The value of entrepreneurship by gender on regional behaviour

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Abstract

This paper examines how the value of entrepreneurship by gender is related to regional behaviour. Researchers have traditionally defined entrepreneurial organization as separate to gender and to economic growth. Using the Global Entrepreneurship Monitor (GEM) we complete a dataset of 50 countries using variables such as total early-stage entrepreneurial activity (TEA) and opportunity-driven entrepreneurial activity (OPP). The methodology used proposes an analysis of regional convergence, comparing the evolution over time of both the rate of entrepreneurial activity and the ratios of opportunity-driven and need-driven entrepreneurial activity, distinguishing by gender. On the other hand, a regression model is proposed that explains the greater presence of female entrepreneurship. The results show that entrepreneurship by gender is an important factor to define different cluster of countries according to how men and women entrepreneurs create new economic opportunities.

Introduction

The importance of entrepreneurship on economic growth has been studied by many authors around the world. The analysis of regional behaviour could be explained at different levels but in this paper, we consider the country's level to compare the different

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entrepreneurial behaviours (Carree & Thurik, 2010). Some studies hold that women entrepreneurs present individual characteristics self-motivation, fear of failure and personal satisfaction more than men (Anna et al., 2000; Ljunggren & Kolvereid, 1996; Shabbir & DiGregorio, 1996; Terrel & Troilo, 2010; Wagner, 2004). Other studies demonstrate that female entrepreneurship tends to create small businesses and to grow less than the case of male entrepreneurs (DuReitz & Henrekson, 2000; Coleman, 2007; Minniti et al., 2005).

During the last period of economic recession, entrepreneurial activity reached remarkable values as an alternative to working for others, with a significant incorporation of women entrepreneurs in those years. With economic growth, the trend tends to reverse.

For this reason, the main objective of this work is to analyse the impact of the female entrepreneurship rate and try to answer questions such as: Does the country's regional environment condition the evolution of entrepreneurship? by gender? Are there differences in the type of entrepreneurship (motivated by need or opportunity) according to the gender of the entrepreneur? Have women consolidated a significant presence within entrepreneurial activity? What factors are significant to favour female entrepreneurship? All of these questions try to analyse the similarities and differences between female and male entrepreneurship in different countries and cultures.

In this sense, the Global Entrepreneurship Monitor (GEM) allows to analyse all doubts about entrepreneurship by gender around the world, testing different related variables in more than 50 countries.

The paper proceeds as follows: first, we discuss earlier work on entrepreneurship by gender; second, data and methodology are set out; third, we present and discuss our results; and finally, we draw some conclusions and explain the limitations of our research.

Literature review

Several studies from the 1980s and 1990s start to consider gender as variable in entrepreneurial analysis (Greene et al., 2007). So, these individual characteristics of entrepreneurship by gender were studied to identify an epitome entrepreneurial profile (Fuller-Love, 2009; Galindo et al., 2009; Minniti & Naudé, 2010). This first approximation was the beginning of how women entrepreneurs operate compared to men entrepreneurs (Masters & Meier, 1988). It was the bridge to academic studies oriented to feminist approaches, which cannot obtained significant impact than the studies related to economic development and female employment. One of the relevant books taking this approach is *Understanding the Gender Gap: An Economic History of American Women* (Goldin, 1990) which highlighted the importance of woman's labour as a research topic. Therefore, variables related to motherhood, self-confidence or well-being begin to be included in the studies (Shelton, 2006; Williams, 2004; Collins-Dodd et al., 2004).

Following Galindo et al. (2009), female entrepreneurship is a crucial unexplored topic and the conclusions about how economic contribution that female

entrepreneurs can make have been analysed around the world by academicians and experts.

These variables, among others used by researchers over the last four decades, try to explain the concept of entrepreneurial orientation (EO). The authors who promote the EO concept hold that entrepreneurial organizations could be defined as innovative, proactive and risk-tasking (Miller, 1983; Lumpkin & Dess, 1996; Covin et al., 2006; Covin et al., 2012). EO's process is proposed in terms of decision-making entrepreneurs as a part of the process.

At the same time, other researchers started to include gender in their studies and recognise differences between male and female entrepreneurs (Bae et al., 2014; Fagenson, 1993; Sexton & Bowman-Upton, 1990). Recent studies hold that gender explains differences for starting business and expectations for success and growth (Lim & Envick, 2013).

Regional vision of entrepreneurship by gender and its relationship with growth is still studied by researchers around the world. Female entrepreneurship is strongly connected to the national culture of a country. For that reason, culture and EO has been studied by several authors at organizational level (Pinillos & Reyes, 2011; Thomas & Mueller, 2000). Most recently, Gupta and Fernandez (2009) found in their research that entrepreneurial behaviour depends on national culture. Even more, Seongbae and Envick (2013) summarize results that indicate that firms with strong EO related to national culture are more likely to form extensive strategic alliances. Other authors, such as Fuller-Love (2009), Giménez and Calabrò (2018) explore the impact of regional aspects about the women's role at work and in business. Other authors, such as Goktan, and Gupta (2015), explain the relationship between biological sex, gender identity and entrepreneurial orientation and provide a framework of conclusions according four different countries: the United States, Hong Kong, India, and Turkey. In all of them, they demonstrate that the robustness of gender identity is an important factor in the rate of entrepreneurship. From other perspectives about research entrepreneurship, Kuschel et al. (2020) explain how institutional, organizational, and individual factors influencing women's entrepreneurship in STEM fields.

