Comparative Analysis: Factors Influencing Female Entrepreneurship in Europe

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***Abstract*—The main purpose of this paper is to analyze the differences between the European regions when considering female entrepreneurship key factors (attitudes, education and expectations). The areas considered are the South, North and Central Europe. The data utilized is from the Global Entrepreneurship Monitor (GEM) database, specifically interviewing individuals from 18-64 years to get the key insights about the female entrepreneurship situation in many different countries of the world. The method used in the analysis was the CHAID regression tree and the target variable was the TEA, also known as the key indicator of the entrepreneurship activity (Total Entrepreneurship Activity). Some interesting findings were identified, as for example the importance of the perception of having the skills directly related with starting a nascent entrepreneurship activity in females or the key consideration of knowing a entrepreneur, independently of the European region. Moreover, there is an asymmetry in the fear of failure that could prevent female with the right skills of starting a nascent entrepreneurship activity.**

***Index Terms*—Female entrepreneurship, Europe, factors, comparative analysis.**

I. Introduction

Female entrepreneurship is a key factor when analyzing entrepreneurship, considering the female represent a 52% of the European population but only a third of the start-up entrepreneurs. It is considered that for the female population the creativity and entrepreneurship potential are under exploit.

Improving female entrepreneurship facts would suppose an increase in the economic growth and in the creation of job in the affected area. The approach to perform this analysis is to compare the 3 different European regions: South Europe, North Europe and Central Europe. The main is reason is due to the growth of the gap between north and south in the last 15 years, especially in the divergence between north and south in average annual growth of per capita income [1]. This point reflects the unsatisfactory convergence that could potentially lead to threatening social cohesion in the European Union, due, to systemic causes, such as the lack of an architecture that completely build the euro monetary situation, an unequal growth in productivity, the brain drain from the south to the central and north regions and to the lack of innovation, especially the lack of outstanding universities. In this analysis the data is taken from the GEM database, for the year 2015 and Spain, Italy and Portugal (South Europe) are compared with the North area (Finland, Sweden and Norway) and with the Central region (Switzerland, Germany and Poland) to identify the attitudes that are related to the female entrepreneurship in those regions, especially influencing in the act of starting a new nascent entrepreneur activity. This article is organized as follows: in Section II, the literature is reviewed, Section III covers the method used and Section IV presents the data utilized. In Section V, the main findings are presented and finally in Section VI, the conclusions are presented.

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II. Literature Review

The importance of female entrepreneurship has been a growing interest topic due to two main reasons: first, female entrepreneurship can be considered a key source of economic growth, with different weights depending on the country and second, female entrepreneurship has usually been under studied [2]. Specifically, other researchers [3], documented that in recent years, an increasingly and significant number of women decided to start entrepreneurial activities, contributing to entrepreneurship in the different worldwide economies.

Female entrepreneurship was ignored for a long time by academic investigations. Most of the studies until 1990s were focused on male entrepreneurs or on entrepreneurs in general [4]. According to [5], women entrepreneurship represents around one third of the entrepreneurial activities in the world. The top countries for female entrepreneurs are United States, Australia, United Kingdom, Denmark, Netherlands, France, Iceland, Sweden, Finland and Norway [6].

In general, gender equality could have a great impact in the global economy and even though, the European Union is a global leader in gender equality, there are still several stereotypes that need to be addressed. According to the European Institute for Gender Equality report [7], achieving gender equality in STEM education could add up to 1.2 million jobs to the job market and could increase the Europe ś GDP by 2050 to EUR 610-820 billion. It is important to highlight that the number of female entrepreneurs has grown in recent years. More precisely, according to the American Express ś State of Women-Owned Business Report, the number of women-owned business has grown 114 percent over the past 20 years. Apart from the economic benefits, there are benefits that directly derived from the creation of companies, such as, for example, increasing self-esteem, improving the quality of

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life, reducing the incidences of diseases, or reducing domestic violence, to name a few.

