

## Opportunity or necessity entrepreneurship? A study based on the national system of entrepreneurship



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### ABSTRACT

This study investigates synergies between individual and national variables that promote opportunity and necessity entrepreneurship with a framework based on the national system of entrepreneurship. A qualitative comparative analysis of fuzzy sets of 39 country cases shows that institutional or individual cognitive elements are not necessary for high-opportunity or high-necessity entrepreneurship but that enhancing entrepreneurs' ability perceptions play a universal role. The study's findings reveal optimal pathways that combine the institutional environment and individual perceptions to promote the synergistic development of opportunity and necessity entrepreneurship and reduce differences in entrepreneurial activities between countries.

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### Introduction

Entrepreneurship is the engine of economic and social development (Sendra-Pons et al., 2022), and the institutional environment somewhat affects people's entrepreneurial behavior (North, 1971). Research has shown that entrepreneurial activity is influenced by institutional factors (Acs et al., 2014) and individual entrepreneurial cognition (Li, 2020). When the formal institutions are similar, it suggests that informal logic, norms, and cognitions interact with formal institutions to generate differing outcomes (Easley et al., 2018). The relationship between entrepreneurship and institutions is complex (Eler & Henrekson, 2021), and we must understand the interaction between formal and informal institutional environments to better understand entrepreneurial activity. Despite extensive research in these fields, our understanding of potential correlations between dimensions such as entrepreneurship, perception of opportunities, and entrepreneurial motives remains limited (Kusa et al., 2021). Further empirical research is needed to analyze different entrepreneurial models.

Entrepreneurship results from the interaction between individuals and the external environment, and individuals may engage in entrepreneurial activities differently (Matos & Hall, 2020). Cohen et al. (2020) categorized entrepreneurial motives into four types: advancement opportunities, income level, self-challenge, and contribution to society. Based on the push-pull theory, Antonioli et al. (2016) classified entrepreneurial motives into intrinsic and extrinsic ones. However, most influential empirical studies follow the Global Entrepreneurship Monitor (GEM) categorization, dividing entrepreneurial motives into survival-driven and opportunity-driven types. This is primarily because necessity entrepreneurship is seen as an essential way to reduce unemployment and increase entrepreneurial activity (Sendra-Pons et al., 2022), while opportunity entrepreneurship drives rapid and sustainable economic growth (Cervelló-Royo et al., 2020). The relationship between entrepreneurship and economic development depends on the type of entrepreneurship (Aparicio et al., 2016). From a theoretical and practical perspective, it is important to distinguish between these two types of entrepreneurial activity (Block & Wagner, 2010), which contribute to job creation and sustainable economic development. In this context, our study incorporates the perspective of a national system of entrepreneurship (NSE) proposed by Acs et al. (2014), which emphasizes the integration of individual- and national-level factors. The study of the

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national system level incorporates formal (education) and informal (national entrepreneurial context) institutions as well as enabling the institution (national innovation). The study of the individual system level incorporates individual perceptions of opportunity, perceived capabilities, and fear of failure.

This study uses a combination of fuzzy set qualitative comparative analysis (fsQCA) and necessity conditional analysis (NCA) to understand how individual- and country-level factors combine to influence entrepreneurial motivation and promote entrepreneurial activity at a finer granularity. It analyzes both necessary and sufficient causal relationships and explores the complex interaction mechanisms of NSE. The results also help gain insight into the driving forces behind the different types of entrepreneurial activity and answer scholars' calls for multi-level research on entrepreneurship (Shepherd, 2011). The primary objective of this study is to address the following inquiries: Are there essential conditions that influence opportunity-driven entrepreneurship? What configurations manifest for both high-level opportunity-driven entrepreneurship and necessity-driven entrepreneurship?

## Theoretical framework

### *National system of entrepreneurship*

The national system of entrepreneurship (NSE) refers to the dynamic interaction between individual entrepreneurial attitudes, abilities, aspirations, and environmental factors (e.g., resource availability and social norms) that drive resource allocation through the creation and operation of new ventures (Acs et al., 2014). The core principle of NSE is that there are two levels of analysis: an individual level and a national level.

On a national level, institutions are often defined as the rules of the game in society (North, 1971) based on NSE. Since national institutional constraints often hinder individual resource development (Brieger & De Clercq, 2019), national institutions are critical to entrepreneurial behavior (Weber et al., 2023). This study introduces three national institutional-level factors—entrepreneurship education and training, national entrepreneurial context, and national innovation—influencing individuals' motivation to engage in entrepreneurship-related activities. On an individual level, the cognitive abilities of individual entrepreneurs are an important factor in deciding whether to start a business (Brieger & De Clercq, 2019). Individual entrepreneurial cognition encompasses perceived ability, perceived opportunity, and fear of failure. These cognitive resources are reflected in an individual's entrepreneurial ability and willingness to start a business, which are closely related to entrepreneurial decisions (Xie et al., 2021).

Current studies on entrepreneurship are often limited to one of the two levels of analysis (Li, 2020; Brieger & De Clercq, 2019). Single-level studies produce an incomplete understanding of the entrepreneurial process (Lim et al., 2016) and must be complemented by multi-level models (Li, 2020). Therefore, an NSE-based approach is key in revealing the impact of a combination of national institutions and cognitive antecedents on promoting opportunity and necessity entrepreneurship.

