the influence of gender and in particular, women project leaders on the success of the campaign. This hypothesis converges with the signal theory which expresses the idea according to which certain factors are signals, which donors would consider to engage or not in the project.

For the 30 campaigns selected, we chose to collect the gender of the project leaders but also their level of education to ensure the results put forward by the authors. Given the results obtained, we can conclude that neither gender nor level of education have any impact on the success of the campaign. The study carried out by the authors on an Italian equity crowdfunding platform can, perhaps, explain why we did not obtain the same results. Indeed, the average amount of contributions for crowdfunding in the form of investment is around €5896 (for bonds), compared to €69 for donations without compensation and €62 for donations with compensation. The Kisskisskbankbank platform on which we carried out

our study does not offer crowd equity. The average amounts are lower, which would explain in particular why donors are not influenced by the gender of the project leaders.

We, therefore, broadened our research and considered other parameters such as the % of achievement of the objective set to determine the success of the campaign and the number of news on the fundraising campaign page. The results are rather mixed, but the number of news items would significantly influence the success of the campaign.

3) Hypothesis 3: Crowdfunding influences innovation in times of crisis.

Through this third hypothesis, we wanted to show the role and importance of crowdfunding on innovation. The study carried out by Battaglia et al. (2021) highlighted that nearly 35% of campaigns on Italian equity crowdfunding platforms have a patent and that around 76% of them devoted their resources to developing innovative products and services. They claimed that donors invested more in projects with a higher level of R&D. So, to confirm these results, we questioned the project leaders by asking them if they had filed a patent as part of their campaign. In our study, 96% of them have not filed a patent. These differences can be explained on the one hand by the nature of the selected campaigns, but also by the form of the crowdfunding platform. The study done by Battaglia et al. (2021) focuses on crowd equity platforms. The amounts raised are greater and the investments are made over the long term. We sought to understand the importance of the type of financing on the innovation process as also suggested by Nigam et al. (2018). We expressed in the literature review that reward-based crowdfunding could provide the entrepreneur with information on demand. As a result, it not only makes the product known but also constitutes a source of information, because donors can participate in the development of the product throughout the campaign.

By carrying out our survey by questionnaire, we note that the type of financing that requires the most support is the donation with counterpart followed by the pre-order of a product. We then wondered about the reasons why project leaders had resorted to pre-ordering. As mentioned above, project leaders recognize the virtue of pre-ordering in making their product known and testing the feasibility and viability of the market. In addition, it also allows you to obtain feedback from backers on improving the product. The results are sensitive and it is difficult to assert that crowdfunding would significantly influence innovation in times of crisis. The link between the innovation and the patent that we had established had restricted our study.

Like Hypothesis 2, we broadened our research by objectifying innovation through 3 criteria. We sought to understand whether donors invested more in innovative projects by taking the number of investors and the amount collected as reference variables. Given the results obtained, we can suggest a link between innovation and the campaign's success in terms of the amount collected and number of contributors.

6. Conclusion

The COVID-19 health crisis has marked a turning point in our modern economies. The changes (economic, and societal) caused by this global crisis were the starting point of our reflection. We then wondered about the measures taken by the government to revive the economies. To support our hypotheses, we carried out a quantitative survey of project leaders and collected data on the Kisskissbankbank crowdfunding platform.

Our results suggest that crowdfunding allows young start-ups to have access to financing for their project, most of the time in addition to self-financing, for the sake of financial independence. Furthermore, what seemed remarkable to us in this type of financing, unlike traditional financing, is that the involvement of financiers is not limited to a contribution of funds, but also concerns the improvement of the product throughout the life of the project. Moreover, we noted that there is a link between innovation and the success of the campaign in terms of the amount collected and the number of contributors. We have seen in the literature review that crowdfunding has been increasing for several years and that it has gained additional momentum in the context of the COVID-19 health crisis. The data on this is clear, as you can see in Table 8.

Table 8. Funds raised on participative financing platforms in France.

2017	2018	2019	2020
336 million €	402 million €	629 million €	1020 million €
% of growth	15%	36%	62%

Our data and results support our hypotheses. We have seen in crowdfunding a democratization of access to financing. This observation was made using different criteria:

- Possible financing for those who did not have access to traditional financing.
- Crowdfunding is not a matter for "experts" or a male-dominated world. We found that gender or level of education had no impact on the outcome of the project.
- The possibility offered to the public to make improvements to the product.

The aspect of access to financing for as many people as possible seems interesting and even attractive to our respondents. The majority of responses express the positive aspect of crowdfunding in terms of the democratization of financing.

