Instituto Tecnológico y de Estudios Superiores de Monterrey

EGADE Business School

The role of institutions over the development of an entrepreneurial ecosystem in Mexico

A dissertation presented by

Allan Oswaldo Villegas Mateos

Submitted to the EGADE Business School

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

In

Business Administration

Major in Entrepreneurship

May 2nd, 2019

Dedication

I dedicate this work to my brother Miguel Alfonso Villegas Mateos that never had the chance to obtain his bachelor's degree because he lost the fight against cancer before, but we know he tried until the last of his days and he taught us all about persistence. Thanks to my parents Miguel Alfonso Villegas Salazar and America Mateos Guerrero for your unconditional support and for teaching me the value of education. Thank you Elizabeth Castillo Guadarrama for your patience, confidence, and love, because without you this process would have been so much harder. Thanks to all my family and friends for all your encouragement, and comprehension for all the events I missed. You all were my main motivation for pushing through this work.

Acknowledgments

The role of institutions over the development of an entrepreneurial ecosystem in Mexico

By Allan Oswaldo Villegas Mateos

Abstract

The Entrepreneurial Ecosystem approach tries to understand the mechanisms behind new businesses creation and helps developing tools, governmental policies, and support systems that enhance entrepreneurship activities outcomes. To ensure a better understanding of those mechanisms this thesis aims to contrast the importance of regional policies in emerging Latin American economies designed to foster local new business creation and development through the case of Mexico. Therefore, this work is divided in three empirical studies conducted using data from one of the Global Entrepreneurship Monitor's surveys, the National Experts' Survey (NES) which measures the Entrepreneurial Framework Conditions (EFCs). The first study of this work follows a qualitative methodology to provide a general overview of the Mexican entrepreneurial ecosystem obtained from the experts' responses to nine open questions of the NES. The second study analyses the quantitative responses of experts located in different entities of Mexico for which we used non-parametric statistics to evaluate the different perceptions of the EFCs. Also, this study follows the replication and adaptation of a Chilean research to generalize and validate the findings to contribute to the literature of regional entrepreneurial ecosystems. On the other hand, the third study uses structural equations models to test the directions of the EFCs that measure the entrepreneurial education, and cultural and social norms. This research was the result of identifying, in the first study, the key role of entrepreneurial education and training in the entrepreneurial ecosystem, and the differences of it between central to non-central regions in the second study. The main results of this work indicate that the government has a moderating effect to control through policies and programs the outcomes of the entrepreneurial activities. Nevertheless, each institution is responsible of understanding which actions are fostering and which are obstructing the entrepreneurial activities to improve the efficiency and build together a more dynamic entrepreneurial ecosystem in terms of opportunities being followed by entrepreneurs. Therefore, the general implication of this thesis underlies on the fact that the location of a person changes its opportunities to create a new business or grow an existing one, whether, it is necessity or opportunity driven. Hence, this thesis was not limited to high nor low levels of innovation, because all the experts responded accordingly to their own evaluation of the general status of the EFCs in their country/region's economies towards new business creation and development. Finally, this thesis implication for the Mexican government results that it must prioritize the homologation of the opportunities for people whether they are in big cities or small cities, and by that it means understanding the cultural and institutional context of each location. Consequently, this thesis contributes to the regional development literature of emerging Latin American countries and sets new lines to conduct future research in the last chapter.

CONTENTS

INDEX OF TABLES

INDEX OF FIGURES

Chapter 1

INTRODUCTION

1.1. Introduction and Problem Statement

The *Entrepreneurial Ecosystem* (EE) theory is a recent research approach, that is helping to underhand how new innovative and competitive new firms emerge in determinate geographic space and under which conditions these entrepreneurship activities interact with other components of the "ecosystem" (Stam, 2015). Also, entrepreneurship has been known for serving an important function in the creation of jobs, economic growth, and the development of many geographic entities, from small villages to regions and even entire countries (Lour et al., 2014). Many of the empirical research has also outstand the role of entrepreneurship and the new business creation as a mechanism for the creation of jobs, innovation, and economic growth (Thurik and Wennekers, 2004). The research in entrepreneurship mechanisms provides a better understanding of new firm's creation dynamics and helps developing tools, public policies, and other support systems that can help improving the EE around the globe. There are many economic and non-economic factors that can influence entrepreneurship in that sense (De Clercq and Arenius, 2006; Levie and Autio, 2008; Frederick and Monsen, 2009), but the mix of all contributes to the creation of organizations and economic growth. The convergence between the academic development of entrepreneurship and its impact in the practice of it, is a research field that has given bird to projects like the *Global Entrepreneurship Monitor* (GEM) which recognizes the approach to the entrepreneurial ecosystem as the framework of the conditions needed to launch a business, which it defines as the *Entrepreneurial Framework Conditions* (EFCs) (Reynolds, 1999). Hence, the recognition of the importance of entrepreneurship has unchained a transition to pay special attention in the policies that might help not only increasing the quantity of new business ventures, but also the quality of them (Stam, 2015).

