



# Cross-country differences in drivers of female necessity entrepreneurship

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Received: 13 April 2021 / Accepted: 8 November 2021  
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## Abstract

This paper analyzes the drivers of female necessity entrepreneurship using a sample of 59 countries, with data sourced from the 2018–2019 global entrepreneurship monitor (GEM). It develops a theoretical framework describing how post-secondary education, startup skills, fear of failure, knowing another entrepreneur, entrepreneurial intentions, and hiring expectations act as drivers of female necessity entrepreneurship. Using qualitative comparative analysis, two models are tested to explain the presence and absence of female necessity entrepreneurship. This outcome is measured using the GEM indicator of total early-stage entrepreneurial activity.

**Keywords** Women entrepreneurship · Global entrepreneurship monitor · Necessity entrepreneurship · QCA

## 1 Introduction

“There is no royal flower-strewn path to success. And if there is, I have not found it... for if I have accomplished anything in life it is because I have been willing to work hard.”

Madam Walker

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According to Audretsch (2014), the economy has transitioned from one driven by physical capital, as per Solow's model, to, first, one driven by knowledge, as per Romer's model, and then to one driven by entrepreneurship, as per Audretsch's model. This evolution means that, worldwide, entrepreneurship is perceived as the engine of economic and social development (Audretsch 2006). Hence, understanding entrepreneurship and its repercussions for the economy and society have become an issue of growing interest in the literature. As a specific example of these repercussions, Martínez-Rodríguez (2021) empirically showed that more women enter entrepreneurship for necessity than for opportunity, regardless of their home country's GDP.

According to the global entrepreneurship monitor (GEM), entrepreneurship is "any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business." A clear trend in entrepreneurship is the increasing rate of women entrepreneurs, which is growing internationally. Despite this growth, the rate of women entrepreneurship is still low compared to the rate of male entrepreneurship. According to the GEM, the average total early-stage entrepreneurial activity (TEA) was 11.45% for women and 15.82% for men in the period 2019–2020. Even though the importance of women entrepreneurship has been recognized by governments, academics (Cardella 2020), and policymakers, especially from the institutional side (Udimal 2020), this phenomenon remains an untapped source of economic growth (Georgeta 2012). Unsurprisingly, diversity in terms of age, religion, nationality, and gender, among others, is a recurring topic in research (Dos Reis et al. 2007).

Given the need to investigate what factors lead to the presence of women entrepreneurship worldwide, the current study uses a sample of 59 countries and qualitative comparative analysis (QCA) to provide causal configurations of conditions that explain both the presence (Model 1) and the absence of female necessity entrepreneurship (Model 2) in different socioeconomically diverse countries. Qualitative comparative analysis (QCA), specifically fuzzy-set qualitative comparative analysis (fsQCA), which is used for continuous data, can reveal causal configurations of logically possible conditions that result in a given outcome. Given the wide range of relationships between social and economic factors and the presence or absence of female necessity entrepreneurship, the study starts by exploring one-directional linear relationships between the factors in the fuzzy model and the outcome. Then, the interactions between these factors are explored by studying the combinations emerging in the resulting causal configurations. Therefore, while this study initially follows a deductive approach focusing on one-directional relationships, the analysis is enriched by the inductive process initiated in the discussion, which reveals inter-relationships between these antecedent factors (Ragin 1987). Thus, theoretical and configurational multiplicity emerge in the form of causal recipes, generating two-way knowledge: from theoretical background to configurations and vice versa.

The paper is organized as follows. First, the theoretical framework reviews both necessity and opportunity entrepreneurship, as well as women entrepreneurship. It then discusses the conditions employed in the QCA models aimed at explaining the rate of female necessity entrepreneurship. Second, the data and method are

explained. Third, the results and discussion are presented. Finally, the conclusions, limitations and implications of the study are provided.

## 2 Theoretical framework

### 2.1 Necessity, opportunity, and women entrepreneurship

The GEM report classifies the motivations that drive entrepreneurship using the approach of Reynolds et al. (2005), who differentiated between necessity and opportunity entrepreneurship. Until then, the dominant logic was push–pull theory (Sexton and Vasper 1982; Shapero and Sokol 1982; Hisrich and Brush 1985; Sibanda 2020; Alam et al. 2021). Under this theory, when entrepreneurs consider company creation as a source of income (material or otherwise), a pull force acts. In contrast, when entrepreneurs are forced to find a company to attain a desirable state of living, a push force acts (Giacomin et al. 2011).