Over the last two decades, with the generalization of the Internet and the development of social networks, information circulates instantly from one end of the planet to the other, it has become democratized, opening an ideal context for innovation.

In this study, we have provided suggestions of variables that can be considered by investors when choosing crowdfunding campaigns to fund. However, much remains to be learned about the impact of these variables on the financial per-

formance of projects. Social targets and impacts of campaigns and how they benefit businesses may also be tested. These studies can contribute to a better understanding of the link between the sustainability of campaigns and investor targets and interests.

We also could observe that the number of answers can be influenced by the media choice and the fact that the campaign is ongoing, closed for a long time, or barely closed. For future research, we suggest testing the same variables by doing cross-country comparisons. Moreover, comparisons between crisis periods with "normal" periods can highlight the performance of some platforms.

As a limitation, our study is concentrated in one platform in France. Then, we know that the number of campaigns is enough for the first results only. Unfortunately, during the COVID crisis, these were the data that we could find.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendixes

Appendix 1: Analysis of the Gender of Project Promoters and the Success or Otherwise of Their Fundraising Campaigns

Step 2: *Analysis of the data using simple linear regression*

Statistics for	linear regression
Multiple coefficient of determination	0.0909090909090896
Coefficient of determination R^2	0.00826446280991711
Coefficient of determination R^2	−0.0271546635183001
Standard error	0.496742636335202
Comments	30

Analysis of variance					
	Degree of freedom	Sum of squares	Average square	F	Critical value of F
Regression	1	0.057575758	0.057575758	0.23333333	0.63281878
Residues	28	6.909090909	0.246753247		
Total	29	6.966666667			

	Coefficients	Standard error	Statistics t	Probability	Lower limit for confidence level = 95%.	Upper limit for confidence level = 95%.	Lower limit for confidence level = 95.0%.	Upper limit for confidence level = 95.0%
Constant	0.409090909	0.126248195	3.240370349	0.00307379	0.1504832	0.667698614	0.150483204	0.66769861
If yes, was your project successful?	−0.045454545	0.094099849	−0.483045892	0.63281878	−0.23820935	0.147300257	−0.238209348	0.14730026

Appendix 2: Analysis of the Success or Failure of the Fundraising Campaign According to the Gender and Level of Education of the Project Promoters

Step 2: Data analysis using multiple linear regression

Regression statistics	
Multiple coefficient of determination	0.2969787
Coefficient of determination R^2	0.08819635
Coefficient of determination R^2	0.02065534
Standard error	0.99754911
Comments	30

Analysis of variance					
	Degree of freedom	Sum of squares	Average square	F	Critical value of F
Regression	2	2.598852441	1.29942622	1.30581921	0.2875199
Residues	27	26.86781423	0.99510423		
Total	29	29.46666667			

	Coefficients	Standard error	Statistics t	Probability	Lower limit for confidence level = 95%.	Upper limit for confidence level = 95%.	Lower limit for confidence level = 95.0%.	Upper limit for confidence level = 95.0%
Constant	1.35563495	0.354571841	3.8233012	0.000705	0.62811362	2.08315627	0.62811362	2.08315627
Gender	−0.22539786	0.377955419	−0.59636096	0.55590158	−1.00089832	0.55010261	−1.00089832	0.55010261
Level of study	−0.277038	0.183775489	−1.50748068	0.14330005	−0.65411416	0.10003816	−0.65411416	0.10003816

Appendix 3: Analysis of the Percentage of Target Achievement Based on the Number of News Items

Step 2: *Analysis of the data using simple linear regression*

Regression statistics	
Multiple coefficient of determination	0.637635626
Coefficient of determination R^2	0.406579191
Coefficient of determination R^2	0.385385591
Standard error	4.01724037
Comments	30

	Degree of freedom	Sum of squares	Average square	F	Critical value of F
Regression	1	309.5965014	309.5965014	19.18405486	0.000150608
Residues	28	451.8701653	16.13822019		
Total	29	761.4666667			

	Coefficients	Standard error	Statistics t	Probability	Lower limit for confidence level = 95%.	Upper limit for confidence level = 95%.	Lower limit for confidence level = 95.0%.	Upper limit for confidence level = 95.0%
Constant	1.826686443	0.823490776	2.218223321	0.034822811	0.139842057	3.513530829	0.139842057	3.513530829
% of target achieved target	0.601606832	0.137354394	4.3799606	0.000150608	0.320249111	0.882964552	0.320249111	0.882964552