### *Opportunity and necessity entrepreneurship*

The various motivations underlying entrepreneurial decisions shape a new venture's potential impact on society and the economy (Amorós et al., 2019). The Global Entrepreneurship Monitor (GEM) project identifies two types of entrepreneurial activity: necessity and opportunity entrepreneurship (Block & Wagner, 2010). The dominant logic for distinguishing between those two is based on the push-pull theory (Alam et al., 2021). Opportunity entrepreneurs have other job options but participate in entrepreneurship because they can

increase their income (Sautet, 2013), while necessity entrepreneurs start a business without other income options (Weber et al., 2023). However, entrepreneurship is a more intricate process (Puente et al., 2019); apart from motivation, it is also influenced by factors such as institutional environment and individual perceptions (Estrin et al., 2022). For instance, gaps in formal institutions might force citizens to resort to necessity-driven informal entrepreneurship as a survival strategy (Williams et al., 2017). Therefore, the simple concept of necessity-driven and opportunity-driven entrepreneurs has also faced scrutiny (Dencker et al., 2019), with scholars noting that entrepreneurial motivation variables are complex and dynamic and cannot be simplified into two choices (Puente et al., 2019). Some scholars have even suggested that these two categories coexist (Giacomin et al., 2011).

Despite these criticisms, many researchers still employ the Global Entrepreneurship Monitor (GEM) binary approach to study opportunity and necessity entrepreneurship (Fairlie & Fossen, 2018; Amorós et al., 2021). This indicates that GEM's categorization method remains useful and insightful in certain contexts, even though it may not capture all the intricacies of the entrepreneurial process. Therefore, based on data availability, this study utilizes GEM's binary classification, combining institutional environment and individual cognitive factors to investigate opportunity and necessity entrepreneurship.

## Research propositions

### *Entrepreneurial education and training*

Based on Whitley's (1999) national institutional framework, this study incorporates entrepreneurship education and training into the formal system, affecting individuals' business decisions (Levie & Autio, 2008). Entrepreneurship education drives knowledge generation, societal advancement, and sustainable development (Ramadani et al., 2022). Over the past few decades, the development of entrepreneurship education and training has significantly impacted cultivating the right personal mindset and fostering the development of knowledge and skills relevant to entrepreneurship (Amalia & Von Korfflesch, 2021). Literature suggests that entrepreneurship education and training contribute to individuals' capacity to recognize and generate opportunities (Ratten & Jones, 2021) and improve their information-gathering, analysis, and processing skills (Miço & Cungu, 2023). These skills and practical experiences enable individuals to keenly grasp opportunities within the industry, filter potential financially viable prospects, and simultaneously enhance their ability to assess and capitalize on these opportunities (Amankwah-Amoah et al., 2022; Huang et al., 2023), thereby contributing to proactive entrepreneurial endeavors. Therefore, this study proposes the following hypotheses:

**Hypothesis 1a.** Entrepreneurship education and training positively impact opportunity entrepreneurship.

**Hypothesis 1b.** Entrepreneurial education and training do not affect the necessity entrepreneurship.

### *National entrepreneurship context*

The national entrepreneurship context (NEC) is a quantitative indicator of the national entrepreneurial environment and is an informal institution. The NEC data for this study are derived from the National Entrepreneurship Context Index (NECI) of the 2020 GEM National Expert Survey (NES), which summarizes the average conditions of a country's entrepreneurial environment as a single number that reflects the entrepreneurial framework conditions (EFC) of its economy. The arithmetic mean of the EFC scores can be used to measure how easy it is to start and grow a business. The nine conditions identified by GEM that enhance (or hinder) new business creation in

a given country provide the basis of the NES. These conditions include entrepreneurial finance, government entrepreneurship programs, and market dynamics (GEM, 2020).

Individuals' different motivations for entrepreneurial behavior could depend on the context in which they live (Bruton et al., 2010). Environmental factors foster entrepreneurship and economic development (Pfeifer et al., 2021). The NECI, developed by GEM, is a crucial instrument for appraising the entrepreneurial landscape on a national and regional scale, rendering it indispensable for scholars and policymakers alike. Encompassing institutional backdrop and resource accessibility, the national entrepreneurial context offers a direct avenue for cross-national and longitudinal juxtapositions, catering to the needs of policymakers and the general populace. It significantly influences potential entrepreneurs' evaluations of the entrepreneurial milieu and their determinations regarding engagement in entrepreneurial pursuits (Rietveld & Patel, 2022). Therefore, this study proposes the following hypotheses:

**Hypothesis 2a.** NEC has a positive impact on opportunity entrepreneurship.

**Hypothesis 2b.** NEC has a positive impact on necessity entrepreneurship.

### National innovation

Innovation is an important resource for firm survival and the generation of competitive advantage (Martins et al., 2015). This study focuses on a broader concept of innovation, that is, innovation at a national level, and it is the result of the inputs and outputs of conditions such as institutions, average human capital, and market structures (GII, 2020). National innovation refers to the process and practice of a country actively promoting innovative activities across various domains such as technology, economy, and society. This encompasses developing and adopting new technologies, novel modes of thinking, new products and services, and enhancing existing technologies and methods, all aimed at stimulating economic growth, enhancing competitiveness, and addressing societal issues (Fuentelsaz et al., 2018).

Since entrepreneurship can foster innovations and drive economic growth, institutional gaps exist in existing formal and informal systems to support entrepreneurship. This study draws on Stenholm et al. (2013) to incorporate national innovation into the enabling regime, which not only influences a person's decision to start a business but also guides the direction of innovation in firms (Baumol, 1996). Previous studies have typically assumed a positive relationship between entrepreneurship rates and innovation (McMullen et al., 2008; Bygrave et al., 2003). However, some studies have shown that business opportunities associated with innovation may not directly result in entrepreneurial activity due to increased opportunity costs associated with innovation (Shane, 2009). Wennekers et al. (2005) concluded that opportunity entrepreneurship is positively associated with a country's gross domestic product (GDP) per capita and innovation capacity, while necessity entrepreneurship is not significantly associated with innovation capacity. Therefore, this study proposes the following hypotheses:

**Hypothesis 3a.** National innovation has a positive impact on opportunity entrepreneurship.

**Hypothesis 3b.** National innovation does not affect necessity entrepreneurship.

### Perceived opportunities

Perceived opportunities (PO) refer to an entrepreneur's perception of an excellent entrepreneurial opportunity (GEM, 2020). The ability of entrepreneurs to perceive opportunities is an important

factor in creating and running a business (Shane et al., 2003). People who have a good perception of opportunities tend to be more inclined to use physical and mental skills to explore and develop high-quality entrepreneurial opportunities and will be more inclined to start a new business (Fuentelsaz et al., 2015). Also, they will have more confidence in entrepreneurial ventures because they can identify resources and utilize them to complement their resources, thus creating a positive perception of entrepreneurship (De Clercq et al., 2013). Therefore, this study proposes the following hypotheses:

**Hypothesis 4a.** Perceived opportunities have a positive impact on opportunity entrepreneurship.

**Hypothesis 4b.** Perceived opportunities have a positive impact on necessity entrepreneurship.

### Perceived capabilities

Perceived capabilities (PC) are defined as an individual's belief that they have the skills and knowledge to start a new business (GEM, 2020). Individuals' assessment of their ability to complete tasks influences their choice of activities and behaviors in a given environment (Wood & Bandura, 1989). Entrepreneurs' perceptions of their capabilities influence their motivation to start a new business, which determines the effort they put into the venture (Li, 2020). A stronger entrepreneurial perception of capabilities will also further enhance entrepreneurial confidence. Therefore, this study proposes the following hypotheses:

**Hypothesis 5a.** Perceived capabilities have a positive impact on opportunity entrepreneurship.

**Hypothesis 5b.** Perceived capabilities have a positive impact on necessity entrepreneurship.

### Fear of failure

Fear of failure (FOF) is a person's appetite for risk and refers to their willingness to act or make decisions associated with uncertainty concerning the potential success or failure of outcomes (Sitkin & Pablo, 1992). Individuals with a low tolerance for risk tend to view entrepreneurial activity as a threat rather than an opportunity, which can inhibit the generation of entrepreneurial activity (Kikul et al., 2011). In the context of this study, FOF refers to the fear that failure will deter entrepreneurship (GEM, 2020). Those with a greater FOF will perceive entrepreneurship as demanding and are more likely to be sensitive to the problems and risks faced in the entrepreneurial process (Li, 2020). They will not choose to start a business. Therefore, this study proposes the following hypotheses:

**Hypothesis 6a.** Fear of failure has a negative effect on opportunity entrepreneurship.

**Hypothesis 6b.** Fear of failure has a negative effect on necessity entrepreneurship.

Based on the NSE, this study draws on institutional and entrepreneurial cognition theory, introduces six antecedent variables, and explores multiple concurrent conditions and causally complex mechanisms that affect opportunity and necessity entrepreneurship across two levels: the national institutional environment and individual entrepreneurial cognition. The theoretical conceptual model is shown in Fig. 1.

## Methodology

### Method

NCA is a new data analysis tool that can identify individual necessary conditions more precisely and helps to compensate for existing

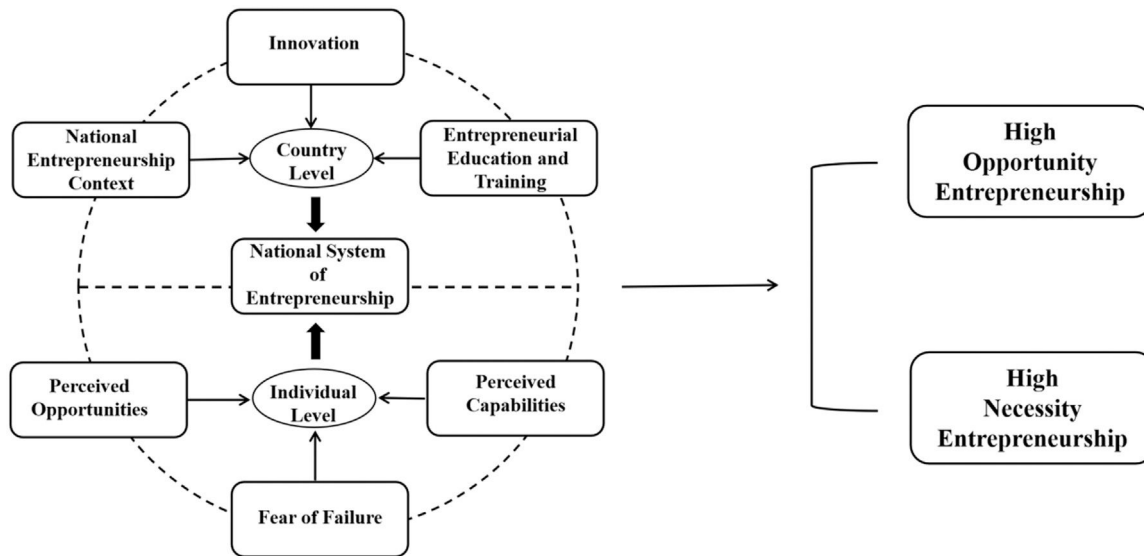


Fig. 1. Theoretical model.

adequacy analysis methods that may overlook some of the necessary conditions. It is also well suited to answer the question of what level of institutional and individual elements is required to study the outcomes of high-opportunity and high-necessity entrepreneurship (Dul et al., 2020).

Qualitative comparative analysis (QCA) has both qualitative and quantitative research characteristics. It is mainly used to test the individual conditions necessary to satisfy the outcome generation and to identify the grouping to satisfy the outcome generation, where fsQCA can solve the degree of change and partial affiliation problems (Ragin, 2009). It focuses on the impact of a multi-factor interaction on the outcome and can effectively deal with the coupling effect of multiple interdependent factors (Douglas et al., 2020). It is also suitable for analyzing which institutional environment groupings can generate high-opportunity and high-necessity entrepreneurship in a country.

