



Public policy recommendations for promoting female entrepreneurship in Europe

Isabel Martínez-Rodríguez¹ · Consolación Quintana-Rojo¹ · Pedro Gento¹ · Fernando-Evaristo Callejas-Albiñana¹

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Abstract

From 2021 onwards, female entrepreneurship is expected to grow very substantially as a result of the Covid-19 pandemic. The introduction of teleworking and staggered hours in many countries at national or workplace level will make possible the conciliation between labour and family life. The purpose of this paper is to identify the most influential explanatory factors in the behaviour of female entrepreneurship in Europe so as to subsequently propose efficient economic policy measures to promote it. The distinction between opportunity and necessity female entrepreneurs have been considered since both motivation and factors are different in each case. 15 econometric models using the panel data method for a sample of 20 previously selected European countries (grouped by their GDP level) during the period 2001 to 2018 have been estimated to determine which explanatory factors affect female entrepreneurship and necessity-based female entrepreneurship. The empirical analysis used demonstrates that more women enter into entrepreneurship due to necessity rather than in pursuit of opportunity for European countries both with higher levels of GDP and for countries with lower levels of GDP. In this context, the following policy measures should be implemented to promote female entrepreneurship in Europe: the optimization of government spending (training courses and mentoring, public procurement, stronger networks, support in reconciling business and family life, etc.), the government incentives for subsidizing high interest rates to support women in accessing financing, and the improvement of entrepreneurship education to increase the confidence of women in themselves in their own entrepreneurial capabilities.

Keywords Female · Entrepreneurship · Necessity · Opportunity · Explanatory factors · Development · GDP

✉ Isabel Martínez-Rodríguez
isabel.mrodriguez@uclm.es

Extended author information available on the last page of the article

Introduction

Worldwide, females are showing a considerable interest in entrepreneurship, resulting in more females establishing new business ventures (Meyer, 2018; Wu et al., 2019; Hechavarria et al., 2019). Female entrepreneurship has recently been established as a priority for the governments of the world's main economies due to the benefits that both developed and underdeveloped countries can gain from it (Rubio-Bañón & Esteban-Lloret, 2016; Hechavarria et al., 2019). Although women's social and economic participation in the work environment has advanced substantially in the last few decades, several new policy approaches to supporting women in entrepreneurship are starting to emerge (OECD, 2017), specially during the Covid-19 pandemic (European Commission, 2020a).

From 2021 onwards, entrepreneurship is expected to grow very substantially, especially female entrepreneurship. The Covid-19 pandemic has affected the many advanced economies labor market model. For instance, teleworking and staggered hours are being introduced in many countries at national or workplace level (ILO, 2020) making possible the conciliation between labour and family life. As a result, female entrepreneurship is likely to increase.

Given this situation, the main objective of this work is to identify the most influential social, institutional and financial factors in the behaviour of female entrepreneurship in Europe so as to subsequently propose efficient economic policy measures to promote it.

To achieve the objective, Sect. 2 will examine the current increasing interest in the role of woman in entrepreneurial activity by policy makers and scholars (Brush et al., 2020; Wassem, 2018). Section 3 will explain the difference between necessity-driven entrepreneurship and opportunity-driven entrepreneurship and will consider the reasons for starting a business among females. This distinction is important because by understanding the real reasons why women decide to start a business, more efficient economic policies can be designed to promote their activity.

Section 4 will then review the literature on some of the key explanatory factors driving necessity- and opportunity-based female entrepreneurship. Section 5 will estimate 15 econometric models using the panel data method during the period 2001 to 2018. The models are run using a sample group of 20 European countries (classified by higher or lower levels of development -level of GDP at absolute values-) and explanatory factors considered to be the most characteristic of female entrepreneurship and of necessity-based female entrepreneurship. The aim is to determine which is the predominant motivation (necessity vs. opportunity) and to identify which explanatory factors are determinant for each situation so as to subsequently propose efficient economic policy measures to promote female entrepreneurship in each particular case. Finally, Section 6 contains conclusions and policy implications for promoting female entrepreneurship in Europe that are derived from the empirical studies presented in this research.

The relevance of female entrepreneurship

Today, the figure of the entrepreneur is increasingly important in our society and entrepreneurship has become a primary objective of governments of the world's leading, emerging and advanced economies due to its positive impact on wealth and employment (Thurik et al., 2008; Sugheir et al., 2013; Doran et al., 2016; Åstebro & Tåg, 2017), which in turn increases productivity, and encourages innovation (Audretsch, 2007; Cuervo et al., 2007) by enhancing competitiveness (Pradhan et al., 2020) and generating long-term economic growth (Doran et al., 2018; Galindo-Martín et al., 2019; Urbano et al., 2019; Pradhan et al., 2020). Furthermore, recent literature highlights that entrepreneurial activity not only leads to sustained economic growth and a persistent rise in living standards through innovation and enhanced competitiveness, but it can also reduce income inequality and even promote social fairness and justice (Stoica et al., 2020).

In this research, we intend to analyze the case of female entrepreneurship. This consideration is important because contemporary research has shown that there are some differences between men and women when it comes to entrepreneurship (Shmailan, 2016).

The interest in women's entrepreneurship is relatively recent. Up until the late 1970s, the role of women entrepreneurs was rarely considered (Humbert et al., 2010). It was only then when researchers started to recognize that "entrepreneurship is a gendered phenomenon" (Jennings & Brush, 2013). Nowadays, there is a consistent opinion among both policy makers and scholars that women entrepreneurship in last decades has grown significantly all over the world (Cabrera & Mauricio, 2017; OCDE, 2017; Ratten & Dana, 2017). Thus, research on women entrepreneurship has attracted their attention (Eddleston et al., 2016; Ramadani et al., 2015; Shmailan, 2016; Wassem, 2018; Brush et al., 2020).

If we accept that gender is embedded both in how society is structured and in individual choices (Lykke, 2010), it is key to study its impact on entrepreneurial behaviour. This is even more interesting if we consider that, in recent years, there has been a growth in the number of business start-ups by women and that, for this reason, governments have devised different policies to encourage female participation in entrepreneurial activities (Wassem, 2018). Despite this growing interest, women's entrepreneurial potential has only started to materialize (Malach-Pines et al., 2010).

The growing interest on the part of policy makers and scholars in the role of entrepreneurial women is due to the positive effects that an increase in the rate of female entrepreneurs generates in the economic conditions and social well-being of a country (Allen et al., 2008; Wiklund et al., 2019), both in developed and underdeveloped countries (Rubio-Bañón & Esteban-Lloret, 2016). Specifically, in the case of under-developed countries, it is particularly relevant as it can act as a practical solution to reduce poverty (Sarfaraz et al., 2014; Doran et al., 2018).

