



Crowdfunding for the rescue of micro-businesses. Factors and perceptions of potential investors in Mexico

Crowdfunding para el rescate de microempresas. Factores y percepciones de inversionistas potenciales en México

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Abstract

During the confinement associated with the health contingency due to Covid-19, almost four hundred thousand micro and small businesses were forced to close in Mexico. This document presents the results of a quantitative descriptive and cross-sectional study, the objective of which was to track the perceptions of micro-investors and factors that would influence their decision to help rescue micro-enterprises and jobs in the scenario of the economic contingency. The Actor-Network Theory (ANT) was used as the analysis methodology. It was found that, in the scenario of economic recession associated with the health contingency, approximately 23% of economically active people have surpluses that could be used for collective financing; Furthermore, the interest of micro-investors in projects that create jobs or help to preserve existing ones has been reinforced. On the other hand, as an element that helps to trace the associations between investors and entrepreneurs, a variable that we call mediation was identified; Based on the above, a list of criteria was defined that could help design a collective financing platform with a decentralized and solidarity network approach. In addition, it was found that digitization is key for a microenterprise to aspire to obtain collective financing, and therefore, to improve its chances of survival in a scenario of economic contingency.

Resumen

Durante el confinamiento asociado a la contingencia sanitaria por la COVID-19, casi cuatrocientas mil micro y pequeñas empresas se vieron forzadas a cerrar en México. En este documento se presentan los resultados de una investigación cuantitativa, de alcance descriptivo, cuyo objetivo fue rastrear percepciones de microinversionistas y factores que influirían sobre su decisión de ayudar al rescate de microempresas y empleos en el escenario de la contingencia económica derivada de la COVID-19. Como metodología se utilizó la *Actor-Network Theory* (ANT) y como herramienta de análisis el *Chi Square Automatic Interaction Detection* (CHAID). Se encontró que, en el escenario de recesión económica, aproximadamente 23% de las personas económicamente activas cuentan con excedentes que podrían destinarse al financiamiento colectivo; además, se ha reforzado el interés de los micro inversionistas hacia proyectos que crean empleos o ayudan a conservar los ya existentes; por otra parte, como elemento que ayuda a rastrear las asociaciones entre inversionistas y emprendedores se identificó una variable que llamamos mediación; con base en lo anterior, se definió un listado de criterios que podrían ayudar a diseñar una plataforma de financiamiento colectivo con enfoque de red descentralizada y solidaria. Además, se encontró que la digitalización es clave para que una microempresa aspire a obtener financiamiento colectivo, y por lo tanto, para mejorar sus posibilidades de sobrevivencia en un escenario de contingencia económica.

Keywords | palabras clave

Micro-enterprise, crowdfunding, actor-network, micro-investors, entrepreneurs, COVID-19, fintech, platform.

Microempresa, crowdfunding, actor-red, microinversionistas, emprendedores, COVID-19, fintech, plataforma.

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1. Introduction

As a result of the slowdown of the global economy, and specifically, of the Mexican economy in the scenario of the contingency due to COVID-19, thousands of micro and small companies have closed or are at risk of bankruptcy, and with it, the disappearance of millions of jobs is possible, given the impossibility of a micro-enterprise sector to pay for its operating expenses. The Study on Business Demography (SBD) 2020, of the National Institute of Statistics and Geography (INEGI, 2020), shows that, between May 2019 and September 2020, the number of micro, small and medium-sized companies in Mexico decreased from 4.85 to 4.46 million, which represents a decrease of 8.06% in the number of establishments.

According to estimates by the Inter-American Development Bank (IDB, 2020), Mexico could lose between 4.1% of formal jobs in the event of a short-term crisis, up to 14.4% in the event of a prolonged recession.

According to the 2019 Economic Censuses, 95% of formal establishments have less than ten workers (INEGI, 2019). These businesses are highly vulnerable to contingency situations, since many of them do not have economic reserves to survive prolonged recesses such as that caused by the health contingency.

1.1. Crowdfunding or collective financing

The health and economic crises associated with COVID-19 have exposed the weaknesses of the capitalist model and of liberal democracy. The speed of contagion revealed strong limitations by the State, the financial institutions, and the private sector in the implementation of effective actions to contain the epidemic outbreak, the preservation of the productive system, and the protection of especially vulnerable social strata. This is associated with the global and interdependent of the productive system, but also with the asymmetric and exclusive of the financial systems. However, the uncertainty generated by COVID-19 also offers us clues about the way in which elements associated with the knowledge society and the solidarity economy can help build solutions that we could call “post-capitalist” (Nelson, 2020).

Crowdfunding (CF) is a phenomenon in which factors typical of the information and knowledge society concur: digitization, new spaces for coexistence with technological mediation, and alternative models of entrepreneurship and financing. García and Garibay (2016) define CF as “a method through which individuals or non-profit organizations and companies obtain resources to carry out initiatives or projects of a social or business nature” (p. 37). Other authors, such as Schwienbacher and Larralde (2010), and Belleflame et al. (2012), coincide in conceptualizing FC as a call that uses the internet to provide financial resources to a project. These funds can take the form of donations, loans, or be given in exchange for some kind of reward.

The modality of collective financing using the internet was first observed in 1997 when musical groups began to collect donations to finance tours (García & Garibay, 2016). The same authors place the Artist Share company, in 2003, as the first collective financing platform focused on the artistic sector, and the Kickstarter company in 2008, as the first one focused on business.

According to Salido et al. (2019), most CF models are based on the concept of equity or capital investment, that is, an economic reward that can mean participation in the ownership of the project. However, there is a growing interest in some segments of the populati

CF has been examined from an economic perspective as an opportunity to capture economic surpluses from consumers and limit prices in the supply of goods and services to attract a greater number of funders (Belleflame et al., 2012; Bahena et al.

2017). On the other hand, authors such as Agrawal et al. (2011) highlight the role that CF plays to shorten the distances between investors and entrepreneurs, reducing unwanted effects of bank financing.

Salvador (2018) points out that the lack of liquidity in the banking system is a factor that drives the operation of CF platforms, and that this has occurred especially since the financial crisis of 2008 and 2009, therefore there is currently a transition from the traditional venture capital model to participatory financing platforms in which the power of the crowd helps to satisfy credit demands.

1.2. Financial Technology Ecosystem (Fintech)

In addition to the restrictions and difficulties that have arisen from the confinement by COVID-19, in Mexico, there is a structural problem of financial inclusion and access to credit. According to Demirguc-Kunt et al. (2015), in Mexico, only 39% of the adult population has a bank account in a formal institution.

León and Saavedra (2018) warn that, for MSMEs, bank financing, in addition to being expensive, is asymmetric; microenterprises are seen by banks as risky clients due to the lack of mortgage guarantees, high mortality, low productivity, and the possibility that they may change the destination of the borrowed resources. The interest rate is determined by adverse selection since it is difficult to distinguish between payers and non-payers, and this, together with the imperfections of the capital market, becomes a rationing problem that especially affects smaller companies. According to Bank of Mexico (2015), in Mexico, only 29.5% of companies with less than 100 employees have bank financing.

This set of variables has configured a favorable scenario for the rise of emerging players that help to resolve asymmetries in the financing market, such as financial technology companies (Fintech). Fintech companies and initiatives are part of an ecosystem that, using mobile telephony and innovation, expand the coverage of financial services with lower costs, better-distributed information, greater transparency, and accessibility (Zedeli, 2019).

In a study carried out in micro and small companies in 22 countries affiliated with the Organization for Economic Cooperation and Development (OECD), Abbasi et al. (2020) found a positive relationship between the efficiency of MSMEs and the use of Fintech, which is why they suggest that governments introduce policies to support this type of initiative. On the other hand, when analyzing success factors in the financing of MSMEs through CF, González et al. (2021) find that risk is the variable with the greatest impact on successful funding.

