

# Divergence in female entrepreneurial activity: an international comparison<sup>♦</sup>

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## Abstract

The objective of the study is to analyze female entrepreneurship in eighteen countries in America and Europe during the period 2003 to 2015, identifying some factors associated with it. It focuses on the New Institutional Economics, which considers the role played by institutions (formal and informal) in the materialization of entrepreneurship. The study uses a multivariate statistical analysis based on two different sources (Global Entrepreneurship Monitor and World Bank) to explain the phenomenon based on various institutional factors (financing, government programs and policies, social and cultural aspects, administrative procedures, corruption). The results reveal some factors associated with female entrepreneurship, highlighting socio-cultural conditions, government policies, knowledge and skills of female entrepreneurs. These findings provide information derived from various policy adjustments and changes related to female entrepreneurship.

## Keywords

Entrepreneurial activity, Entrepreneurship and gender, International entrepreneurship.

## Resumo

O objetivo do trabalho é analisar o empreendedorismo feminino em dezoito países da América e da Europa durante o período 2003-2015, identificando alguns fatores associados a ele. Tem como foco a Nova Economia Institucional, a qual considera o papel desempenhado pelas instituições – formais e informais – na materialização do empreendedorismo. O estudo usa análise estatística multivariada apoiada em duas fontes diferentes – Global Entrepreneurship Monitor e Banco Mundial – para explicar o fenômeno com base em vários fatores institucionais – financiamento, programas e políticas governamentais, aspectos sociais e culturais, procedimentos administrativos, corrupção. Os resultados revelam fatores associados ao empreendedorismo feminino, destacando as condições socioculturais, as políticas governamentais, os conhecimentos e competências das mulheres empresárias. Essas descobertas fornecem informações derivadas de vários ajustes e mudanças de políticas relacionadas ao empreendedorismo feminino.

## Palavras-chave

Atividade empreendedora, Empreendedorismo e gênero, Empreendedorismo internacional.

## Classificação JEL

L26, F01, J16

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## 1. Introduction

In recent years, women's participation in business has become an essential catalyst for the growth of developed, emerging and developing economies. On the one hand, it has contributed to the production of goods/services, and on the other hand, it has added economic boosting and development through new employment sources (Adom 2015). Furthermore, academics have paid particular attention to the factors or reasons that could be driving the growth of female companies at a global market (Anderson et al. 2012; Renko et al. 2012; Entrialgo and Iglesias 2017; Poggesi et al. 2015; Eddleston et al. 2016).

Regarding this background, the institutional theory has gained relevance in business research. Recent studies reveal the importance of institutions in industry activity (Nogera et al. 2015; Hörisch et al. 2017). Moreover, North (1990, 2005) shows that the institutional environment has a significant influence on human behavior. Therefore, the final decision on when starting a new business is aligned with a multilevel interaction of institutions that support productive entrepreneurship, labeled the "entrepreneurial ecosystem" (Stam 2015; Sthepan et al. 2015; Acs et al. 2017).

Institutions are implemented at different jurisdiction levels, from the global system to delimited interpersonal relationship. Additionally, they are responsible for establishing certain restrictions of different boundaries through legal and cultural reinforcement, where legitimate or illegitimate activities are considered. Furthermore, they also allow the development of certain types of behaviors (Thornton et al. 2011; Urbano and Álvarez 2014). In some cases, the establishment of different regulations, norms, and laws can create positive incentives or may present opportunities that could foster entrepreneurship. They are considered as regulations that govern economic agreements between people and social groups that are involved in entrepreneurship and economic growth and development (Álvarez and Urbano, 2012; Liñán et al. 2013; Strielkowski and Aábelková 2015; Aparicio et al. 2016). Thus, in specific contexts, institutions may legitimize or delegitimize corporate actions, considering them as socially valued or appreciated activities (Gómez-Haro et al. 2011; Thornton et al. 2011).

In this regard, Panda and Dash (2014, 2016) mention that female entrepreneurship is especially difficult in developing countries, given that women face unique challenges, such as: confronting the reconciliation of work life

with family, functioning within patriarchal societies, gender discrimination, few opportunities and limited resources.