Fortunately, women's rights and roles have evolved and progressed over recent decades and the negative viewpoint of most societies about women's attainment

of independence and wealth is being left behind (Antai & Anam, 2016). Women are increasingly educated, empowered politically and given economic freedoms (McGowan et al., 2012), which has radically accelerated the number of female entrepreneurs in recent years around the globe (Powell, 2011; Weiler & Bernasek, 2001). Furthermore, studies have found that the determinants of survival and success operate in much the same way for men and women, suggesting that the processes underlying small business performance are similar regardless of gender (Minniti & Arenius, 2003).

Nevertheless, female entrepreneurs continue to face multiple obstacles in their journey (Tewoldebirhan & Joseph, 2019). As such, economic policies should support women in order to promote the development of total entrepreneurial activity, thereby generating economic growth (Rubio-Bañón & Esteban-Lloret, 2016; Hechavarria et al., 2019).

Necessity and opportunity drivers of female entrepreneurship

Since 2001, the Global Entrepreneurship Monitor (GEM) project has differentiated between two different types of entrepreneurial activity: entrepreneurship driven by “necessity”, and entrepreneurship driven by “opportunity” (Block & Wagner, 2010; Reynolds et al., 2005). While there are many other secondary motivations that can influence the decision to become an entrepreneur, such as mixed motivations (a combination of opportunity and necessity or having a job but looking for better opportunities) (Block & Wagner, 2010), necessity-driven and opportunity-driven are the two main kinds and will, therefore, be considered in this research.

On the one hand, necessity-driven entrepreneurs are pushed to start businesses because they have no other job options and need a source of income (Peña et al., 2015). Although they largely arise as a result of purely economic motivations (Block & Wagner, 2010; Hessels & van der Zwan, 2013), based on the need for survival (Carsrud & Brännback, 2010), they may also be motivated by occupational safety concerns (Tyszka et al., 2011) or their own professional or personal dissatisfaction (Noorderhaven et al., 2004).

Opportunity-driven entrepreneurs, on the other hand, choose to start or create a business based on the perception that there is a business opportunity that has not yet been taken advantage of (or which has not been *fully* taken advantage of) by existing companies (Peña et al., 2015). They are generally driven by both economic motivations, associated with the desire to increase their income (Carter et al., 2003) and gain of power, prestige, and/or status (Carsrud & Brännback, 2010), in addition to non-economic motives (Block & Wagner, 2010; Hessels & van der Zwan, 2013), such as the need for independence and achievement (Amorós & Guerra, 2009; Tyszka et al., 2011), or the aspiration to create their own business, be their own boss, and develop new products (Carter et al., 2003).

This distinction is necessary as not all entrepreneurial initiatives contribute to economic growth in the same way. Generally, opportunity-driven entrepreneurs have a greater positive impact on economic growth (Urbano et al., 2019), since they are comparable to larger companies with higher business volumes (Block

& Wagner, 2010; Fairlie & Fossen, 2018), and higher growth expectations than necessity-driven entrepreneurs (Poschke, 2013). The latter are more likely to be located in lower-income regions with limited access to human capital, financial capital, technology, and other resources, which inhibits their potential to innovate and generate employment (Hessels et al., 2008, p. 327).

Women and men have differing reasons for starting a business (Moore & Buttner, 1997). Shapero and Sokol (1982) were the first to distinguish between necessity-driven and opportunity-based entrepreneurship among females. This distinction is important in order to benefit from the participation of women in entrepreneurial activities (Wassem, 2018), because by understanding the real reasons why women decide to start a business, more efficient economic policies can be designed to promote their activity. However, some evidence on relationship between woman entrepreneurship and necessity/opportunity-driven entrepreneurship has already been provided by empirical studies, but it is often quite ambiguous (Holienkaa et al., 2016).

For example, some of the extant literature agrees that more women enter into entrepreneurship due to necessity rather than the pursuit of opportunity. For instance, family conciliation (Baughn et al., 2006; Malach-Pines et al., 2010; Minniti & Naudé, 2010), the exclusion of women in the labour market (Malach-Pines et al., 2010), or the labour market inequalities (Noguera et al., 2015) may push some women to become entrepreneurs. Women at low-income levels may be pushed towards necessity-based entrepreneurship as a substitute for traditional wages/ salaried employment (Maniyalath & Narendran, 2016), as is often the case for single mothers (Jennings & Brush, 2013). Moreover, when women feel that they are earning less income than desired or anticipated, or the working conditions are poor, they tend to start their own businesses (Noguera et al., 2015).

However, some other arguments defend the possibility that women may decide to start their businesses driven by opportunity (Sörensson & Dalborg, 2017; Ndikubwimana et al., 2020). They can be motivated by independence, autonomy, job loss, dissatisfaction with their current job or low career growth, more income, a lack of positive environment, the lack of recognition coupled with a need for achievement and personal growth (Goby & Eroglu, 2011; Ramadani et al., 2015) flexibility and control over one's career, recognition, and self-fulfillment (Jennings & Brush, 2013). For instance, women regard flexibility and childcare obligations as strong motivators to become entrepreneurs (McGowan et al., 2012). Likewise, women now seek financial independence to engage in opportunity-based entrepreneurship. This trend has in turn led to more entrepreneurial initiatives from women who believe that they can earn more from their own businesses compared to traditional wages/ salaried employment (Wassem, 2018).

Finally, it is important to consider those integrative findings that suggests that necessity and opportunity are not two discrete motivations. They argue in terms of a combination of various pull (through necessity) and push (through opportunity) factors often motivating women to make the best use of opportunities that come their way (Goby & Eroglu, 2011).

Explanatory factors of female entrepreneurship

In the task of studying female entrepreneurship and distinguishing between what is necessity- and opportunity-driven, it is crucial to define how these could be affected by different economic, social, and cultural factors. Research has shown that there are some characteristics that are found in both men and women but there are also some distinct differences that exist between the two (Shmailan, 2016). It is imperative to consider this, in particular where governments and policy makers are concerned, due to the implementation of policies for encouraging female entrepreneurs, in addition to the level of entrepreneurial activities in a given country and, therefore, the potential improvement for economic growth therein (Sarfaraz et al., 2014).

The following are some of the factors that may be taken into consideration when becoming an entrepreneur: human capital, perceived capabilities, a country's level of development, and institutional and financial factors. Albeit men may be equally influenced and affected by these factors, in the context of this study, we will look at the effects that they have upon women.

Human capital

Human capital, defined as the skills and knowledge that individuals acquire through investments in education, on-the-job training, and other types of experience (Becker, 1964), is a key factor for entrepreneurship. However, despite being a widely researched topic (Oosterbeek et al., 2010; Peterman & Kennedy, 2003), there is no evidence of a systematic relationship between the level of human capital and the probability of becoming an entrepreneur since economic theory points out that education has two opposite effects (van Der Sluis et al., 2008).

Some authors argue that the individual with the highest level of human capital has skills and attitudes that will encourage him/her to be an entrepreneur (Barba-Sánchez & Atienza-Sahuquillo, 2018; Herrera et al., 2018), such as self-confidence (Kim et al., 2006; Shane & Venkataraman, 2000), lower risk aversion (Shane & Venkataraman, 2000; Ucbasaran et al., 2008), the agility (Westhead et al., 2005) to identify and discover business opportunities (Hajizadeh & Zali, 2016; Qian et al., 2016; Sánchez, 2011), evaluate them and exploit them (Shane & Venkataraman, 2000).