In Mexico, a regulatory scheme has been developed in recent years that favors the growth of the Fintech ecosystem. According to Oxford Analytical (2019), the country is now a leader in financial technology in Latin America. This regulatory framework has as a key piece the Law to Regulate Financial Technology Institutions, also known as the Fintech Law. It includes collective financing entities and electronic payment funds such as Financial Technology Institutions (FTI). Collective Financing is defined in the Fintech Law as “activities designed to put people, of the general public, in contact, in order for them to grant each other financing” (Ministry of Finance and Public Credit, 2018, p. 6).

González (2018) considers that the Mexican Fintech Law is a window of opportunity that allows the entry of new actors to the business financing scene on equal terms with banks; by opening up competition, it is possible to offer more and better financial services in less time and at lower prices, in addition to motivating entrepreneurs to advance their projects by accessing new sources of capital.

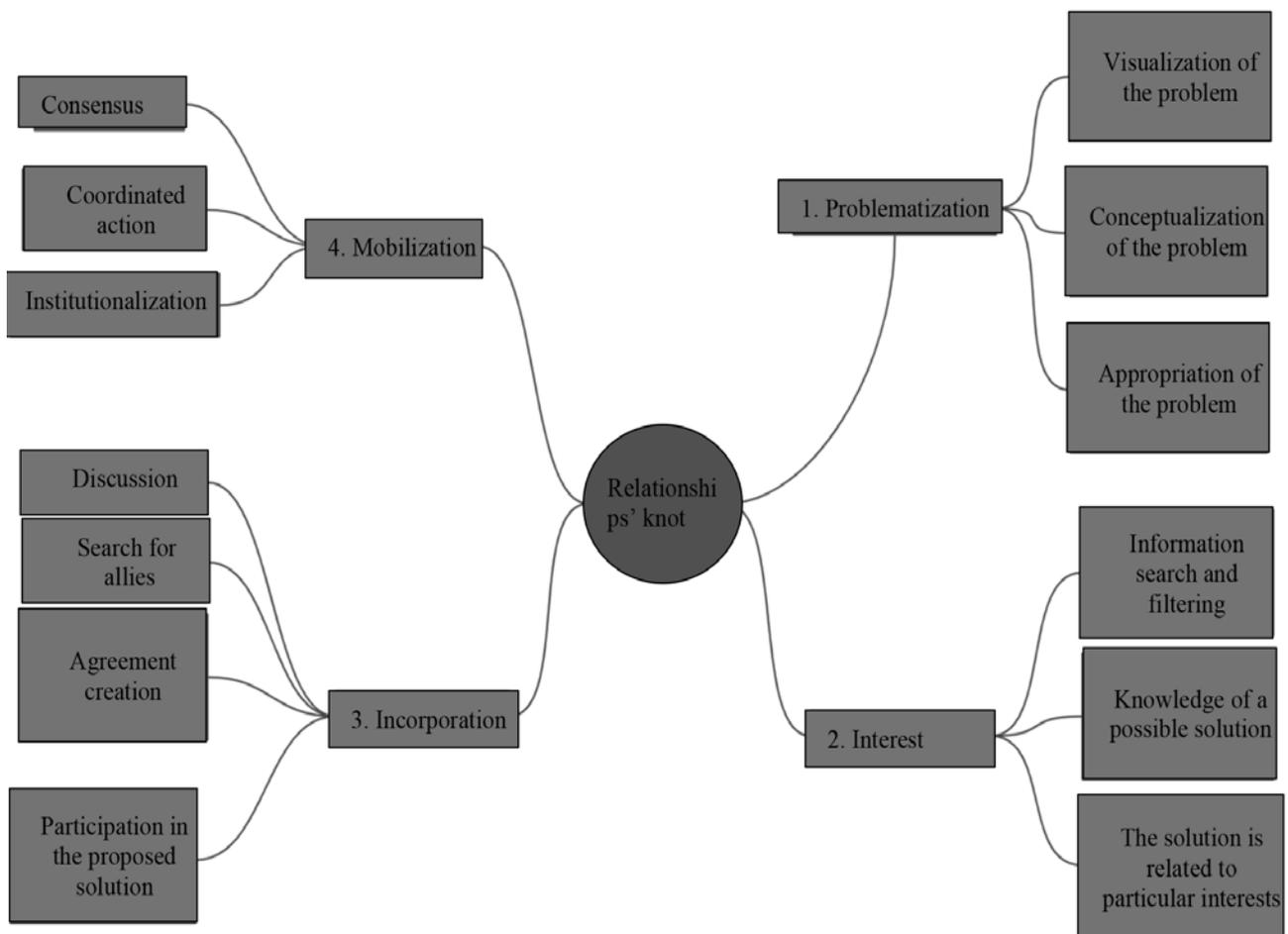
1.3. From Fintech companies to actor-network theory

One way of approaching the way in which crowdfunding networks are integrated is what is known as Actor Network Theory (ANT), which Law (2009) defines as “a diverse family of semiotic-material tools, sensitivities, and methods of analysis that treat all the elements of the natural and social worlds as a permanently generated effect of the networks of relationships within which they are located” (p.141).

Latour (2008) highlights that the social is constructed with the participation of people, organizations, and non-social entities, such as technology, and runs through associations and movements (a continuous process of reassembly) that if systematically tracked end in a shared definition of the world, or “collective”.

To integrate the collective, a process called translation is carried out (Jarrahi & Sawyer, 2019), which is the sequence of a group of actors who try to advance on an agenda, and for this, they mobilize their resources and translate the interests of others with the hope of involving them, transforming matters of fact into matters of interest (García, 2017). According to Iyamu et al. (2018), there are four moments in this process: problematization, interest, incorporation, and mobilization (Figure 1).

Figure 1. Translation process in the Actor Network Theory



Source: Own elaboration based on Iyamu et al. (2018); Sánchez et al. (2020).

The translation process is relevant to our analysis because it is a model that helps to interpret the redefinitions and changes of interests of the actors. According to Ruiz

(1999), it implies linguistic and geometric modifications. In the scenario of the contingency due to COVID-19, we can observe a translation in the linguistic sense as the actors begin to reinterpret and verbalize their reality based on the real and imaginary changes that have occurred during confinement; and in a geometric sense, to the extent that they participate in new associations and begin to play roles different from those they did before.

2. Materials and methods

The questions that give rise to this research are: Can associations between actors of the financing ecosystem be traced? And based on these associations, what are the criteria that a micro-company or an entrepreneurial project should meet to attract the interest of micro-investors?

A quantitative research, with descriptive scope, and non-experimental cross-sectional design was carried out. The methodology used was actor-network theory (ANT). According to Echeverría and González (2009), ANT is a descriptive theory that allows characterizing the natural and social world as a product of the networks of relationships between actors, which can be both human and non-human, and according to McBride (2003), provides a social and technical description of the processes of organization and association between heterogeneous elements.

To collect the information, a questionnaire was designed consisting of four socio-demographic identification questions (age, gender, marital status, place of residence, and level of studies); and 14 questions related to the predictor variables and research criteria (Tables 1 and 4). The information collection instrument was applied through the Microsoft Forms platform during the months of August, September, and October 2020.

A sampling by social networks was used (Heckathorn, 1997), which combines the snowball technique with a controlled selection system so that the initial subjects are the recruiters (they propose other subjects who have some similar characteristic) and each participant can act as a recruiter until the desired sample size is achieved (Baltar & Gorjup, 2011). This type of sampling is used in hidden populations, which are characterized by their difficulty in identification, lack of a sampling frame, and little-known geographic distribution (Marpsata & Razafindratsimab, 2010). In this case, the population under study, defined as “potential micro-investors”, has characteristics of a hidden population. Using a confidence level of 94% and a margin of error of 6%, a sample size of 245 people was obtained, of which 242 provided valid information.