In this way, this paper tries to analyse the relationship between regional behaviour and the value of entrepreneurship by gender comparing the differences between more than 50 countries over five years. Our main objective is to analyse the impact of the female entrepreneurship rate in the years of economic recovery (2015–2020). The methodology presented here uses the convergence matrices between countries, as it is a dynamic technique that allows us to analyse the evolution of a variable in a region over time, relative to the behaviour of the other countries being compared.

Methodology

Database

In this paper, we have used the reports and records issued annually by the Global Entrepreneurship Monitor (GEM). This database provides a complete sequence

of data on entrepreneurship by country and with disaggregation by gender of the entrepreneur, since the late 1990s. These reports collect on an international level the entrepreneurial activity of more than 90 countries, based on robust surveys carried out in each country of the active population (between 18 and 64 years old) as well as a panel of experts and local institutions. These reports focus on the figure of the entrepreneur and the environment that surrounds him, considering the different attitudes and perceptions that occur in the different phases of entrepreneurial activity (initial phase, establishment, consolidation, and business failure). For the study, the entrepreneurship has been considered to capture the phenomenon of entrepreneurship in a stage of economic recovery for the period 2015–2020. Specifically, there is a sample of 50 countries with complete data for the period analyses, with representation of the different world cultures (European, American, Asian and African countries). A phase of economic recovery has been considered in order not to consider extreme situations (economic crisis), the availability of complete data in the period considered and cultural representativeness.

Variables

Using the reports of the Global Entrepreneurship Monitor (GEM), the following variables have been selected:

a) Total Entrepreneurial Activity Rate (TEA): This rate includes the level of entrepreneurial activity for one hundred individuals of working age. That means that it identifies those individuals who have had a relationship with some phase of entrepreneurship in the last three and a half years. Of this variable it is also known which part is due to undertakings motivated by reasons of necessity and which for reasons of detecting an opportunity in the market, be it a temporary opportunity, caused by the location or the activity sector. In this way, this information is differentiated by gender variable as follows:

$TEA\_M_{x,j}$ = Entrepreneurial Activity Rate by men in year x in and in region j

$TEA\_W_{x,j}$ = Entrepreneurial Activity Rate by women in year x in and in region j

$TEA\_Op_{g,x,j}$ = Percentage of TEA per opportunity – in gender g – in year x and in region j

$TEA\_Nc_{g,x,j}$ = Percentage of TEA by necessity – in gender g – in year x and in region j

With these variables, two relativized variables have been constructed:

$$TEA\_W/M_{x,j} = \frac{TEA\_W_{x,j}}{TEA\_M_{x,j}}$$

Percentage of women entrepreneurs for one hundred entrepreneurs in year x and in region j.

$$TEA\_Op/Nc_{x,j} = \frac{TEA\_Op_{w,x,j}/TEA\_Nc_{w,x,j}}{TEA\_Op_{m,x,j}/TEA\_Nc_{m,x,j}}$$

Percentage of entrepreneurship by opportunity of women entrepreneurs compared to businessmen, in year x and in region j.

Likewise, a series of variables has been considered that analyses the entrepreneurial ecosystem of the regions, as well as the conditions and policies that favour its expansion by the different states. As they are evaluations obtained from a panel of experts, the evaluation of these variables is a Likert scale (1 to 5). Specifically, they considered the following:

- Financ: Financing for entrepreneurship: The availability of financial resources—equity and debt—for small and medium enterprises.
- Policy: Governmental Support and Policies: The extent to which public policies support entrepreneurship as a relevant economic issue.
- Programme: Governmental Programmes: The presence and quality of programmes directly assisting SMEs at all levels of government.
- R&D: R&D Transfer: The extent to which national research and development will lead to new commercial opportunities and is available to SMEs.
- Infra: Commercial and Professional Infrastructure: The presence of property rights, commercial, accounting, and other legal and assessment services and institutions that support or promote SMEs.
- Market: Internal Market Dynamics: The level of change in markets from year to year.
- Cultural: Cultural and Social Norms: The extent to which social and cultural norms encourage or allow actions leading to new business methods that can potentially increase personal wealth and income.

In the same way, some variables are included about the perception that entrepreneurs have of the economic and social environment that surrounds them, as well as their own perception of the skills they must possess in order to start an entrepreneurial activity:

- Popp: Perceived opportunities. Percentage of 18–64 population who see good opportunities to start a firm in the area where they live.
- Percap: Perceived capabilities. Percentage of 18–64 population who believe they have the required skills and knowledge to start a business.
- Fear: Fear of failure rate. Percentage of the 18–64 population who agree that they see good opportunities but would not start a business for fear it might fail.

The median has been considered statistical in the case of considering information relative to the entire period analysed.