A hybrid NCA and QCA approach can complement each other to obtain more reliable results (Vis & Dul, 2018). Therefore, this study uses a combination of NCA and fsQCA based on Huang et al. (2022) to explore the non-linear relationship between the national institutional environment and individual perceptions and different types of entrepreneurial activities based on the NSE to understand multiple equivalent impact pathways.

Data and measurement

The data for this study is primarily drawn from two data sources, the GEM and the Global Innovation Index (GII). GEM is an international entrepreneurship research project jointly sponsored by the London Business School and Babson College. The GI is an annual ranking published by the World Intellectual Property Organization, Cornell University, and INSEAD to measure the performance of more than 120 economies worldwide regarding innovation capacity.

This study selects six antecedent conditions of national innovation: entrepreneurship education and training, national entrepreneurial context, perceived capabilities, perceived opportunity, and fear of failure, and two outcome variables of opportunity and necessity entrepreneurship. In medium study samples, the ideal antecedent conditions are generally four to seven; selecting six conditions in this study meets the research requirements (Dul et al., 2020). In this study, the following data are selected and cleaned: (1) opportunity entrepreneurship, necessity entrepreneurship, and entrepreneurship perception data from the 2020 GEM adult population database, and entrepreneurship education and training and national

entrepreneurship background data from the national expert survey database; (2) national innovation capacity index data from the 2020 GI report; (3) the two datasets are matched, countries that lack entrepreneurship data are removed, and we retained 39 country cases with complete data. There are four types of economies in these 39 country cases: low income, lower middle income, upper middle income, and high income.

Calibration

Calibration assigns an affiliation to a specific set of conditions for a case. The affiliation set after calibration ranges from 0 to 1 (Huang et al., 2022). Referring to Kusa et al. (2021), this study uses a direct calibration method with three value limits for all the conditional and outcome variables: 0.05 is set as completely unaffiliated, 0.50 is set as a crossover point, and 0.95 is set as fully affiliated. The calibration anchor points and affiliation scores for each variable are shown in Table 1.

Analytical technique

Necessity analysis

The necessary conditions in the NCA approach must satisfy two conditions: the effect value is not less than 0.1, and the Monte Carlo simulation substitution test shows that the effect size is significant (Dul et al., 2020). The results are shown in Table 2. For opportunity entrepreneurship, the effect values of PC and FOF are greater than 0.1 with significant p-values, which can be considered a necessary condition to promote opportunity entrepreneurship. The effect values of PC are greater than 0.1 with significant p-values for necessity

Table 1 Calibration criteria and descriptive statistics.

Conditions	Calibration Criteria		
	Fully in	Crossover	Fully out
OE	76.70	39.80	10.00
NE	89.80	71.40	28.90
PO	83.80	47.30	16.50
PC	86.40	60.00	37.70
FOF	53.60	42.30	17.50
NI	62.47	37.27	22.35
EET	3.61	2.51	2.06
NEC	6.34	4.64	3.78

**Table 2**  
Necessary condition analysis (NCA) result tables.

Variable	Method	OE					NE				
		Accuracy	Ceiling zone	Scope	Effect size (d)	P-value	Accuracy	Ceiling zone	Scope	Effect size (d)	P-value
PO	CR	82.10 %	0.183	0.880	0.207	0.011	92.30 %	0.135	0.860	0.157	0.081
	CE	100.00 %	0.128	0.880	0.145	0.017	100.00 %	0.129	0.860	0.149	0.010
PC	CR	82.10 %	0.193	0.890	0.216	0.006	92.30 %	0.182	0.870	0.208	0.012
	CE	100.00 %	0.166	0.890	0.186	0.002	100.00 %	0.204	0.870	0.233	0.000
FOF	CR	84.60 %	0.219	0.900	0.242	0.002	92.30 %	0.118	0.880	0.134	0.161
	CE	100.00 %	0.179	0.900	0.198	0.007	100.00 %	0.102	0.880	0.116	0.087
NI	CR	87.20 %	0.057	0.900	0.063	0.450	100.00 %	0.000	0.880	0.001	0.966
	CE	100.00 %	0.024	0.900	0.026	0.812	100.00 %	0.002	0.880	0.002	0.966
EET	CR	84.60 %	0.125	0.890	0.140	0.072	97.40 %	0.014	0.870	0.016	0.724
	CE	100.00 %	0.066	0.890	0.074	0.131	100.00 %	0.024	0.870	0.027	0.484
NEC	CR	87.20 %	0.113	0.870	0.129	0.101	97.40 %	0.006	0.860	0.007	0.807
	CE	100.00 %	0.036	0.870	0.042	0.414	100.00 %	0.007	0.860	0.008	0.836

Note:  $0 < d < 0.1$ : Low level;  $0.1 \leq d < 0.3$ : Middle level;  $0.3 \leq d < 0.5$ : High level; CR: ceiling region; CE: ceiling envelope.  $P < 0.01$ : Significant.

**Table 3**  
The bottleneck table of OE and NE.

OE	PO	PC	FOF	NI	EET	NEC	NE	PO	PC	FOF	NI	EET	NEC
0	NN	NN	NN	NN	NN	NN	0	NN	NN	NN	NN	NN	NN
10	NN	NN	NN	NN	NN	NN	10	NN	NN	NN	NN	NN	NN
20	NN	NN	NN	NN	NN	NN	20	NN	NN	NN	NN	NN	NN
30	NN	NN	NN	NN	NN	NN	30	NN	NN	NN	NN	NN	NN
40	NN	NN	4.4	NN	NN	NN	40	NN	NN	4.2	NN	NN	NN
50	4.9	4.1	16.4	NN	NN	NN	50	NN	5.2	10.2	NN	NN	NN
60	19.5	19.7	28.3	NN	NN	NN	60	6.4	19.7	16.1	NN	NN	NN
70	34	35.3	40.3	2.2	17.3	NN	70	22.6	34.2	22.1	NN	NN	0.8
80	48.6	50.9	52.2	14.7	35.1	26.4	80	38.8	48.8	28.1	NN	NN	1.8
90	63.2	66.5	64.1	27.1	52.8	59.2	90	55.1	63.3	34	NN	NN	2.8
100	77.8	82.1	76.1	39.6	70.6	92	100	71.3	77.8	40	3.2	51.4	3.8

Note: CR method; NN= not necessary.

entrepreneurship, which can be considered necessary to promote necessity entrepreneurship.