Likewise, research carried out by Gupta et al. (2014) points out factors that are considered decisive in female entrepreneurship, namely: characteristics of the institutional environment, stereotypes of gender, access and costs of resources, enabling culture, leadership, financing and quality of human capital, among others (Brush et al. 2019).

In recent years, various investigations have been carried out on the most relevant factors that affect or promote female entrepreneurship, among which stand out: motivation (Modarresi et al. 2016; Devece et al. 2016); opportunities (Davidsson 2015; Garud and Giuliani 2013; Gupta et al. 2014; Warnecke 2014); intentions (Entrialgo and Iglesias, 2017; Jiang and Wang 2014; Schlaegel and Koenig 2014), conflicts between work and family roles (Thébaud 2015; Agarwal and Lenka 2015; Poggesi et al. 2015; Powell and Eddleston 2013; Eddleston and Powell 2012), propensity to become an entrepreneur (Greene et al. 2013; Morales-Urrutia et al. 2022), relationship networks (Ortiz-Walter et al. 2015), financial limitations (Kanze et al. 2018), gender (Eddleston et al. 2016; Langevang et al. 2015), institutions (Martin et al. 2015), organizational level (Brush et al. 2019); networks (McAdam et al. 2018; Neumeyer et al. 2018); entrepreneurial education, social entrepreneurship and the socio-cultural context (Cardella et al. 2020)

Female entrepreneurial activity could be an optimal alternative to the current conditions of unemployment and labor market inequalities. However, related literature and empirical evidence show that on average women generate less income and are underrepresented in certain economic sectors. Undoubtedly, the study of female entrepreneurship as such and in particular from the approach of the New Institutional Economic theory is welcome, both from a socioeconomic and an academic-scientific point of view.

This study reports an analysis from the perspective of both formal and informal institutions, identifying factors that are in some way influencing the environment and the necessary conditions for a woman to start a new enterprise. The paper is structured in three sections, in addition to the introduction and the conclusions. The second section contains a review of formal and informal factors that could be related to female entrepreneur-

ship. The third section addresses various aspects related to methodological and statistical issues. The fourth section reports the main results and a discussion of them.

## **2. Formal and informal institutional factors in female entrepreneurship**

### *2.1. Formal institutional factors in female entrepreneurship*

In recent decades, the study of formal institution's role in setting up new companies has become increasingly important. These institutions correspond to regulatory aspects, such as: laws, political, legal, and economic regulations, as well as governmental and administrative procedures (North 1990).

Among the means through which institutions can promote the creation and development of economic activities, in the field of regulations, there are two main modes of action: firstly, the reduction of barriers to entry and, secondly, the reduction or simplification of administrative regulations. In general, excessive administrative regulations and procedures can cause individuals to opt for the informal market (submerged economy). This could lead to increased corruption (Dreher and Gassebner; 2013) and illegal or unproductive activities (Baumol 1990; Capelleras et al. 2008). The literature shows that potential entrepreneurs may feel unmotivated to start an economic activity if they must follow too many rules and procedures (Djankov et al. 2002; Wennekers et al. 2005; Klapper et al. 2006; Álvarez and Urbano 2011). These aspects would justify why governments are increasingly working to provide a simpler and more transparent regulatory environment, for example by reducing the number of permits and days to register a new company, in order to stimulate and foster the creation of enterprises.

#### *2.1.1. Access to funding*

One significant aspect, especially in a context of crisis, is access to funding. This element is of crucial importance for small and medium-sized enterprises, which are restricted in accessing financial resources. Regarding

the European experience, both small and medium-sized entrepreneurs agree that obtaining funding is a significant hindrance, second only to bureaucratic procedures (Henrekson and Stenkula 2010). Governments should design policies facilitating access to funding (Álvarez and Urbano, 2011) and maintaining a stable financial system.

Some authors such as Roper and Scott (2009) look at inequalities in access to funding that affect women more than men; this acts as an obstacle to starting economic activity. Other authors remain ambiguous about the difficulties involved in obtaining financing in the early stages of a company but do believe that the problem becomes salient when the company tries to expand (Naudé et al. 2008).