**Table 1. Theoretical model of the investigation.
Predictor variables and criterion variable**

Predictor variables	Criterion variable
Age (E)	Availability to make contributions via CF (DAFC). Categories: 0 = No, 1 = Micro-contributions, 2 = Capital contributions
Gender (G)	
Marital status (EC)	
Scholarship (ESC)	
Perception of changes in the economic situation associated with Covid-19 (PCE)	

Predictor variables	Criterion variable
Degree of economic impact associated with Covid-19 (GAE)	Availability to make contributions via CF (DACF). Categories: 0 = No, 1 = Micro-contributions, 2 = Capital contributions
Level of economic solvency during the pandemic (SE)	
Job stability (EE)	
Degree of involvement in CF campaigns (GICF)	
Altruism vs personal gain approach (EAP)	
Local vs global approach (LG)	
Degree of effort to obtain information (EI)	
Type of expected benefit (BE)	
Factors that make a project attractive (FA)	
Technological resources associated with mediation (RM)	
Confidence Building Factors (FC)	
Factors that generate mistrust (DF)	

Source: Own elaboration.

To validate the questionnaire, an Exploratory Factor Analysis (EFA) was performed using the Principal Component Analysis and Varimax Rotation method, in which it was determined that there are four factors that explain 45.3% of the total variance (Table 2).

Table 2. Rotated matrix of components. Varimax rotation

Variable	Factor1	Factor2	Factor3	Factor4	Communality
PCE	0.699	-0.155	0.004	0.064	0.517
GAE	0.676	-0.279	0.014	0.125	0.551
SE	0.044	-0.081	-0.044	0.838	0.713
EE	0.582	-0.023	-0.022	-0.338	0.454
GICF	0.206	0.138	0.731	0.074	0.602
TB	0.444	0.056	-0.349	-0.005	0.322
LG	-0.025	0.777	-0.008	-0.020	0.604
DACF	0.596	0.442	0.155	0.030	0.575
EI	0.180	-0.038	-0.327	0.203	0.182
RM	0.127	0.399	0.038	0.450	0.380
FC	-0.149	0.630	-0.094	-0.041	0.430
FD	-0.016	0.129	-0.723	-0.052	0.543
EAP	-0.245	0.413	0.147	0.364	0.384
FA	-0.090	-0.021	0.200	0.191	0.085
Variance	2.0215	1.6754	1.3849	1.2605	6.3423
% Var	0.144	0.120	0.099	0.090	0.453

Source: Own elaboration using Minitab-19.

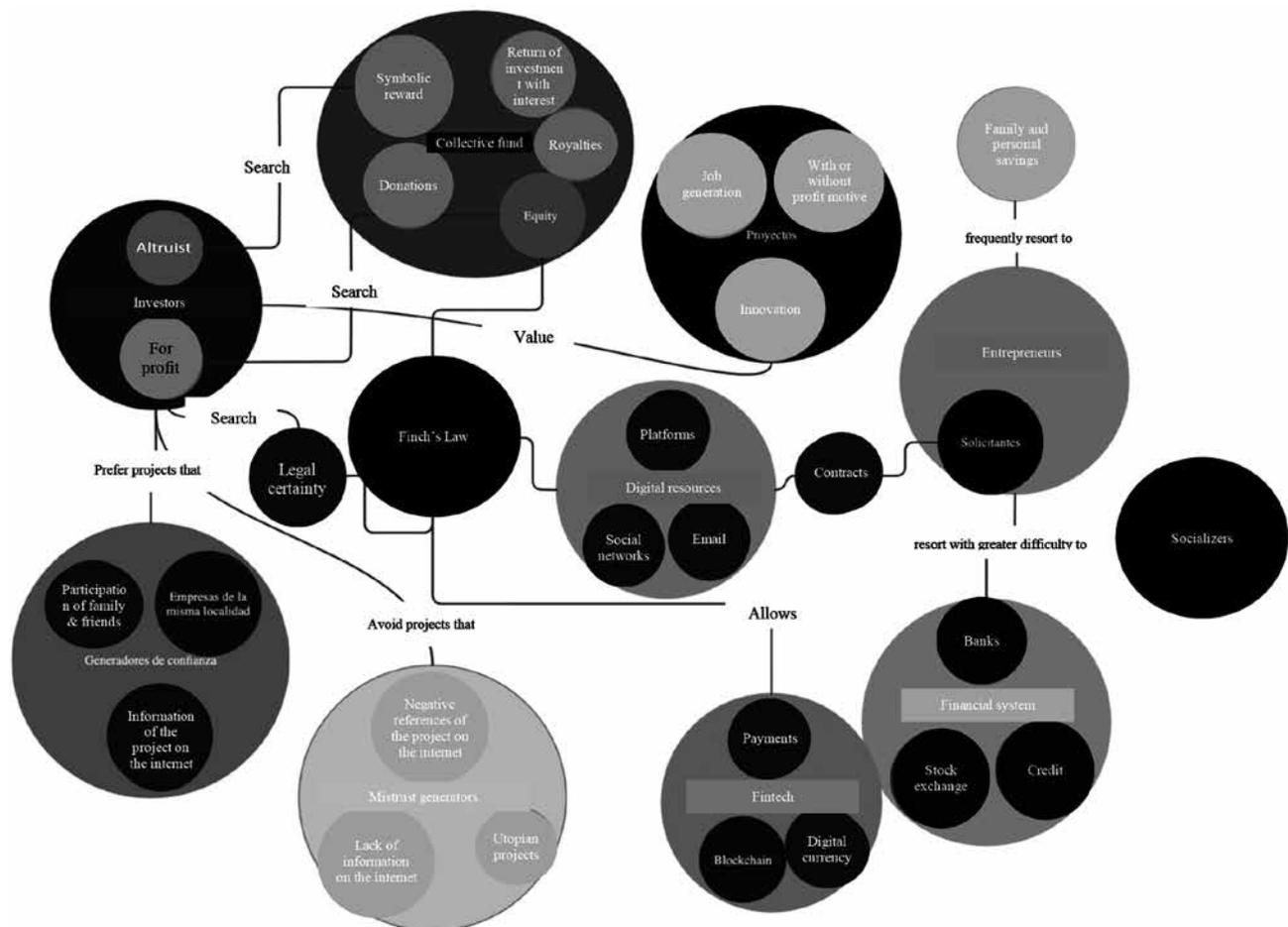
After the Varimax rotation, the matrix of components shows that the first factor groups, with high scores, the items related to the perception of the effects generated from the confinement due to COVID-19, while the second factor groups elements related to mediation, that is, the interests of the micro-investors, the aspects that generate trust and the preferred technological resources.

3. Results

3.1. Description of the crowdfunding ecosystem

The first step of the analysis is to draw the investor-entrepreneur network. The objective is to establish a starting point to trace the formation of specific associations. Figure 2 shows the generality of the elements identified between which some type of association can be established, that is, the “panorama”, according to the terminology of Latour (2008). This is what Correa-Moreira (2012) calls framework or actor-network.

Figure 2. Investor-entrepreneur ecosystem



Source: Own elaboration.

3.2. Analysis of responses and behaviors associated with the translation phases

The second part of the exercise consisted of analyzing the database constructed from the baseline survey to identify what Latour (2008) calls questions of interest.

First, descriptive statistics (frequencies and percentages) were used to characterize the results of the survey (Tables 3 and 4). For this, the statistical software XLSTAT was used.

