

Article

Corruption Shock in Mexico: fsQCA Analysis of Entrepreneurial Intention in University Students

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Abstract: Entrepreneurship is the basis of the production network, and thus a key to territorial development. In this line, entrepreneurial intention has been pointed out as an indicator of latent entrepreneurship. In this article, the entrepreneurial intention of university students is studied from a configurational approach, allowing the study of the combined effect of corruption perception, corruption normalization, gender, university career area, and family entrepreneurial background to explain high levels of entrepreneurial intention. The model was tested with the fsQCA methodology according to two samples of students grouped according to their household income (medium and high level: $N = 180$; low level: $N = 200$). Stress tests were run to confirm the robustness of the results. This study highlights the negative impact produced by corruption among university students' entrepreneurial intention. Furthermore, the importance of family entrepreneurial background for specific archetypes like female, STEM, and low household income students is pointed out, as well as the importance of implementing education programs for entrepreneurship in higher education, and more specifically in STEM areas. Policies focused on facilitating the access to financial resources for female students and low household income students, and specific programs to foster female entrepreneurship, are also recommended.

Keywords: corruption perception; corruption normalization; gender; entrepreneurial intention; STEM; family entrepreneurial background; fsQCA; household income



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1. Introduction

Studies on territorial development point to the production network as one of the fundamental pillars to generate well-being and prosperity [1,2]. Thus, the study of entrepreneurial activity takes on special relevance, since it is the variable on which the productive network is based [3]. However, the microeconomic characteristics of each country prevent a single solution from being offered for the promotion of entrepreneurship from public policies [4], which underlines the need to adapt these policies to the different casuistry that surrounds entrepreneurial activity in each territory [5]. In this context, many authors point out the importance of studying entrepreneurial intention to predict entrepreneurship, as it is considered an indicator of latent entrepreneurship [6,7]. This is because it represents “a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future” [8] (p. 676).

The phenomenon of entrepreneurship has been studied by considering the internal determinants, as well as the effect of the context in which it develops, since the environment surrounding the entrepreneur exerts an important influence [9,10]. Furthermore, the external and internal factors that affect entrepreneurship are interrelated [11]. In the same way, the entrepreneurial intention is determined by the characteristics and abilities of each individual, their life experiences, and their context [12]. Mexico has high levels

of corruption in its institutions, as reflected in the transparency index prepared by Transparency International [13], in which it ranks 124th out of a total of 180 countries analyzed. A deficient or inadequate regulation favors the appearance of corruption [14,15], and this is the case in Mexico concerning the ease of doing business, as highlighted by the World Bank in *Doing Business 2020* [16]. Corruption affects companies both directly and indirectly, and therefore also entrepreneurial activity [17]. However, in certain specific contexts in which there is a bad business climate, some studies have found a positive relationship between corruption and entrepreneurship [18], which justifies delving into this anomaly in the stage preceding the entrepreneurial event. In the same way, in Mexico, there is still a gender gap in terms of entrepreneurship, as reflected in the Global Entrepreneurship Monitor [19], which highlighted that in 2019, the country had a female/male ratio of Total early-stage Entrepreneurial Activity—TEA of 0.91. This gap is accentuated in the businesses related to STEM—the acronym for “Science, Technology, Engineering and Mathematics” [20,21]—which, however, are the ones that contribute the most to the development of the territories due to their great capacity to generate innovation [22,23]. Finally, the literature points out the interrelationship between individuals’ family entrepreneurial background and their probability to start an entrepreneurial project [24].

Studies focused on the entrepreneurial phenomenon have traditionally used samples from higher-education students [25], since these individuals, due to their age and educational level, are the most likely to carry out an entrepreneurial project [26]. This also occurs in the specific case of the study of entrepreneurial intention [27], in which studies carried out with samples of university students are very common [28,29].

Nowadays, the importance of offering person-oriented research to explain the entrepreneurial phenomenon is highlighted [30], and more specifically to clarify the role of internal variables in the configuration of entrepreneurial intention [25,31]. Along these lines, authors such as Gartner [32] suggest that research in the area of entrepreneurship should focus on showing profiles in which the internal variables of individuals are combined and interact with variables of the social context surrounding entrepreneurs. Thus, this study addresses, from a cognitive point of view, the combined effect of several internal variables, some influenced by the environment, which may explain high levels of entrepreneurial intention among Mexican students. This article provides a novelty in the literature by addressing a field of study with a very limited amount of empirical evidence, contributing to the construction of the theory through an adequate methodology for the development of multilevel theory. We chose fsQCA as the methodology to carry out this analysis since, unlike symmetry-based methodologies such as regressions, it offers the possibility of studying the combined effect of different individual characteristics, allowing equifinality and causal asymmetry, and thus providing information that other statistical–inferential methods do not contemplate [33]. This research addresses, from a configurational approach, the effect of two internal variables related to corruption (corruption perception and corruption normalization), two socio-demographic variables (gender and the family entrepreneurial background), and the degree area (STEM or not STEM), on the entrepreneurial intention among students of the Technological University of Zacatecas (Mexico). The analysis was carried out on two subsamples differentiated by the level of household income (High Household Income—HHI, and Low Household Income—LHI), to obtain more specific information and make recommendations for policymakers.

This paper is structured as follows. First, it highlights the importance of studying entrepreneurial intention in the context of economic development, exposing the paradigm in which the research is conducted. In addition, as part of the literature review, a deep insight is offered on corruption perception, corruption normalization, gender, STEM studies, and family entrepreneurial background as factors that can determine an individual’s entrepreneurial intention. In the same way, the propositions related to the study are presented. In the following sections, the applied methodology is explained, the research results are presented, and the main findings are discussed. Finally, the conclusions, limitations of the study, and future lines of research are presented.

2. Theoretical Background, Conditions, and Propositions

2.1. Economic Development, Entrepreneurship, and Entrepreneurial Intention (EI)

Regions, and specifically countries, boost their economic growth thanks to entrepreneurship, which favors the economic dynamics of the territories [34]. Furthermore, favoring the development of entrepreneurial activity has positive effects on economic development, since, as pointed out by Levie and Autio [35], entrepreneurship stimulates production factors and their efficiency, and favors the appearance of innovations [36]. The capacity of the entrepreneurial phenomenon to encourage innovations and create jobs is of special relevance for the economic development of the territories [37], since it generates prosperity and well-being for citizens [35,38]. In this way, entrepreneurship, as the basis of the production network, is a key element for territorial development [2] and justifies the study of its dynamics.

Moriano [39] stated that entrepreneurship is a sequential process that goes beyond the start-up phase. Specifically, it incorporates a pre-launch phase, a launch phase, and a post-launch phase. Stages prior to the act of entrepreneurship are difficult to observe, as they remain in the field of intentions [10,39]. In this sense, the intention to start an entrepreneurial project represents the first stage of the entrepreneurial process [40] and is of crucial relevance, since it represents the prior decision that an individual must make before becoming an entrepreneur [41,42]. Thus, understanding entrepreneurial intention is key to understand the entrepreneurial process [41]. This fact explains why EI is considered as a predictor of entrepreneurial behavior [8,43,44] and an indicator of latent entrepreneurship [6,7]. In this study, EI is considered as the conscious will of a person to start a business in the future [8,31].

2.2. Corruption Perception (COPER) and Corruption Normalization (CONOR)

The existence of corruption in public institutions has negative consequences on the well-being of citizens, increases inequality, and harms entrepreneurship [45]. Specifically, the institutional environment directly affects entrepreneurial activity [17]. On one hand, to the extent that there are institutions that favor the emergence of opportunities and generate economic growth, this will have a positive effect on business activity, greatly facilitating the success of entrepreneurs [46,47]. On the other hand, when corruption exists within institutions, entrepreneurial activity is seriously affected [48]. This is because corruption lowers institutions' quality to the extent that it reduces the correct redistribution of resources, increases capital cost, and slows the production-network development [49]. Furthermore, the existence of corruption generates uncertainty around investment projects, which increases transaction-related costs and increases inefficiency of market and business activity [50,51]. Consequently, the absence of corruption control reduces the performance of companies and their ability to generate innovations [52,53].