On the contrary, contributions can be highlighted that ensure that the level of education does not have a significant impact on the preferences for being an entrepreneur (Goby & Erogul, 2011; Jones & Jayawarna, 2010), with this relationship being over-emphasized (Baum & Silverman, 2004; Nabi et al., 2010). Other non-cognitive skills such as social skills or creativity (Ward, 2004; Weitzel et al., 2010; Zhao & Seibert, 2006), are much more decisive in the decision to become an entrepreneur. With a higher level of human capital, the individual will prefer the security of a salary according to his/her qualifications with good conditions against the

risk and uncertainty associated with self-employment (van Der Sluis et al., 2008; Millán & Congregado, 2014; Galindo-Martin et al., 2010).

This lack of consensus in the relationship between human capital and entrepreneurship may be due to differences in the motivation, whether through necessity or opportunity. It has been shown that necessity-driven entrepreneurs are more likely to lack entrepreneurial skills, experience, and high levels of education (Block & Wagner, 2010). Human capital is an important factor in identifying more and better opportunities and promoting entrepreneurship (Marques, 2017; Nasiri & Hamelin, 2018).

Although all these assessments can be applied to both men and women, the way in which they may make use of stocks of human capital to identify opportunities may differ (DeTienne & Chandler, 2007). Human capital is an important determinant for females to engage in entrepreneurship and has been extensively used to predict female propensity towards entrepreneurship (Wassem, 2018, p. 135).

Perceived capabilities

Beyond the level of human capital, the perception of one's own abilities to start a business is a differential component of entrepreneurship according to gender (Álvarez et al., 2012). Entrepreneurs often perceive their own abilities as crucial to the success of their business (Cooper et al., 1988; Hsu et al., 2019). It is thus also important for individuals to be able to recognize that they effectively possess the knowledge and skills necessary to be an entrepreneur (Peña, Guerrero & González-Pernía, 2015). Specifically, women's motivation in launching business ventures depends upon the level of their self-assessment of their abilities and knowledge (Brush et al., 2017), and a lack of confidence reduces the growth of women's businesses (Carter, 1993).

For instance, at the European Union-level, women were less likely than men to feel that they had the skills, knowledge and experience to start a business over the 2010–14 period. This gender gap held across all EU Member States (OECD, 2017).

Institutional and financial factors

Access to capital plays an important role in entrepreneurship, and yet it is one of an entrepreneur's most challenging problems (Hwang et al., 2019). It is important to facilitate entrepreneur's access to capital because this has a positive impact on income, well-being, economic growth (Anton & Bostan, 2017), as well as the progress of female entrepreneurs (Halabisky, 2018).

In this regard, although women have made progress in gaining similar access to financing as men, some recent studies have indicated that gendered biases exist that prevent them from being equally funded when demonstrating their business's viability and commitment (Bigelow et al., 2014; Shmailan, 2016; Halabisky, 2018). Evidence suggests that females encounter greater barriers in gaining access to funding (Alsos & Ljunggren, 2017; Hwang et al., 2019; Marlow & Patton, 2005; Muravyev et al., 2009), they receive smaller loan amounts in comparison to their male counterparts (Treichel & Scott, 2006; Verheul & Thurik, 2001), and that they are often

charged higher interest rates (Wu & Chua, 2011). For this reason, female entrepreneurs establish firms with significantly less financial capital than men do (Treichel & Scott, 2006; Shaw et al., 2009). Sometimes the discrimination is not so evident, and it appears that covert and implicit biases exist that create barriers for women (Eddleston et al., 2016).

On the one hand, the discrepancy regarding the amount of capital raised by male versus female entrepreneurs can be caused by the discrimination of institutions. Studies suggest that the legitimacy, commitment and credibility, as well as the venture's viability and quality of female entrepreneurs are often questioned by capital providers (Greene et al. 2001; Eddleston et al., 2017). Women entrepreneurs need to share greater information than male entrepreneurs to obtain financing (Murphy et al., 2007) because the evaluative criteria applied by bank loan officers are different to the detriment of women (Constantinidis et al., 2006). On the other hand, the discrepancy can also be attributed to a lack of confidence in their own entrepreneurial capabilities (Minniti & Arenius, 2003). This may lead them to perceive that bankers have a negative view of their creditability and reject them (Carter et al., 2006; Hill et al., 2006).

Recent research, however, has shown that gender differences in obtaining financial capital are diminishing (Becker-Blease & Sohl, 2007; Carter et al., 2007), or even disappearing (Orser et al., 2006; Wilson et al., 2007; Eddleston et al., 2016).

In general, without considering the impact of gender, it can be concluded that necessity-driven entrepreneurs, who tend to be linked to small companies, with low-income levels, solvency and, therefore, fewer collateral assets, will face more difficulties in gaining access to bank credit and alternative sources of financing (Block & Wagner, 2010; Poschke, 2013). Moreover, a monetary restriction could be more worrisome for them, as they depend heavily on short-term financing by banks (Vendrell, 2012), and trade credit (Coleman, 2000).

The country's level of economic development (GDP at absolute values)

In this research the indicator Gross Domestic Product (at absolute values) has been used as a measure of economic development as the economic growth is a complementary indicator to development, and it is measured popularly via GDP. This indicator estimates the value added in a country which is the total value of all goods and services produced in a country minus the value of the goods and services needed to produce them. Thus, GDP is the single most important indicator to capture economic activity and a feedback effect can be accepted: activity promotes entrepreneurship and innovation activities, and the latter enhances economic activity (Galindo-Martin & Méndez-Picazo, 2014).

Although the phenomenon of female entrepreneurship is present in all countries, there is a considerable variation among different countries (Estrin & Mickiewicz, 2011) because their level of economic growth (Fairlie & Fossen, 2018) and development can affect both the rates of entrepreneurial efforts and their type (Sternberg & Wennekers, 2005; van Stel et al., 2005). Specifically, the national income level plays a critical role in deciding whether female entrepreneurship is necessity-driven or opportunity-based (Terjesen & Amorós, 2010).

The occurrence of necessity entrepreneurship can be expected to be related to the early development stage of an economy (Koster & Rai, 2008). Women in low-income countries engage in necessity-based entrepreneurship due to economic necessities, survival needs, a way out of poverty (Naudé, 2011; Terjesen & Amorós, 2010), health requirements and family education (Jennings & Brush, 2013; Wassem, 2018), the need for selfsupport and lack of employment opportunities (Amorós et al., 2019).