Europe needs to innovate, to grow, to become digital and for these missions, entrepreneurs are playing a key role. The Global Entrepreneurship Monitor reports from 2016 shows that Europe had the lowest female involvement in early-stage entrepreneurial activity of the analyzed region, with a total of 6%, and also, the lowest gender parity rate. Considering those numbers, it is critical to highlight that Malta has the lowest rate and Lithuania has the highest rate of female entrepreneurs between the European Union member states. Another important factor related to startups is that there are researches that shows that digital start ups founded by female are more likely to success than those founded by male. However, regarding investment, for example in United Kingdom, male entrepreneurs are 86% more likely to obtain venture capital funds than women.

Deeper analysis is needed to evaluate the status of the female entrepreneurship related to STEM areas to evaluate differences between the countries, most critical factors influencing women to become entrepreneur from different point of views (educational, motivational…etc.) and identifying common characteristics in the countries of the same region.

III. Method

The main objective of this study is to perform a comparison between the different regions of the European area, focusing of the North, Central and South countries analyzing the main factors affecting how the key attitudes variables analyzed in the Global Entrepreneurship Monitor (GEM) database for 2015, affect the female entrepreneurship. The method selected to analyze this data is the CHAID regression tree with the main purpose of identifying the different variables of the GEM study affecting the female entrepreneurship. In the literature, there is another article analyzing the GEM data with this algorithm but for a different area, focusing in general entrepreneurship, not specifically on female entrepreneurship and using other independent variables [8].

According to McCarty and Hastak, [9] his study shows how to use the CHAID regression tree algorithms as a new method for detecting responses concluding that the CHAID regression tree algorithm is very useful for analyze different types of information. The CHAID technique was created by Gordon V. Kass in 1980, and is used to build a predictive model for helping identifying how the variables explain the output of the selected model. Moreover, this technique creates a visual relationship between the split variables and the associated related with the tree. One of the main advantage of this algorithm is that the data analyzed does not have to be normally distributed.

IV. Data

The data utilized in this article is obtained from the 2015 Global Entrepreneurship Monitor (GEM) Database and is based on specific European countries, representing the different areas in which they are based, South Europe, Central Europe and North Europe. The countries reviewed were Spain, Portugal, Italy and Greece for the Southern group, Sweden, Norway and Finland for the Northern group, and finally Germany, Switzerland and Poland for the Central group.

The variables analyzed are detailed below:

TABLE I: The Arrangement of Channels

Variable Name	Description
TEAyy	early stage entrepreneurship, specifically for women
knowent	personally, knows someone who started a firm in the past two years
opport	perceives good opportunities to start a business in the area where you live
suskill	perceives to have the required knowledge and skills to start a business
fearfail	fear of failure would prevent you from starting a business
equalinc	preference for similar standards of living in the country
nbgoodc	people consider starting a business a desirable career choice
nbstatus	those successful at starting a business have a high level of status and respect

The data are extracted from the GEM Adult Global Population Survey (AGPS), produced by interviewing 23.733 individuals during 2015. The analysis was focus on Spain, Portugal, Italy, Greece, Sweden, Norway, Finland, Germany, Switzerland and Poland. The software used to execute this analysis and build the trees presented in the next section was the IBM SPSS Modeler.

The trees have not been included in this paper due to lack of space in the work content but can be requested to the article ś author.

V. Results

Considering the results shown in the Table II and Table III, it is possible to conclude that the most important predictors for the females interviewed in 2015, independently of the area, is having the expectation of creating jobs within the next 5 year (South Europe and Central Europe) and to have the appropriate skills to do so (North Europe).

The fear to failure is an important predictor factor for females in the decision of starting a new business in South Europe (with importance percentage of 6.3, 4.3 and 9.3 in Spain, Italy and Portugal, respectively) and also in the Central European countries (Germany, Poland, Hungary and Switzerland). However, it is not a considerable factor in the North European countries (Sweden, Norway and Finland). This is happening, perhaps because of the education as, in the North European countries one of the education objectives is to prepare the population to face failure in different life situations. The lowest tolerance to failure, when starting a new business is present in the South and Central Europe group countries, perhaps because of the lack of education for tolerating failures.