The evidence obtained shows that there is an inverse relationship between corruption and entrepreneurial activity; however, there are differences at the cognitive level between individuals from the same territory that affect their COPER differently. This fact causes differences between the perception of different individuals, and also between the levels of real corruption and what is perceived by people [54–56]. Since this study is person-oriented, it focuses on the subjective element of corruption; that is, COPER and its possible inhibiting effects on EI. In this way, this research proposes the existence of a causal relationship between the COPER of university students and their EI level.

However, some authors found a positive relationship between corruption and entrepreneurship [18], and explained that when there is a bad business climate, characterized by inefficient or inadequate regulation of business activity, individuals perceive corruption as an opportunity to accelerate the bureaucratic processes that exist around entrepreneurial activity. In this way, Dreher and Gassebner [18] indicated that in these countries, entrepreneurs perceive the possibility of using bribes with public officials as a very interesting shortcut that reduces the problems and times of these procedures. This “grease the wheels” argument can be explained by the normalization of corruption that appears in countries

where people coexist with corruption for a long time [57] (Guerber et al., 2016). This normalization of corruption occurs in societies through three interrelated effects: the institutionalization, rationalization, and socialization of corruption [57,58]. The first refers to the fact that a corrupt act becomes routine within institutional structures and processes, the second refers to the development of selfish behaviors that justify and even give value to corrupt acts, and the third indicates the phenomenon by which newcomers are led to think that corruption is permissible or even desirable in society [58]. In this context, it could be argued that when COPER coexists with corruption normalization, this has a positive effect on EI, since corruption is presented as an opportunity and not as a threat. Thus, this study proposes the existence of a causal relationship between the normalization of corruption in university students and their level of EI.

2.3. Gender (GEN)

Regarding EI, the differences between men and women are largely produced by the influence of the environment that surrounds them, which is accentuated in the case of more traditional cultures [59]. This phenomenon explains that, worldwide, women are less likely to start a business [60,61], and that in the case of Latin America, this probability is lower in comparison with those of other more-developed regions [62–64].

Women in Latin America have fewer incentives to undertake a business project than men [64,65]: they are more affected by the corruption of institutions [66,67], find difficulties in accessing services related to business development and training systems [68–70], and have problems joining professional networks in which they can access essential information to start and manage a business, as well as find easier access to financial and technological resources and marketing channels [69,70]. Furthermore, the inequality present in the region penalizes women even when they are trained, motivated, and have the necessary knowledge to be able to start a business [65]. One of the main obstacles they must face is related to obtaining financial resources [71], which, in the end, forces them to focus on their ability to save before starting an entrepreneurial project [72].

This set of barriers that women in Latin America must face negatively conditions their perception of entrepreneurship and reduces, in most cases, their motivation to start a business to the cases in which they are driven by necessity [73], pointing to self-employment as the main motivation of women who undertake a business venture [69]. Thus, considering the influence of the environment surrounding women in Latin America that interposes all these barriers on their path to entrepreneurship, this study proposes the existence of a causal relationship between the gender of university students and their EI.

2.4. STEM Studies

The areas of knowledge related to the fields of Science, Technology, Engineering and Mathematics are known as STEM. This type of knowledge area is directly related to the generation of innovations, competitiveness improvements, and economic and social growth, which ends up having a positive impact on well-being [74,75]. Thus, several studies have linked the creation of new technology-based firms, focused on STEM areas, with economic growth and development [4,76], since innovative entrepreneurship contributes significantly to value creation and the improvement of economic dynamics. This is due, among other things, to its job creation capacity [77]. This explains the growing interest in this type of entrepreneurship, not only within academia, but also within national and supranational organizations such as the Organization for Economic Co-Operation and Development—OECD or the United Nations, which have developed some programs focused on attracting and retaining people within STEM areas [21].

However, there are not many studies that have been developed relating STEM areas and EI [78]. In some cases, they select samples of students from the area of business vs. non-business [79], others use samples from the field of engineering [28], and on very few occasions, both groups are compared [80,81]. In the same way, few studies indicate the degree subject showing the dichotomy of STEM/no STEM as an element to

consider when measuring the level of EI [78]. Given the interest in the STEM collective and its potential in territorial development, this study proposes, in an exploratory way, the existence of a causal relationship between the degree subject and the level of EI. In the same way, the combination of this condition with some others in the analysis will show specific profiles that characterize potential entrepreneurs and, in this way, offer interesting information for policymakers. In this sense, the relationship between gender and STEM should be highlighted, since, although women are underrepresented in this area in terms of entrepreneurship, “women entrepreneurs have a 5% greater likelihood of innovativeness than men” [82] (p. 9), which reflects the potential of this group.

2.5. Family Entrepreneurial Background (FEB)

The literature offers evidence that suggests that the probability that an individual feels an interest in entrepreneurship increases if they come from a family in which other members have undertaken entrepreneurial projects [83,84]. Furthermore, various studies find that entrepreneurs often come from entrepreneurial families [85,86], a fact by which the option of self-employment becomes more attractive [87,88] and increases the EI [89]. In this way, it can be suggested that the family environment can function as an antecedent for entrepreneurship [24].

The influence of the family, and more specifically in the case of family entrepreneurs, has been studied from a sociological perspective in which entrepreneurs make their social capital and social networks available to potential entrepreneurs [90,91]. However, this is not the only way in which the FEB exerts an influence on individuals, since having entrepreneurial relatives also serves as a learning model for individuals, improving their attitudes and behaviors related to entrepreneurial activity [92]. In this way, the values and norms of close family members can determine the EI of individuals [93]. Thus, parents act as role models for their children [92]. This means that, for example, these children have had more experiences related to proactivity, risk-taking, and innovation [93]. In this context, Marques et al. [93] highlighted that the learning processes that take place in the family environment favor and reinforce the appearance of strong attitudes and intentions related to entrepreneurship, since children who have grown up in business environments have more learning experiences related to entrepreneurship. Thus, living in a family with a business background makes individuals progressively enter the world of entrepreneurship [94] and offers the option of doing things differently, becoming a motivational factor for the child [95]. Mexican culture is very collectivist, which implies that individuals interact regularly with their extended family members with whom they maintain strong ties [96,97]. As a consequence, to study the influence of the FEB, in this research the extended family model was used [98], including grandparents and uncles in the family unit.

Considering the evidence presented, this study proposes the existence of a causal relationship between the university students' FEB and their level of EI.

The theoretical framework allows the formulation of the following causal model and propositions:

$$EI = f(\text{COPER, CONOR, GEN, STEM, FEB})$$

Proposition 1. *None of the five causal conditions (COPER, CONOR, GEN, STEM, FEB) is necessary to merit a prediction of high levels of EI among university students.*

Proposition 2. *The five causal conditions form multiple configurations that are sufficient to predict a high level of EI among university students.*

3. Materials and Methods

A questionnaire with 23 questions (Appendix A) was provided, including in the first part items of academic (degree name) and socio-demographic (gender, age, household income and family entrepreneurial background) types.

Following Liñan and Chen [26], the questionnaire included items for the analysis of the EI of university students according to a type 1–3 Likert scale, where 1 meant “totally disagree” and 3 “totally agree”. According to the Transparency International Corruption Perception Index [99,100], students were asked about their perception of corruption and their degree of normalization while assessing environmental corruption. These questions were evaluated by means of a Likert scale of type 1–5, where 1 meant “totally disagree” and 5 “totally agree”. In our study, we used 1–3 Likert scales to obtain the polarized information that was requested in the EI variable and 1–5 Likert scales for COPER and CONOR variables (Appendix B).