A country's level of economic growth and development is positively related to the probability that individuals will engage in opportunity-based entrepreneurship (Fairlie & Fossen, 2018; Amorós et al., 2019). As economies develop, the number of people who might engage in necessity-based entrepreneurship to meet their basic needs decreases because economic development is correlated with poverty reduction and an improved standard of living (Acs, 2006). Higher income level countries have auspicious economic conditions that offer more entrepreneurial opportunities for women. They can benefit from stronger institutions, along with easy access to human and monetary capital. Therefore, women in high-income level countries enter into opportunity-driven entrepreneurship due to frustration in career advancement (Lerner, & Malach-Pines, 2011), because of their need for achievement, or their desire for independence, self-efficacy, and self-reliance (Wassem, 2018).

The empirical aim of this paper is to analyse the necessity- and opportunity-based female entrepreneurship in European countries. Although all the countries which have been analysed are developed, their level of Gross Domestic Product (GDP) at absolute values have been also considered as way of determining the level of economic activity and thus the level of economic growth.

In light of these considerations, the following hypotheses are proposed:

- H1: Females are more likely to engage in opportunity-based entrepreneurship rather than necessity-based entrepreneurship in European developed countries (GDP at absolute values).
- H2: The explanatory socio-economic factors that determine necessity-based female entrepreneurship differ for the European country's level of development (GDP at absolute values).

Empirical analysis

Methodos and data

The empirical work was carried out using the statistical method of panel data analysis. The information provided by the GEM database¹ on total entrepreneurial activity (TEA) was taken as a reference, using 20 European countries (sufficient statistical information) and time series from 2001 to 2018 (GEM, 2020). The proposed models consider four types of entrepreneurship: Total Entrepreneurial Activity (TEA), Female Total Entrepreneurial Activity (FTEA), Female Opportunity-Driven Entrepreneurial Activity (FOTEA), Necessity-Driven Female Total Entrepreneurial Activity (FNTEA), to be dependent variables; the rest are considered proxy variables of socio-economic explanatory factors: human capital, perceived capabilities, institutional and financial factors and the country's level of development. In this study we constructed and validated models of the behavior of female entrepreneurs in European countries at different levels of development. The aim is to determine which is the predominant motivation (necessity vs. opportunity) and to identify which explanatory factors are determinant for female entrepreneurship (FTEA) so as to subsequently propose efficient economic policy measures to promote it and, consequently, stimulate economic growth.

The empirical analysis procedure is shown in Fig. 1.

The proxy variables for the explanatory economic and social factors (human capital, perceived capabilities, institutional and financial factors) (with sufficient data) were collected, as explained in the literature review above. Table 1 shows all the proxy variables² considered to represent the effect of explanatory factors on entrepreneurship.

Likewise, the sample has been divided according to the country's level of development in order to be more concrete and precise in the results and to obtain valid conclusions for more national economies. This division has been made by obtaining the GDP average of all countries and by classifying in the sample accordingly: (1) all countries, (2) higher development countries (those countries for which their GDP average from 2001 to 2018 is above the total average GDP for the group) (3) lower development countries (those countries for which their GDP average from 2001 to

¹ GEM began in 1999 as a joint research project between Babson College (USA) and London Business School (UK). The consortium has become the richest source of reliable information on the state of entrepreneurship and entrepreneurial ecosystems across the globe, publishing not only the GEM Global Report annually, but also a range of national and special topic reports each year. GEM's first annual study covered 10 countries, since then some 115 countries from every corner of the globe have participated in GEM research. As a result, GEM has gone beyond a project to become the highly networked organization that it is today. GEM can confidently stake a claim to be the largest ongoing study of entrepreneurial dynamics in the world (GEM, 2020).

² During the specification process, different combinations of all proxy variables were tried to produce the optimum models, but only significant variables were included in the final regression models estimated (see Tables 4–10). All the descriptive statistics and contrast tests were analyzed during the process.

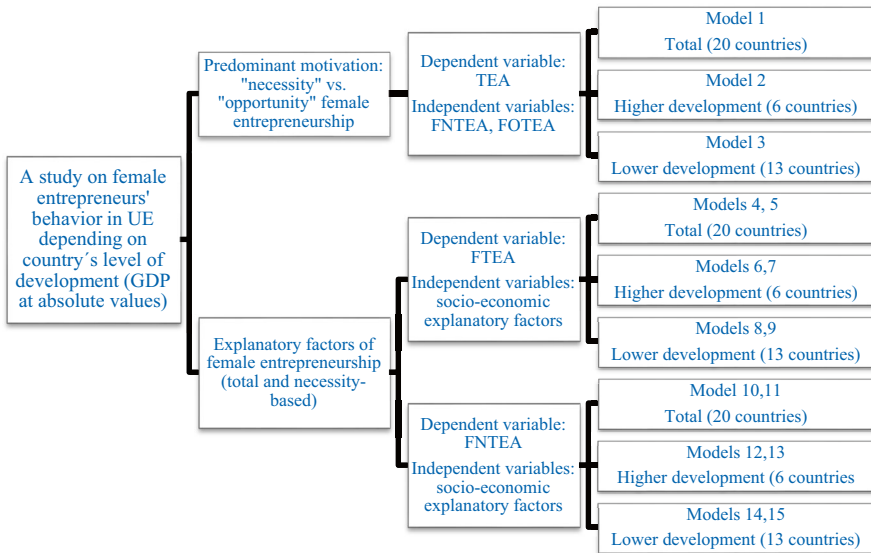


Fig. 1 Empirical analysis procedure

2018 is below the total average GDP for the group).³ Table 2 presents the countries considered for each exploratory model.

Results and discussion

Panel data regressions were run to test the hypotheses. The regression model results are shown in Tables 4 to 5. Table 3 summarizes the structure of the empirical analysis with the models' estimated classification. During the specification process, different combinations of all proxy variables collected (see Table 1) were tried in order to produce the optimum model (by analyzing descriptive statistics and contrast tests), however, only significant variables were included in the final regression models estimated (Tables 4, 5).

First, an exploratory econometric model of total entrepreneurial activity (TEA) was proposed. This is important to determine which entrepreneurial motivation (necessity vs. opportunity) is dominant among female entrepreneurship and which one explains the TEA to a greater extent depending on the country's level of development (measured

³ The variable Gross domestic product (GDP) is measured at purchaser prices and it represents the sum of value added by all its producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. The data processing has been: 1°) The GDP (at absolute values, US\$ current prices) average from 2001 to 2018 by country (20 countries) is calculated. 2°) The total average of these 20 individually GDP averages is calculated. 3°) This overall average is the reference value to classify the countries accordingly: (a) higher development countries: those countries for which their GDP average from 2001 to 2018 is above the reference value (b) lower development countries: those countries for which their GDP average from 2001 to 2018 is below the reference value.