However, the most popular classification in the literature, and the one used in the GEM reports, was introduced by Reynolds et al. (2005). Under this approach, the motivation for entrepreneurship is classified as opportunity or necessity. Opportunity entrepreneurship occurs when entrepreneurs identify and exploit a business opportunity, whereas necessity entrepreneurship occurs when entrepreneurs feel forced to undertake a business endeavor because employment alternatives are non-existent or unsatisfactory (Wennekers et al. 2005). Although the nomenclature is different, there are similarities with push–pull theory, and both classifications relate to the origin or cause of entrepreneurial activity: necessity entrepreneurship corresponds to push motivations, whereas opportunity entrepreneurship corresponds to pull motivations. Later, Caliendo and Kritikos (2019) showed that there is a third type of entrepreneur, namely one who is motivated by both pull and push forces.

Entrepreneurial motivation has been linked to entrepreneurs' level of knowledge about starting a business. A low level of knowledge can lead to greater difficulty in finding a job, which would encourage necessity entrepreneurship (Arenius and Minniti 2005). Necessity-driven entrepreneurship is usually less innovative than opportunity-driven entrepreneurship, which, by its nature, usually requires a higher level of knowledge and is usually more innovative. Nair (2020) provides a discussion of the links between women entrepreneurship and innovation.

Additionally, the literature suggests that the relationship between entrepreneurship and economic development depends on the nature of the entrepreneurship (Audretsch and Keilbach 2008; Aparicio et al. 2016), with opportunity-driven entrepreneurship having a positive relationship with economic development. However, Acs and Varga (2005) concluded that necessity entrepreneurship has no effect.

In recent years, scholars have also highlighted the relationship between women's empowerment and economic development. Duflo (2012), whose research was later developed by Doepke and Tertilt (2019), reported that women's empowerment and economic development are closely related in two ways: development can reduce inequality between genders and women's empowerment may benefit

development. Sarfaraz et al. (2014) also concluded that both women entrepreneurship and gender equality result in economic development.

Nevertheless, some studies suggest that the motivations behind entrepreneurship differ between men and women (Hisrich and Brush 1985; Orhan and Scott 2001; Manolova et al. 2008). According to the literature, some of the motivations that drive women to engage in entrepreneurial activity are frustration, dissatisfaction at work, the existence of glass ceilings, the need for flexibility to find a work-life balance, the need for inclusion in the labor market, and the need for increased wage income. Ultimately, these motivations are of a social or economic nature. Thus, the distinction between opportunity and necessity entrepreneurship is particularly relevant when considering gender.

As Kelley et al. (2010) noted, in most countries, women are more likely than men to be necessity entrepreneurs. The reasons for this difference were identified by Warnecke (2013). First, the informal economy is usually dominated by women. Second, in developing countries, the educational level of women is usually lower than that of men. Third, access to formal business networks is less likely and access to finance presents more barriers in all countries, regardless of the level of development. Fourth, due to gender norms related to domestic work, women tend to have “time poverty”. Necessity entrepreneurs can be considered agents of social change because, through entrepreneurship, they not only improve their employment situation but also influence the environment where they operate. This argument is in line with the development of a social economy after the 2008 financial crisis (Chaves and Monzón 2012). Thus, entrepreneurship is motivated by a need to be included in the labor market and to seek improvements in quality of life (Velásquez et al. 2008).

## 2.2 Drivers of female necessity entrepreneurship

This section discusses the drivers of female necessity entrepreneurship. It provides a theoretical framework of the drivers of female necessity entrepreneurship, which is later taken as the outcome in the QCA. Specifically, the following conditions are used to explain female necessity entrepreneurship: post-secondary education level, entrepreneurial skills, knowing another entrepreneur, job creation expectations, fear of failure, and entrepreneurial intentions.

### 2.2.1 Post-secondary education level

Educational level is cited in the literature as one of the key socioeconomic characteristics in the decision to become an entrepreneur and as an important indicator of entrepreneurial success (Kolstad and Wiig 2015). Education, together with an individual’s skills, is responsible for human capital (Becker 1994). Le (1999) identified two channels through which the level of education can influence the propensity to become an entrepreneur. First, through education, individuals can improve their managerial skills, which can increase their willingness to become entrepreneurs. Second, a higher level of education can help people enter the paid market.