Maden (2015), Ramadani et al. (2015) and Naguib and Jamali (2015) agree that access to financing is one of the main limitations that women face when starting a business. In this sense, the authors highlight that the lack of a credit history and backing guarantees makes women less likely to obtain credit by financial institutions.

On this, Panda (2018) mentions that when there are problems with financing, whether they are due to the size of the loan, to interest rates, to requirements and guarantees or to denials, women tend to invest their own capital in companies related to the services sector, since they consider that they are cheaper and easier to establish.

In general, formal bank financing for start-ups also appears to be available mainly to low-risk cases. Banks are unlikely to be the main funders of business projects in high-tech and scientifically-based industries, preferring low-risk companies (Audretsch et al. 2006; Naudé et al. 2008). Other studies (van Gelderen et al. 2005; Ho and Wong 2007) confirm that low capital requirements and improved access to credit increase the chance of setting up a business. For example, in countries like the United States, the perception of difficulties in accessing funding is higher than in other OECD countries (Grilo and Irigoyen 2006).

### *2.1.2. Administrative regulations and procedures*

Intimately linked to the scope of regulation are the administrative processing requirements necessary for the start-up of a company. Djankov et al.

(2002) noted in a study conducted by the World Bank that the time and costs associated to the setting up of a business in developed economies were similar to the ones in emerging economies, but with critical exceptions - for example, 97 days in Russia and 4 days in the United States (Manolova et al. 2008).

Regulatory complexity - e.g., excessive administrative procedures and bureaucracy - can change entrepreneurs' preferences and negatively influence business activity (Djankov et al. 2002; Grilo and Thurik 2005; Klapper et al. 2006; Bowen and De Clercq 2008).

Since the regulatory dimension emphasizes administration and legitimacy issues, it suggests that a strong presence of excessive governmental barriers, procedures, and bureaucracy can adversely affect the intention to form a new company (Stenholm et al. 2013). Labor costs and employment conditions inflexibility is a disincentive to the creation of businesses. This aspect impacts growth by negatively affecting job creation (Brunet and Baltar 2010).

The legal framework influences the cost of creating a company and the development or closure of the business activity. In addition, it affects the formal institutional benefits (financial subsidies, personalized advice, technical and legal guidance, among others), that allow the viability of the organizational activity (Muñoz and Kibler 2016).

Likewise, within the formal regulations established, as is the case of legislation on gender equality and policies to promote a balance between work and personal life. The aforementioned legislation has increased economic empowerment and female leadership (Yousafzai et al. 2015). However, some of the institutions established by the government may have a hidden gender dimension, partially reducing the incentives to fostering female entrepreneurship. For example, in some countries there are regulations that preclude women from being owners, and in addition, they face a series of difficulties when trying to fund the creation of a profitable business (Brush et al. 2019).

In general, empirical studies have pointed out that regulation's complexity discourages entrepreneurship (Grilo and Thurik 2005; Lim et al. 2010).

### 2.1.3. Taxes

According to the existing literature on the role of taxation in the creation of companies, there is a stream suggesting that low tax rates favor the formation of new companies, contributing to generate employment, stimulating investment and ultimately promoting economic growth (Kitao 2008; Da Rin et al. 2011). However, arguments based on market failures state that uniform taxation on enterprises, regardless of their size, can lead to a high tax burden on small and medium-sized enterprises. From the point of view of the defenders of corporate taxation, taxes regulate the economy and increase social welfare. Nevertheless, authors such as Baumol (2002) point out that high tax rates can also act as a disincentive to entrepreneurial activity because the returns generated are reassigned to those who have no risk associated with the companies' start-up.

On the other hand, several studies suggest that the impact of taxes on entrepreneurship is not significant enough to affect entrepreneurial policies (Holtz-Eakin 2000). According to this literature, the role of corporate taxes on the creation of enterprises does not appear to be sufficiently clear, either theoretically or empirically (Chen et al. 2002; Kitao 2008).