Table 3. Sociodemographic profile of the sample

Variable	Categories	Frequency	%
Age	20 to 29 years old	133	55.649
	30 to 39 years old	17	7.113
	40 to 49 years old	32	13.389
	50 to 59 years old	29	12.134
	60 to 69 years old	9	3.766
	Less than 20 years old	19	7.950
Marital status	Married	54	22.594
	Other	10	4.184
	Single	175	73.222
What is your educational level?	Baccalaureate or technical studies	62	25.941
	Undergraduate	130	54.393
	Postgraduate	43	17.992
	High school	4	1.674
Sex	Female	147	61.506
	Male	92	38.494

Source: Own elaboration.

Table 4. Table of frequencies per question

Variable	Item	a	b	c	d	e	f	g	h
PCE	As a result of the health contingency associated with Covid-19 and its effects on the productive sector, you consider that your personal economic situation: a) Has improved; b) Has worsened; c) It remains the same as before.	8	148	86					
GAE	Which of the following effects associated with the Covid-19 contingency have you suffered?: a) I lost my job; b) A close relative lost their job; c) Someone I know lost their job; d) My income was reduced; e) My family's income was reduced; f) We close a personal or family business; g) I have a business whose income was significantly reduced; h) None of the above	33	78	55	89	125	15	35	38
SE	How easy or difficult is it for you to cover the expenses of the month?: a) I finish the month without problems and I have a surplus that I can invest to save or finance projects; b) Tight, but I cover the expenses of the month; c) Sometimes I can't make ends meet; d) Usually I can't make ends meet.	55	108	59	20				
EE	Do you currently have any paid work, even if it is temporary?: a) Yes, I work permanently for a company or institution; b) Yes, I have my own business; c) Yes, I work temporarily for a company or institution; d) Yes, I do temporary jobs on my own account; e) I am unemployed.	90	19	32	29	72			
GICF	Have you ever supported a collective financing initiative or crowdfunding campaign with money?: a) Yes; b) No, although I do know the concept of crowdfunding or collective financing; c) No and I am not familiar with the concept of crowdfunding either.	15	50	177					

Variable	Ítem	a	b	c	d	e	f	g	h
EAP	Which of the following factors would influence your decision to support a project through crowdfunding or collective financing? a) That the project is creative or innovative; b) That the support makes it possible to save one or more sources of employment; c) That the support allows the creation of one or more new jobs; d) That the support generates some symbolic benefit for me e) That the support generates some economic benefit for me f) That it be altruistic. For example, that supports people in situations of poverty; g) None of the above. I am not interested in supporting projects through crowdfunding.	87	89	103	35	82	65	18	
LG	If you were invited to participate in a collective financing campaign to rescue micro-businesses at risk of closure due to the health contingency derived from Covid-19, what projects would you prefer to support?: a) Companies of known people; b) Companies of my locality; c) Companies from any location, but that are in Mexico d) Companies from other countries; e) I am not interested in participating in this type of campaign.	104	132	77	7	15			
DACF	If you decided to participate in a collective financing campaign to rescue micro-businesses at risk of closure, what would be the amount of your contribution?: a) Less than 100 pesos; b) From 101 to 500 pesos; c) From 501 to 1000 pesos; d) From 1000 to 5000 pesos; e) More than 5000 pesos; f) I cannot contribute resources; g) I am not interested in providing resources	39	76	40	41	5	32	9	

Variable	Ítem	a	b	c	d	e	f	g	h
EI	What information about a project would you research to be willing to support it with microfinance?: a) General description of the company, its market, and its products; b) Profile of entrepreneurs or project managers c) Fiscal and financial situation of the business; d) History of the project e) Other	180	112	107	64	14			
BE	If you supported an entrepreneurial or micro-business project through a collective financing campaign, what would you expect to receive?: a) Nothing specific; b) Detailed information on the use made of the resources c) That the contributions are tax-deductible; d) That the contributions be returned to me as if it were a loan; e) That the contributions are returned to me with interest; f) That the contributions allow me to become a business partner; g) That the entrepreneurs send me a symbolic reward (for example a souvenir or a thank you letter)	34	117	49	40	38	83	33	
FA	Which of the following factors would influence to make a project attractive for microfinance purposes?: a) That it inspires confidence; b) That it be feasible, not very utopian c) That it be told in an attractive way; d) That it proposes to do things of high quality; e) That proposes any innovation or scientific and technological development; f) That it generates jobs and wealth; g) That it be supportive, that is, that it takes care of the most vulnerable; h) others	139	99	39	91	82	120	66	63
RM	Through what means would you prefer to receive information about a project to decide whether to support it?: a) An internet platform; b) Email; c) Social networks; d) By traditional mail; e) By telephone; f) Other.	121	148	73	21	36	13		

Variable	Ítem	a	b	c	d	e	f	g	h
FC	Which of the following factors would favor your confidence to support a project through crowdfunding?: a) That family or friends participate in it; b) That there are relatives or friends of people I know; c) That there are known people, even if we do not have family or friendship ties; d) That it has the backing of a recognized person or company; e) That there is sufficient information available about the project on the internet; f) That they have sent me information about the project through social networks; g) In general they do not inspire confidence in me, since I cannot know how they will use the money.	62	68	86	99	112	41	28	
FD	Which of the following factors would cause you to distrust when supporting a project through crowdfunding? a) There are no known people in the project; b) That it does not have an internet page; c) That there is no information about the project available on the internet; d) That it has bad references on the internet or on social networks; e) That it may be related to political interests; f) That it does not offer information on results to its investors or benefactors (accountability); g) That it seems too utopian or unrealizable.	56	74	124	133	124	124	76	

Note: In some questions the sum is greater than 242 because more than one answer was allowed.
Source: Own elaboration.

Here are some of the findings organized according to the phases of the translation process.

3.2.1. *Problematization*

84% of those surveyed state that they had had some degree of economic issues as a result of the contingency caused by COVID-19, ranging from the loss of a job, the unemployment of a relative or acquaintance, or a reduction in family income.