According to Shane (2000), through formal education, individuals become better equipped to learn about markets and technology and to recognize opportunities in their environment. Becker (1964) not only put forward some ideas that were later defended by Shane but also argued that entrepreneurs with higher levels of education want to receive a higher return on their investment. Several authors have argued that education makes it possible to develop skills that then help with the identification of market opportunities (Grant 1996; Shane 2000) and even allow people to engage in knowledge-intensive activities (Bosma et al. 2004). For instance, Audretsch (2012) reported that both education and experience enable entrepreneurs to identify sources of information and know how, thus contributing to firm performance growth. In fact, according to Van der Sluis et al. (2008), the benefits of education for entrepreneurs' performance are quantifiable not only in terms of income (as in the basic human capital model) but also in terms of business survival, firm growth, and return on investment. Additionally, as noted by Gawel (2021), "female entrepreneurship is explained by both male and female education levels" because it generates the right social environment for entrepreneurship promotion.

The GEM Report defines the variable "post-secondary education" [POSED] as the "percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) indicating to have a post-secondary degree or more" (Reynolds et al. 2005). Much of the literature is based on the assumption that opportunity and necessity entrepreneurs differ in their human capital. Accordingly, individuals with high educational levels would generally be opportunity entrepreneurs (Ucbasaran et al. 2008), whereas necessity entrepreneurs would have difficulties in developing differentiated products and services because of, among other conditions, their educational limitations (Dencker et al. 2009; Poschke 2013). These difficulties are linked to the fact that necessity entrepreneurs have a lower educational level, that their companies are smaller, and that they have less growth potential. However, although much of the literature suggests a positive relationship between educational level and opportunity entrepreneurship, Block and Wagner (2010) concluded that specific vocational education is positively related to the income of necessity entrepreneurs but not to that of opportunity entrepreneurs.

**Preposition 1** *A lower level of education is conducive to female necessity entrepreneurship.*

### 2.2.2 Entrepreneurial skills

Entrepreneurial skills are another source of human capital, together with knowledge, abilities, experience, and training. Being an entrepreneur requires the execution of a wide variety of tasks that may require different skills. According to Lazear (2004), as a consequence, entrepreneurs must be "jacks of all trades" (JATs). That is, they do not have to be experts in any particular skill or area, but they have to be good enough in a wide variety of skills or areas for the business not to fail. He also reported that JATs have a higher probability of becoming entrepreneurs. This positive relationship between the variety of skills and entrepreneurial activity has been confirmed by other authors (e.g., Wagner 2003; Baumol 2005). In fact, based on

JAT theory, Stuetzer et al. (2013) concluded that entrepreneurs with varied professional experience have greater entrepreneurial skills and that this greater skill level increases their tendency to engage and persist in entrepreneurial activities.

The GEM report defines the variable “startup skills” [SKILL] as the “percentage of adults aged 18–64 indicating to have the required skills and knowledge to set up a business” (Reynolds et al. 2005). According to this definition, the skills variable is measured based on an individual’s self-perception of skills, knowledge, and abilities. Therefore, the term “perceived self-efficacy” plays an important role when analyzing the skills variable. This concept was introduced by Bandura in 1977 to refer to individuals’ perceptions of their ability to influence events that occur in their lives (Bandura 2010). In entrepreneurship, an individual’s ability to start a successful entrepreneurial venture is measured through entrepreneurial self-efficacy (Chen et al. 1998). Several studies linking this variable to entrepreneurial intentions (Chen et al. 1998; Krueger and Brazeal 1994) have empirically shown a positive relationship between entrepreneurial self-efficacy and entrepreneurial intentions. However, fear of failure can negatively alter that relationship (Ng and Jenkins 2018). In addition, self-efficacy facilitates entrepreneurs’ opportunity detection (Shane 2000), which should encourage opportunity entrepreneurship.

Considering gender, Bandura (1992) argued that women are more likely to limit their career aspirations because they believe they lack the necessary skills. Eccles (1994) reported that there are social and psychological reasons why women are still underrepresented in some occupational and educational areas. These gender differences are mainly observed in areas that have been stereotypically linked to “masculine” skills, including business and entrepreneurship careers (Wilson et al. 2007). Koellinger et al. (2013) concluded that women have more fear of failure and less confidence in their entrepreneurial skills than men and are less likely to know other entrepreneurs than men. According to these authors, greater fear of failure, lower self-confidence and less exposure to other entrepreneurs are factors that reduce women’s propensity to start a business.