Statistical model

A regional convergence analysis is proposed, comparing the evolution over time of both the entrepreneurial activity rate and the ratio of ventures per opportunity to those motivated by need. This analysis allows us to know the countries where the number of women entrepreneurs has been significantly consolidated within entrepreneurial activity. Through a convergence/divergence matrix that relates the rate of entrepreneurial activity of women at the beginning of 2015 (TEA_W/M) with its evolution throughout the period considered (2015–2020), it is possible to know the degree of rapprochement or polarity of the different countries in their dynamics of incorporating women into entrepreneurial activity. The average values of the group of countries in both variables are taken as reference. Thus, those countries that started with rates of female entrepreneurship below the average but have had growth in the period above the average converge positively, while other countries that started with rates of entrepreneurship above the average and have growth in the period above average diverge. A second matrix is presented relating the rate of entrepreneurial activity motivated by opportunity needs (TEA Op/Nc) with respect to the variation rate of the same variable in the period under analysis. These matrices allow a first approach to the phenomenon of entrepreneurship in the countries and determine those countries with the greatest potential of the rate of female entrepreneurship.

Once the most dynamic regions in the participation of women in business creation have been determined, a series of regression models is proposed that explain which environmental and perception variables explain the greater presence of women in entrepreneurial activity, both at the beginning and at the end of the period. In the case of differences, the most significant factors can be determined.

As all the countries do not have values at some intermediate moments, we do not work with panel data, but instead carry out two analyses (beginning and end of period) in order to know their temporal evolution.

$$TEA\_W/M_{2015} = \alpha + Financ_{2015} + Policy_{2015} + \cdots + Fear_{2015} + \epsilon$$

$$TEA\_W/M_{2020} = \alpha + Financ_{2020} + Policy_{2020} + \cdots + Fear_{2020} + \epsilon$$

Discussion and results

Table 1 shows the average values of the main variables used in the study. In average terms, for every ten female ventures worldwide there are seven female-led ventures. The average female TEA worldwide during the period analysed is 9.8, still well below the entrepreneurial rate for men, which stands at 14%. Only in Indonesia is the percentage of women entrepreneurs higher than men. The case of Latin American countries (Brazil, Ecuador and Peru) and some Asian countries (Malaysia and Kazakhstan) also stand out, where there is a certain balance in entrepreneurship due

Table 1 Descriptive entrepreneurship indicators and explanatory factors. Median values

Country	TEAW	OP/NCW	W/M	W/MOp	financ	policy	program	R&D	infra	market	cultural	popp	percap	fear
ARGENTINA	10.7	1.79	0.76	0.83	1.90	3.17	2.87	2.48	2.86	3.29	3.08	42.15	49.45	26.04
AUSTRALIA	10.1	4.22	0.63	0.92	2.59	2.43	2.57	2.21	3.04	2.97	2.81	48.82	51.47	43.32
AUSTRIA	7.6	5.33	0.67	0.97	2.91	2.68	3.75	2.74	3.58	2.65	2.29	45.29	43.17	24.41
BRAZIL	19.0	1.55	0.99	0.88	2.63	1.99	2.04	1.90	2.62	3.40	2.25	45.93	52.47	36.46
BULGARIA	4.6	1.72	0.73	0.82	2.78	1.82	2.10	2.08	3.09	2.71	2.27	23.31	36.05	20.79
CANADA	13.7	5.68	0.72	1.02	3.01	2.91	3.02	2.74	3.61	2.60	3.39	59.07	51.85	36.79
CHILE	21.3	2.16	0.73	0.83	2.21	2.77	3.20	2.21	2.70	2.36	3.10	54.68	58.58	38.05
CHINA	10.3	2.21	0.78	1.01	3.08	3.11	2.71	2.49	2.58	4.22	3.33	40.65	38.71	38.09
COLOMBIA	18.0	2.74	0.75	0.90	2.07	2.39	2.70	2.14	2.62	2.58	3.29	55.03	58.27	32.36
CROATIA	5.9	1.24	0.53	0.83	2.29	1.83	2.09	1.83	2.55	3.41	1.74	37.68	50.00	33.22
CYPRUS	6.1	2.64	0.47	0.93	2.12	2.54	2.11	2.36	3.12	2.70	2.50	42.82	51.34	39.43
ECUADOR	31.3	1.59	0.99	0.89	1.93	2.35	2.28	2.13	2.91	2.60	3.22	51.30	73.98	29.18
EGYPT	5.6	0.99	0.37	0.82	2.39	2.33	2.11	1.83	2.47	3.16	2.46	51.91	46.01	40.38
ESTONIA	11.6	4.37	0.59	0.98	3.05	2.78	3.15	2.80	3.36	2.88	3.70	54.89	45.80	37.40
FRANCE	3.8	3.08	0.58	0.86	2.77	3.52	3.32	2.95	3.17	2.68	2.58	33.39	36.57	32.64
GERMANY	3.5	3.97	0.55	0.97	2.80	2.55	3.42	2.56	3.42	2.93	2.60	41.66	38.38	31.03
GREECE	4.9	2.25	0.63	0.89	2.09	1.91	1.87	2.38	2.76	3.02	2.34	27.43	48.26	40.63
GUATEMALA	18.7	1.23	0.72	0.84	1.70	1.64	1.90	1.89	2.80	2.14	2.95	56.37	58.76	37.38
INDIA	7.4	1.61	0.62	0.96	3.33	3.42	2.95	2.83	3.11	3.68	3.12	52.47	51.83	40.82
INDONESIA	13.8	3.20	1.04	0.95	3.24	3.34	3.05	2.96	3.01	3.98	3.54	51.20	52.96	36.54
IRAN	9.0	2.20	0.53	1.05	1.95	2.20	1.46	1.78	1.76	3.17	2.30	41.83	54.78	38.58
IRELAND	6.2	3.67	0.52	1.01	2.97	2.85	3.44	2.76	3.23	2.48	3.13	44.97	42.69	33.31
ISRAEL	9.6	6.45	0.69	1.05	3.07	2.10	2.36	2.63	3.30	2.59	4.28	50.99	43.52	45.19
ITALY	2.9	6.54	0.49	1.01	2.50	2.22	2.18	2.47	2.61	2.85	2.27	31.59	38.37	38.57