Table 1 Proxy variables (initial) for the socio-economic explanatory factors affecting FTEA

Socio-economic explanatory factor	Proxy variable	Concept	Database
Entrepreneurship	TEA	Total Early-Stage Entrepreneurial Activity (%). Percentage of 18–64 population who are either a nascent entrepreneur or owner-manager of a new business	GEM
	MTEA	Male Early-Stage Total Entrepreneurial Activity (%)	
	FTEA	Female Early-Stage Total Entrepreneurial Activity (%)	
	FOTEA	Female Opportunity-Driven Early-Stage Entrepreneurial Activity (%)	
	FNTEA	Necessity-Driven Female Total Early-Stage Entrepreneurial Activity (%)	
Human capital	HCF	Human capital female (Progression to secondary school refers to the number of new entrants to the first grade of secondary school in a given year as a percentage of the number of students enrolled in the final grade of primary school in the previous year (minus the number of repeaters from the last grade of primary education in the given year)	OECD ^a
	TEDF	Adult education level. Tertiary education in woman (the highest level of education completed by the 25 – 64 year-old population)	
	TEDT	Adult education level. Tertiary education total (the highest level of education completed by the 25 – 64 year-old population)	
Perceived capabilities	CAP	Perceived capabilities (Percentage of 18 – 64 year-old population who believe they have the required skills and knowledge to start a business)	GEM
Institutional and financial factors	FIN	Financing for entrepreneurs (The availability of financial resources -equity and debt- for small and medium enterprises (SMEs). Including grants and subsidies)	GEM
	INTER	Central bank interest rate (%)	Datosmacro ^b
	TAXB	Taxes and bureaucracy (The extent to which public policies support entrepreneurship—taxes or regulations are either size-neutral or encourage new and SMEs)	GEM
	TAX	Tax Burden	IEF ^c
	GOVSP	Government Spending	
	GOVINT	Government Integrity	
	BF	Business Freedom	
	LF	Labour Freedom	
	TF	Trade Freedom	
	MF	Monetary Freedom	
IF	Investment Freedom		

Table 1 (continued)

Socio-economic explanatory factor	Proxy variable	Concept	Database
	FF	Financial Freedom	
	POL	Governmental support and policies (The extent to which public policies support entrepreneurship—entrepreneurship as a relevant economic issue)	GEM
Country's level of development	GDP	Gross Domestic Product at absolute values (US\$ current prices)	World Bank

^aOECD iLibrary is the online library of the Organisation for Economic Cooperation and Development (OECD) featuring its books, papers and statistics and is the gateway to OECD's analysis and data (OECD, 2020)

^bDatamacro aims to offer the main economic and socio-demographic variables of hundreds of countries, to offer a global vision of the economic situation at all times and in each country (Datosmacro.com, 2020)

^cThe Index of Economic Freedom (IEF) is an annual guide published by The Heritage Foundation. The Index of Economic Freedom documents the positive relationship between economic freedom and a variety of positive social and economic goals. The ideals of economic freedom are strongly associated with healthier societies, cleaner environments, greater per capita wealth, human development, democracy, and poverty elimination. The Index covers 12 freedoms – from property rights to financial freedom – in 186 countries. For this study, the factors most representative of entrepreneurship were selected (Index of Economic Freedom, 2020)

by using GDP at absolute values). These findings will be useful for the formulation and implementation of effective public policies that promote female entrepreneurship.

Models 1, 2 and 3 were designed to consider the relative importance depending on the country's level of development. Model 1 (M1) was proposed for all countries, Model 2 (M2) was proposed for higher development countries (their GDP is above the total average GDP for the group), and Model 3 (M3) was proposed for lower development countries (their GDP is below the total average GDP for the group) (see Table 4).

These models shows that all relationships among variables are significant, (p -values: $*p \leq 10$ per cent; $**p \leq 5$ per cent; $***p \leq 1$ per cent) and, therefore, it is valid

Table 2 Countries considered for each exploratory model (2001–2018)

Classification	Countries
Total UE	Austria, Croatia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom
Higher development (above the total average GDP)	France, Germany, Italy, Russia, Spain, United Kingdom
Lower development (below the total average GDP)	Austria, Finland, Greece, Hungary, Ireland, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Sweden, Switzerland

Table 3 Exploratory econometric models estimated

	Total (20 countries)	Higher develop- ment (6 countries)	Lower develop- ment (13 countries)
Dependent variable: TEA Independent variables: FNTEA, FOTEA	M1	M2	M3
Dependent variable: FTEA Independent variables: socio-economic explanatory factors	M4, M5	M6, M7	M8, M9
Dependent variable: FNTEA Independent variables: socio-economic explanatory factors	M10, M11	M12, M13	M14, M15

($p \leq 0.01$) to study and analyze TEA through the two main FTEA components considered, both through necessity and opportunity. In most settings, researchers choose a significance level of 5 per cent, which implies that the p-values must be lower than 0.05 in order to render the relationship under consideration significant. When researchers are very conservative or strict in their testing of relationships, the significance level is set to 1 per cent. In studies that are exploratory, however, a significance level of 10 per cent is commonly used (Hair et al., 2016, p. 153).

However, both motivations do not explain to the same extent the behaviour of the total entrepreneurial activity since results suggest that more women enter into entrepreneurship due to necessity rather than pursuit of opportunity in all countries considered ($\beta_{FNTEA/TEA}^* = 0.5275 > \beta_{FOTEA/TEA}^* = 0.0594$; $\beta_{FNTEA/TEA}^* = 1.6909 > \beta_{FOTEA/TEA}^* = 0.1092$; $\beta_{FNTEA/TEA}^* = 1.5735 > \beta_{FOTEA/TEA}^* = 0.0623$). Therefore, H1 is not supported.

Table 4 Exploratory explanatory models of TEA by FNTEA and FOTEA component. All countries, higher development countries and lower development countries

Dependent variable: TEA	M1 (all countries)	M2 (higher development)	M3 (lower development)
Independent variables (significant and uncorrelated)	FNTEA (+) *** FOTEA (+) *	FNTEA (+) *** FOTEA (+) *	FNTEA (+) *** FOTEA (+) *
Coefficients	FNTEA: 1.4614 FOTEA: 1.1104	FNTEA: 1.6941 FOTEA: 1.4471	FNTEA: 1.5735 FOTEA: 1.1639
Standardized coefficients(β^*)	FNTEA: 0.5275 FOTEA: 0.0594	FNTEA: 1.6909 FOTEA: 0.1092	FNTEA: 1.5735 FOTEA: 0.0623
R2-adjusted	0.8071	0.7620	0.7865
Estimation (Hausman Test) ^b	FE	FE	FE
N (groups)	108 (20 groups)	33 (6 groups)	56 (11 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$

^aThe standardized coefficients obtained in the six models are not an output of Stata software. The standardized coefficients have been calculated directly from the unstandardized coefficients along with the standard deviations of the variables involved: $\beta_j^* = \hat{\beta}_j * \left(\frac{SD_{x_j}}{SD_{y_j}} \right)$

^bThe Hausman test was used to determine the most appropriate estimation method – fixed effects (FE) or random effects (RE) – in order to obtain the most robust parameters in each case

Table 5 Explanatory exploratory models of FTEA by socio-economic explanatory factors (all countries)