The students’ responses to question 1 (degree name) were tabulated to obtain the variable type of university career (STEM or not STEM), generating a dichotomous variable (0, 1). Likewise, the students’ responses regarding question 4 (household income) were used to divide the sample ($N = 380$) into two subsamples (medium and high level: $N = 180$; low level: $N = 200$), applying a threshold of MXN 11,600.

The variables EI, COPER, and CONOR were constructed using the eigenvalues resulting from two exploratory factor analyses (EFAs) performed with the statistical software IBM SPSS (v24). The EI EFA was carried out on questions 6–10 (Appendix B), and the EFA on corruption perception and normalization of environmental corruption (COPER, CONOR) was carried out according to questions 11–23 (Appendix B). The first EFA gave rise to a factor (7–10 questions), the eigenvalues of which were taken to configure the EI variable. The second EFA resulted in two factors (questions 12–15 and questions 20–23, respectively), whose two eigenvalues were taken to configure the variables COPER and CONOR.

Table 1 reports on the values of the Bartlett sphericity test and the sample adequacy measure for the factors obtained after the analysis of EI and the perception and normalization of environmental corruption (COPER, CONOR). Appendix B reports the methodological detail of the EFAs carried out in this study.

Table 1. Exploratory factor analysis (EFA) results.

Factors Variables Items	Entrepreneurial Intention		Corruption	
	1		2	
	EI		COPER	CONOR
	4		4	4
Cronbach’s alpha	0.867		0.889	
KMO (Kaiser–Meyer–Olkin)	0.829		0.805	
Barlett test (sig.)	0.000		0.000	

Source: authors’ elaboration.

The correlation analysis between the variables EI and COPER corroborated a positive relationship ($r = 0.170$; $p < 0.001$). Table 2 reports on the descriptive statistics for the variables differentiated by degree type (STEM vs. not STEM) and by gender.

Table 2. Descriptive statistics.

	STEM	GEN	IE	COPER	CONOR
Mean	Non-STEM	Male	0.224	0.203	−0.0182
		Female	−0.0633	−0.0758	−0.0530
	STEM	Male	0.0248	0.108	0.0590
		Female	−0.156	−0.273	0.0248
Standard deviation	Non-STEM	Male	0.878	0.882	1.02
		Female	0.952	0.915	0.930
	STEM	Male	0.926	0.970	0.894
		Female	0.939	1.00	1.01

Source: authors’ elaboration.

The proposed model, designed to explain the result (EI), included five variables: two continuous variables (COPER and CONOR) and three categorical variables (GEN, STEM,

FEB). To test the model ($EI = f(\text{COPER}, \text{CONOR}, \text{GEN}, \text{STEM}, \text{FEB})$), we carried out a qualitative comparative analysis of fuzzy sets (fsQCA).

fsQCA is a methodology designed for the systematic analysis of cases that allows researchers to find causal patterns that determine the result or outcome [101,102]. This methodology was originally designed for the analysis of small or medium-sized samples [103,104]. However, fsQCA does not offer any mathematical limitation for its application in large samples, guaranteeing valid results for this type of analysis [105,106]. This methodology is based on Boolean logic and allows the identification of need relationships and sufficiency relationships between a set of independent variables (conditions or attributes) and the dependent variable (outcome). A condition is necessary when it must be present for the outcome studied to occur. The absence of necessary conditions implies the existence of multiple combinations of conditions that can give rise to the outcome studied. The factual analysis of the available cases makes it possible to identify the pathways followed by the profiles of students who manifest a high level of EI.

In addition, fsQCA allows the identification of counterfactual evidence, described as combinations of attributes that could occur and have not been observed within the available sample [102]. Therefore, fsQCA is an adequate methodology for the development and profiling of a theoretical scheme [107], as well as the evolution of multilevel theory [108]. In addition to facilitating the validation of hypotheses, it allows the generation of new knowledge based on the analysis of the different causal relationships of the observed phenomenon. This insight is especially useful in case studies in which the research field falls between diverse and complex theoretical frameworks. When the research areas find contradictory evidence on many occasions or, as in our study, when it comes to novel and little explored relationships. In all cases, the research design must guarantee methodological control [109] and facilitate the understanding of the criteria applied throughout the process, especially in the calibration phase of the variables.

fsQCA is a variant of the original QCA methodology, and is applied in fuzzy sets. These types of sets retain most of the essential mathematical properties of sharp sets [110]. Unlike other methodologies, fsQCA does not compare individual variables, but rather analyzes complete combinations of simultaneous conditions, and allows researchers to overcome the limitations of inferential statistical techniques [33]. Furthermore, this methodology perfectly captures the idea of causal asymmetry [105], because a certain attribute that occurs in a specific directionality does not necessarily offer the same result as its opposite directionality.

Following Ragin [102], it is known that fsQCA allows the deconstruction of a single symmetric analysis in two different asymmetric analyzes of set theory, one focused on sufficiency and the other on necessity. In addition, this methodology allows the display of the advantages of equifinality in the analysis [111], since the same phenomenon (outcome) can be explained through different combinations of attributes grouped in different causal configurations (pathways or recipes). fsQCA has been used in multiple areas of the social sciences (e.g., [112]), highlighted especially in those of management and entrepreneurship [30].

Our fsQCA analysis was performed with the fs/QCA 3.0 software, and the methodological procedure followed four sequential steps [102,105,113]:

1. Calibration: in this step, the variables (dependent and independent) must be calibrated using a logarithmic function so that they can be analyzed based on set theory. The calibration process involves recalculating all continuous variables so that they are integrated into the continuum 0–1, establishing thresholds that allow determining the membership of a value to one of the following three sets: (1) fully inside; (0.5) maximum ambiguity; (0) fully outside. Following Misangyi and Acharya [114], this study used the continuous variable calibration method with percentiles, with the percentiles proposed by Climent-Serrano et al. [115]: 90%, 50%, and 10%, to delimit the thresholds (1), (0.5), and (0) of the variables EI, COPER, and CONOR, respectively.

2. Construction of the “truth table”: in this step, a data matrix must be constructed (the “truth table”), which includes 2k rows, where k is the number of causal conditions proposed by the model.
3. Initial reduction of the number of rows: in this step, two sequential criteria are applied. First, from a factual approach, pathways that do not collect cases are eliminated. Second, from a reliability approach, pathways that do not achieve a consistency threshold equal to or greater than 0.75 are eliminated [102].
4. Final reduction of the number of rows: In this step, a final reduction of the number of rows of the “truth table” is carried out by applying the Quine–McCluskey algorithm (Ragin, 2008).

Tables 3 and 4 show the calibration thresholds and descriptive statistics of the variables used in the model for the high and low household subsamples.

Table 3. Calibration and descriptive statistics (HHI).

Calibration			Descriptive Statistics			
Variables	Fully Inside	Maximum Ambiguity	Fully Outside	Max	Min	Median
EI	0.8086	0.6025	−1.2717	0.8086	−3.3520	0.6025
COPER	1.1718	0.3103	−0.9450	1.2184	−2.1499	0.3103
CONOR	1.3265	−0.1676	−1.2256	1.8893	−1.2407	−0.1676
GEN	1	-	0	-	-	-
STEM	1	-	0	-	-	-
FEB	1	-	0	-	-	-

Source: authors’ elaboration.

Table 4. Calibration and descriptive statistics (LHI).

Calibration			Descriptive Statistics			
Variables	Fully Inside	Maximum Ambiguity	Fully Outside	Max	Min	Median
EI	0.8086	0.2180	−1.2717	0.8086	−3.3520	0.2180
COPER	1.0899	−0.1961	−1.4167	1.1667	−2.2011	−0.1961
CONOR	1.4191	0.1200	−1.2083	1.9712	−1.2421	0.1200
GEN	1	-	0	-	-	-
STEM	1	-	0	-	-	-
FEB	1	-	0	-	-	-

Source: authors’ elaboration.