Table 1 (continued)

Country	TEAW	OP/NCW	W/M	W/MOp	financ	policy	program	R&D	infra	market	cultural	popp	percap	fear
JAPAN	2.5	3.60	0.39	0.98	2.82	2.96	2.57	2.82	2.44	4.06	2.27	9.34	23.72	29.90
KAZAKHSTAN	11.1	3.00	0.92	0.98	2.51	3.20	2.71	1.96	3.01	3.11	2.97	47.77	55.58	41.43
LEBANON	20.0	1.90	0.62	0.97	2.95	2.00	2.24	2.31	3.21	2.77	3.62	58.14	58.72	21.50
LUXEMBOURG	7.1	7.19	0.63	1.00	2.41	3.14	3.57	3.12	3.41	2.30	2.58	50.93	44.27	39.13
MALAYSIA	10.9	7.13	0.92	1.02	3.37	2.95	3.03	2.71	3.17	3.75	3.26	32.91	34.10	36.25
MOROCCO	4.5	3.07	0.53	1.05	2.24	2.27	2.18	1.74	2.95	2.69	2.29	40.83	55.96	41.83
NETHERLANDS	7.4	4.61	0.59	0.95	3.48	3.25	3.49	3.16	3.59	3.23	3.74	55.47	40.60	27.12
PANAMA	13.7	2.75	0.88	0.93	1.93	1.93	2.49	2.07	2.53	2.43	2.97	46.66	49.45	26.84
PERU	23.7	3.51	0.92	0.94	2.14	2.20	2.49	2.02	2.37	2.49	3.13	58.87	58.00	31.62
POLAND	6.5	3.26	0.59	0.96	2.99	2.76	2.58	2.19	2.84	3.88	2.66	55.02	49.99	37.01
PUERTO RICO	8.1	2.42	0.65	0.93	2.07	2.24	2.09	1.92	2.77	2.73	2.56	30.56	49.64	24.07
QATAR	8.6	6.33	0.69	1.07	2.81	3.48	3.35	2.91	3.18	3.19	3.28	48.76	41.42	35.43
RUSSIAN FED	4.5	1.42	0.69	0.87	2.01	2.14	1.94	1.69	2.98	3.63	2.39	40.31	50.10	30.72
SAUDI ARABIA	9.6	4.08	0.73	0.95	2.23	2.50	2.27	1.79	2.21	3.04	2.99	66.73	65.39	40.64
SLOVAK REP	8.1	1.62	0.60	0.90	2.81	1.87	2.09	1.93	3.13	2.63	1.99	32.92	45.46	32.71
SLOVENIA	4.2	2.34	0.46	0.88	2.66	2.52	2.74	2.46	2.96	3.14	2.15	35.81	48.63	31.09
SOUTH AFRICA	7.4	2.09	0.70	0.89	2.51	2.61	1.92	1.94	2.88	2.95	2.42	45.04	46.65	35.08
SPAIN	5.2	2.25	0.80	0.91	2.49	2.37	3.06	2.52	2.99	2.67	2.68	33.60	44.75	34.33
SWEDEN	4.9	12.23	0.53	0.99	2.82	2.35	2.79	2.53	2.99	3.37	2.99	69.28	38.93	33.28
SWITZERLAND	5.6	4.75	0.58	0.92	3.04	3.09	3.47	3.46	3.48	2.79	3.23	41.46	43.67	25.05
TAIWAN	6.4	4.26	0.61	0.98	2.94	2.85	2.96	2.75	2.91	3.60	3.19	30.52	31.99	35.82
THAILAND	18.4	4.28	0.92	0.95	2.89	2.62	2.32	2.40	2.89	3.78	3.25	44.70	49.38	45.73
UNITED ARAB	5.9	2.20	0.74	0.97	2.74	3.61	3.30	2.70	3.27	3.43	3.79	48.47	58.95	45.37
UNITED KINGD	5.7	6.03	0.50	1.01	2.91	2.42	2.55	2.49	3.01	2.78	3.08	42.94	48.31	37.63

Table 1 (continued)

Country	TEAW	OP/NCW	W/M	W/MOp	financ	policy	program	R&D	infra	market	cultural	popp	percap	fear
USA	11.0	6.61	0.69	0.96	3.22	2.66	2.63	2.49	3.26	2.99	4.11	60.91	57.24	33.27
URUGUAY	11.2	2.56	0.58	0.90	2.15	2.22	3.14	2.48	2.93	2.04	2.06	33.38	58.28	28.14
Median	*9.8*	*3.6*	*0.7*	*0.9*	*2.6*	*2.6*	*2.7*	*2.4*	*3.0*	*3.0*	*2.9*	*44.9*	*48.4*	*34.6*

Own work based on GEM reports

to gender. The greatest gender differences are found in Cyprus, Egypt, and Japan, where for every two male entrepreneurs there is barely one woman involved in entrepreneurial activity. If the evolution over time is considered, most of the countries analysed have increased their presence of women entrepreneurs, especially in countries like Japan, the United Arab Emirates and Qatar, unlike countries like Austria, Greece, and Switzerland where there has been a considerable reduction.