**Preposition 2** *Entrepreneurial skills are not conducive to female necessity entrepreneurship.*

### 2.2.3 Knowing an entrepreneur

As discussed, human capital is the set of experiences, training, knowledge, skills, and capabilities that define and add value to a person’s profile. This human capital is complemented by social capital, which is regarded as “friends, colleagues, and more general contacts through whom you receive opportunities to use other forms of capital” (Burt 1992, p 9). According to this definition, social capital depends on interaction with other agents. Forret (2006) argued that, although individuals tend to develop human capital, this human capital is not enough. Hence, the development of social capital provides individuals with a formidable professional advantage. In addition, social capital is more difficult to imitate than human capital because relationships are unique, valuable, and not replicable.

The GEM report defines the variable “knowing entrepreneurs” [KNOW] as referring to any entrepreneur who “personally knows someone who started a firm in the last two years” (Reynolds et al. 2005). The influence of others is often crucial in the decision to become an entrepreneur (Bosma et al. 2012). The literature explains that peer influence can affect entrepreneurial potential in several ways by providing role models and access to networks and knowledge (Markussen and Røed 2017). In addition, knowledge transfer can reduce the level of uncertainty experienced by potential entrepreneurs (Wyrwich et al. 2016). Perceiving similarities in certain attributes is a key factor when selecting role models (Byrne 1971; Gibson 2004). In particular, perceiving demographic similarities intensifies interpersonal attraction (Ibarra 1992). Gender is a demographic attribute that can lead to similarity perception and can thus influence the selection of role models. In line with this idea, Markussen and Røed (2017) concluded that, generally, same-sex peers have a greater influence than opposite-sex peers and that this gender-based influence explains the existence of a gender gap in entrepreneurship. Rocha and Van Praag (2020) have observed that the influence of women company founders on female workers is even greater than the influence of other social interactions such as that exerted by interactions with peers or parents.

Klyver and Grant (2010) showed that individuals who know an entrepreneur show a greater tendency to become entrepreneurs. However, women are less likely to know an entrepreneur. The reasons are a lack of resource providers or a lack of role models in their networks. Warnecke (2013) went further, explaining that it is more difficult for women to access formal business networks. When having entrepreneurial connections is linked to entrepreneurial motivation, Wagner (2005) found that opportunity entrepreneurs are more likely than necessity entrepreneurs to have a role model in the family. In contrast, Morales-Gualdrón and Roig (2005) argued that the influence of knowing an entrepreneur is equivalent for both types of entrepreneurship.

**Proposition 3** *Knowing an entrepreneur is not conducive to female necessity entrepreneurship.*

#### 2.2.4 Job creation expectation

In recent years, entrepreneurship has been seen as an opportunity to create jobs and contribute to economic development. Despite a lack of consensus on the relationship between entrepreneurship and job creation and the effects of entrepreneurship on job creation (Fritsch and Muellero 2004), research has identified a clear link between the two (Badal 2010). However, some literature suggests that the contribution of employment to economic development depends on the reason for starting a business. Opportunity-driven entrepreneurship has a positive relationship with economic development, whereas necessity entrepreneurship has no effect (Acs and Varga 2005).

The GEM report defines the variable “high job creation expectation rate” [HIRES] as the “percentage of those involved in TEA who expect to create 6 or more jobs in 5 years”. The literature on this variable treats it as closely related to

firm growth expectations and links it to the term “high-growth entrepreneurship”. Just as the literature classifies entrepreneurs according to their motivation (i.e., necessity vs. opportunity), it emphasizes the existence of “solo entrepreneurs”. According to GEM, a solo entrepreneur is an entrepreneur “that operates on their own, with no co-founders or employees, and projecting no hiring”.

When analyzing the hiring expectations of entrepreneurs, it is important to differentiate between solo entrepreneurs and those who enter the world of entrepreneurship to found and grow a company. According to Fairlie and Fossen (2018), three quarters of necessity entrepreneurs are solo entrepreneurs, whereas only 53% of opportunity entrepreneurs are solo entrepreneurs. This gap implies that opportunity entrepreneurs are more likely to contribute to job creation than necessity entrepreneurs. Additionally, according to Bergmann and Sternberg (2007, p 206), “the majority of necessity entrepreneurs are primarily looking to safeguard their own living, not to generate revenue growth or additional jobs.”

The hiring expectations of solo entrepreneurs have been studied by Van Stel et al. (2020), who concluded that solo entrepreneurs with high educational levels tend to have low hiring intentions and that these low intentions are due to the need for autonomy and self-expression or self-realization. Darnihamedani and Terjesen (2020) analyzed the hiring expectations of entrepreneurs from the perspective of regulatory efficiency, composed of business freedom, labor freedom, and monetary freedom. After analyzing 68 countries, they concluded that entrepreneurs in countries with fewer labor restrictions and greater monetary freedom have higher growth ambitions. Moreover, these conclusions are accentuated when gender is considered, with men having higher growth ambitions than women.