4. Results

4.1. Analysis of Necessary Conditions

This study analyzed the EI of Mexican male and female university students, taking as a reference the concurrence, COPER, and normalization, based on gender, university career, and FEB. The analysis was carried out in two subsamples of students, grouped by the household income of their family units. The analysis of necessary conditions (Table 5) reported information on causal conditions that are necessary for the investigated outcome to occur. Ragin [102] accepted that a condition is necessary if it exceeds the threshold of 0.9.

Table 5. Analysis of necessary conditions.

Condition Tested	HHI		LHI	
	Consistency	Coverage	Consistency	Coverage
fs_COPER	0.6241	0.7140	0.6254	0.6194
~fs_COPER	0.5088	0.5253	0.5289	0.5656
fs_CONOR	0.4356	0.4744	0.5340	0.5929
~fs_CONOR	0.6942	0.7509	0.6286	0.6020
fs_GEN	0.3549	0.5630	0.6196	0.5057
~fs_GEN	0.6451	0.5321	0.3805	0.5287
fs_STEM	0.2958	0.4692	0.4398	0.4916
~fs_STEM	0.7042	0.5809	0.5602	0.5335
fs_FEB	0.6192	0.6081	0.4152	0.6280
~fs_FEB	0.3808	0.4620	0.5848	0.4556

Source: authors' elaboration.

The analysis of necessary conditions reports that the presence (or absence) of any condition is not mandatory for a university student (male or female) to increase their EI, for both subsamples (high and low family income). This finding implies the existence of multiple combinations of factors that can lead to high levels of EI. To get closer to a more extensive knowledge beyond the observed reality, we must delve into the analysis of cases by conducting the sufficiency analysis. This fact confirms both Propositions 1 and 2.

4.2. Analysis of Sufficient Conditions

The consistency of the solutions (complex, intermediate, and parsimonious) was satisfactory. Table 6 reports the results of the analysis of sufficiency for the outcome (EI) for two subsamples (high and low household income). The relevant information was synthesized to understand the solutions of the model (consistency and coverage) and the characteristics that helped us to understand the EI of the different profiles of university students. Black circles indicate the presence of a condition, and white circles indicate its absence. The criterion proposed by Fiss [105] was followed to graphically represent the presence (or absence) of conditions in each pathway, reporting the “core conditions” with large circles and the peripheral conditions with small ones. When a condition is not marked (blank spaces), it indicates “don't care”.

Appendices C and D offer more detailed information.

The solutions to the models (HHI and LHI) had an adequate level of consistency (HHI: 0.8301; LHI: 0.7991), higher than the minimum threshold required by Ragin [102] (2008). Both subsamples took cut-off thresholds for the selection of cases in the “truth table” that were higher than 0.75, as established by the best practices in fsQCA [102].

The coverage levels varied depending on the database used. The HHI subsample had a coverage of 0.6992, and the LHI subsample had a coverage of 0.2926. In both cases, the minimum threshold of 0.75 was exceeded [102]. The differences in coverage between the two subsamples must be understood in the Mexican social context, in which opportunity-driven entrepreneurship is scarce among people with less income, developing a search for resources that in many cases leads to necessity-driven entrepreneurship.

Table 6. Analysis of sufficiency for the outcome (EI).

Intermediate Solutions for the Proposed Model ⁽¹⁾											
Conditions/Pathways	HHI						LHI				
	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5
COPER	●		○	○	●	●		○	●		○
CONOR	○	○	○	●	●	○	○			●	○
GEN	○	○	●	○	●	●	●	●	○	●	○
STEM		○	○	●	○	●	○	○	○	●	●
FEB	○	●	○	●	●	●	●	●	●	●	●
Raw coverage	0.1971	0.2289	0.0492	0.0448	0.1029	0.0462	0.1295	0.0873	0.0609	0.0503	0.0243
Unique coverage	0.1971	0.2289	0.0492	0.0448	0.1029	0.0462	0.0698	0.0276	0.0609	0.0503	0.0243
Consistency	0.8409	0.8197	0.8509	0.8341	0.7640	1	0.7870	0.7512	0.9163	0.9103	0.7699
Intermediate solution											
Coverage	0.6692						0.2926				
Consistency	0.8301						0.7991				
Cutoff											
Frequency	1						1				
Consistency	0.7564						0.7649				
Directional expectations ⁽²⁾	(-, -, -, -, -)						(-, -, -, -, -)				

⁽¹⁾ Black circles indicate the presence of a condition, and white circles indicate its absence. According to Fiss [105], large circles indicate “core conditions”, small ones indicate peripheral conditions, and blank spaces indicate “don’t care”. ⁽²⁾ Given the exploratory nature of this study, the methodology was not conditioned by directionalities established a priori. Source: authors’ elaboration.

The sufficiency for the outcome (EI) analysis in HHI reported six different profiles of university students with high EI. Men with HHI were concentrated in three different profiles (H1, H2, and H4). Pathway H1 explained the behavior of one in five students (unique coverage: 0.1971) and included an archetype of male students with a family background in business creation. They were students with COPER and without corruption normalization. The male students explained by the H2 pathway were not STEM students, and their profile was not permissive regarding environmental corruption either. However, this archetype of entrepreneurial students did not have a family background in the creation of companies, and their perception of environmental corruption was not decisive to explain their EI. One in five college students with HHI fit this archetype (unique coverage: 0.2289).

The H4 solution contributed to improving the understanding of the profile of male students pursuing STEM degrees, with a family background and who were characterized by not having COPER, but having corruption normalization.

The female students in STEM disciplines (H6) had a family background, the entrepreneurial culture was affected by their high COPER, and they were not flexible regarding the corrupt environment, because they did not normalize corruption, showing integrity in the values of social behavior. Solutions H3 and H5 (unique Coverage: 0.0492 and 0.1029, respectively) explained the behavior of female students pursuing non-STEM degrees with a family background and high perception and normalization of corruption (H5) and, on the contrary, without a family background and without perception or normalization of corruption (H3).

The analysis of conditions carried out under the approach of core and peripheral conditions [105] reported important findings. The family background was a core condition for generating EI among STEM degree students, both men and women. In the case of men, it was also a core condition not to declare high levels of COPER (H4). In the case of women, conversely, the core sine qua non condition being the presence of COPER and, simultaneously, the absence of CONOR (H6). Women who clearly perceived the level of environmental corruption (core condition) developed high levels of EI when their perception of corruption was internalized and normalized (H5). Other relevant core conditions were the absence of normalization of corruption in the case of men (H1, H2, H3),

which occurred particularly in non-STEM grade students (H2, H3), and the core condition that these students did not have an entrepreneurial background in their family (H3) also was relevant.

The analysis of the subsample of students with LHI revealed the core condition for the presence of a family background for all the profiles identified. In this sense, the archetype of male students in STEM degree programs developed high levels of EI, relying on an archetype that does not perceive environmental corruption, precisely because it normalizes it (L5). Non-STEM female students did not normalize corruption, and in fact, their COPER was not significant in inhibiting EI (L4).

The L1 and L2 solutions for the LHI subsample helped define and understand the profiles of female students in non-STEM degree programs who do not perceive environmental corruption (L2) or do not normalize such corruption (L1). Finally, there was a highly relevant profile (consistency: 0.9163), whose causal configuration of attributes grouped male students in non-STEM degree programs that did have a high rate of COPER, which reflected the feeling of many young people in Mexico who do not support corruption, are aware of it, and try to keep on with their lives while assuming that corruption is a part of their context.

4.3. Reliability and Robustness Fit

A sensitivity test was performed following Skaaning [116] and Schneider and Wage-mann [113]. The cut-off points for calibration were modified as suggested by Fiss [105] and Stevens [117]. The percentile that defined the fully inside point was reduced by 10%, and the point that defined the fully outside point was increased by 10%, establishing the following points for fully inside (80%), maximum ambiguity (50%), and fully outside (20%). This new sensitivity analysis involved applying a stress test to the model to validate its robustness fit.