According to these results, the differences by gender are considerably reduced if the reason for starting businesses is motivated by opportunity or by necessity. Thus, in the case of women, 71.1% of the enterprises are motivated by reasons of opportunity compared to 75.4% in the case of men. However, there are countries where these differences are greater, as is the case for Argentina, Croatia, Guatemala, and the Russian Federation where women find fewer opportunities for entrepreneurship than men. On the contrary, women have a greater ability to find attractive market niches in countries such as Canada, China, Iran, and Israel. During the period analysed, there has been an increase in entrepreneurship by women motivated by reasons of opportunity in most of the countries analysed, especially in Colombia and Poland. On the contrary, this capacity has been reduced in Ecuador, India, Saudi Arabia, and the Russian Federation.

According to the factors that contribute to the generation of an entrepreneurial environment, it is possible to observe very heterogeneous behaviour among the countries analysed. In average terms, the two factors with the best average valuation are the provision of infrastructures (below) as well as the dynamics of changes in the internal market (market), with a valuation of 3 out of 5. Countries with a valuation above the average in the variable related to access to sources of financing include China, Estonia, Israel, and the United States. For having government policies in favour of entrepreneurship, France, Indonesia, Qatar, and the United Arab Emirates stand out. Regarding the development of new business opportunities thanks to R&D, Switzerland, Netherlands, and Luxembourg stand out positively. Another variable in which there is high dispersion is having an entrepreneurial culture within social values. Thus, the United States and Israel stand out positively, with values that exceed 4, while those countries with little entrepreneurial culture are Uruguay and Croatia.

Finally, observing the variables of perception of the economic reality by entrepreneurs themselves, the possession of entrepreneurial skills is more valued by entrepreneurs than the ability to perceive opportunities in the environment. However, with the passage of time, the importance given to this ability to recognize opportunities has increased, as well as a general reduction in all countries of the fear of failure.

Once the main indicators under study have been described, two convergence/ divergence matrices are presented to determine the evolution over time of female entrepreneurship and its motivation among the different countries analysed. Figure 1 relates the relativized female entrepreneurship ratio with respect to the group of entrepreneurs at the beginning of 2015 with the growth rate of the same variable throughout the period under study. Thus, at the beginning of the period, the number of women entrepreneurs compared to men was 0.678 and the average growth of this variable over time was 7.64%. These two values mark the axis on which the countries move, giving rise to four intersections. This technique, in addition to

Fig. 1 Convergence matrix of the relative rate of female entrepreneurship

classifying the countries into categories, allows us to know if there is a convergence process regarding female entrepreneurship in the regions. In the first place, the countries with a presence of women above the average can be highlighted and they have increased their participation in the process, such as Spain, Ecuador, Panama, and Guatemala. It can be seen how the Latino culture positively recognizes the participation of women in business activity. At the opposite extreme are the countries with the least weight of female entrepreneurs at the beginning of the period and they have also seen their participation reduce over time below the world average.

Most of the European countries, among them Greece, the United Kingdom, the Netherlands, and Italy stand out. Regarding the countries that converge, those that started with rates of relative female entrepreneurship below the average but that over time have strengthened this figure with growth above the average can be highlighted. Among them, Japan stands out with twice as many women incorporated into entrepreneurial activity compared to the initial year. Qatar, the United Arab Emirates and Egypt have the same consideration: they are countries in which with the passage of time the glass ceiling of women in business and professional activity is breaking. Finally, there are the regions that having a relative rate of female entrepreneurship higher than the average at the beginning of the period, have seen the importance of this figure in their entrepreneurial activity diminish over time. Specifically, the Czech Republic, Malaysia, Indonesia, Puerto Rico, South Africa, and Saudi Arabia stand out.

On the other hand, Fig. 2 incorporates the reason for starting businesses. Specifically, the rate of female entrepreneurship motivated by reasons of opportunity is compared relative to that of the group of men with the variation of this same variable over time. The existence of a certain correlation between both matrices would explain whether the increase/decrease in female entrepreneurship is explained by the reasons for detecting opportunities. Thus, at the beginning of the period, the number of women entrepreneurs who chose the business for reasons of opportunity compared to men was 0.94 and the average growth of this variable over time was 1.72%. These two values mark the axis on which the countries move, giving rise to four intersections. The countries where women detect more opportunities to undertake compared to the average and which have also seen this capacity increase over time are Sweden, Poland, Morocco, and Luxembourg.

On the other hand, in regions such as Greece, Guatemala, Uruguay, Chile and Ecuador, entrepreneurships by women for reasons of opportunity occur to a lesser extent than in the group of men at the beginning of the period, and this capacity has been reduced over time. In the rest of the countries, there has been a process of convergence towards the average values, highlighting on the one hand Ireland, Egypt, Canada, and China where there has been a considerable increase in the number of relative female enterprises motivated by the need for opportunity; and on the other hand, India, Italy, South Africa, and Saudi Arabia present a reduction in female entrepreneurship of opportunity over time.