The bottleneck level (%) refers to the level (%) that needs to be satisfied within the maximum observed range of the antecedent condition to reach a certain level of the maximum observed range of results. The bottleneck table explains the necessary level of the condition required for the given level of results (Dul et al., 2020). In this study, the ceiling regression-free disposal hull (CR-FDH) technique is used for the level of necessity analysis. The results are shown in Table 3. To reach 70 % of opportunity entrepreneurship, 34 % of perceived opportunity, 35.3 % of perceived ability, 40.3 % of fear of failure, 2.2 % of national innovation, 17.3 % of entrepreneurship education and training, no bottleneck level of other conditions are required; to reach 70 % of necessity entrepreneurship, 22.6 % of perceived opportunity, 34.2 % of perceived ability, 22.1 % of fear of failure, and 0.8 % of national entrepreneurial background, other conditions do not exist at the bottleneck level.

This study uses the fsQCA method to test the necessary conditions. Table 4 shows that the consistencies of the individual antecedent conditions of necessity are all less than 0.9, not strong enough to explain the results, and do not constitute a necessary condition for the study's results. It is worth noting that the necessary condition in NCA is that X is necessary for Y at a lower level of X (Dul et al., 2020); that is, lower levels of perceived opportunity ability and fear of failure are necessary for opportunity entrepreneurship and lower levels of perceived ability are necessary for necessity entrepreneurship. The condition in QCA is necessary to satisfy a certain degree of affiliation, such as the one studied in this study, to generate high-opportunity entrepreneurship and high necessary conditions for necessity entrepreneurship. It can be seen that a degree of perceived capabilities and fear of failure are necessary conditions for opportunity entrepreneurship.

In contrast, high perceived capabilities and fear of failure are not necessary conditions for high-opportunity entrepreneurship. The relationship between perceived capabilities and necessity entrepreneurship is similar. To summarize, this study concludes that there is no necessary condition for generating high-opportunity or high-necessity entrepreneurship.

*Sufficiency analysis*

This study uses fsQCA 3.0 software to analyze the histories leading to high-opportunity and high-necessity entrepreneurship and name the histories found in this study according to the histories theorizing process (Furnari et al., 2021). The original consistency threshold is set to 0.8, the proportional reduction in inconsistency (PRI) threshold is set to 0.7, and the case frequency threshold is set to 1. The core conditions of each solution are identified by comparing the nested relationships between the intermediate and parsimonious solutions: the

**Table 4**  
Necessity test for a single condition.

Conditions	OE		NE	
	Consistency	Coverage	Consistency	Coverage
PO	0.718	0.723	0.745	0.704
~PO	0.590	0.628	0.575	0.574
PC	0.725	0.763	0.808	0.798
~PC	0.626	0.636	0.570	0.544
FOF	0.767	0.738	0.778	0.703
~FOF	0.601	0.672	0.544	0.570
NI	0.627	0.647	0.558	0.540
~NI	0.674	0.700	0.801	0.780
EET	0.697	0.768	0.591	0.611
~EET	0.648	0.632	0.714	0.653
NEC	0.695	0.763	0.562	0.578
~NEC	0.653	0.639	0.754	0.693

**Table 5**  
Configurations for achieving high OE and NE.

Conditions	OE			NE		
	O1	O2	O3	N1	N2	
					N2a	N2b
PO		⊙	⊙	●		⊙
PC	△	⊙	⊙	●	●	●
FOF	⊙	●	△	△	●	●
NI	⊙	△	△	▲	△	△
EET	⊙		●		△	
NEC		●	▲	▲	△	⊙
Consistency	0.941	0.957	0.928	0.910	0.932	0.964
Raw coverage	0.432	0.346	0.242	0.370	0.447	0.371
Unique coverage	0.218	0.110	0.030	0.035	0.108	0.106
Overall solution consistency		0.913			0.902	
Overall solution coverage		0.600			0.605	

Note: ● = core causal condition (present); ▲ = core causal condition (absent); ⊙ = contributing causal condition (present), △ = contributing causal condition (absent); Blank spaces indicate a “don’t care” condition.

conditions that occur in both the intermediate and parsimonious solutions are the core conditions of that solution, and the conditions that occur only in the intermediate solution are the marginal conditions (Fiss, 2011) and the specific histories. The results are summarized in Table 5. As seen from Table 5, highlighting the key factors in several opportunity and necessity entrepreneurship groupings helps to grasp the main line to drive the entrepreneurial model. Therefore, combining the core conditions of higher-order histories, this study summarizes three opportunity entrepreneurship driving models and two necessity entrepreneurship driving models.

**Results**

A fuzzy set analysis (Table 5) shows that there are three groupings (O1, O2, O3) that drive high-opportunity entrepreneurial activity, and the consistency of the solution is 0.913, which indicates that the three configuration coverings are sufficient to achieve high-opportunity entrepreneurial activity. The coverage of the solution is 0.6, indicating that the three configurations explain 60 % of high-opportunity entrepreneurship. In addition, two groupings generate high-necessity entrepreneurial activity (N1, N2). The consistency index of the solution is 0.902, indicating that the three configurations covering most cases are sufficient to achieve high-necessity entrepreneurial activity. The coverage of the solution is 0.605, indicating that the two configurations explain 60.5 % of high-necessity entrepreneurial activity.