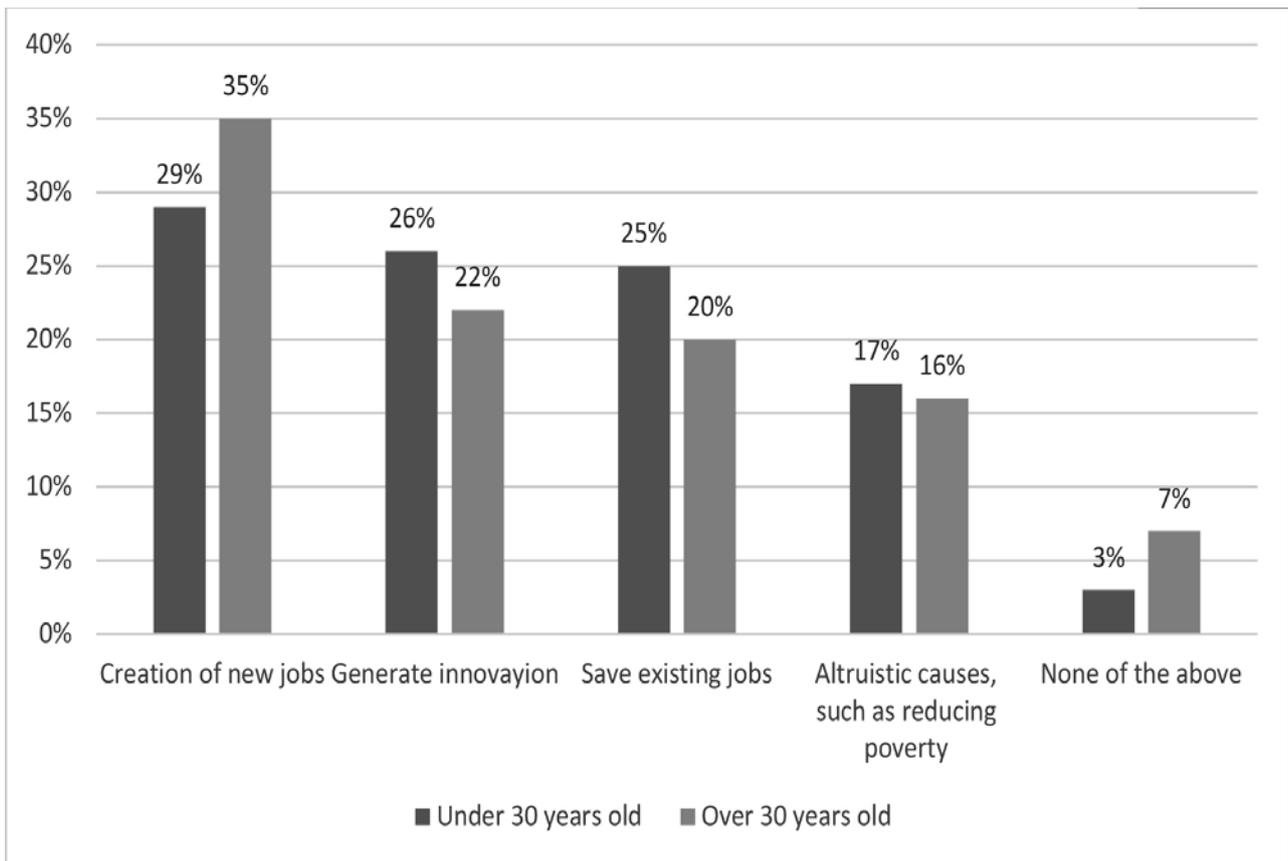
3.2.2. *Interest*

22% of those under the age of 30 know the concept of crowdfunding or collective financing, while in the population aged 30 and over, the percentage of people who know the concept is 17.5%. In those under 30 years of age, 29% would participate in crowdfunding campaigns if this allows creating new jobs, and 25% if it helps to save existing ones, while 26% prefer proposals that generate innovation and 17% focus on

altruistic causes. In those over 30 years of age, the greatest interest is directed towards creating new jobs (35%), innovation (22%), saving existing jobs (20%), and altruism (16%) (Figure 3).

The economic surpluses that can be used for collective financing have been reduced during the contingency; despite this, 23% of those surveyed state that they have surpluses that allow them to save and invest.

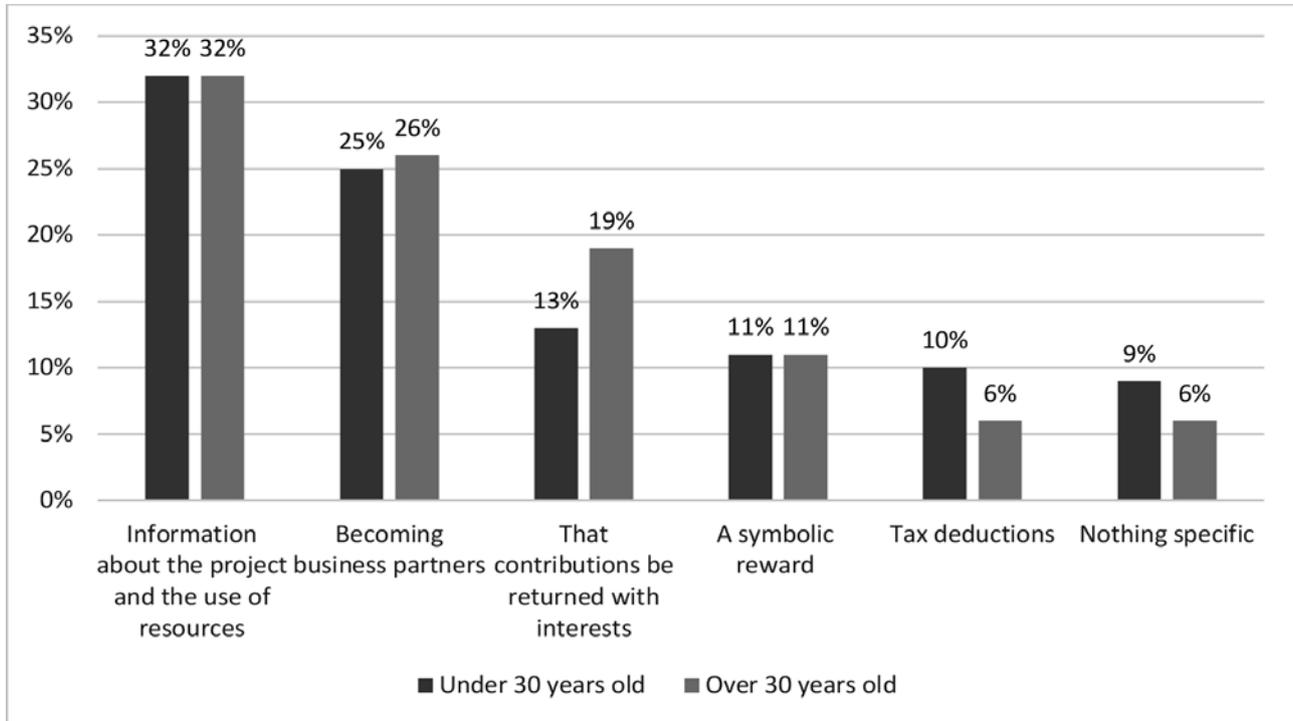
Figure 3. Aspects valued by potential investors in the projects to be funded



Source: Own elaboration.

In case of participating in a crowdfunding campaign, people under 30 years of age would expect to receive, in the first place, information about the project and the use of resources (32%); a segment of investors (25%) would expect to become project partners, and 11% would expect only a symbolic reward (Figure 4).

Figure 4. Expectations of potential investors when participating in the funding of microprojects



Source: Own elaboration.

3.2.3. Incorporation

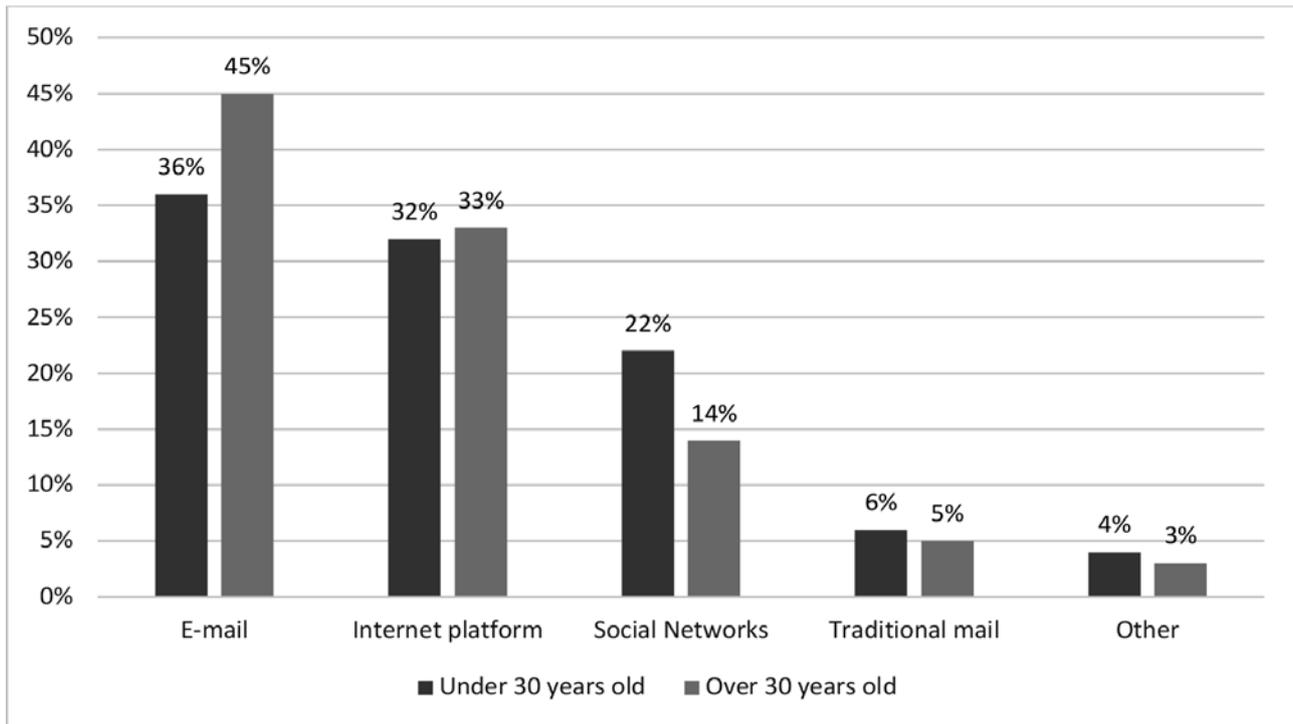
6.5% of those under 30 years of age have participated in a donation or collective financing campaign, while in those over 30 the participation level is 5.6%.