### 2.1.4. Education

Within a society involved in the process of constant evolution and development, education is an essential substrate for entrepreneurs. The entrepreneurs' education level and skills are vital resources to start a new company (Davidsson and Honig 2003; Ucbasaran et al. 2008).

Furthermore, authors such as De Clercq and Arenius (2006), Autio and Acs (2010) note that higher education allows individuals to increase confidence in their skills, opening up more possibilities to start an economic activity. Similarly, for Levie and Autio (2008), the entrepreneurship education system of a country increases the number of individuals with entrepreneurial knowledge and promotes entrepreneurship as a career (De Clercq et al. 2013).

Professional training and education in some cases represent influential factors in female entrepreneurship (Iversen et al. 2016). Adema et al.

(2014) state that women entrepreneurs come from a variety of educational backgrounds and that in some cases the training is so technical that they are unable to transfer their skills and abilities, either by lack of work experience or ease of adaptation to changes.

Meunier, Krylova and Ramalho (2017) show that schooling brings important benefits for entrepreneurship and business performance (Islam and Amin 2016). Specifically, they point out that there is evidence that women entrepreneurs benefit more from education than their male counterparts. In this sense, the authors highlight that economies with higher levels of education are also characterized by higher rates of participation in the labor force.

#### 2.1.5. *Government programs*

Beyond entry barriers, regulations, and administrative procedures, other types of formal factor are government programs and policies to support and encourage the creation of enterprises. These programs can be general, although there are specific support measures, such as: economic and non-economic assistance services and programs for new entrepreneurs. Additionally, access to financing seems to play a significant role in determining entrepreneurship (Szerb et al. 2007).

However, policies can also lead to ambiguous results. On the one hand, they can make economic activities more attractive, highlighting their benefits/advantages. On the other hand, they can make economic activity unfeasible through restrictive or disincentive laws and regulations for potential entrepreneurs. Policies can have a positive or negative effect on attitudes, altering them over time, especially if the public policies involve institutional changes.

Spencer et al. (2005) point out that companies should avoid over-relying on government programs or aid, because they may unexpectedly end, reduce capital or change direction. Experience reveals that some companies that have participated in government-led programs have developed a dependency that jeopardizes their survival (Murtha et al. 2001). On the contrary, there is an example of a successful set of government programs and strategies, namely, Ireland, a country which enabled the economy to be

revitalized through local and international collaborative networks, leading to better macroeconomic effects and more entrepreneurship (O'Higgins 2002). Likewise, company changes are not observed in the short term, but they produce a long-term demonstration effect (Henrekson and Stenkula 2010).

## *2.2. Informal institutional factors in female entrepreneurship*

Following the typology suggested by North (1990), sociocultural components are considered as informal factors, and they may affect entrepreneurship, either through social recognition of entrepreneurship or by promoting individual positive attitudes towards it (Fernández et al. 2009; Liñán et al. 2013). Ultimately, these informal factors are also related to society's attitudes towards business creation (perception of desirability, feasibility, and intentionality).

### *2.2.1. Culture*

In this regard, North (1990) states that informal institutions come from socially transmitted information, and they are part of an inheritance, known as culture. Culture can also be defined as the transmission from one generation to the next, through teaching or imitation, of knowledge, values, and other behavioral factors (Barnouw 1979). Hoftstede (1980) considers culture to be a collective programming of the mind that distinguishes one human group from another.

Culture can influence entrepreneurial activity through the social appreciation of entrepreneurs, which could be taken as a role model or not. Culture can impact through shared values, ways of thinking, and positive attitudes, creating a favorable institutional environment to start an economic activity. Moreover, cultural values provide an indicator regarding the valuation society assigns to entrepreneurial activity (Liñán et al. 2013).

At a cultural level, entrepreneurship is generally perceived as a male domain (Jennings and Brush 2013; Panda and Dash 2013). Women must establish credibility and face both overt and covert discrimination; for

example, the gender wage gap and the low value placed by society on female independence (Maden 2015). In the same vein, there are less possibilities for women to dedicate themselves to entrepreneurial activity, since it goes against what is established by the traditional (patriarchal) gender roles of mother and wife (Panda 2018).