Next, we consider the configurations that affect high-opportunity and high-necessity entrepreneurial activity in greater detail.

*The driving mechanism of high-opportunity entrepreneurship*

*O1: institutional-driven with a lack of perceived capabilities*

This model of opportunity-driven entrepreneurship suggests that the presence of national innovation capacity and entrepreneurship education and training can compensate for the lack of individual entrepreneurial perceptions. In other words, national institutional leadership can effectively drive opportunity entrepreneurship, given the lack of individual perceptions of entrepreneurial capabilities and the high FOF. The internal logic of this grouping is that in this entrepreneurship-driven model, the state plays a leading role in stimulating entrepreneurial potential and market dynamism in society. This is possible when the state has a relatively well-developed entrepreneurship education system and high innovation capacity and can consequently drive individuals with a lack of perception ability and a high fear of failure to engage in opportunity entrepreneurship. This reaffirms that a single factor cannot effectively promote opportunity entrepreneurship and points to different regional pathways and patterns.

*O2: perception-assisted supported by a national entrepreneurial background*

This entrepreneurship-driven model suggests a high fear of failure and a high national entrepreneurial background as the core

conditions and non-high national innovation capacity, high perception of opportunity, and high perception of capability as the marginal conditions. The internal logic is that although the national innovation capacity is low, a good national entrepreneurial context can compensate for this deficiency. While opportunity perception and ability perception exist as auxiliary conditions, entrepreneurs' fear of failure could motivate them to seek entrepreneurial opportunities, which can drive high-opportunity entrepreneurship. A good national entrepreneurial context can effectively reduce the psychological stress of entrepreneurs and enable them to better perceive opportunities and entrepreneurial capabilities, and thus actively engage in opportunity entrepreneurial activities.

### *O3: capability-opportunity type guaranteed by entrepreneurship education and training*

In this model, a high level of entrepreneurship education and training and a non-high national entrepreneurial context are the core conditions. In contrast, non-high national innovation capacity, high perception of opportunity, high perception of capability, and low fear of failure are the marginal conditions. The internal logic of this grouping is that when a country has a relatively well-developed entrepreneurship education and training system, individuals with perceived capabilities, opportunities, and low fear of failure will be driven to opportunity entrepreneurship even without a good national entrepreneurial context.

### *The driving mechanism of high-necessity entrepreneurship*

#### *N1: opportunity-capacity-dominated model with a lack of institutional environment*

In this model, high opportunity perception, high capability perception, non-high national innovation capacity, and non-high national entrepreneurial background are the core conditions, and non-high fear of failure is the marginal condition. The logic of this grouping is that individuals with a high perception of entrepreneurial ability and opportunity and a low fear of failure will also actively engage in necessity entrepreneurship when the national macro-institutional environment is poor. In other words, when the national innovation capacity is low, the entrepreneurial environment is inadequate, and the education system is incomplete.

#### *N2: risk-taking type dominated by capability perception*

In this model, a high perception of capability and fear of failure are the core conditions, and non-high national innovation capacity is a marginal condition. N2b shows that the perception of opportunity and a favorable national entrepreneurial environment can assist in promoting necessity entrepreneurship. This model suggests that perceptions of entrepreneurial ability play a dominant role and that opportunity entrepreneurship requires individuals to have strong ability perceptions that can compensate for their fear of failure in entrepreneurship, help them identify entrepreneurial opportunities that exist in the market, and actively engage in necessity entrepreneurship.

### *Sensitivity analysis*

In this study, robustness tests are conducted in two ways. First, increasing the PRI value from 0.7 to 0.75 (Du & Kim, 2021) produces consistent histories. Second, increasing the consistency threshold from 0.8 to 0.85 (White et al., 2021) yields histories identical to the original. This indicates that the conclusions are relatively reliable.

## **Discussion**

Based on the NSE, this study examined how the interaction between individual-level and country-level institutions affected different types of entrepreneurial activity in response to calls (Li, 2023)

for a more empirical multi-level cross-country analysis of the interaction between individual- and country-level factors that affect entrepreneurial activity. This study focused on groupings that promote high necessity and opportunity entrepreneurship, distinguished between entrepreneurship types, and provided a targeted grouping reference for different entrepreneurship types. Previous studies have typically been based on individual or country-level effects alone, and single-level investigations can produce an incomplete understanding of differences in entrepreneurial activity across countries (Li, 2020; Brieger & De Clercq, 2019). To address this important gap in the literature, this study examined different types of entrepreneurial activity based on a cross-level framework of the NSE to reveal those groupings of individual and institutional factors that promote individuals to engage in necessity or opportunity entrepreneurship. This study responds to earlier requests (Su et al., 2017) to combine institutional theory with a model of individual entrepreneurship to assess how changes in entrepreneurial activity can be explained by considering individual and national institutional factors.

First, the sufficiency analysis suggests that the configuration of driving high-opportunity and high-necessity entrepreneurship differs, and the findings support Audretsch et al.'s (2022) view. Second, the findings suggest that the national institutional environment plays a more important role in opportunity entrepreneurship, consistent with Li's (2021) findings. Last, the results show that national innovation is central to driving opportunity entrepreneurial pathways but not at all in promoting high-necessity entrepreneurship. This suggests that national innovation is important for individuals to explore opportunities for entrepreneurial activities when engaging in opportunity entrepreneurial activities. However, for necessity entrepreneurship, individuals highly motivated by innovative activities can innovate within existing organizations and choose not to start a business, which aligns with the findings of Fuentelsaz et al. (2018). The results of this study are consistent with a reciprocal causal logic in which individual cognitive characteristics and environmental factors interact and jointly shape behavior (Lim et al., 2016).