A model has a robust and acceptable fit only if its consistency level remains within the range (+5%, −5%) after performing the stress test, and only if, simultaneously, the consistency of the three solutions (complex, parsimonious, and intermediate) exceeds the threshold of 0.75 and the minimum coverage of the three solutions is 0.25, according to the criteria established by Ragin [102].

Once the new calibration of the variables was carried out, the model was retested and the evidence found by the new analysis (Table 7) validated the robustness of the proposed model for analyzing the EI of university students in corruption environments.

Table 7. Stress test of the calibration process and methodological robustness of the proposed model For the high family income subsample.

Solutions/Test	Solution Indicators		
	Pathways	Consistency	Coverage
Complex			
Model (90%; 50%; 10%)	6	0.8301	0.6692
Stress Test (80%; 50%; 20%)	6	0.8252	0.3640
Robustness Fit (+5%; −5%)		−0.59%	
Parsimonious			
Model (90%; 50%; 10%)	6	0.8268	0.7358
Stress Test (80%; 50%; 20%)	6	0.8163	0.3661
Robustness Fit (+5%; −5%)		−1.27%	
Intermediate			
Model (90%; 50%; 10%)	6	0.8301	0.6692
Stress Test (80%; 50%; 20%)	6	0.8252	0.3640
Robustness Fit (+5%; −5%)		−0.59%	

Source: authors' elaboration.

The stress test result was positive and guaranteed the robustness of the fit of the model in the subsample of students with high family income. The three solutions generated in fsQCA (complex, parsimonious, and intermediate) had consistency values within the range (0.8140, 0.8716), and a maximum consistency deviation of -1.27% . For more detailed information, see Appendices E and F.

The stress test also reported that the subsample of students with low family income (Table 8) guaranteed the robustness adjustment of the model for the three fsQCA solutions (complex, parsimonious, and intermediate), with consistency values within the range (0.7591, 0.8391), and a maximum consistency deviation of $+3.99\%$. For more detailed information, see Appendix F.

Table 8. Stress test of the calibration process and methodological robustness of the proposed model For the low family income subsample.

Solutions/Test	Solutions Indicators		
	Pathways	Consistency	Coverage
Complex			
Model (90%; 50%; 10%)	5	0.7991	0.2926
Stress Test (80%; 50%; 20%)	4	0.8310	0.2549
Robustness Fit (+5%; 5%)		+3.99%	
Parsimonious			
Model (90%; 50%; 10%)	5	0.7991	0.2926
Stress Test (80%; 50%; 20%)	4	0.8310	0.2549
Robustness Fit (+5%; -5%)		+3.99%	
Intermediate			
Model (90%; 50%; 10%)	5	0.7991	0.2926
Stress Test (80%; 50%; 20%)	4	0.8310	0.2549
Robustness Fit (+5%; -5%)		+3.99%	

Source: authors' elaboration.

After applying the stress test, the solutions to the model for both subsamples remained stable, describing student profiles without significant changes (Appendices E and F). The evidence supported that the solutions of the model remained stable for both subsamples, describing the profiles of the students without significant changes (Appendices E and F). Furthermore, the Castelló-Sirvent [118] Robustness Coefficient was calculated to evaluate the model. In addition to the standards set by Ragin [101,102] (consistency ≥ 0.75 ; coverage ≥ 0.25), and according to Castelló-Sirvent [118], a model is robust only if it reports an adequate RC-value ($RC \geq 0.95$) after the stress test carried out on the cut-off points (Appendix G).

The robustness of a model tested in fsQCA can be established by modifying one or more of the cutoff points (fully inside, maximum ambiguity, fully outside), and can be carried out by modifying the calibration, either with percentiles or manual. The stress test aims to identify the robustness of the model by analyzing the average variation of the consistency. If the stress test has been performed by recalibrating the variables, a threshold of $\pm 10\%$ or $\pm 15\%$ can be used. According to the RC-value, if it was recalibrated $\pm 15\%$, the robustness of the model can be very strong ($0.9900 \leq RC \leq 1$) or strong ($0.9500 \leq RC \leq 0.9899$). If it was recalibrated $\pm 10\%$, the robustness of the model can be strong ($0.9900 \leq RC \leq 1$), moderate ($0.9500 \leq RC \leq 0.9899$), or weak ($0.9000 \leq RC \leq 0.9499$). Standardized symbols are used together with the RC-value (** very strong; * strong; * moderate) to indicate the robustness of the model tested with fsQCA [118] (Appendix G). In our study, the RC-value supported moderate robustness ($RC = 0.9632^*$).

5. Discussion

The analysis of these archetypes allowed us to understand the barriers to entrepreneurship in its immediately preceding stage [43,44] and guide those responsible for formulating policies in the design of public policies for regional economic development.

Our study offers a useful guide for political leaders in Mexico and other countries with similar circumstances of environmental corruption. In general, there are few profiles that present high levels of EI and high levels of perception of corruption. This reinforces the thesis that inversely relates corruption and entrepreneurship [17,45,48]. However, the “grease the wheel” argument [18]) could be present in a specific profile, which should be urgently addressed by policymakers, since this reflects that normalization occurs in a certain sector of the population, and this may generate friction with efforts to reduce institutional corruption. Nevertheless, this case should not overshadow the fact that in general, the causal configurations obtained showed that the normalization of corruption is not generalized among university students, which shows the greater awareness of young people regarding this problem and their determination to end it. Thus, the fight against corruption and the improvement of accountability mechanisms must be included in the basic development objectives of the economic model. Institutions must provide a suitable framework for private action, protecting innovation, ideas and private property, and improving the effectiveness of the bureaucratic processes that surround the entrepreneurial process [16]. In the same way, public institutions (state and federal) must develop actions aimed at taking advantage of intangible capital, inhibiting emigration rates for highly educated individuals and reversing the “brain drain” [119], as corruption has been related directly to higher propensity to emigrate within students with high levels of EI [120].

It is important to note that university students with a high level of EI, coming from families with low family income, have comparatively fewer possibilities of developing business projects driven by opportunity, and are more oriented to entrepreneurship driven by necessity [26]. In fact, students with low family income who reported having an entrepreneurial background in their family were more likely to come from a family in which parents and/or other family members started a business out of necessity, not opportunity, which explains the LHI. According to [121], this impacts on EI and, consequently, on regional economic development [6,7]. The study of this subsample showed that these individuals have higher EI when they have a FEB. In fact, all the profiles obtained showed the presence of this condition. This is explained by the importance of household income to start a business venture. Students with LHI will only be willing to undertake a business project if their relatives have enough expertise in the field of entrepreneurship to guarantee higher levels of success.

Another interesting finding is related to the profiles associated with STEM degrees. The results showed that STEM students have minor levels of EI compared to non-STEM students, in line with previous research [78,79]. This could be explained by the lack of entrepreneurial competencies within STEM degrees’ curricula. It is interesting to point out that this empirical evidence showed the existence of a FEB in profiles with high levels of EI among STEM students, highlighting a similar phenomenon shown by the LHI students. On the contrary, in the case of non-STEM students, high levels of EI occurred without the need of having a FEB. This reflects that learning processes related to entrepreneurship are necessary to increase EI, either coming from relatives or formal education [93].

Furthermore, the design of the policy should allow the promotion of entrepreneurial projects among STEM students. The available evidence suggests that these types of entrepreneurs have the capacity to generate much greater added value with their projects, positively impacting the income level and long-term economic development [74,75]. Previous research highlighted the positive impact of entrepreneurial education over higher-education students, which proves the efficacy of this kind of training, and reinforces the proposal of introducing this knowledge within the curricula of STEM degrees [79,122].