To know the reasons why the evolution of female entrepreneurship in the regions is different, a model is proposed that relates the relative TEA to a set of variables indicative of the environment and entrepreneurial ecosystem of the regions as well as to economic and personal perception values of the entrepreneurs themselves. Table 2 shows the correlation between the different variables. Thus, there is a positive relationship between female entrepreneurship relative to the culture of the
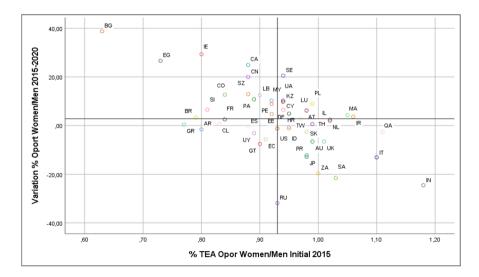

Fig. 2 Convergence matrix of the relative rate of female entrepreneurship for reasons of opportunity

Table 2 Correlations between the study variables

	TEA W/M	Tea Op/Nc	Financ	Policy	Program	R&D	Infra	Market	Cultural	Popp	Percap
TEA W/M	1	-0.13	-0.091	0.052	-0.007	-0.119	-0.093	0.012	0.388**	0.229	0.326*
TEA Op/Nc	-0.13	1	0.473**	0.318*	0.283*	0.378**	0.297*	0.128	0.375**	0.106	-0.228
Financ	-0.091	0.473**	1	0.494**	0.484**	0.670**	0.585**	0.374**	0.476**	0.122	-0.440**
Policy	0.052	0.318*	0.494**	1	0.751**	0.715**	0.416**	0.348*	0.479**	0.129	-0.218
Program	-0.007	0.283*	0.484**	0.751**	1	0.819**	0.598**	-0.059	0.429**	0.151	-0.295*
R&D	-0.119	0.378**	0.670**	0.715**	0.819**	1	0.639**	0.099	0.469**	0.012	-0.507**
Infra	-0.093	0.297*	0.585**	0.416**	0.598**	0.639**	1	-0.158	0.380**	0.136	-0.249
Market	0.012	0.128	0.374**	0.348*	-0.059	0.099	-0.158	1	0.083	-0.136	-0.217
Cultural	0.388**	0.375**	0.476**	0.479**	0.429**	0.469**	0.380**	0.083	1	0.568**	0.119
Popp	0.229	0.106	0.122	0.129	0.151	0.012	0.136	-0.136	0.568**	1	0.504**
Percap	0.326*	-0.228	-0.440**	-0.218	-0.295*	-0.507**	-0.249	-0.217	0.119	0.504**	1
Fear	0.009	0.328*	0.06	0.148	-0.136	-0.071	-0.087	0.189	0.145	0.189	0.186

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Table 3 Explanatory regression models of the relativized female entrepreneurship rate

Variable	TEA W/M Median Period			TEA W/M Initial			TEA W/M Final		
	Coeficient	t	Sig	Coeficient	t	Sig	Coeficient	t	Sig
W/M Op	-0.143	-0.993	0.326	-0.054	-0.311	0.758	0,109	0,505	0,618
Financ	-0.056	-0.306	0.761	-0.546	-1.738	0.092	-0,452	-1,253	0,222
Policy	0.013	0.085	0.933	0.451	1.709	0.098	0,245	0,628	0,535
Program	-0.005	-0.034	0.973	-0.058	-0.187	0.853	-0,017	-0,045	0,965
R&D	-0.163	-0.922	0.361	0.117	0.413	0.683	-0,214	-0,521	0,607
Infra	-0.091	-0.627	0.534	-0.026	-0.090	0.929	0,040	0,116	0,909
Market	0.194	1.422	0.162	0.028	0.130	0.897	0,250	1,024	0,316
Cultural	**0.300**	**2.303**	**0.026**	**0.639**	**2.341**	**0.026**	**0,532**	**2,117**	**0,044**
Popp	-0.236	-1.264	0.212	-0.361	-1.597	0.121	-0,236	-0,870	0,393
Percap	**0.323**	**2.480**	**0.017**	0.087	0.426	0.673	0,297	1,058	0,300
Fear	-0.067	-0.506	0.616	-0.124	-0.718	0.478	-0,039	-0,202	0,842
	R-Squared: 0.223			R-Squared: 0.330			R-Squared: 0.296		

Variable	W/M Op/Nc Median Period			TEA W/M op /Nc Initial			TEA W/M Op /Nc Final		
	Coeficient	t	Sig	Coeficient	t	Sig	Coeficient	t	Sig
TEA W/M	-0.056	-0.445	0.658	-0.059	-0.311	0.758	0,092	0,505	0,618
Financ	**0.416**	**3.325**	**0.002**	0.460	1.374	0.180	0,438	1,325	0,197
Policy	0.068	0.458	0.649	0.349	1.236	0.226	-0,232	-0,648	0,523
Program	0.085	0.575	0.568	-0.431	-1.363	0.183	0,360	1,025	0,315
R&D	0.158	0.954	0.345	0.106	0.355	0.725	0,163	0,429	0,672
Infra	-0.036	-0.232	0.818	-0.182	-0.611	0.546	-0,465	-1,532	0,138
Market	-0.095	-0.668	0.507	-0.084	-0.380	0.707	**-0,482**	**-2,313**	**0,029**
Cultural	0.176	1.254	0.216	-0.197	-0.637	0.529	0,025	0,099	0,922
Popp	0.049	0.382	0.704	0.266	1.097	0.282	**0,584**	**2,596**	**0,016**