In the South Europe, the importance of the splitter variables, in decreasing order, are: suyr5job-suskill-knowent, meanwhile in the North Europe, the importance of the splitter

variables, in decreasing order are suskill-knowent-nbgoodc. Finally, for the Central Europe region, the importance of the splitter variables turn around the axis suyr5job-nbstatus-fearfail in descending order.

TABLE II: SUMMARY TABLE CONTAINING THE INFORMATION OF THE PREDICTOR IMPORTANCE PERCENTAGES FOR NASCENT ENTREPRENEURSHIP FOR FEMALES IN 2015 (I)

Variable Name	knowent	opport	suskill	fearfail	equalinc	nbgoodc
Spain	9	3.87	12	6.3	0	0
Italy	19.05	14.85	24	4.3	21.4	0
Portugal	0	0	14.3	9.3	0	0
South.Europe	7.8	4.6	13	3.3	0	0
Sweden	21.6	0	38.86	0	0	10.4
Norway	35.7	0	64.3	0	0	0
Finland	0	16.47	22.7	0	0	0
North.Europe	24.3	0	38.3	0	0	13.2
Germany	30.7	0	27.8	15.4	0	0
Poland	9.5	0	19.8	11.14	0	0
Hungary	10	0	14.22	0	0	0
Switzerland	10.5	12.9	10.5	0	0	0
Cent..Europe	8	8.6	6.5	1	0	0

TABLE III: SUMMARY TABLE CONTAINING THE INFORMATION OF THE PREDICTOR IMPORTANCE PERCENTAGES FOR NASCENT ENTREPRENEURSHIP FOR FEMALES IN 2015 (II)

Variable Name	nbstatus	nbmedia	gemeduc	easystart	Suyr5job
Spain	0	0	5	4	60
Italy	16.38	0	0	0	0
Portugal	9.7	7.5	0	0	59
South.Europe	0	0	2.2	2.32	66.6
Sweden	0	0	0	0	29
Norway	0	0	0	0	0
Finland	0	0	0	0	60.8
N.Europ	0	0	0	12	12
Germany	0	0	0	0	26
Poland	8.2	0	0	0	51.21
Hungary	0	13.25	0	0	62.53
Switzerland	10.6	0	0	0	55.32
Cent.Europ	11.44	0	0	8.7	46.9

The education level is only important in the South Europe region, concretely in Spain, meanwhile in the North and Central ones, this variable is not an important predictor. This factor probably is due to the education programs established in each country. Countries such as Germany, Switzerland, Sweden…etc have a very broad education system in which university is an option, but there are other well-known paths to "learn" a job. In Spain, the most well-known possibility to get a superior education is through university.

The ease of starting a business is key importance predictor in the North of Europe, meanwhile the importance in Central Europe and South Europe is decreasing. Perhaps, a good action from this result would be to try to map the differences between the business creation in the North of Europe and in the South and extract some conclusions that could be used as potential action plans to be implemented in the South to easy the process of starting a business.

For the analyzed areas, the variable related to the consideration of entrepreneurship as a desirable career choice, is only a key predictor variable in North Europe, maybe for the social paradigms of entrepreneurs in those countries. Perhaps, it is needed to show entrepreneurship as an increasingly attractive career option by enhancing the social consideration of the entrepreneurs, maybe, more success case stories are need in the South and Central Europe regions.

For female entrepreneurs starting a new business, considering of having the appropriate skills to start a business is a key importance predictor in North Europe (38.3), meanwhile in South Europe and Central is not a critical factor (with values of 13 and 0.65 respectively). Perhaps this is because in those areas, it is more important to consider the opportunities around and maybe female entrepreneurs can learn by doing while they are starting the new company. Another possible reason is that in South Europe and Central Europe, founders of business try to outsource the activities they don ŕ have and in North Europe it is more typical to attend programs or courses to reinforce the lack of skills with the purpose of setting a business.