Brush et al. (2019) address the division of functions within the organization. If there is horizontal segregation, women are less likely to be owners; and in the case of vertical segregation, women have fewer opportunities to occupy leadership positions and have experience in decision-making.

Other authors dealing with cultural dimensions at the national level have demonstrated that there are differences in entrepreneurial rates due to population values and beliefs, and the share of potential entrepreneurs (Hofstede et al. 2004; Freytag and Thurik 2007).

Boettke and Coyne (2009) point out that cultural aspects may explain certain individual behaviors, though not all. For example, individuals with the same motivations could act differently within specific institutions. In this way, institutions make it possible to understand economic change and progress, as well as the lack thereof or its dysfunctions. Besides, these authors argue that institutions can influence the entrepreneurial behavior (Koppl and Minniti 2010).

On the other hand, the individual and collective perceptions of entrepreneur's prestige, the fear of failure, entrepreneurial capacities and opportunities have proven to be variables that condition the number of social entrepreneurial initiatives (Koppl and Minniti 2010). Although cultural patterns are immutable in the short term, institutional changes - e.g., through public policies - can alter attitudes over time. Because norms and attitudes are culturally codified products as a result of society's reward structures, institutional changes can affect them (Henrekson and Stenkula 2010).

### 2.2.2. Governance

Regarding informal factors, institutions and governance are interrelated issues. Authors like Williamson (2010) state that governance is the means to instill order, mitigate conflicts, and make mutual gains in transactions.

Other researchers like Dixit (2009: 5) define that "the structure and functioning of legal and social institutions reinforce economic activity and transactions through the protection of property rights, contract compliance and collective action behavior, in order to provide organizational and physical infrastructure".

Kauffman et al. (2008: 10) also make their contribution, stating that "governance can be understood as the traditions and institutions through which authority is exercised in a country. It includes how each government is elected, controlled and replaced; government capacity to formulate and implement good policies and the respect of citizens for the institutions that regulate economic and social interactions". In this context, good governance requires secure property rights, contract compliance, respect and responsibility of governments with and for citizens, laws and policies. Governance has become a central issue for the measurement of world economies.

Similarly, institutions have generated some influence on the convenience of female entrepreneurship, because they determine what the acceptable roles of future entrepreneurs are within society and what their behavior should be (Martin et al. 2015). In this regard, many societies still assign roles related to home and family to women, revealing somewhat implicitly that entrepreneurship is a not-so-desirable professional option for women.

In general, Shinnar et al. (2014) state that the perception of women in the face of the lack of normative support influences the decision to start a business; that is, the absence of institutional support can generate psychological burdens directly related to gender, stereotypes and roles that increase entrepreneurial ambiguity (Kazumi and Kawai 2017).

Authors such as Desrochers and Sautet (2008) declare that the environment where entrepreneurship arises is even more critical than the entrepreneur industry itself. Similarly, Baumol (1990, 1993) states that the entrepreneurs supply is constant, but their social interests' value varies according to environmental rewards. An institutional environment should create conditions to encourage productive and creative entrepreneurship aligned to social interests.

### 2.2.3. *Corruption*

Institutions influencing the reliability of the parties involved in economic transactions have a significant effect on the type of economic behavior in a country. The level of corruption is relevant to the business initiative. Public power might be misused for private profit in commercial transactions (De Soto and Diaz 2000; Bowen and De Clercq 2008).

Corruption is a reflection of weak and inefficient institutions governing trust relations (Djankov et al. 2002). However, some authors consider corruption as a factor that lessens the deficiencies of systems. This hypothesis is also supported by authors who claim that corruption decreases aggregate efficiency in countries where institutions are valid; but it increases efficiency when institutions are ineffective (Brunet and Baltar 2010).

Additionally, it has been argued that there may be corruption-related benefits in economic development and entrepreneurship, such as lower transaction costs through informal networks. This is especially evident in countries where formal institutions are not adequately developed (McMullen et al. 2008).

However, other studies (Aidis et al. 2008; Bowen and De Clercq 2008) argue that corruption can induce uncertainty and discourage potential entrepreneurs. Lim et al. (2010) have also found that high levels of corruption are often associated with lower productivity and slower growth. Corruption, therefore, increases uncertainty and mistrust in the business environment, and it decreases people's willingness to participate in entrepreneurial activities.