### *Theoretical implications*

This study makes an important contribution to the theory of entrepreneurship. Firstly, this study is anchored in the theoretical framework of the national entrepreneurship system, offering a fresh perspective on entrepreneurship research. By delving into the intricate interplay between individual and national variables, it uncovers the manifold factors that shape entrepreneurial activities, thus paving new avenues for advancing entrepreneurship theory. Secondly, the research boldly departs from conventional viewpoints by asserting that individual cognitive factors and institutional environments are not inherently tethered to high-opportunity or high-necessity entrepreneurship. This supplements and refines previous unidimensional approaches in entrepreneurship research and underscores the universally paramount role of individual capacity perception in entrepreneurial endeavors. Lastly, through the meticulous exploration of the interplay between individual cognition and institutional context, this study charts out optimal pathways for the synergistic evolution of opportunity and necessity entrepreneurship. Unveiling the intricate relationships among these diverse factors furnishes invaluable insights that drive the evolution and innovation within entrepreneurship.

### *Managerial implications*

This study sheds light on the interplay between individual cognition and institutional context, presenting valuable insights for policymakers to craft targeted and effective entrepreneurship policies. For instance, governments could concentrate on augmenting

entrepreneurs' capacity perception while fine-tuning the institutional landscape to strike a more harmonious balance between promoting both opportunity-driven and necessity-driven entrepreneurship (Piñeiro-Chousa et al., 2020). Moreover, the study accentuates the universal importance of entrepreneurs' capacity perception in attaining entrepreneurial success. Consequently, institutions offering entrepreneurship training and education can customize pragmatic and potent training programs based on these research findings, aiding entrepreneurs in amplifying their entrepreneurial skill set. Lastly, the study posits that kindling opportunity-driven and necessity-driven entrepreneurship unfolds as a dynamic process, warranting distinct strategies during various stages of development. Nations inclined towards innovation should contemplate strategies that kindle entrepreneurs' innovative prowess, with a strong focus on opportunity-driven entrepreneurship. Conversely, nations driven by efficiency should consistently refine their institutional framework to fortify necessity-driven entrepreneurship, transitioning towards nurturing opportunity-driven entrepreneurship. This strategic approach fosters robust entrepreneurial growth and propels innovation.

## Conclusion

Based on the NES, this study developed a new model spanning two levels of extended entrepreneurship research by showing the influence of macro- and micro-level antecedents on the combination of entrepreneurial activities. It confirmed that a combination of factors at different levels affects entrepreneurial behavior. We draw several conclusions.

First, individual and institutional elements do not constitute the conditions for generating high-opportunity or high-necessity entrepreneurship. The NCA analysis shows that lower levels of perceived opportunity capability and fear of failure are necessary conditions for generating a level of opportunity entrepreneurship, and lower levels of perceived capability are necessary conditions for generating a level of necessity entrepreneurship. Second, three histories drive high-opportunity entrepreneurship: institutional-driven with lack of capability perception, cognitive-assisted with national entrepreneurial background support, and capability-opportunity with entrepreneurial education and training guarantee. There are two paths for high-necessity entrepreneurship: entrepreneurial cognition-led with a lack of institutional environment and capability-perception-led with risk-taking. Third, the results show that the national institutional environment plays a central role in driving high-opportunity entrepreneurship, and individual entrepreneurial cognition plays a central role in driving high-necessity entrepreneurship. However, national

innovation capacity does not promote high-necessity entrepreneurship, and the results support all the study's hypotheses.

## Limitations and future research

We acknowledge that this study is not without limitations. First, this study only examines 39 countries. In the future, data from more countries could be collected to further analyze the pathways that generate high-opportunity and high-necessity entrepreneurial activity. Second, the data in this study are static, and future data could be collected across time to study how changes in the institutional environment affect changes in entrepreneurial activity and to rationalize the development of the time series-based QCA method. At the same time, future research should respond to the call of Justo et al. (2015) and incorporate gender perspective into entrepreneurship research. Last, the individual and country-level institutional factors in this study do not include all possible micro and macro conditions that may have an important impact on entrepreneurial activity, e.g., the cultural environment in which entrepreneurial activity takes place. Future research could consider the impact of more detailed antecedent variables on different types of entrepreneurial activity.

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## Declaration of Competing Interest

None

## CRediT authorship contribution statement

**Yangjie Huang:** Writing – original draft, Writing – review & editing, Funding acquisition, Project administration, Supervision. **Ping Li:** Conceptualization, Writing – original draft, Writing – review & editing. **Lu Chen:** Conceptualization, Writing – original draft, Writing – review & editing. **Jing Wang:** Writing – review & editing.