Dependent variable: FTEA	M4 (all countries)	M5 (all countries)
Independent variables (significant and uncorrelated)	TEA (+) *** TEDT (-) ** INTER (-) ***	MTEA (+) *** FNTEA (+) *** CAP (-) **
Coefficients	TEA: 0.3629 TEDT: -5.17E-09 INTER: -0.0341	MTEA: 0.2729 FNTEA: 0.5511 CAP: -0.0129
Standardized coefficients (β^*)	TEA: 0.9134 TEDT: -0.0757 INTER: -0.1021	MTEA: 0.4556 FNTEA: 0.5007 CAP: -0.1266
R2-adjusted	0.8225	0.7868
Estimation (Hausman Test)	FE	FE
N (groups)	229 (18 groups)	206 (20 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

Next, exploratory models of the behaviour of FTEA were proposed (see Tables 5, 6, 7). As in the previous case, the effect of the country's level of development (measured by using GDP at absolute values) -all countries (see Table 5, M4 y M5), higher development countries (Table 6, M6 y M7) and lower development countries (see Table 7, M8 y M9)—was analyzed. These models were estimated to explain the behaviour of FTEA, thus socio-economic explanatory factors (human capital, perceived capabilities, institutional and financial factors) were also considered.

These models suggest that it is valid ($p \leq 0.01$) to study and analyze FTEA through socio-economic explanatory factors. Once again (as in M1 to M3) the results shows that more women enter into entrepreneurship due to necessity (FNTEA)

Table 6 Explanatory exploratory models of FTEA by socio-economic explanatory factors (higher development countries)

Dependent variable: FTEA	M6 (higher development)	M7 (higher development)
Independent variables (significant and uncorrelated)	TEA (+) *** TEDF (-) * INTER (-) *	MTEA (+) *** LF (+) * CAP (+) *
Coefficients	TEA: 0.4041 TEDF: -4.44E-09 INTER: -0.0308	MTEA: 0.4306 LF: -0.0108 CAP: 0.1331
Standardized coefficients (β^*)	TEA: 0.9443 TEDF: -0.0845 INTER: -0.1354	MTEA: 0.6666 LABF: -0.1880 CAP: 2.0030
R2-adjusted	0.7858	0.5342
Estimation (Hausman Test)	FE	FE
N (groups)	83 (5 groups)	67 (6 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

Table 7 Explanatory exploratory models of FTEA by socio-economic explanatory factors (lower development countries)

Dependent variable: FTEA	M8 (lower development)	M9 (lower development)
Independent variables (significant and uncorrelated)	TEA (+) *** TEDT (-) *** INTER (-) ***	MTEA (+) *** FNTEA (+) *** CAP (-) ***
Coefficients	TEA: 0.3527399 TEDT: -7.07E-09 INTER: -0.0398	MTEA: 0.2439 FNTEA: 0.6469 CAP: -0.0241
Standardized coefficients (β^*)	TEA: 0.9236 TEDT: -0.0939 INTER: -0.0398	MTEA: 0.4614 FNTEA: 0.6521 CAP: -0.2060
R2-adjusted	0.8261	0.7791
Estimation (Hausman Test)	FE	FE
N (groups)	144 (12 groups)	139 (14 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

rather than pursuit of opportunity in all European countries considered. The R2 of M7 was small. This is because many other factors also influence the opportunity and necessity entrepreneur variables.

The level of education does not have a positive impact on female entrepreneurship for any country considered. Women with higher levels of human capital will prefer the security of a salaried job according to their qualifications with good conditions (Millán et al., 2014), against the risk and uncertainty associated with self-employment (Galindo-Martin et al., 2010; Valliere & Peterson, 2009; van Der Sluis et al., 2008). Conversely, financing dependent on interest rates is a determining factor for female entrepreneurship in the three groups of countries considered. Additionally, the value of the standardized coefficients obtained makes it possible to conclude that financial factors explain FTEA behaviour to a greater extent than human capital for all the groups of countries considered (M4: $\beta_{INTER/FTEA}^* = |-0.1021| > \beta_{TEDT/FTEA}^* = |-0.0757|$; M4: $\beta_{INTER/FTEA}^* = |-0.1021| > \beta_{TEDT/FTEA}^* = |-0.0757|$ M6: $\beta_{INTER/FTEA}^* = |-0.1354| > \beta_{TEDF/FTEA}^* = |-0.0845|$; M8: $\beta_{INTER/FTEA}^* = |-0.0398| > \beta_{TEDT/FTEA}^* = -7.07E-09$ M6: $\beta_{INTER/FTEA}^* = |-0.1354| > \beta_{TEDT/FTEA}^* = |-0.0845|$ M8: $\beta_{INTER/FTEA}^* = |-0.0398| > \beta_{TEDT/FTEA}^* = -7.07E-09$).

Perceived capabilities (CAP) positively affect FTEA in higher development countries (with higher GDP levels) but not in lower development (with lower GDP levels) countries. The woman will put her self-perceived knowledge and skills into practice if the economic environment is favourable. Otherwise, in countries with a lower level of development, they are more likely to be employed by public or private organizations.

Finally, considering that more women enter into entrepreneurship due to necessity rather than pursuit of opportunity in all countries considered, exploratory models of the behaviour of FNTEA were proposed (Tables 8, 9, 10). As in the previous case,

Table 8 Explanatory exploratory models of FNTEA by socio-economic explanatory factors (all countries)

Dependent variable: FNTEA	M10 (all countries)	M11 (all countries)
Independent variables (significant and uncorrelated)	MTEA (+) *** TEDF (-) *** PIB (-) *	MTEA (+) *** TEDT (-) *** INTER (+) ***
Coefficients	MTEA: 0.3743 TEDF: -9.55E-09 PIB: -1.57E-13	MTEA: 0.3979 TEDT: -9.35E-09 INTER: 0.0720
Standardized coefficients (β^*)	MTEA: 0.6825 TEDF: -0.1529 PIB: -0.1984	MTEA: 0.7314 TEDT: -0.1507 INTER: 0.2374
R2-adjusted	0.5162	0.5040
Estimation (Hausman Test)	FE	FE
N (groups)	223 (16 groups)	(18 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

the effect of the country's level of development (measured by using GDP at absolute values) -all countries (Table 8, M10 y M11), higher development countries (higher levels of GDP) (Table 9, M12 y M13) and lower development countries (lower levels of GDP) (Table 10, M14 y M15)—was analyzed. These models were estimated to explain the behaviour of FNTEA, thus socio-economic explanatory factors (human capital, perceived capabilities, institutional and financial factors) were also considered.

They show that that FNTEA behavior is influenced by similar factors in all 20 countries considered. Therefore, significant differences are not observed between the explanatory factors of FNTEA depending on their level of GDP, except for the perceived capabilities (CAP). Therefore, H2 can be partially accepted. R2-adjusted of M10 to M15 were small. This is because many other factors also influence the necessity entrepreneur variables.