In addition, the design of the policy must prioritize female entrepreneurship, especially in disadvantaged contexts, assuming the fact that women must face higher barriers than men when it comes to entrepreneurship [19].

In the same way, raising awareness about the role of women in business creation, successful examples of local entrepreneurs (STEM and non-STEM) should be formed as a measure of normalization of female entrepreneurship, making these examples of women

entrepreneurs visible, and making it possible to make them visible within local and regional communities. In this line, it should be noted that women are more likely to innovate than men [82]; hence, taking advantage of their entrepreneurial potential in STEM areas can have a significant impact on the economies of the region [21].

Finally, as access to financial resources is one of the principal obstacles for women [71,72], policymakers should focus on promoting bank and alternative financing mechanisms, business angel networks, seed capital, and venture capital. In fact, these measures should focus on female and LHI students, as this can help them to develop their entrepreneurial venture. In Mexico's case, these kinds of programs have been implemented with good results [123,124].

6. Conclusions

Since entrepreneurship is the basis that nurtures the growth of the production network, the interest in the dynamics that surround it keep increasing. Several studies reported entrepreneurial intention as an indicator of latent entrepreneurship. This is because, prior to undertaking a business project, individuals present the intention to do so. In this study, the entrepreneurial intention of university students was studied from a configurational approach thanks to the use of the fsQCA. This allowed the study of the combined effect of several internal variables, some affected by the environment, to explain high levels of entrepreneurial intention.

This study reaffirmed the negative effects that corruption has on entrepreneurship and highlights the importance of implementing policies aimed at eradicating it from institutions. In the same way, it indicates how, for a specific profile of students, corruption can be seen as an opportunity to accelerate processes related to entrepreneurship. However, the results also reflect that, in general, Mexican students do not tolerate corruption. In the same way, the analysis of the results showed the importance of implementing education programs for entrepreneurship in higher education, and more specifically in STEM areas. Finally, the need to implement programs to facilitate access to financial resources for both LHI students and female students was highlighted. In the latter case, it is necessary to set up specific programs dedicated to promoting female entrepreneurship.

The results and recommendations offered can serve as inputs for policymakers in countries with similar characteristics to Mexico, with the countries of the Latin American and Caribbean regions being good examples. These recommendations can favor the dynamics of the productive network and have positive effects on regional development. The design of public policies must focus on corruption control and focus especially on the university context when working against corruption normalization. The evidence found suggested a deep impact on the generation of business opportunities. In addition, the promotion of female entrepreneurship must be highlighted among the priorities of the policymakers. Both male and female students must have access to specific resources to avoid the perverse dynamics of brain drain. Similarly, university students from lower-income households must find adequate support in the federal and state public administrations for the development of early vocations that modernize the production network and promote innovation and long-term economic growth in the region. This article provides important information to guide the achievement of the Sustainable Development Goals (SDGs) and the implementation of the 2030 Agenda for Sustainable Development.

This research had some limitations. On the one hand, the sample studied came from a single university, which offers the possibility for future studies to delve into these results by studying samples obtained from other universities. On the other hand, the limitations of the methodology used did not allow us to combine too many variables. Future works should address these results by combining other methodologies that allow delving into these and other variables.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Questionnaire

University career

Question 1: Please write down the name of the degree you are studying.

Socio-demographic questions

Question 2: Sex (male or female)

Question 3: Age

Household income question

Question 4: Please indicate the monthly amount corresponding to your household income.

Options	Check
More than 85,000 pesos per month	
Between 35,000 and 84,999 pesos per month	
Between 11,600 and 34,999 pesos per month	
Between 6800 and 11,599 pesos per month	
Between 2700 and 6799 pesos per month	
Between 0 and 2699 pesos per month	

Family entrepreneurial background

Question 5: Do you have a close family member who is or has been an entrepreneur (parents, brothers, grandparents, uncles)?

Options	Check
Yes	
No	

Entrepreneurial intention

Please indicate your degree of intention regarding the following statements, with 1 being 'totally disagree' and 3 'totally agree'.

Questions	1	2	3
Question 6: I have serious doubts about whether I will ever start a business			
Question 7: It is very likely that I will start a business in the future			
Question 8: I am willing to do whatever it takes to be an entrepreneur			
Question 9: I am determined to start a business in the future			
Question 10: My professional goal is to be an entrepreneur			

Corruption perception

Please indicate your degree of agreement with the different statements, with 1 being ‘totally disagree’ and 5 ‘totally agree’.

Questions	1	2	3	4	5
Question 11: There are clear accountability procedures and mechanisms that apply to the allocation and use of public funds.					
Question 12: It is common for politicians/civil servants to appropriate public funds for personal or partisan purposes					
Question 13: There are special funds for which there is no accountability					
Question 14: There is widespread abuse of public resources					
Question 15: There is a professional career in the public sector or there are a large number of civil servants who are directly appointed by the government					
Question 16: There is an independent body that audits the administration of public finances					
Question 17: There is an independent judiciary power with the competences to judge public ministers/civil servants who commit abuses.					
Question 18: It is traditionally resorted to paying bribes for awarding contracts or obtain favors.					

Corruption normalization

Please indicate if you consider the following actions to be justified or unjustified, with 1 being ‘never justified’ and 5 ‘always justified’.

Questions	1	2	3	4	5
Question 19: Claim state benefits to which you are not entitled such as scholarships, grants, benefits, or subsidies					
Question 20: Avoid paying the ticket in some public transport					
Question 21: Avoid paying the bill in a restaurant or cafeteria					
Question 22: Cheat on paying taxes					
Question 23: That someone accept a bribe in the performance of their duties.					

Appendix B. Exploratory Factor Analysis (EFA) for the Construction of the Variables Entrepreneurial Intention (EI), Corruption Perception (COPER), and Normalization of Corruption (CONOR)

Entrepreneurial Intention (EI)

For years, there has been a classic debate about the number of options that Likert scales should incorporate [125]. However, there is consensus on the adequacy of 1–3 Likert scales [126], since it is of great importance that any scale includes a central point [127]. In our study, we used a 1–3 Likert scale to obtain the polarized information requested. The reliability analysis allowed us to validate the internal consistency of the scale proposed by Liñan and Chen [25]. The first step was to recode question 85, the sense of which was the reverse. However, Cronbach’s alpha improved substantially when eliminating the inverse variable of this question.

Table A9. Variable statistics.

	Statistics Total-Item			
	Mean of Scale If Item Is Removed	Scale Variance If Item Is Removed	Corrected Item—Total Correlation	Cronbach’s Alpha If Item Is Removed
Inverse variable of Question 6	10.930818	3.204	0.031	0.892
Question 7	10.364780	2.853	0.647	0.509
Question 8	10.314465	2.976	0.628	0.527
Question 9	10.301887	2.997	0.651	0.524
Question 10	10.389937	2.910	0.574	0.536

Cronbach’s Alpha calculated after eliminating the inverse variable of question 6, an adequate scale reliability, with a value greater than 0.8.

Table A10. Reliability statistics.

Cronbach's Alpha	Items
0.867	4

An exploratory factor analysis was carried out with the following remaining variables, and since the variables did not present normality, following Liñan and Chen [25], a main axis factorization was applied as an extraction method. The resulting factor analysis presented an adequate goodness of fit, the level of significance of Bartlett's sphericity test is less than 0.05, and the Kaiser–Meyer–Olkin index (KMO) exceeded the minimum value of 0.50 and was very close to 1, so its significance was optimal.

Table A11. KMO and Bartlett's test.

Kaiser–Meyer–Olkin measure of sampling adequacy		0.829
Bartlett's test of sphericity	Chi-squared	709.035
	df	6
	Sig.	0.000

There was only one factor with an eigenvalue greater than 1. As a consequence, a single factor was extracted.

Table A12. Total variance explained.