E-mail is mentioned as the predominant means of contact for those who would be interested in participating in CF campaigns (45% in the population aged 30 and over and 36% in those under 30), followed in importance by an internet platform (33% and 32% respectively). Social networks would have a greater presence in those under 30 years of age (22%) than in the older population (14%) (Figure 5).

Respondents express a preference for supporting projects from their own locality (39%) and from known people (31%). The information they would require to make the decision to support a project is the general description of the company, line of business, and products (37%); profile of entrepreneurs (23%); and the fiscal and financial situation of the project (22%).

The factors that encourage trust in projects, for collective financing purposes, are, firstly, that relatives participate in them, or relatives of known people (26%); that there is sufficient information available about them on the internet (22%); and that it has the endorsement of a recognized person or company (20%). On the other hand, the factors that generate distrust are, in the first place, bad references on the internet (18%) and that there is no information available about the project on the internet (17%).

Figure 5. Technology mediators preferred by potential investors



Source: Own elaboration.

3.2.4. Mobilization

According to Gunawong and Gao (2010), mobilization comprises both an implementation model and channels for the different actors to align their interests and actions to the route proposed by the focal actor. In Mexico there is a CF ecosystem, which brings together four donations and rewards platforms, five equity platforms, five real estate platforms, 11 loan platforms, and a royalty platform (Asociación de Plataformas de Fondo Colectivo-AFICO, 2020); however, its level of penetration is still incipient, since at least 78% of the people surveyed are unaware of the concept of collective financing. The existence of a focal actor (AFICO) and a participation mechanism (ecosystem and crowdfunding platforms) can be identified. In addition, there is a process of institutionalization of the proposed solutions (Fintech Law).

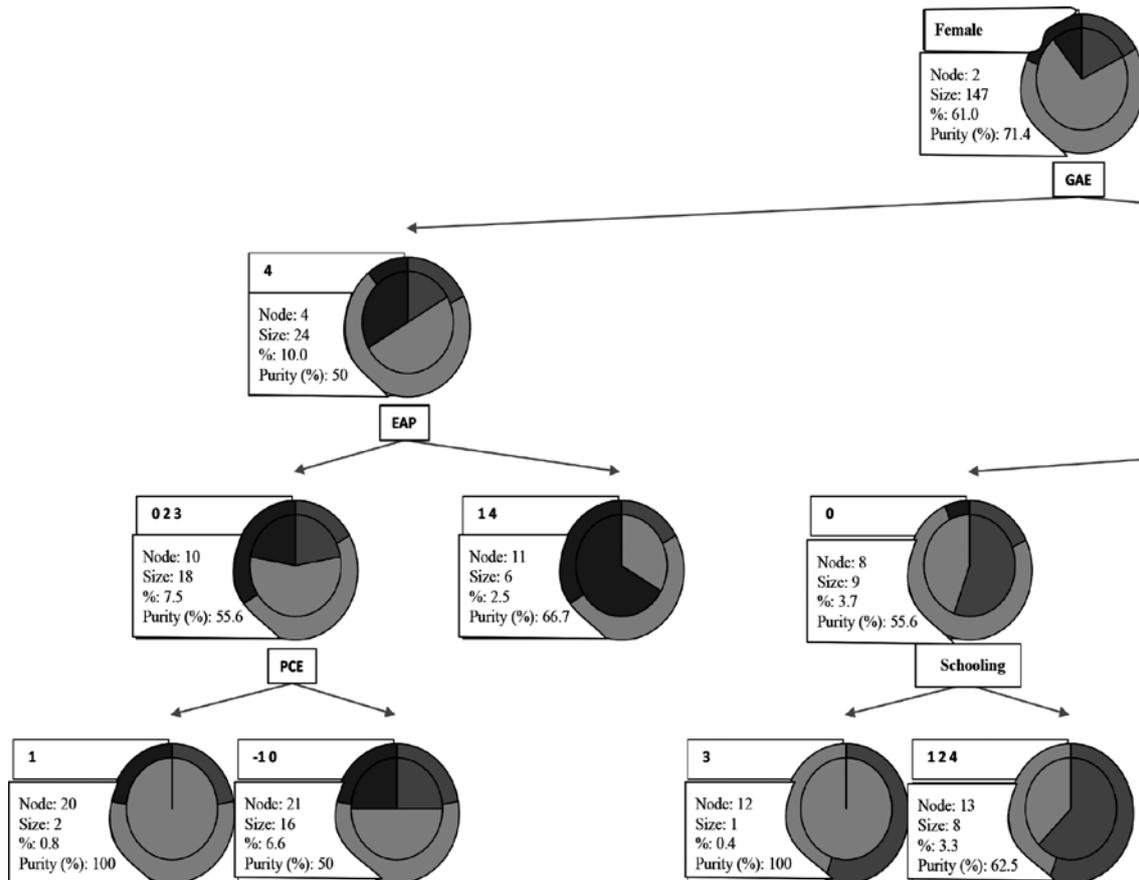
3.3. Identification of traceable associations

In the third stage of the analysis, the CHAID (Chi-Square Automatic Interaction Detection) algorithm with XLSTAT-2016 was used as a tool. It is a hierarchical segmentation predictive algorithm that works with a nominal or ordinal categorical dependent variable, from which as many partitions are created as independent variables are considered for the model. The CHAID uses the Chi-square to study all the values of each predictor variable, which helps to find how similar or associated the variables are and which is the most significant predictor (Sanz & Ponce de León, 2010). In this way, a classification tree in which each node is made up of similar categories of the selected variable is formed. As it is a hierarchical segmentation technique, it identifies homogeneous groups of subjects based on the values taken by the criterion variables based on the statistical significance of the explanatory variables (p-value).

To carry out the analysis, the Availability to make contributions via CF was taken as a criterion variable. It is a categorical variable with three possible values: 0 = Not

willing to make contributions; 1 = Would be willing to make micro-contributions (less than 1000 pesos), and 2 = would be willing to make capital contributions (greater than 1,000 pesos). First, the classification and regression algorithm was applied to the criterion variable and the predictor variables corresponding to the investor's profile (age, gender, education, perception of changes in the economic situation associated with COVID-19, degree of economic impact associated with COVID-19, and altruism vs. personal gain approach). A part of the results can be seen in Figure 6.

Figure 6. Classification tree for the criterion variable and the investor profile



Source: Own elaboration utilizing XLSTAT-2016.

Each node represents a homogeneous group with specific characteristics, whose predictive capacity occurs when conditions of the type If p, then q is met. For example, node 20 in Figure 6 shows us a group of people who are willing to make micro-capital investments (the criterion variable has a value of 1). The rules for this node are:

If PCE=1 (Perceive that the economic situation has improved); EAP = 2.3 (Would support projects that generate employment or that are creative and innovative); GAE = 4 (Someone you know lost their job during the contingency) Gen = 2 (Female) **then** Availability to Make Contributions = 1 in 100% of the cases.