Table 9 Explanatory exploratory models of FNTEA by socio-economic explanatory factors (higher development countries)

Dependent variable: FNTEA	M12 (higher development)	M13 (higher development)
Independent variables (significant and uncorrelated)	MTEA (+) *** TEDF (-) * TRADF (-) **	MTEA (+) *** CAP (+) * MONF (-) *
Coefficients	MTEA: 0.3963 TEDF: -9.38E-09 TF: -0.0442	MTEA: 0.2458 CAP: 0.0227 MONF: -0.0339
Standardized coefficients (β^*)	MTEA: 0.5746 TEDF: -0.1671 TRADF: -0.5464	MTEA: 0.3564 CAP: 0.3193 MONF: -0.4468
R2-adjusted	0.3338	0.4366
Estimation (Hausman Test)	FE	FE
N (groups)	87 (5 groups)	67 (6 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

Table 10 Explanatory exploratory models of FNTEA by socio-economic explanatory factors (lower development countries)

Dependent variable: FNTEA	M14 (lower development)	M15 (lower development)
Independent variables (significant and uncorrelated)	MTEA (+) *** TEDF (-) * GOVSP (+) *	MTEA (+) *** TEDT (-) ** INTER (+) ***
Coefficients	MTEA: 0.3471 TEDF: -7.80E-09 GOVSP: 0.0050	MTEA: 0.3919 TEDT: -1.00E-08 INTER: 0.0604
Standardized coefficients (β^*)	MTEA: 0.6513 TEDF: -0.1285 GOVSP: 0.1125	MTEA: 0.7352 TEDT: -0.1318 INTER: 0.2270
R2-adjusted	0.4953	0.5062
Estimation (Hausman Test)	FE	FE
N (groups)	136 (11 groups)	144 (12 groups)

p-value * $p \leq 0.10$; ** $p \leq 0.5$; *** $p \leq 0.01$

First, high levels of human capital (TEDF, TEDT) do not have a positive effect on FNTEA for any group of countries considered (just as for the FTEA case in M4, M6 and M8) because higher levels of education increase well-paid employment opportunities. However, the perceived capabilities (CAP) positively affect FNTEA in higher development countries (higher levels of GDP) but not in lower development countries (lower levels of GDP) (as in the case of FTEA in M7).

Secondly, these models suggest that institutional and financial factors exert a significant influence on the behaviour of FNTEA. Furthermore, financial factors explain FNTEA behaviour to a greater extent than human capital in lower development countries (M15: $\beta_{INTER/FNTEA}^* = 0.2270 > \beta_{TEDT/FNTEA}^* = |-0.1318|$) and CAP in higher development countries (M13: $\beta_{MONF/FNTEA}^* = |-0.4468| > \beta_{CAP/FNTEA}^* = 0.3193$).

Thirdly, the direct relationship between FNTEA and MTEA may be due to the fact that, as discussed above, men are in a better position to take advantage of all the business opportunities, forcing women to become entrepreneurs out of necessity.

Table 11 summarises the empirical results. All the explanatory factors of female entrepreneurship are shown. The explanatory factors of FNTEA which can be apply as the most efficient policy instruments to promote FNTEA have been highlighted with asterisk (*) for each group of countries. Two selection criteria have been applied for selecting them. Firstly, the higher the absolute value of the standardized beta coefficient (β^*), the stronger the effect on dependent variable (FNTEA). Secondly, variables should have signs consistent with economic theory.

The following findings can be drawn from each one of these final econometric models (M1 to M15).

Firstly, models M1 to M3 show that more women enter into entrepreneurship due to necessity (FNTEA) rather than pursuit of opportunity in all European

Table 11 Explanatory factors of female entrepreneurship by group of EU countries

Dependent variable	Explanatory factors		
	All countries	Higher development (GDP)	Lower development (GDP)
TEA (M1 to M3)	<ul style="list-style-type: none"> • (M1) FNTEA (*) • FOTEA 	<ul style="list-style-type: none"> • (M2) FNTEA (*) • FOTEA 	<ul style="list-style-type: none"> • (M3) FNTEA (*) • FOTEA
FTEA (M4 to M9)	<ul style="list-style-type: none"> • TEA • MTEA • FNTEA • Human capital • Financial factor • <i>Perceived Capabilities</i> 	<ul style="list-style-type: none"> • TEA • MTEA • Human capital • Institutional factors • Financial factors • <i>Perceived Capabilities</i> 	<ul style="list-style-type: none"> • TEA • MTEA • FNTEA • Human capital • Financial factors • <i>Perceived Capabilities</i>
FNTEA (M10 to M15)	<ul style="list-style-type: none"> • MTEA • PIB • Human capital • (M11) <i>Financial factors (INTER)</i> (*) 	<ul style="list-style-type: none"> • MTEA • Human capital • Institutional factors • Financial factors • (M13) <i>Perceived Capabilities (CAP)</i> (*) 	<ul style="list-style-type: none"> • MTEA • Human capital • (M15) <i>Institutional factors (GOVSP)</i> (*) • (M15) <i>Financial factors (INTER)</i> (*)

(*) Instrumental variables with the strongest effect on dependent variable

countries considered. Thus, exploratory models of the behaviour of FNTEA must be considered in order to implement more efficient public policies to promote it.

Secondly, models M4 to M9 show that female total entrepreneurial activity (FTEA) is naturally driven by total entrepreneurial activity (TEA) and by male entrepreneurial activity (MTEA). However, FTEA is also driven by other specific factors that will be used to design efficient and effective policies to promote FTEA (as will be shown in the next section). For instance, “perceived capabilities” (CAP) stimulate the FTEA for higher development countries (higher GDP average), while the opposite situation exists for lower development countries (lower GDP average). For this reason, H2 have been partially accepted.

Finally, models M10 to M15 inform how to implement efficient policy to promote FNTEA for each group of countries. In addition to identify the explanatory factors on those policies can't be implemented (i.e., MTEA and PIB), the following are worth noting. Perceived capabilities (CAP) positively affect FNTEA in higher development countries (with higher GDP levels) and FNTEA can be promoted by rises in interest rates (INTER) and rises in government spending (GOVSP) in lower development countries (with lower GDP levels). All in all, perceived capacities, interest rates and government spending should be considered in order to implement efficient policies to promote female entrepreneurship in Europe.

Conclusions and policy implications

Nowadays, women entrepreneurs have become part of the important factor in the world of entrepreneurship and they are recognised as key contributors to economic growth. Thus, her activity has attracted the attention of researchers and policy makers alike (Alsos et al., 2016; Shmailan, 2016; Brush et al., 2020).

This paper has explored and examined the behaviour of female entrepreneurial activity in 20 European developed countries, considering two main types of entrepreneurship (necessity and opportunity). To do this, it defined the explanatory factors that determine this behaviour, as well as the relative importance of these factors at different levels of economic development (measured by using GDP at absolute values). The results of the empirical analysis do not offered support for the hypothesis H1, and H2 was counted as being partially supported.