Factor	Initial Eigenvalues			Sums of the Squared Saturations of the Extraction		
	Total	Variance	Accumulated	Total	Variance	Accumulated
1	2.863	71.580	71.580	2.488	62.198	62.198
2	0.419	10.478	82.058			
3	0.401	10.033	92.091			
4	0.316	7.909	100.000			

Extraction method: factorization of main axes.

The factorial loads are shown in Table A13.

Table A13. Factor matrix.

Factor Matrix	
Questions	Factor
	1
7	0.809
8	0.767
9	0.826
10	0.750

Extraction method: factorization of the principal axis. One factor was extracted, and six iterations were required.

Next, the factor scores of each student for the entrepreneurial intention factor (EI) were calculated using regression. The coefficients of the factor scores were as follows:

Table A14. Coefficient matrix for calculating factor scores.

Questions	Factor
	1
7	0.300
8	0.243
9	0.333
10	0.223

Extraction method: factorization of the principal axis. Rotation method: varimax normalization with Kaiser. Factor score method: regression.

Corruption Perception (COPER) and Corruption Normalization (CONOR)

The main axis factorization [25] was applied as an extraction method because the available data did not show normality. In addition, following Kaiser [128], a varimax rotation was applied, with the aim of ensuring that the factors had a few high saturations in the variables and many that were almost zero. Thus, there were factors with high correlations and with a small number of variables and with null correlations, thus leaving the variance of the factors redistributed.

The first factorial analysis presented a correct goodness of fit: The significance level of the Bartlett sphericity test was less than 0.05, and the Kaiser–Meyer–Olkin index (KMO) reached a minimum value greater than 0.50 and was very close to 1, therefore its significance is very high.

Table A15. KMO and Bartlett's test.

Kaiser–Meyer–Olkin measure of sampling adequacy		0.791
Bartlett's test of sphericity	Chi-squared	2778.113
	df	78
	Sig.	0.000

The correspondence of factors with corruption perception (Factor 1, COPER) and another that corresponded to corruption normalization (Factor 2, CONOR) was noted.

Table A16. Rotated factor matrix.

	Factor			
	1	2	3	4
Question 11	0.275	0.206	0.259	0.511
Question 12	0.787	0.006	0.061	0.047
Question 13	0.837	0.030	0.089	0.105
Question 14	0.889	0.013	0.090	−0.003
Question 15	0.726	0.040	0.162	0.131
Question 16	0.233	0.130	0.839	0.100
Question 17	0.100	0.120	0.790	0.107
Question 18	0.575	0.050	0.501	−0.417
Question 19	0.006	0.350	0.310	−0.168
Question 20	0.054	0.830	0.065	0.151
Question 21	−0.045	0.819	0.204	−0.013
Question 22	0.000	0.815	0.181	−0.061
Question 23	0.132	0.803	−0.135	0.346

Extraction method: factorization of the principal axis. Rotation method: varimax normalization with Kaiser. The rotation converged in five iterations.

The empirical evidence showed two additional factors that were not used in this study. Consequently, the items that did not load on the two indicated factors were ignored, and the exploratory factor analysis was carried out again for questions 12–15 and 20–23.

In the second analysis, the goodness-of-fit tests were also adequate:

Table A17. KMO and Bartlett's test.

Kaiser–Meyer–Olkin measure of sampling adequacy		0.805
Bartlett's test of sphericity	Chi-squared	1774.709
	df	28
	Sig.	0.000

Two factors with eigenvalues greater than 1 were reported:

Table A18. Total variance explained.

Factor	Initial Eigenvalues			Sums of the Squared Saturations of the Extraction			Sum of the Squared Saturations of the Rotation		
	Total	Variance	Accumulated	Total	Variance	Accumulated	Total	Variance	Accumulated
1	3.263	40.789	40.789	2.941	36.759	36.759	2.708	33.849	33.849
2	2.774	34.669	75.458	2.455	30.693	67.452	2.688	33.603	67.452
3	0.443	5.542	81.000						
4	0.404	5.046	86.047						
5	0.364	4.546	90.593						
6	0.294	3.677	94.270						
7	0.267	3.335	97.605						
8	0.192	2.395	100.000						

Extraction method: factorization of main axes.

The factor load analysis of the rotated factor matrix showed a correspondence with the factors of corruption perception (Factor 1, COPER) and corruption normalization (Factor 2, CONOR).

Table A19. Rotated factor matrix.

Questions	Factor	
	1	2
12	0.797	0.015
13	0.861	0.051
14	0.876	0.020
15	0.736	0.062
20	0.068	0.843
21	−0.040	0.836
22	−0.002	0.811
23	0.129	0.783

Extraction method: factorization of the principal axis. Rotation method: varimax normalization with Kaiser. The rotation converged in three iterations.

As indicated, the factor scores of each individual were calculated for the COPER factor and for the CONOR factor by means of a regression. The coefficients for the calculation are shown in Table A20.

Table A20. Coefficient matrix for calculating factor scores.

	Factor	
	1	2
12	0.208	−0.014
13	0.336	−0.001
14	0.377	−0.022
15	0.153	0.002
20	−0.001	0.316
21	−0.028	0.290
22	−0.026	0.261
23	0.019	0.222

Extraction method: factorization of the principal axis. Rotation method: varimax normalization with Kaiser. Factor score method: regression.

The reliability analysis allows the checking of the internal consistency of both factors. For this, Cronbach’s alpha was used. As we can see, the scale was reliable, and it was not necessary to eliminate any variable in both cases. The reliability of the COPER scale was correct, since Cronbach’s alpha was greater than 0.8. Cronbach’s alpha did not improve when removing an item.

Table A21. Reliability statistics.

Cronbach’s Alpha	Items
0.889	4

Table A22. Statistics total-item.

Questions	Mean of Scale If Item Is Removed	Scale Variance If Item Is Removed	Corrected Item—Total Correlation	Cronbach’s Alpha If Item Is Removed
12	10.836842	11.862	0.741	0.865
13	10.823684	11.945	0.796	0.842
14	10.734211	12.148	0.804	0.840
15	10.836842	12.997	0.691	0.881

The reliability of the COPER scale was correct, since Cronbach’s alpha was greater than 0.8. Cronbach’s alpha did not improve when removing an item.

Table A23. Reliability statistics.

Cronbach’s Alpha	Items
0.889	4

Table A24. Statistics total-item.

Statistics Total-Item				
Questions	Mean of Scale If Item Is Removed	Scale Variance If Item Is Removed	Corrected Item—Total Correlation	Cronbach’s Alpha If Item Is Removed
20	7.492105	14.446	0.782	0.849
21	7.702632	14.020	0.763	0.855
22	7.742105	14.139	0.755	0.858
23	7.600000	13.713	0.731	0.869

Appendix C. Model Proposed, Truth Table Analysis, Quine–McCluskey Algorithm, and HHI Subsample