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Appendix

Tables A, B, C

**Table A**  
Countries' Data and descriptive statistics.

Number	Country	OE	NE	PO	PC	FOF	NI	EET	NEC
1	Austria	39.00	49.30	31.20	53.30	36.80	50.13	2.21	4.79
2	Brazil	65.60	81.90	57.30	67.80	43.40	31.94	2.34	4.21
3	Chile	58.40	81.20	46.70	71.70	46.30	33.86	2.32	4.35
4	Colombia	62.90	77.00	47.90	64.80	39.50	30.84	3.02	4.64
5	Croatia	39.00	69.40	47.20	75.00	52.10	37.27	2.06	3.73
6	Cyprus	37.50	77.40	21.10	58.10	49.10	45.67	2.44	4.47
7	Egypt	49.20	54.00	65.70	56.10	41.60	24.23	2.25	4.30
8	Germany	39.80	45.10	36.00	47.60	31.00	56.55	2.51	4.93
9	Greece	26.90	69.00	27.90	53.30	53.10	36.79	2.32	4.30
10	Guatemala	76.70	91.10	62.70	74.40	40.00	22.35	2.58	3.92
11	India	80.70	87.30	82.50	81.70	56.80	35.59	3.07	6.02
12	Indonesia	44.70	71.40	80.60	79.00	23.50	26.49	3.89	6.39
13	Iran	30.10	64.80	13.30	64.90	17.70	30.89	2.18	3.98
14	Israel	35.60	53.60	25.00	37.70	45.00	53.55	2.84	5.33
15	Italy	26.60	82.20	62.20	60.80	28.40	45.74	2.39	4.12
16	Kazakhstan	0.40	40.00	44.80	63.80	17.50	28.56	2.35	4.30
17	Kuwait	40.10	59.60	62.60	63.40	47.80	28.40	2.22	4.30
18	Latvia	39.80	73.60	37.10	55.30	41.60	41.11	2.86	4.64
19	Luxembourg	51.10	44.30	41.90	45.70	42.30	50.84	2.82	5.05
20	Morocco	11.80	72.80	57.30	63.40	38.70	28.97	2.16	3.78
21	Netherlands	46.60	47.80	48.80	43.60	38.30	58.76	3.61	6.34
22	Norway	26.70	23.10	57.00	41.60	27.40	49.29	3.29	5.74
23	Oman	47.90	89.80	83.80	64.50	42.80	26.50	2.90	5.10
24	Panama	66.60	84.70	47.20	72.70	39.80	29.04	2.19	4.21
25	Poland	22.00	62.00	51.60	60.00	41.20	39.95	2.11	4.24
26	Qatar	37.60	56.60	72.30	68.20	41.30	30.81	3.28	5.67
27	Korea	10.00	32.90	44.60	53.00	13.90	56.11	2.68	5.49
28	Russia	24.20	71.40	33.50	34.50	46.50	35.63	2.31	3.79
29	Saudi Arabia	60.80	89.50	90.50	86.40	51.60	30.94	2.46	5.69
30	Slovakia	33.60	73.80	40.90	56.40	48.70	39.70	2.42	4.12
31	Slovenia	44.60	72.20	42.00	59.40	43.80	42.91	2.54	4.59
32	Spain	32.30	72.30	16.50	51.90	53.60	45.60	2.51	4.69
33	Sweden	41.50	28.90	62.50	52.10	42.80	62.47	2.62	4.52
34	Switzerland	42.50	52.00	26.70	44.50	33.50	66.08	2.65	5.39
35	Togo	36.90	84.60	78.50	91.90	44.20	18.54	2.02	3.78
36	United Arab Emirates	52.40	74.70	62.10	54.70	47.10	41.79	3.35	6.03
37	United Kingdom	57.60	54.40	27.30	54.50	48.30	59.78	2.54	5.02
38	United States	68.20	50.20	48.60	64.00	41.20	60.56	2.83	5.15
39	Uruguay	31.70	80.10	47.30	65.60	48.80	30.84	2.85	4.88
Mean		42.04	65.28	49.56	60.44	40.69	40.13	2.61	4.77
SD		17.62	17.77	19.21	12.86	10.11	12.52	0.44	0.74
Max		80.7	91.1	90.5	91.9	56.8	66.08	3.89	6.39
Min		0.4	23.1	13.3	34.5	13.9	18.54	2.02	3.73

Source: The authors based on the GEM and the Global Innovation Index (GII).

**Table B**  
Definition of variables.

Conditions	Variable name	Definition/ Measure	Source	
Outcome/ Results	Necessity entrepreneurship (NE)	Percentage of those involved in TEA who primarily attribute their involvement to having no other work options or simply seeking to increase their income	GEM	
	Opportunity entrepreneurship (OE)	Percentage of those involved in TEA who indicate the main driver for being involved in this opportunity is being independent or make a difference in the world, rather than just maintaining their income	GEM	
Antecedent Conditions	Country Level	Entrepreneurial education and training (EET)	The extent to which training in creating or managing SMEs is incorporated within the education and training system at primary and secondary levels and in higher education such as vocational, college, business schools, etc.	GEM
		National entrepreneurship context (NEC)	The arithmetic mean of that economy's EFC scores, it is measured on a Likert scale from 0 to 10	GEM
		National innovation (NI)	The score of the inputs and outputs of conditions such as institutions, average human capital, and market structures	GII
	Individual level	Perceived opportunities (PO)	Percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who see good opportunities to start a firm in the area where they live	GEM
		Perceived capabilities (PC)	Percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who believe they have the required skills and knowledge to start a business	GEM
		Fear of failure (FOF)	Percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who indicate that fear of failure would prevent them from setting up a business	GEM

**Table C**  
Countries with a membership score greater than 0.5 in the solution and outcome.

Solutions		Countries	
High opportunity entrepreneurship	O1	Togo (0.63, 0.74), Sweden (0.53, 0.53), Slovenia (0.52, 0.6), United Kingdom (0.52, 0.81)	
	O2	Saudi Arabia (0.78, 0.85), India (0.58, 0.97), Oman (0.53, 0.66)	
	O3	Guatemala (0.54, 0.95)	
High necessity entrepreneurship	N1	Morocco (0.6, 0.56), Guatemala (0.57, 0.96)	
	N2	N2a	Chile (0.67, 0.83), Togo (0.62, 0.9), Brazil (0.57, 0.85)
		N2b	Saudi Arabia (0.78, 0.95), India (0.58, 0.93), Oman (0.53, 0.95)

Note: The first number in parentheses indicates the membership score in the solution set, and the second number is the membership score in the outcome set (i.e., opportunity/necessity entrepreneurship). For example, "Togo (0.63, 0.74)" means Togo scored 0.63 in the set of O1 and 0.74 in the set of high opportunity entrepreneurship (Muñoz et al., 2022).

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