Moreover, knowing other entrepreneurs is key in North Europe (24.3), meanwhile the importance is almost residual in South Europe and Central Europe (7.8 and 0.8, respectively). This result is in line with the importance of the variable of considering entrepreneurship a desirable career option, reinforcing the idea that success case stories of entrepreneurs are needed to be promoted between women entrepreneurs' communities in South Europe and Central Europe.

Some interesting results observed in the different countries are detailed below:

• Germany has a low value of female entrepreneur activity (3,88%). The positive point is that almost half of the women who are starting up a business has expectations to

create job positions.

• Finland has also a female entrepreneur activity under 5% (4,225%).

• Italy has a female entrepreneur activity also under 5% (3.045%). It is remarkable that a 23.57% considered to have skills to startup a business. From this group of women, 14.63% of the women with no fear to failure were starting a business, meanwhile, only a 5.6% of the women with fear were founding a business. From the group of people that considered they were not having the right skills to startup a business, only a 1,25% were founding their own business.

Therefore, it is important to highlight the need of providing education to manage and tolerate failure in Italy, especially for increasing the number of women creating businesses and the need to provide education to manage a business.

• In Norway, from the participants interviewed, only a 21,98% considered to have the needed skills to start a business. From the group of women that considered herself with the enough skills to start a business, a 14% were starting up a business, however, from the group of women who considered they were not having the enough skills to start a business, only 1.048% started a business. It is quite significant the need to provide women with the skills to start up a business in this area.

• In Switzerland, only a 3,47% of the respondents were starting up a business. It is remarkable that a 46,51% of the women who were starting a business, had expectations to create job positions.

• In Poland, it is important to highlight that the female starting a business were 5.97% which is higher than in the other countries analyzed. It is also important to remark that when evaluating if the individual has or not the skills to start a business there are important differences in the action taken. Female who considered to have the appropriate skills to start a business, really took action in a 7,045%, meanwhile, if female considered not having appropriate skills to start a business, this had as a consequence only starting a business in less than 1% of the times (0,558%).

VI. Conclusion

As mentioned, the objective of this analysis is to understand the main differences between the different European regions when female decide to become entrepreneurs. To perform this analysis, a CHAID method were used to evaluate the data taken from the GEM Database for year 2015 from different European countries, segregated into three different regions: South Europe (including Spain, Italy, Portugal and Italy), Central Europe (including Germany, Hungary and Switzerland) and North Europe (including Finland, Sweden and Norway). According to the estimations using the CHAID method the main conclusions are summarized below:

Main conclusions obtained are based on the fact that suyr5job (expectations for creating a job) is a key factor when deciding to start a business for South Europe and Central Europe, meanwhile in North Europe the most important variable is subskill (having the skills to do so). The fear to failure is an important predictor factor for females in the decision of starting a new business in South Europe and Central Europe meanwhile it is almost residual in North Europe. The education is only an important factor when considering starting up a business in the South of Europe, in concretely, in Spain. Considering how easy is to start a business is a key importance predictor in the North of Europe, meanwhile the importance is considerably lower in Central Europe and South Europe. In North Europe, considering having the appropriate skills to do so is considerably an important factor to decide to create a business, meanwhile it is not a critical factor in South and Central Europe. Moreover, the fact of knowing other entrepreneurs or to consider entrepreneurship as a good career option are important facts in North Europe when considering to create a business, meanwhile, the importance is much lower in South and Central Europe maybe because of the entrepreneurship culture and tradition in the different regions.

An interesting extension for this analysis would be considering three different approaches. The first approach would be to extend the analysis to evaluate the differences between the regions considering the Top 10 PIB ranking of the European countries. The second potential analysis would be to extend the analysis to compare the results obtained for Europe with the results that could be obtained in America, comparing North America, Central America and South America. The third interesting potential analysis would be to select a region (for example South Europe) and analyze deeply the answers in the different communities, regions or main cities).

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

M.B executed the analysis and wrote the paper.

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