**Proposition 4** *Hiring expectations are not conducive to female necessity entrepreneurship.*

### 2.2.5 Fear of failure

According to Frank Knight, risk occurs when the future is unknown, but the probability of the future is “known”. In contrast, uncertainty occurs when the probability is unknown (Runde 1998). Thus, coping with uncertainty and predicting what will happen in the future is one of the biggest challenges that entrepreneurs have to face (Forrester 1971). Traditionally, entrepreneurs have been perceived as risk takers. Some of the literature depicts fear of failure as an attitude towards risk. Fear of failure continues to be one of the factors that is most feared by entrepreneurs, and much of the literature identifies it as a barrier to entrepreneurship. Several studies have shown that fear of failure has a negative relationship with entrepreneurial activity (e.g., Arenius and Minniti 2005; Ardagna and Lusardi 2010). In a society where success and achievement are so important, the possibility of failure is often minimized or even denied (Rothblum 1990). According to the GEM report, “fear of failure” FAILU is defined as the “percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) who indicate that fear of failure would prevent them from setting up a business.”



The relationship between fear of failure and entrepreneurship has also been analyzed by differentiating between opportunity and necessity entrepreneurship. According to Morales-Gualdrón and Roig (2005), this negative relationship between fear of failure and entrepreneurship is present in both types of entrepreneurs but is accentuated in necessity entrepreneurs (Morales-Gualdrón and Roig 2005). Some studies have shown that opportunity entrepreneurs are more willing to accept risks than necessity entrepreneurs (Brünjes and Diez 2013; Block et al. 2015). Wagner (2005) concluded that fear of failure is lower among opportunity entrepreneurs. However, conceiving fear of failure as a negative emotion, Cacciotti and Hayton (2014) argued that risk aversion is a simplistic conceptualization of fear of failure. Several studies have shown that fear of failure can not only inhibit entrepreneurs but also have a motivational effect (Ray 1994; Cacciotti et al. 2016).

With respect to gender, most articles report that men and women perceive fear of failure differently, which can be linked to the gender gap in entrepreneurship (Wagner 2007). Several studies suggest that women are more risk averse and thus less risk tolerant than men (Johnson and Powell 1994; Eckel and Grossman 2003). They also suggest that women consider fear of failure to be an obstacle to entrepreneurship. In fact, fear of failure and women's perceptions of their capabilities and skills are two of the most common subjective variables in the literature on the barriers to women entrepreneurship and the gender gap.

**Proposition 5** *Fear of failure is not conducive to female necessity entrepreneurship.*

### 2.2.6 Entrepreneurial intentions

The models that are most commonly used to study entrepreneurship from the perspective of intentions are the theory of planned behavior, proposed by Ajzen (1991), and the entrepreneurial event model of Shapero and Sokol (1982). One of the main elements in the theory of planned behavior is the individual's intention to carry out a specific behavior. This intention captures a motivating element in that the more intense the intention is, the more likely an individual will be to carry out the action (Ajzen 1991). In contrast, the event model seeks to explain why individuals become entrepreneurs, describing an entrepreneurial event as the result of an individual's perceptions in terms of desire and feasibility. In the model described by Ajzen (1991), intention is influenced by "personal attitude, subjective norm and perceived behavioral control." These two models have served as the basis for new models aimed at explaining entrepreneurial intentions (Krueger and Carsrud 1993; Boyd and Vozikis 1994) and have generally been applied in an educational context focusing on opportunity entrepreneurship. In fostering entrepreneurial intentions, culture, which has been found to be crucial in creating high growth expectations among female entrepreneurs, is decisive (Xie et al. 2021). For example, Anggadwita (2021) found that sociocultural environment has a positive effect on a woman's intention to become an entrepreneur.

The GEM report defines "entrepreneurial intentions" INTEN as "the percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within

three years.” Bird (1988) affirmed that the intentional process starts with an entrepreneur’s needs, values, wants, habits, and beliefs. Accordingly, the assumption is that different necessities may lead to different entrepreneurial intentions. This assumption has been tested by Lucas and Cooper (2012), who concluded that one of the effects of necessity is its direct influence on intentions. However, given the lack of literature linking necessity-driven entrepreneurship and entrepreneurial intentions, the results of the aforementioned study should be further tested.