Another example would be node 11, which profiles a group willing to make capital contributions (the criterion variable has value = 2). The rules for this node are:

If EAP = 1 or 4 (Would support projects that generate some economic benefit and have an altruistic purpose) and GAE = 4 (Someone known to me has lost their job

during the contingency) and Gen = 2 (Female) **then** Availability to Make Contributions = 2 in the 66.7% of the cases.

Next, the classification algorithm was replicated for the criterion variable and the variables related to the profile of the entrepreneurship projects: Type of economic benefits offered, local vs. global, factors that make a project attractive, technological resources associated with mediation, factors that generate trust, factors that generate mistrust. From this analysis 27 nodes emerged and, as an example, the rules of nodes 10 and 23 are explained.

If RM = 2 (The project is promoted by email and a platform); FC = 2, 3, 4, 5 (Family, friends, or acquaintances participate in the project, there is information about the project on the internet, entrepreneurs send information via email, platform or social networks); FA = 1, 2, 3, 4, 6, 7, 8 (The project is presented in an attractive manner, it is related to social goods, it produces jobs and wealth, it shows successful experiences, it shows testimonials from people it has supported and proposes some innovation or technological development) and LG = 1, 2, 3, (The project involves companies of well-known people, from my town or from another part of Mexico), **then** Availability to Make Contributions = 2 in 61.5% of the cases.

If FC = 2 (Family members or acquaintances participate in the project); RM = 1,2,3 (Entrepreneurs send information via email, platform, or social networks); BE = 1,2,3 (The project offers information on the use of resources, could return the contributions as if it were a loan or offers a symbolic reward) and FA = 5, 9, 10, 11 (The project inspires confidence, proposes to do things of high quality, it is feasible, not very utopian, it is supportive) and ELG = 1,2,3 (The project involves companies of well-known people, from my town or from another part of Mexico) **then** Availability to Make Contributions = 1 in 83.3% of the cases.

Finally, the confusion matrix is shown (table 6) in which the accuracy of the model can be appreciated. The number of correct answers, which appear in bold in the table, indicates that the model has a moderate predictive capacity, since it was only correct in 72% of the cases, therefore, in a subsequent investigation, it would be convenient to expand the sample and adjust the questionnaire to increase the reliability of the algorithm.

Table 6. Confusion matrix for the estimation sample

Estimated Real	0	1	2	Total	% correct
0	19	22	0	41	46,34%
1	3	147	5	155	94,84%
2	2	34	9	45	20,00%
Total	24	203	14	241	72,61%

Source: Own elaboration utilizando XLSTAT-2016.

4. Conclusions and discussion

The ANT methodology proposes to construct a narrative in which a network similar to a music sheet can be traced that links heterogeneous and inconstant actors from an oligoptic point of view, which allows seeing little but seeing well (Seijo, 2006). By following the sequence of problematization - interest - incorporation - mobilization, we

can trace the movements of the actor-network, which allows understanding the nature of the transactions that can occur between an investor and an entrepreneur.

In the framework of the investor-entrepreneur ecosystem, each action is motivated by the movements of other participants, their expectations, and their interests. This is what Greimas and Courtès (1982) call “actants”, that is, who at the same time acts and suffers an action. Tirado et al. (2005), define it as any entity that produces a relationship or acquires significance value, and that is defined by its ability to produce an action within a framework.

In response to our first research question, we can conclude that it is possible to trace the associations between actors, and that these occur through a series of tangible and intangible elements grouped in a factor that we call “mediation”. The classification and regression analysis allows us to visualize the way in which the actors of the network are linked through symbolic elements corresponding to this variable. For example, an investor is willing to commit his resources to a project when he sees it as reliable and attractive; this is especially the case when there is the participation of relatives or acquaintances; is from the same community as the investor; has a presence on the internet; provides information on the use of resources; and generates a social good, such as jobs or wealth, among other criteria.

Mediation has been widely discussed in the context of the ANT and has several meanings or dimensions. It can be understood as a translation of goals and as coordination between actors and actants (technical mediation), but also as a process of space-time folding or black box where “various elements, goals, actions given in other times and different spaces coexist compressed, folded, in a single actant” (Correa-Moreira, 2012, p. 69).

The mediation factor also provides the guideline to answer our second research question, as it suggests aspects that a micro-enterprise or an entrepreneurial project should gather to “produce an action within the framework”. In this sense, a microenterprise or project is significant for investors and can contribute to their mobilization if they answer affirmatively to key questions such as: Does it help to solve any problem that affects me? Allows me to get involved? And in doing so, does it provide me with a social or economic reward? Does it inspire me a reasonable level of confidence? Does it allow me to contribute resources according to my possibilities? Is it easy to access the project information? Does it involve well-known people or companies? Is it visible on the internet? Is there accountability for the resources it receives? Does it operate in my locality? What references do they have?

It is important to highlight how the presence on the internet, the positive and negative references about the business, and the possibility of accessing information on the use of resources, are key for a potential investor to consider that an entrepreneurial project is reliable, which gives us leads to the conclusion that digitization is an essential requirement not only to activate sales, but to access financing through CF. This is consistent with the findings of Ortega (2020), who highlights the importance of designing digital marketing strategies focused on the customer rather than the product. In addition to the above, the presence of relatives and acquaintances in the projects is relevant, since they are generators of trust, which in turn is related to the reliability of the contact network (Gamero & Ostos, 2020).

It is important to highlight that, in accordance with the advice of authors such as Belleflame et al. (2012), despite the fact that in the confinement scenario the income of most of the population was reduced, almost a quarter of economically active people still have economic surpluses that make them potential investors. Finally, the preference of potential investors for local projects denotes the positive effect of what Agrawal

et al. (2011) call “the geography of crowdfunding”, that is, the possibility of connecting investors with entrepreneurs almost without intermediaries.

With this information, it is possible to advance in the design of a collective financing platform that fulfills the role of mediator and helps to increase the flow of resources to microenterprises. Furthermore, the growing interest in micro-projects that support the creation or conservation of jobs at the local level, allows us to see that it is possible to develop solidarity networks of financing, with a decentralized structure and with a not necessarily lucrative approach. For practical purposes, this type of association could support the development of CF campaigns, and even in the development of algorithms that serve as a basis for the design of microfinance platforms.