Chafuén and Guzman (2000: 53) also note that "corruption is the cost of obtaining state privileges, such as regulation taxes, tariffs, subsidies, loans, and government contracts favoritism". As a result, corruption weakens the rule of law. Considering that the rule of law is predictable and it enables entrepreneurial plans and actions, then the gradual substitution of government by 'informal, man-made, rules' results in a capricious and arbitrary application of laws, rights, and contracts. Corruption undermines the stability and reliability of institutions when deciding on entrepreneurial activity (McMullen et al. 2008).

### 3. Methodology

The data employed in the study comes from official statistics published by the Global Entrepreneurship Monitor (GEM) project, and the World Bank (WB) through the Doing Business and Worldwide Indicator Government reports from 2003 to 2015. The data matrix consists of 18 variables collected for 18 countries from Europe (Denmark, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom) and America (Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, United States, and Uruguay).

Table 1 shows the variables that have been employed:

**Table 1. Description of variables**

Factors	Code	Description	Source
Formal	ENTFIN	Valuation of the financial environment	GEM
	POLGOB	Valuation of government policies	
	PROGOB	Valuation of the country's Government Support Programs	
	NIVEDU	Education level	
Informal	VISEMP	Appreciation of women's vision for entrepreneurship	GEM
	CAROPT	Question assessing whether setting up a company is a socially accepted professional option for women.	
	ENCSELF	Question assessing whether self-employment or business creation is encouraged among women.	
	CONEMP	Question assessing whether women have equal access to excellent opportunities to create a company.	
	KNOEMP	Question assessing whether women have the same level of knowledge and skills for business creation.	
	FEARFA	Level of fear of failure	
Formal	NUMIMP	Number of tax payment procedures	WB
	HORIMP	Number of hours for tax payment procedure	
	TIEMSB	Number of days for business opening procedure	
	NUMSB	Number of procedures for opening a business	
	CAPTSB	Minimum capital percentage to start a business	
Informal	EFEGOB	Government effectiveness	WB
	CALREG	Regulatory quality	
	CONTCOR	Control of corruption	

Source: World Bank (WB), Global Entrepreneurship Monitor (GEM)

The variables relate to formal and informal factors previously discussed. Each of them includes an aspect that attempts to explain female entrepreneurial activity.

Although the statistical availability of these variables is generally extensive, it has been necessary to carry out - prior to statistical testing - a procedure for rearranging the available data series. This was performed with the purpose of establishing a standardized data sample, which allows an analysis in comparable terms. Factor analysis is applied, in order to identify factors that allow explaining the relationships between different variables, so that they can express the effect on the phenomenon under study. Additionally, by testing different combinations of the selected variables, a smaller number of factors (latent or unobserved variables) is extracted. This feature makes it possible to explain the behavior of the group of countries under study employing a certain set of variables. Finally, the criterion for factor selection is the collection of the unit's largest eigenvalue (Kaiser 1960).

#### **4. Results and discussion**

##### *Factor analysis*

In order to carry out the study of the influence of both formal and informal factors on female entrepreneurship, two types of analyses have been performed using two different statistical sources: ten variables coming from the GEM and eight variables taken from the World Bank Doing Business and World Government reports.

Subsequently, we verified whether the factor model was appropriate. For this purpose, we carried out an analysis of the correlation matrix associated with the variables. We applied the Bartlett's sphericity test to contrast whether such a model was an identity matrix. When the Bartlett statistical values (GEM Component 1279,888) (BM Component 1850,741) are higher and the level of significance (0.000) is lower, the application of factor analysis is correct. (tables 2 and 3).