In terms of gender, Strobl et al. (2012) found that men have stronger entrepreneurial intentions than women. Haus et al. (2013) supported this idea, concluding that men are more likely to transform their intentions into actions. There are also numerous studies relating entrepreneurial intentions with all the variables described throughout this paper (Krueger and Brazeal 1994; Chen et al. 1998; Do Paço et al. 2015; Ng and Jenkins 2018).

**Proposition 6** *Entrepreneurial intentions are not conducive to female necessity entrepreneurship.*

### 3 Data and method

#### 3.1 Data

The data used in this study were gathered from the 2018/2019 Women’s Entrepreneurship Report issued by the GEM. The outcome was female necessity total early-stage entrepreneurial activity (TEA). The conditions analyzed in the study are reported in the following Table 1.

The sample covered 59 countries: Angola, Argentina, Australia, Austria, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Cyprus, Ecuador, Egypt, Estonia, France, Germany, Greece, Guatemala, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Republic of Korea, Latvia, Lebanon, Luxembourg, Madagascar, Malaysia, Mexico, Morocco, Netherlands, Panama, Peru, Poland, Puerto Rico, Qatar, Russian Federation, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Spain, Sudan, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, United Kingdom, United States, Uruguay, and Vietnam.

#### 3.2 Method

Qualitative comparative analysis (QCA) was used to study the causality of conditions leading to a given outcome in a systematic way. There are several methodological variants of QCA, all of which enable the evaluation of different conjectured causes of a given outcome. Fuzzy-set qualitative comparative analysis (fsQCA) was used in this study. This approach differs from crisp-set qualitative comparative analysis (csQCA) in that it permits the use of continuous data, whereas csQCA uses

**Table 1** Conditions used in the study

Conditions	Definition
Women TEA post-secondary education POSED	Percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) indicating to have a post-secondary degree or more
Women have startup skills SKILL	Percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) who believe they have the required skills and knowledge to start a business
Women personally knows an entrepreneur KNOW	Percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) who indicate that they personally know someone who started a firm in the past two years
Women expecting 6+ hires in next five years HIRES	Percentage of those involved in TEA who expect to create 6 or more jobs in 5 years
Women undeterred by fear of failure FAILU	Percentage of 18–64 women (individuals involved in any stage of entrepreneurial activity excluded) who indicate that fear of failure would prevent them from setting up a business
Women entrepreneurial intentions INTEN	Percentage of 18–64 population (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within three years

Source: GEM—Reynolds (2015)

dichotomous data. Using this method and the data sourced from the GEM, a cross-sectional study was carried out for the period 2018–2019.

To determine which combinations of conditions lead to the presence or absence of female necessity entrepreneurship in the current sample of countries, two models were designed. The outcome analyzed in Model 1 was the presence of female necessity entrepreneurship, measured as the indicator of female necessity total-early state entrepreneurial activity (TEA) provided by the GEM. The outcome in Model 2 was the absence of female necessity entrepreneurship. Both models were considered because, under the concept of asymmetric causality, knowing the causes of the presence of a given outcome does not automatically reveal the causes of the absence of that outcome. The models can be stated as follows:

Model 1:  $NECTEA = f(POSED, SKILL, KNOW, HIRES, FAILU, INTEN)$ .

Model 2:  $\sim NECTEA = f(POSED, SKILL, KNOW, HIRES, FAILU, INTEN)$ .

Note: NECETA refers to female necessity total-early state entrepreneurial activity (TEA) provided by the global entrepreneurship monitor (GEM).

**Table 2** Analysis of necessary conditions

Condition	Outcome: NECTEA		Outcome: ~ NECTEA	
	Consistency	Coverage	Consistency	Coverage
POSED	0.582430	0.571620	0.580368	0.579608
~POSED	0.571658	0.572422	0.571059	0.581872
SKILL	0.653421	0.610733	0.544208	0.517595
~SKILL	0.483876	0.510591	0.590718	0.634287
FAILU	0.633314	0.611908	0.534261	0.525276
~FAILU	0.508669	0.517680	0.605269	0.626819
ENTRE	0.549875	0.530623	0.622307	0.611075
~ENTRE	0.596963	0.608343	0.521995	0.541295
INTEN	0.636836	0.651518	0.479047	0.498705
~INTEN	0.510002	0.490334	0.665255	0.650842
HIRES	0.638888	0.635390	0.480694	0.486464
~HIRES	0.483637	0.477869	0.639715	0.643195

The symbol “~” refers to the negation of a condition. For example, “~POSED” refers to the absence of post-secondary education

## 4 Results and discussion

First, analysis of necessary conditions was conducted. Given that no condition had a consistency greater than 0.9 (Cruz-Ros et al. 2017), this analysis indicates that no condition is necessary for the presence or absence of female necessity entrepreneurship (Table 2).