The rate of total entrepreneurial activity (TEA) was shown to be sufficiently and very well represented by two of the components of female entrepreneurship, i.e., opportunity-driven, and necessity-driven entrepreneurship (FOTEA and FNTEA, respectively). This finding is consistent with the opinion of scholars who argue that women can improve the level of entrepreneurial activities in a country (Sarfaraz et al., 2014). Additionally, the value of the standardized coefficients obtained makes it possible to conclude that FNTEA explains TEA behaviour to a greater extent than FOTEA in the three groups of countries considered (H1 was not supported) (M1 to M3). These results show that more women enter into entrepreneurship due to necessity rather than in pursuit of opportunity, but the most surprising finding was that contrary to related research on the subject so far (Fairlie & Fossen, 2018; Amorós et al., 2019), most women in developed countries with high levels of GDP engage in necessity-based entrepreneurship. For this reason, to design and implement effective policies to promote women entrepreneurship in Europe, factors influencing necessity-based female entrepreneurship (FNTEA) should be considered.

Significant differences were not observed between the explanatory factors of FNTEA depending on their level of GDP. The only exception is for the “perceived capabilities” (CAP) (H2 was partially accepted) that positively affect FNTEA in higher development countries (with higher GDP levels) (M13) but not in lower development countries (with lower GDP levels). This finding will facilitate the implementation of effective common policies in Europe to promote female entrepreneurship.

In light of the consistency between theory and practice, the analytical technique used here can be considered adequate.

These findings have the following policy implications for promoting female entrepreneurship in Europe (Fig. 2).

In lower development countries (with lower GDP levels) the following policy measures should be implemented to promote FNTEA. On the one hand, the quality of governance should be improved, for example, by optimizing government spending (GOVSP). Following the European Commission policy recommendations (OECD, 2017), policy makers can support female entrepreneurs by offering training courses and mentoring and ensuring that their policies help women to participate in the labour market. The public procurement could be another important programme to open up market opportunities for women and providing more support for growth-oriented women entrepreneurs with dedicated business incubator and business accelerator programmes and the creation of an infrastructure for risk capital. In this context, the Entrepreneurship 2020 Action Plan calls for awareness raising, entrepreneurship training, stronger networks and support in reconciling business and family life (European Commission, 2020a). This is particularly important now in relation to the Covid-19 pandemic.

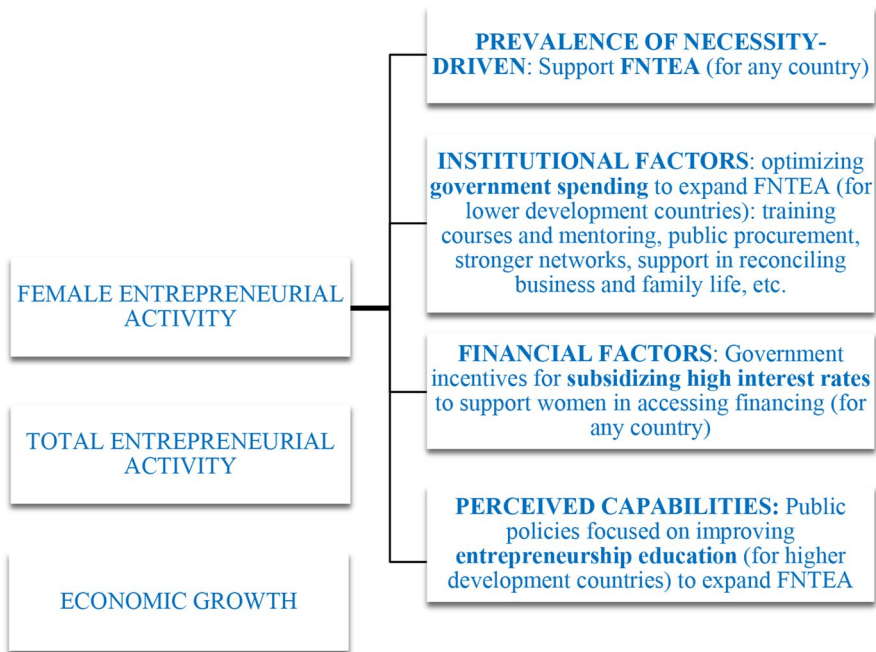


Fig. 2 Summary of results obtained: drivers of female entrepreneurship

On the other hand, interest rates increase can be a response of Central banks when the economy is overly strong. The higher the level of economic activity rate of growth, the greater the women possibilities for starting a business. However, the main obstacle for investment will be the higher cost of bank financing. The solution to overcome this problem could be government incentives for subsidizing high interest rates. Fortunately, there is a growing trend in public policy to offer more substantial tailored financial supports for women entrepreneurs (OECD, 2017, p.21). For instance, the Commission is launching a gender-smart finance initiative under the InvestEU programme, to stimulate funding for female-led companies and funds (European Commission, 2020a). Likewise, there are a number of public policy instruments used in EU Member States to improve access to finance for women entrepreneurs: grants, microcredits, crowdfunding and public procurement opportunities, etc. (OECD, 2017).

Finally, in higher development countries (with higher GDP levels) perceived capabilities (CAP) positively affect FNTEA. This finding is consistent with the fact that one of the most important features of entrepreneurship is entrepreneurs' recognition that they possess the knowledge and skills needed to start a business (Peña et al., 2015). Accordingly, the implementation of public policies focused on improving entrepreneurial education could be a good measure to promote FNTEA in higher development countries. This is corroborated by the European Commission (2020b) as one of its main objectives is to promote education in this field and stress its importance at all levels from primary school to university and beyond. Likewise,

The Commission has encouraged initiatives that help women build confidence in their remarkable abilities (European Commission, 2020b).

Limitations and directions for future research

The empirical work had certain limitations. For instance, the data are not homogeneous due to the lack of statistical information for many of the years and countries considered in the selected databases, especially when the analysis is conducted for multiple countries, as in the present case. When GEM presents the homogenized data without statistical gaps, the resulting conclusions will be more solvent and closer to reality.

Notwithstanding its limitations, the present research opens avenues of future research. First, the empirical analysis aimed at providing an adequate and effective methodology for studying female entrepreneurial activity in terms of the technique used, which is valid for all European countries. Secondly, analyzing female entrepreneurial behaviour by levels, divided into levels of development of the countries (measured by using GDP at absolute values), makes it possible to use the results for decision-making, by designing more effective economic policy measures to achieve the objective of promoting female entrepreneurship and, with it, economic growth. TEA behaviour could thus be further specified. At the same time, given the scant literature to date focused on the impact of factors on necessity- or opportunity-driven female entrepreneurship, future research could seek to overcome this limitation.

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Declarations

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Authors and Affiliations

Isabel Martínez-Rodríguez¹  · Consolación Quintana-Rojo¹ · Pedro Gento¹ · Fernando-Evaristo Callejas-Albiñana¹ 

Consolación Quintana-Rojo
consolacion.quintana@uclm.es

Pedro Gento
pedro.gento@uclm.es

Fernando-Evaristo Callejas-Albiñana
fernando.callejas@uclm.es

¹ Faculty of Law and Social Sciences, University of Castilla—La Mancha, Ronda de Toledo S/N., 13071 Ciudad Real, Spain