References

- Abbasi, K., Alam, A., Du, M.A., & Huynh, T.L.D. (2020). FinTech, SME efficiency and national culture: evidence from OECD countries. *Technological Forecasting and Social Change*, 163, 120454. <https://doi.org/10.1016/j.techfore.2020.120454>
- Agrawal, C., Catalini, C., & Goldfarb, A. (2011). Offlinerelationships, distance made the internet: the geography of crowdfunding. National Bureau of Economic Research. <https://bit.ly/394j9eN>
- Asociación de Plataformas de Fondeo Colectivo-AFICO (2020). Ecosistema del crowdfunding mexicano. <http://bit.ly/36GiE9u>
- Baltar, F., & Gorjup, M. T. (2012). Muestreo mixto online: Una aplicación en poblaciones ocultas. *Intangible Capital*, 8(1), 123-149. <http://dx.doi.org/10.3926/ic.294>
- Bahena, L.E.M., Velázquez, A.R., & Hernández, A.F. (2017). El crowdfunding en México, una alternativa real de financiamiento e inversión para la mujer emprendedora. *UPGTO Management Review*, 2(2), 1. <http://bit.ly/39XsvIR>
- Banco de México (Banxico) (2015). Reporte sobre las condiciones de competencia en el otorgamiento de crédito a las pequeñas y medianas empresas (PYME). México. <https://bit.ly/2LQ4yLl>
- Banco Interamericano de Desarrollo (2020). ¿Cómo impactará el COVID-19 al empleo? Posibles escenarios para América Latina y el Caribe. <https://bit.ly/3jqInYE>
- Belleflamme, P., Lambert, T., & Schwienbacher, A. (2012). Crowdfunding. Tapping the wright crowd. *Journal of Business Venturing*, 29(5), 585-609. <https://doi.org/10.1016/j.jbusvent.2013.07.003>
- Demirguc-Kunt, A., Klapper, L., Singer, D., & Van Oudheusden, P. (2015). *The Global Findex Database 2014: measuring financial inclusion around the world*. <https://bit.ly/3p2R0dS>
- Echeverría, J., & González, M. I. (2009). Actor-network theory and the thesis of technoscience. *Arbor-ciencia Pensamiento y Cultura*, 185(738), 705-720. <https://doi.org/10.3989/arbor.2009.738n1047>
- Gamero, H., & Ostos, J. (2020). Revisión sistemática de literatura sobre factores clave en la identificación de oportunidades de negocio. *Retos. Revista de Ciencias de la Administración y Economía*, 10(20), 307-327. <https://doi.org/10.17163/ret.n20.2020.07>
- García, M.A. (2017). Encuentro en el laboratorio: la teoría del actor-red y la escena musical pilagá. *Indiana*, 34(1), 309-329. <https://doi.org/10.18441/ind.v34i1.309-329>
- García de León, S., & Garibay, R. (2016). Financiamiento alternativo: crowdfunding para pequeños y medianos proyectos empresariales e iniciativas sociales. *Hospitalidad ESDAI*, (29), 35-52. <https://bit.ly/2M5Y4ru>
- González, J., Valdés, F., & Saavedra, M. (2021). Factores de éxito en el financiamiento para Pymes a través del crowdfunding en México. *Revista Mexicana de Economía y Finanzas Nueva Época REMEF*, 16(2) 1-23. <https://doi.org/10.21919/remef.v16i2.471>
- González, K.M. (2018). An Overview of Fintech in the Mexican Entrepreneurial Ecosystem. *Network Intelligence Studies*, 6(12), 141-148. <http://bit.ly/39T2tpM>
- Greimas, A., & Courtès, J. (1982). *Semiotics and Language. An Analytical Dictionary*. Indiana University Press.

- Gunawong, P., & Gao, P. (2010). *Challenges of eGovernment in Developing Countries: actor-network analysis of Thailand's smart ID card project*. Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development (pp. 1-9). ACM Press. <https://doi.org/10.1145/2369220.2369235>
- Heckathorn, D. (1997). Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems*, 44(2), 174-199. <http://dx.doi.org/10.1525/sp.1997.44.2.03x0221m>
- INEGI, C.E. (2019). Censos económicos 2019. Resultados oportunos. <https://bit.ly/3ixpgLZ>
- INEGI, EDN (2020). Estudio sobre la demografía de los negocios 2020. Primer conjunto de resultados. <https://bit.ly/3sKWbRK>
- Iyamu, T., Nehemia-Maletzky, M., & Shaanika, I. (2018). The use of activity theory and actor network theory as lenses to underpin information systems studies. *J. Syst. Inf. Tehcnology*, 20(2). <http://dx.doi.org/10.1108/JSIT-10-2017-0098>
- Jarrahi, M.H., & Sawyer, S. (2019). Networks of innovation: the sociotechnical assemblage of tabletop computing. *Research Policy*, X(1), 100001. <https://doi.org/10.1016/j.repolx.2018.100001>
- Latour, B. (2008). *Reensamblar lo social. Una introducción a la teoría del actor-red*. Manantial.
- Law, J. (2009). Actor network theory and material semiotics. *Social theory*, 141. <https://bit.ly/2YMaMPq>
- León, E.L., & Saavedra, M.L. (2018). Sources de financiamiento para las MIPYME en México. Cambio climático. Caso de estudio: evaluación del Programa del Cambio Climático del Estado de Chihuahua, 113. <https://bit.ly/3qQ5LRV>
- Marpsata, M., & Razafindratsimab, N. (2010). Survey methods for hard-to-reach populations: introduction to the special issue. *Methodological Innovations Online*, 5(2), 3-16. <https://doi.org/10.4256/mio.2010.0014>
- Correa-Moreira, G. (2012). El concepto de mediación técnica en Bruno Latour Una aproximación a la teoría del actor-red. *Psicología, Conocimiento y Sociedad*, 2(1), 56-81. <https://bit.ly/3b6rVKl>
- Nelson, A. (2020). COVID-19: Capitalist and postcapitalist perspectives. *Human Geography*, 13(3), 305-309. <https://doi.org/10.1177/1942778620937122>
- Ortega, M. (2020). Efectos del Covid-19 en el comportamiento del consumidor: Caso Ecuador. *Retos. Revista de Ciencias de la Administración y Economía*, 10(20), 233-247. <https://doi.org/10.17163/ret.n20.2020.03>
- Oxford Analytica (2019). "Mexico fintech sector to boom as the economy struggles". Expert Briefings. <https://doi.org/10.1108/OXAN-DB245174>
- Ruiz, R. (1999). Las traducciones dinámicas de las series temáticas: propuesta de una nueva clasificación. En *La representación y la organización del conocimiento en sus distintas perspectivas. Su influencia en la recuperación de la información*. Actas del IV Congreso ISKO-España EOCONSID 99. 22-24 de abril de 1999, Granada (pp. 211-216). Universidad de Granada. <https://bit.ly/3sEiTKK>
- Schwienbacher, A., & Larralde, B. (2010). Crowdfunding of small entrepreneurial ventures. *Handbook of entrepreneurial finance*, Oxford University Press, Forthcoming. <http://dx.doi.org/10.2139/ssrn.1699183>
- Salido, N., Rey, M., Álvarez, L.I., & Vázquez, R. (2019). Determinants of success of donation based crowdfunding through digital platforms: The influence of offline factors. *CIRIEC - España, Revista de Economía Pública, Social y Cooperativa*, (95), 119-141. <https://doi:10.7203/CIRIEC-E.95.13001>
- Salvador, D. (2018). La inversión privada en el Crowdfunding lucrativo: crecimiento, nuevas modalidades y constitución de Plataformas de financiación participativa. *Revista Española de Capital Riesgo*, 2, 5-26. <http://bit.ly/3oYfN2C>
- Sánchez, M., Zalba, P., & Zoppis, J. (2020). Evolution of Fintechs in Argentina. *Dimensión Empresarial*, 18(4). <https://doi.org/10.15665/dem.v18i4.2322>
- Sanz, E., & Ponce de León, A. (2010). Claves en la aplicación del algoritmo Chaid: un estudio del ocio físico deportivo universitario. *Revista de Psicología del Deporte*, 19(2), 319-333. <https://bit.ly/3aE9XgQ>
- Seijo, G. (2006). Reseña de "Reassembling the social. An introduction to Actor-Network-Theory" de Bruno Latour. *Redes*, 12(24), 151-161. <https://bit.ly/3sHnSuW>

- Secretaría de Hacienda y Crédito Público, SHCP (2018). Ley para regular las Instituciones de Tecnología Financiera. <https://bit.ly/2Y0Itfs>
- Tirado, F., López, D., Callén, B., & Domènech, M. (2008). La producción de fiabilidad en entornos altamente tecnificados. Apuntes etnográficos sobre un servicio de teleasistencia domiciliaria. *Papeles del CEIC*, 2(38). Universidad del País Vasco. <https://bit.ly/3c8BSYy>
- Zedeli, K. (2019). *The role of Fintech in promoting financial inclusion in developing countries: the case of Mexico*. (Master Thesis). Berlin School of Economics and Law. <http://bit.ly/2NqFDP7>