Second, although no condition was found to be necessary at the individual level in either of the two models (consistency less than 0.9 in all cases), the fsQCA method can be used to obtain causal configurations of several conditions that explain the outcome (Table 3).

Overall, proposition one is rejected. For the rest of the propositions, the results are mixed. Some causal configurations include conditions in line with the propositions,

**Table 3** Parsimonious solution for model 1

Causal configuration	Raw coverage <sup>a</sup>	Unique coverage <sup>b</sup>	Consistency
SKILL*~KNOW*~INTEN	0.204767	0.050884	0.761445
SKILL*~FAILU*~KNOW	0.227713	0.019253	0.869208
~KNOW*INTEN*HIRES	0.288821	0.092501	0.793201
SKILL*FAILU*KNOW*INTEN	0.232808	0.006155	0.871145
SKILL*INTEN*HIRES	0.333994	0.031221	0.825055

Solution coverage: 0.575351, solution consistency: 0.77991

<sup>a</sup>Indicates the proportion of the outcome explained by a certain solution

<sup>b</sup>Indicates the proportion of the outcome explained by each individual condition in the causal configuration (Florea et al. 2019)

whereas others do not. No causal configuration includes either the presence or absence of post-secondary education.

The five causal configurations in the parsimonious solution for Model 1 explain approximately 57% of the empirical cases, as reflected by the solution coverage of 0.575351. The first causal configuration of conditions in the parsimonious solution attributes the presence of female necessity entrepreneurship to the presence of entrepreneurial skills, the absence of knowing another entrepreneur, and the absence of entrepreneurial intentions. For this causal configuration, South Africa (0.841, 0.928), Argentina (0.718, 0.953), Spain (0.625, 0.633), and Ireland (0.559, 0.237) have high levels of female necessity entrepreneurship. That is, their membership in this configuration is greater than 0.5. The second causal configuration combines the presence of entrepreneurial skills with the absence of fear of failure and the absence of knowing another entrepreneur. Uruguay (0.754, 0.943), India (0.628, 0.999), Ireland (0.559, 0.237), and Spain (0.546, 0.633) have a membership greater than 0.5. The third causal configuration consists of not knowing other entrepreneurs but having entrepreneurial intentions and hiring expectations. It applies to Ecuador (0.994, 0.997), Egypt (0.847, 0.998), Guatemala (0.727, 0.995), Turkey (0.708, 0.047), India (0.632, 0.999), Republic of Korea (0.598, 0.249), Madagascar (0.586, 0.925), and Qatar (0.547, 0.123), each with a membership greater than 0.5. The fourth causal configuration combines four conditions: the presence of entrepreneurial skills, fear of failure, knowing other entrepreneurs, and entrepreneurial intentions. Countries with a membership greater than 0.5 are Saudi Arabia (0.809, 0.98), Indonesia (0.68, 0.711), Lebanon (0.667, 0.953), and Angola (0.52, 0.999). Finally, the fifth causal configuration consists of the presence of entrepreneurial skills, intentions, and hiring expectations. Sudan (0.996, 0.977), Ecuador (0.814, 0.997), Saudi Arabia (0.809, 0.98), Lebanon (0.793, 0.953), Peru (0.783, 0.402), Turkey (0.708, 0.047), Indonesia (0.68, 0.711), Qatar (0.676, 0.123), and India (0.628, 0.999) all have a membership greater than 0.5. When allowing for interactions between factors, the linear relationships described in the propositions are no longer valid, offering a wide range of causal multiplicity, i.e., combinations of conditions.