**Table 2 - KMO and Bartlett test – GEM**

Kaiser-Meyer-Olkin measure of sampling adequacy		0.712
Bartlett's test of sphericity	Chi squared Approx	1279.888
	gl	55
	Sig.	0.000

Source: Global Entrepreneurship Monitor (GEM)

**Table 3 - KMO and Bartlett test – WB**

Kaiser-Meyer-Olkin measure of sampling adequacy		0.707
Bartlett's test of sphericity	Chi squared Approx	2906.501
	gl	55
	Sig.	0.000

Source: World Bank data

The criterion set for the eigenvalue's choice is to select those standards that are greater than the unit. This allows extracting three factors that explain 64.6% of the total variance. This percentage is acceptable since, in social sciences, the lower acceptance limit is set at approximately 60% (Hair, 2000). The three extracted factors explains, respectively, 32.3%, 20.4%, and 11.2% of the total variance of the model generated for the GEM. For the World Bank model, two explaining factors are extracted, expressing 53.9%, and 17.8% respectively, of the total variance (table 4).

**Table 4 - Variance explained by model**

GEM Component	Initial eigenvalues			WB Component	Initial eigenvalues		
	Total	% of variance	% Acum.		Total	% of variance	% Acum.
Formal – economic, political and education environment	3.550	32.275	32.275	Governance factor vs. ease of doing business	4.310	53.878	53.878
Informal – social perception of female entrepreneurship	2.237	20.337	52.612	Factor procedures to start a business	1.425	17.814	71.692
Non representative	1.314	11.945	64.557				

Source: Data from the World Bank, Global Entrepreneurship Monitor (GEM).

Figure 1 shows that both in (a) the slope loses importance from the fourth eigenvalue, while in (b) the slope loses importance from the third eigenvalue. Therefore, the first values in both screen plots should be extracted and those where the curve flattens should be discarded.

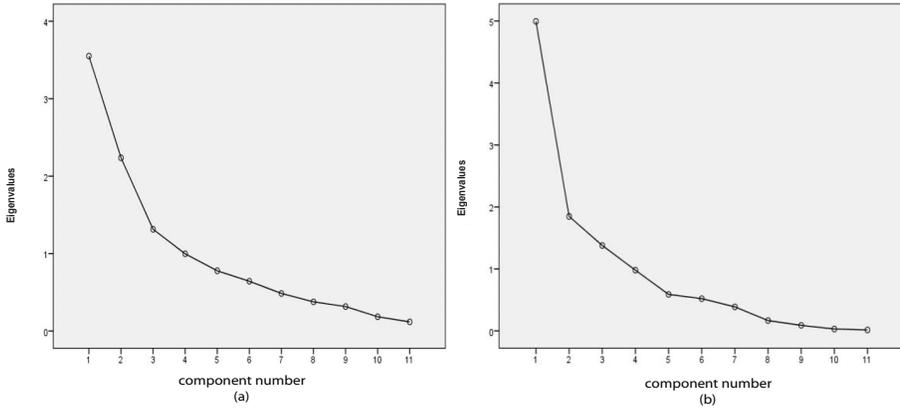


Figure 1 - Screen plot for GEM values (a), and screen plot for WB values (b).

Table 5 shows the unrotated factor matrix for the GEM model, which collects the linear correlation coefficients between the extracted factors and the original variables. This reflects the importance of each variable in each factor, so that the factors with a higher factor weight in absolute terms show a stronger relationship with variables.

Table 5 - Factor weights of the un-rotated factor matrix – GEM

	Components		
	Formal factors – economic, political and education environment	Informal factors – social and cultural perception of entrepreneurship	Non representative
POLGOB	0.856		
ENTFIN	0.850		
PROGOB	0.822		
NIVEDU	0.792		
CONEMP		0.712	0.373
FEARFA		-0.693	
CAROPT		0.575	
ENCSELF		0.540	
VISEMP		0.446	
KNOEMP		0.514	0.566

Note: Extraction method: analysis of major components.

3 extracted components.

Source: Data from the Global Entrepreneurship Monitor (GEM).

The unrotated factor matrix for the World Bank model (table 6) collects the factor weights of the components that show greater representativeness.

**Table 6 - Factor weights of the non-rotated factor matrix – WB**

	Components	
	Governance factor vs. ease of doing business	Factor procedures to start a business
EFEOB	0.949	
CALREG	0.927	
CONTCOR	0.909	
NUMSB	-0.881	0.133
TIEMSB	-0.716	
HORIMP	-0.616	
CAPTSB		0.830
NUMIMP		0.804

Note: Extraction method: analysis of major components.