--- COMPLEX SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.756379

	raw coverage	unique coverage	consistency
	-----	-----	-----
~GEN*fs_COPER*~fs_CONOR*~FEB	0.19714	0.19714	0.840891
~GEN*~fs_CONOR*FEB*~STEM	0.228865	0.228865	0.819662
GEN*~fs_COPER *~fs_CONOR*~FEB*~STEM	0.0492215	0.0492214	0.850855
~GEN*~fs_COPER*fs_CONOR*FEB*STEM	0.0448499	0.0448498	0.834135
GEN*fs_COPER*fs_CONOR*FEB*~STEM	0.102893	0.102893	0.764039
GEN*fs_COPER*~fs_CONOR*FEB*STEM	0.0461908	0.0461907	1

solution coverage: 0.66916

solution consistency: 0.830081

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.756379

	raw coverage	unique coverage	consistency
	-----	-----	-----
~fs_CONOR*~FEB*~STEM	0.165402	0.0498559	0.862856
~GEN*~fs_COPER*FEB	0.211691	0.0678778	0.909417
fs_COPER*~fs_CONOR*STEM	0.170757	0.0438911	0.827329
GEN*fs_COPER*fs_CONOR	0.118344	0.102893	0.761817
~GEN*~fs_CONOR*~STEM	0.335593	0	0.831482
~GEN*fs_COPER*~fs_CONOR	0.344406	0	0.797524

solution coverage: 0.735795

solution consistency: 0.826768

--- INTERMEDIATE SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.756379

	raw coverage	unique coverage	consistency
	-----	-----	-----
~GEN*fs_COPER*~fs_CONOR*~FEB	0.19714	0.19714	0.840891
~GEN*~fs_CONOR*FEB*~STEM	0.228865	0.228865	0.819662
GEN*~fs_COPER*~fs_CONOR*~FEB*~STEM	0.0492215	0.0492214	0.850855
~GEN*~fs_COPER*fs_CONOR*FEB*STEM	0.0448499	0.0448498	0.834135
GEN*fs_COPER*fs_CONOR*FEB*~STEM	0.102893	0.102893	0.764039
GEN*fs_COPER*~fs_CONOR*FEB*STEM	0.0461908	0.0461907	1

solution coverage: 0.66916

solution consistency: 0.830081

Appendix D. Model Proposed. Truth Table Analysis. Quine-McCluskey Algorithm. LHI Subsample

--- COMPLEX SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.764857

	raw coverage	unique coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.129524	0.0697712	0.787042
fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.0873433	0.02759	0.751201
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609087	0.0609087	0.916262
Fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.05029	0.0502899	0.910388
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0242887	0.0242887	0.769856

solution coverage: 0.292602

solution consistency: 0.799093

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.764857

	raw coverage	unique coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.129524	0.0697712	0.787042
fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.0873433	0.02759	0.751201
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609087	0.0609087	0.916262
fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.05029	0.0502899	0.910388
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0242887	0.0242887	0.769856
solution coverage: 0.292602			
solution consistency: 0.799093			

--- INTERMEDIATE SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.764857

	raw coverage	unique coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.129524	0.0697712	0.787042
fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.0873433	0.02759	0.751201
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609087	0.0609087	0.916262
fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.05029	0.0502899	0.910388
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0242887	0.0242887	0.769856
solution coverage: 0.292602			
solution consistency: 0.799093			

Appendix E. Stress Test of the Calibration Process. Truth Table Analysis. Quine-McCluskey Algorithm. HHI Subsample

--- COMPLEX SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.779939

	raw coverage	unique coverage	consistency
	-----	-----	-----
~fs_GEN*~fs_COPER*~fs_CONOR*~fs_STEM	0.0763878	0.0158165	0.852571
~fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.118284	0.06063	0.860816
fs_GEN*fs_COPER*fs_FEB*fs_STEM	0.0300117	0.0300117	0.915681
fs_GEN*fs_COPER*~fs_CONOR*~fs_FEB*~fs_STEM	0.0415437	0.0415435	0.779939
~fs_GEN*fs_COPER*fs_CONOR*~fs_FEB*~fs_STEM	0.0220568	0.0191393	0.791179
~fs_GEN*fs_COPER*~fs_CONOR*~fs_FEB*fs_STEM	0.136314	0.136314	0.788508
solution coverage: 0.364027			
solution consistency: 0.825238			

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.779939

	raw coverage	unique coverage	consistency
	-----	-----	-----
~fs_GEN*~fs_COPER*~fs_CONOR*~fs_STEM	0.0763878	0.0158165	0.852571
~fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.118284	0.06063	0.860816
fs_GEN*fs_COPER*~fs_CONOR*~fs_FEB	0.0435986	0.0415435	0.719418
fs_COPER*~fs_CONOR*~fs_FEB*fs_STEM	0.138369	0.136314	0.767807
fs_GEN*fs_COPER*fs_FEB*fs_STEM	0.0300117	0.0300116	0.915681
~fs_GEN*fs_COPER*fs_CONOR*~fs_FEB*~fs_STEM	0.0220568	0.0191393	0.791179
solution coverage: 0.366082			
solution consistency: 0.816318			

--- INTERMEDIATE SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.779939

	raw coverage	unique coverage	consistency
	-----	-----	-----
~fs_GEN*~fs_COPER*~fs_CONOR*~fs_STEM	0.0763878	0.0158165	0.852571
~fs_GEN*~fs_COPER*fs_FEB*~fs_STEM	0.118284	0.06063	0.860816
fs_GEN*fs_COPER*fs_FEB*fs_STEM	0.0300117	0.0300117	0.915681
fs_GEN*fs_COPER*~fs_CONOR*~fs_FEB*~fs_STEM	0.0415437	0.0415435	0.779939
~fs_GEN*fs_COPER*fs_CONOR*~fs_FEB*~fs_STEM	0.0220568	0.0191393	0.791179
~fs_GEN*fs_COPER*~fs_CONOR*~fs_FEB*fs_STEM	0.136314	0.136314	0.788508
solution coverage: 0.364027			
solution consistency: 0.825238			

Appendix F. Stress Test of the Calibration Process. Truth Table Analysis. Quine-McCluskey Algorithm. LHI Subsample

--- COMPLEX SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.788089

	raw coverage	unique coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.119856	0.119856	0.772482
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609165	0.0609164	0.931511
fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.0508182	0.0508181	0.895114
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0233059	0.0233059	0.792562
solution coverage: 0.254896			
solution consistency: 0.83101			

--- PARSIMONIOUS SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.788089

	raw coverage	unique coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.119856	0.119856	0.772482
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609165	0.0609164	0.931511
fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.0508182	0.0508181	0.895114
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0233059	0.0233059	0.792562
solution coverage: 0.254896			
solution consistency: 0.83101			

--- INTERMEDIATE SOLUTION ---

frequency cutoff: 1

consistency cutoff: 0.788089

	raw	unique	
	coverage	coverage	consistency
	-----	-----	-----
fs_GEN*~fs_CONOR*fs_FEB*~fs_STEM	0.119856	0.119856	0.772482
~fs_GEN*fs_COPER*fs_FEB*~fs_STEM	0.0609165	0.0609164	0.931511
fs_GEN*fs_CONOR*fs_FEB*fs_STEM	0.0508182	0.0508181	0.895114
~fs_GEN*~fs_COPER*~fs_CONOR*fs_FEB*fs_STEM	0.0233059	0.0233059	0.792562
solution coverage: 0.254896			
solution consistency: 0.83101			

Appendix G. Components and Calculation According to the Castelló-Sirvent (2021) Robustness Coefficient

Table A25. Components and calculation.

RC Components	
RC: Robustness coefficient	
CG: Consistency gap	
AC: Average consistency	
MC _i : Model consistency	
STC _i : Stress-Test consistency	
N: Total number of outcomes and subsamples	
RC Calculation	
$RC = 1 - (CG / AC)$ $AC = \frac{\sum_{i=1}^N MC_i}{N}$ $CG = \frac{\sum_{i=1}^N (MC_i - STC_i)}{N}$	

Note: RC-value includes intermediate solution consistency scores for both subsamples (HHI and LHI) used to test the model in fsQCA. Source: adapted from Castelló-Sirvent [118].

Table A26. Robustness analysis of the model in fsQCA using RC-value.

Recalibration				RC-Value	Robustness	Symbol (*)
Percentile Variation	Fully Inside	Maximum Ambiguity	Fully Outside			
±0.15	−0.15	0	+0.15	0.9900 ≤ RC ≤ 1	Very Strong	***
				0.9500 ≤ RC ≤ 0.9899		
±0.10	−0.10	0	+0.10	0.9900 ≤ RC ≤ 1	Strong	**
				0.9500 ≤ RC ≤ 0.9899		
				0.9000 ≤ RC ≤ 0.9499	Weak	*

(*) Weak robustness is pointed out without symbol. Source: adapted from Castelló-Sirvent [118].

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