In Model 2, the outcome was the absence of female necessity entrepreneurship. Three causal configurations were found (Table 4). The first consists of the absence of entrepreneurial skills, entrepreneurial intentions, and knowing another entrepreneur. The second configuration attributes the absence of female necessity entrepreneurship to the absence of hiring expectations, despite the absence of fear of failure and the presence of knowing other entrepreneurs. Finally, the third causal configuration consists of the absence of entrepreneurial skills and the presence of fear of failure and entrepreneurial intentions. These intentions are normally conducive

**Table 4** Parsimonious solution for model 2

Causal configuration	Raw coverage	Unique coverage	Consistency
~SKILL*~KNOW*~INTEN	0.264072	0.125550	0.756887
~FAILU*KNOW*~HIRES	0.298350	0.184494	0.851280
~SKILL*FAILU*INTEN	0.214101	0.074201	0.879365

Solution coverage: 0.542965, solution consistency: 0.784625

**Table 5** Analysis of sufficient conditions for models 1 and 2

Configuration No.	High rates of women entrepreneurship by necessity					Low rates of women entrepreneurship by necessity		
	1	2	3	4	5	6	7	8
POSED								
SKILL	●	●		●	●	○		○
KNOW	○	○	○	●		○	●	
HIRES			●		●		○	
FAILU		○		●			○	●
INTEN	○		●	●	●	○		●
Raw coverage	0.204767	0.227713	0.288821	0.232808	0.333994	0.264072	0.298350	0.214101
Unique coverage	0.050884	0.019253	0.092501	0.006155	0.031221	0.125550	0.184494	0.074201
Consistency	0.761445	0.869208	0.793201	0.871145	0.825055	0.756887	0.851280	0.879365
Solution coverage	0.575351			0.542965				
Solution consistency	0.77991			0.784625				

Black circles indicate the presence of the condition. White circles indicate the absence of the condition

to opportunity entrepreneurship, whereas necessity entrepreneurship is generally linked to economic survival. Table 5 summarizes results on both models.

## 5 Conclusions

Building on a literature-based theoretical framework that offers six linear propositions regarding the conditions that explain necessity entrepreneurship, this paper presents two models: one that explains the presence of female necessity entrepreneurship and one that explains its absence. Data were sourced from the GEM, and fsQCA was then applied to these data.

Ultimately, the results for Model 1 provide five causal configurations of logically feasible conditions that explain the presence of necessity entrepreneurship in different countries. The results provide information about the countries that each configuration applies to with a membership greater than 0.5. In terms of explaining the absence of such female necessity entrepreneurship, the solution for Model 2 presents three causal configurations. In Model 1, the presence of entrepreneurial skills is a recurring condition when explaining the presence of female necessity entrepreneurship. Likewise, in Model 2, the lack of such skills is a recurring explanatory condition in explaining the absence of female necessity entrepreneurship. This finding is in line with the fact that women entrepreneurs, even when engaging in necessity entrepreneurship, seem to have a high level of skills. This attribute could

hypothetically support the conversion from necessity entrepreneurship to opportunity entrepreneurship.

In short, this study provides a better understanding of what combinations of conditions foster both the presence and absence of female necessity entrepreneurship. Although the study was limited by the size of the sample and its cross-sectional nature, it contributes to the literature on entrepreneurship and has practical policy-making implications by highlighting the aspects that should be fostered to promote this type of entrepreneurship. In particular, as explained earlier, skills matter even for necessity entrepreneurship. These skills could be further supported by policies in favor of women's acquisition of a skills toolkit through government-supported training programs. Entrepreneurial skills are present in most of the causal configurations, and the promotion of these skills is crucial for necessity entrepreneurship. Indeed, even when individuals do not know another entrepreneur or have entrepreneurial intentions, the presence of skills is conducive to female necessity entrepreneurship. The presence of entrepreneurial intentions, along with other factors, similarly emerges as conducive to female necessity entrepreneurship. This finding highlights the importance of creating a culture that encourages these intentions. In addition to programs to promote entrepreneurial intentions, often led by governmental organizations, it would also be worth developing programs to facilitate third-party hiring. A crucial aspect of necessity entrepreneurship is the drive to ensure that close family and friends are supported financially. This aspect is reflected by the fact that hiring third parties is a recurring condition in the causal configurations.

As for the limitations of the study, because it was cross-sectional, it was not possible to analyze the evolution of the causal configurations conducive to the presence and absence of female necessity entrepreneurship over time. In addition, the sample, which covered 59 countries, could be expanded. Future lines of research could therefore consider a longitudinal study, as well as including a larger number of countries in the analysis, thus making it possible to form groups of countries with similar socioeconomic characteristics that present the same causal configurations. Additionally, it would be of interest to analyze women's motivations to become necessity entrepreneurs at the individual level because assumptions of homogeneity might mask differences between different groups of women (Brush and Greene 2021).

**Acknowledgements** Alicia Mas-Tur thanks the Generalitat Valenciana for funding under Project GV/2021/121 to support this research. Pau Sendra-Pons thanks the Spanish Ministry of Universities for funding under FPU2019/00867 to support this research.

**Funding** Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature.

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