Table 3 (continued)

Variable	TEA W/M Median Period			TEA W/M Initial			TEA W/M Final		
	Coeficient	t	Sig	Coeficient	t	Sig	Coeficient	t	Sig
Percap	-0,056	-0.385	0.702	0,028	0,129	0,898	-0,389	-1,544	0,135
Fear	**0.287**	**2.294**	**0.026**	0,179	0,996	0,327	-0,140	-0,789	0,438
	R-Squared: 0.267			R-Squared: 0.263			R-Squared: 0.403		

own work

country towards entrepreneurship and own perception of having skills to put into practice by the entrepreneurs themselves. To explain the relative female ventures motivated by reasons of opportunity, there are more factors that contribute. Thus, there is a positive relationship with all the institutional factors that support entrepreneurship (access to financing, government involvement, support programmes, R&D policies, and infrastructure provision) as well as with the perception of fear of starting businesses. Of the rest of the relationships, the positive relationship between the perception of detecting opportunities and the perception of having entrepreneurial skills stands out.

Table 3 proposes several regressions that determine the significant factors for relative female entrepreneurship and that motivated by reasons of opportunity both at the beginning and at the end of the period. Thus, the cultural values of the country in favour of the figure of the entrepreneur are the only statistically significant variable that explains that in a region there is a higher rate of relative female entrepreneurship in the region. The positive relationship between both variables is maintained both at the beginning and at the end of the period analysed. Considering the mean values of the analysed period, another variable that is considered significant is the perception of the skills necessary to undertake a business. The higher the perception of having personal entrepreneurial skills, the greater the ratio of women entrepreneurs in the regions.

If the ratio of the percentage of female ventures per opportunity relative to that of men is considered, at the beginning of the period there was no statistically significant variable, however at the end of the period under consideration there was a significant positive relationship with the ability to detect opportunities in the environment and negative with the variability of the internal markets. If the mean period analysed is considered, the statistically significant variables to explain the ventures motivated by reasons of opportunity are the access to financing sources and the perception of fear of failure. The relationship between entrepreneurship and risk is logical, especially when it is due to detecting an opportunity in the market, which requires access to different means of financing as well as adequate management of the uncertainty of future business results.

In both models, despite having a low regression coefficient (between 0.25 and 0.40), what stands out is the significance of the different variables analysed. The R squared represents the dispersion around the regression line, due to the small number of countries considered. This is not a problem since the proposed model does not seek to make predictions.

Conclusions

Academic research has mainly referred to two issues when it has analysed the perspective of women in business and entrepreneurship: a) the characteristics and motivations for starting an activity; b) and the strategies chosen by women when they manage a business activity and the results and achievements obtained in their companies. These studies pointed to several differences when compared to companies or business projects run by men. However, in the last decade, women's access to entrepreneurial activity

has been widely increased, almost equal to the percentage of men involved in the entrepreneurial economy, as indicated by the GEM data. Over time, the presence of female entrepreneurs has increased in most regions, with an average growth rate of 7.6% per year in the period considered, this increase being much higher in the countries than at the beginning of the year. This period still had few women involved in entrepreneurial activity.

The existence of highly differentiated behaviours can be highlighted between countries, these differences being clearly explained by the importance of the cultural values present in each region in the period 2015–2020, precisely in a stage of the economic cycle of slow recovery after the last economic crisis. A country with an educational system and a tradition that supports entrepreneurial values has a greater balance in the number of entrepreneurs according to gender. Therefore, an intangible such as culture has a greater capacity to encourage entrepreneurship than other variables such as the provision of infrastructure or programmes to encourage technology and innovation. Therefore, answering the first question that is the object of the research, it can be affirmed that the cultural and social values of the regions condition the evolution of female entrepreneurship.

From the convergence matrices analysed, it can be deduced that there are different behaviours when it comes to understanding female entrepreneurship. Thus, in Latin-influenced countries the presence of women is greater, although their ventures have a lower opportunity component, unlike in Asian and African countries with a lower presence of women but with a greater weight in entrepreneurship by opportunity. Finally, regarding the differences by the type of entrepreneurship according to gender, despite these differences in the countries, the behaviour is more stable and there is a smaller difference between the analysed regions, consolidating that for every ten opportunity ventures detected by men there are nine enterprises of the same nature discovered by women.

With respect to the limitations, it is worth highlighting the availability of data offered by the GEM reports that do not allow us to delve into the differences in behaviour patterns, such as the presence of women in certain sectors of activity or the conditions of access for women to entrepreneurial activity. Another limitation of the study is the time horizon considered, which could be contrasted with another period of economic crisis, to determine differences motivated by the moment of the economic cycle.

Finally, it should be noted that the research provides value for government decision-makers, as it allows them to become aware of the importance of favouring a climate and values conducive to entrepreneurship, over concrete or temporary measures to encourage entrepreneurship in the regions. Long-term planning is required to improve the entrepreneurial skills of citizens and help reduce the fear of entrepreneurship, generating positive values to that circumstance, such as a learning process or a stage of managing uncertainty.

References

Anna, A., Chandler, G., Jansen, E., & Mero, N. (2000). Women business owners in traditional and non-traditional industries. *Journal of Business Venturing, 15*(3), 279–303.

Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta–analytic review. *Entrepreneurship Theory and Practice, 38*(2), 217–254.

Carree, M. A., Thurik, A. R. (2010). The Impact of Entrepreneurship on Economic Growth. In: Acs Z.J., Audretsch D.B. (eds) *Handbook of Entrepreneurship Research*. International Handbook Series on Entrepreneurship, vol 1. Springer, Boston, MA.

Coleman, S. (2007). The role of human and financial capital in the profitability and growth of women-owned small firms. *Journal of Small Business Management, 45*(3), 303–319.

Covin, J. G., Green, K. M., & Slevin, D. P. (2006). Strategic process effects on the entrepreneurial orientation–sales growth rate relationship. *Entrepreneurship Theory and Practice, 30*(1), 57–81.

Covin, J. G., & Wales, W. J. (2012). The measurement of entrepreneurial orientation. *Entrepreneurship Theory and Practice, 36*(4), 677–702.

Collins-Dodd, C., Gordon, I. M., & Smart, C. (2004). Further evidence on the role of gender in financial performance. *Journal of Small Business Management, 42*(4), 395–417.

DuReitz, A., & Henrekson, M. (2000). Testing the female underperformance hypothesis. *Small Business Economics, 14*, 1–10.

Fagenson, E. (1993). Personal value systems of men and women entrepreneurs versus managers. *Journal of Business Venturing, 8*(5), 409–430.

Fuller-Love, N. (2009). Female entrepreneurship. In: Entrepreneurship and Business. Springer, Berlin, Heidelberg. 291–308.

Galindo, M. A., Guzman, J., & Ribeiro, D. (Eds.). (2009). *Entrepreneurship and Business*. Springer.

Giménez, D., & Calabrò, A. (2018). The salient role of institutions in women's entrepreneurship: A critical review and agenda for future research. *International Entrepreneurship and Management Journal, 14*, 857–882.

Greene, P. G., Brush, C. G., & Gatewood, E. (2007). *Perspectives on women entrepreneurs: Past findings and new directions*. In: M. Minniti (ed.) Entrepreneurship: The Engine of Growth, Vol. 1. Perspective Series. Westport, CT, USA and London, UK: Praeger Publisher.

Goldin, C. (1990). *Understanding the Gender Gap: An Economic History of American Women*. Oxford University Press.

Goktan, A. B., & Gupta, V. K. (2015). Sex, gender, and individual entrepreneurial orientation: Evidence from four countries. *International Entrepreneurship and Management Journal, 11*, 95–112.

Gupta, V., & Fernandez, C. (2009). Cross-cultural similarities and differences in characteristics attributed to entrepreneurs: A three-nation study. *Journal of Leadership & Organizational Studies, 15*(3), 304–318.

Kuschel, K., Ettl, K., Díaz-García, C., et al. (2020). Stemming the gender gap in STEM entrepreneurship – insights into women's entrepreneurship in science, technology, engineering and mathematics. *International Entrepreneurship and Management Journal, 16*, 1–15.

Lim, S., & Envick, B. R. (2013). Gender and entrepreneurial orientation: A multi-country study. *International Entrepreneurship and Management Journal, 9*(3), 465–482.

Ljunggren, E., & Kolvereid, L. (1996). New business formation: Does gender make a difference? *Women in Management Review, 11*(4), 3–12.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21*(1), 135–172.

Masters, R., & Meier, R. (1988). Sex differences and risk-taking propensity of entrepreneurs. *Journal of Small Business Management, 26*(1), 31–35.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science, 29*(7), 770–791.

Minniti, M. (2005). Entrepreneurship and network externalities. *Journal of Economic Behavior & Organization, 57*(1), 1–27.

Minniti, M., & Naudé, W. (2010). What do we know about the patterns and determinants of female entrepreneurship across countries? *European Journal of Development Research, 22*, 277–293.

Pinillos, M. J., & Reyes, L. (2011). Relationship between individualist–collectivist culture and entrepreneurial activity: Evidence from Global Entrepreneurship Monitor data. *Small Business Economics, 37*(1), 23–37.

Shabbir, A., & DiGregorio, S. (1996). An examination of the relationship between women's personal goals and structural factors influencing their decisions to start a business: The case of Pakistan. *Journal of Business Venturing, 11*(6), 507–529.

Shelton, L. M. (2006). Female entrepreneurs, work–family conflict, and venture performance: New insights into the work–family interface. *Journal of Small Business Management, 44*(2), 285–297.

Sexton, D. L., & Bowman-Upton, N. (1990). Female and male entrepreneurs: Psychological characteristics and their role in gender-related discrimination. *Journal of Business Venturing, 5*(1), 29–36.

Terrel, K., & Troilo, M. (2010). Values and female entrepreneurship. *International Journal of Gender and Entrepreneurship*, 2 (3), 260–286.

Thomas, A. S., & Mueller, S. L. (2000). A case for comparative entrepreneurship: assessing the relevance of culture. *Journal of International Business Studies*, 31, 287–301.

Wagner, J. (2004). What a difference a Y makes: Female and male nascent entrepreneurship in Germany. *Small Business Economics, 28*, 1–21.

Williams, D. R. (2004). Effects of childcare activities on the duration of self-employment in Europe. *Entrepreneurship Theory and Practice, 28*(5), 467–485.