2 extracted components.

Source: Data from the World Bank

According to the GEM model, the first factor has been defined as formal since it contemplates economic, political, and educational aspects. The countries contemplated in the study are aligned with it, highlight financial development, programs and policies of government and education. The correlation of this factor with the previously indicated variables is positive. This suggests that the implementation of public policies, regulations, and incentives by state governments has been optimal for the development and implementation of entrepreneurship; specifically, those led by women. Accordingly, in recent decades, policies have been created to place women in a leading role allowing them to contribute to businesses and economic growth.

On the other hand, in the second factor, only four of the 11 variables (good entrepreneurial conditions, acceptable career for women, a motivation that women receive to start a business and requirement of knowledge/skills for entrepreneurship) show a positive value. One possible reason is that a stronger and more positive link between entrepreneurship and cultural context is perceived in the analyzed countries. Thus, the positive actions and attitudes that enable the emergence of entrepreneurship within the educational system and at a cultural level promote the entrepreneurial

culture. In this sense, the surrounding conditions and social values towards entrepreneurship may provide support or otherwise constitute a limiting factor for female entrepreneurship (Slavica et al. 2014).

Furthermore, it should be emphasized that culture represents an essential constraint when starting an enterprise since the analyzed aspects have a close relationship with what the family role represents in society. This aspect could lead to motivation, perception of opportunities, knowledge, and skills. This evidence confirms the study of North (1990). It highlights that the entrepreneurial establishment is mainly associated with culture and its components. It refers to ideas, perceptions, values, and beliefs of entrepreneurs. In general, launching a new company will depend on the social, cultural, and economic conditions shown by the business environment of each country.

However, in the third factor, only two variables are representative, therefore, it is not considered within this analysis.

Regarding the World Bank data, we observe a strong relationship of the first factor (governance vs. ease of doing business) with three of the eight studied variables (government effectiveness, regulatory quality and corruption control). This relationship is determined by the indicated positive correlations values. Conversely, this first factor is negatively correlated with tax payment variables, the number of procedures for creating a business and time in days to start a company. Therefore, these variables are not considered as critical elements of the factor. These results are aligned with Álvarez and Urbano (2011), who mention that tax burdens and administrative procedures reveal a negative impact over effective decisions to create economic activity, due to a disincentive for the entrepreneur as it depends on the tax and legal regulations of the countries.

The second factor, called “procedures for starting a business”, has a strong positive relationship with two of the eight variables (minimum capital to start a company, tax payment number). However, by looking at the indicators and saturations in the principal component analysis, the variable number of procedures for registering a business (0.133), is somewhat weaker. The weight of the factor load must be greater than 0.5 to be accepted as an integral element of the factor (Hair 2000).

## **5. Conclusions**

Formal factors (economic, political, and education environment) show a positive effect on the development and implementation of entrepreneurship, particularly for those run by women. Regarding informal factors, only good entrepreneurial conditions, an acceptable career for women, the motivation that women receive to start a business and required knowledge/skills to initiate a company, show a positive impact. This means that culture and its components contribute to increasing the likelihood of establishing entrepreneurship. Nevertheless, all that is conditioned on the social and cultural aspects of each country.

When analyzing formal factors with the World Bank data, only government effectiveness, regulatory quality, and corruption control are associated with the development of entrepreneurship. Meanwhile, informal factors such as the minimum capital to start a business and tax payment number have the same effect.

One of the main mechanisms of economic and social growth is entrepreneurship, which is considered as an endogenous development strategy. It leads to understand why some of the selected variables - such as social conditions, the environment of entrepreneurship creation, policies and government procedures, financial assistance, and the knowledge and skills of entrepreneurs - are identified as significant factors that motivate this phenomenon. This research provides insights into factors that have particular relevance in the creation of women-led entrepreneurship. Its main contribution is the analysis it performs from two approaches (formal and informal) which provide essential information to perform adjustments and policy changes related to business creation for women.

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