In accordance with Fabre and Smith (2003), an entrepreneurial culture is needed in Mexico and it should not be about increasing entrepreneurial activity only, rather the challenge is about motivating and enabling people to pursue higher-value-added entrepreneurship. Even that Mexico shows an increasing positive trend in GEM's *Total Early-stage Entrepreneurial Activity* (TEA) indicator, and in the total entrepreneurship activity between the years 2010 to 2015 (Naranjo et al., 2016), most of the entrepreneurship is concentrated among low-risk, low-value-added endeavors that require minimum investment of capital (Fabre and Smith, 2003, p. 4), that means very low innovative new firms. Sargent

and Matthews (2015) found empirically that Mexico is one of the lowest scored Latin American countries with high rates of early stage entrepreneurial activity but average or low rates of ambition and innovation among early stage entrepreneurs. Innovation is the key component by which better quality of high-value-added entrepreneurial activities will increase the competitiveness of the Mexican economy and create the jobs that the country requires. In the case of Mexico, the innovation process is generated in an embryonic ecosystem in which the higher education institutions, research centers, government, financial entities, and companies should interact and participate in a coordinated complementary and systematic way (*Comité Intersectorial para la Innovación*, 2011, p. 10). Therefore, it is necessary the development of coordinated mechanisms between the factors to create a dynamic entrepreneurial ecosystem in terms of entrepreneurial activity, but also the development of accountability mechanisms that allow the review and continuous improvement of the public policies.

1.1.1   The Entrepreneurial Ecosystem in Mexico

Mexico is one of the biggest countries in the world in terms of total area with 1,964,375 sq. km (15th position worldwide) of which 1,943,945 sq. km are of land area and 20,430 km of coastline (CIA, 2018). Mexico is also the 11th largest economy in the world and the second largest in Latin America (World Bank, 2018). Mexico is constituted by 32 entities that together are the United States of Mexico or the Mexican Republic. The capital of Mexico, Mexico City, is the 4th largest city in the world (United Nations, 2018) and accounts for 7% of the country's population and 40% of the economic activity. In general terms, Mexico with a population of 127 million habitants, a density of 64 habitants per sq. km, and Spanish as official language, has the following entrepreneurial profile:

Table 1 Mexican entrepreneurial profile.

Age (average)	27
Gender (F/M)	48% / 52%
Superior education (deserters vs mater's + PhD)	80:8
Entrepreneurship as a good career choice	50.7%
Working hours per day	9.39
Founders that live in Mexico City	25%
Clients (B2B vs B2C)	3:1
Formality vs. Informality	1:5
Unicorn[1] companies	Kio Networks, Softtek

Source: Own elaboration with information from INEGI and GEM.

Each entrepreneurial ecosystem is unique (Isenberg, 2010) and Mexico is no exception. If we calculate the entrepreneurial profile of **Table 1** for a different country, it will be different, but for Mexico we can highlight that half of the Mexicans appreciate entrepreneurship as a good career choice although, in terms of the number of unicorn companies Mexico is surpassed by other Latin American countries like Brazil and Argentina (Arrieta et al. 2017). This means that even when Mexico has higher levels of economic development, the several factors and key players involved on the entrepreneurial ecosystem are affecting in a way that the entrepreneurial activities outcomes are resulting in lower innovative firms. Hence, this thesis focuses on the general evaluation of the entrepreneurial ecosystem by reviewing the purposed attributes/factors/conditions of other authors (Reynolds et al., 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Stam, 2015) and selecting the most appropriate because they have more formal processes, but, also providing implications linked with some of the key actors in Mexico identified in the next paragraphs.

---

[1] In the venture capital industry, a unicorn refers to any tech startup company that reaches a $1 billion-dollar market value as determined by private or public investment.

For someone trying to growth or create a business in Mexico, the government offers tools and systems available to the population, for example the National Institute of Geography and Statistics (INEGI) has at least two online tools: (i) the National Statistics Directory of Economic Units (DENUE), where anyone can access to information about existing businesses by industry, size, and locations, and (ii) the Bank of Economic Information (BIE) concentrates all the national indicators of the market, production, finance, prices, inflation, etc. In the other side, for someone trying to expand its business overseas, the government puts in disposure PROMEXICO, the federal organism to coordinate the strategies directed to strength the participation of Mexico in the international trade, it helps during the exporting process and internationalization of national companies. The Secretary of Economy (SE) among with the National Council of Science and Technology (CONACyT) issue the call for the "Technology Innovation Fund" every year with the purpose of promoting, selecting and supporting directly companies with projects of innovation, technological development, and employment generation. As an administrative division decentralized from the SE, in 2013 the National Institute of the Entrepreneur (INADEM) was created to regulate and create governmental policies and programs that could increase the contribution of new and existing firms to the economic development and social welfare (Official Journal of the Federation of Mexico, January 14, 2013). Both key players, CONACyT and INADEM, have additional support calls for resources in lower amounts. The National Financial (NAFIN) is another institution of the federal government created as a development bank in 1934 and it is in charge of promoting savings and investments through the establishments of financial programs, the coordination of capital investments, and the increase in productivity, its main objective is to foster the economic development of Mexico. In 2018, NAFIN and INADEM launched a new financing program for young entrepreneurs that consists on simplifying the access to finance and providing preferential interest rates.

In contrast, the private sector offers different support mechanisms for entrepreneurship. For example, groups of private companies have created their own programs and strategies to foster entrepreneurial ideas in Mexico such as: Wayra with Telefónica Movistar, Adopt a SME[2] of Walmart,

---

[2] Acronym for Small and Medium Enterprise

Open Talent of BBVA Bancomer, Startup with Google, Cinépolis Accelerator, POSIBLE+ of Televisa, Santander's Award to the Enterprise Innovation, Tecnológico de Monterrey & CEMEX, among others. There are also more than 500 private business incubators and accelerators (Gallegos et al. 2014) in Mexico with special calls for programs of between 3 to 6 months length during which the entrepreneurs are provided with special formation, mentors, and most of them with access to finance. Less than 5% of them are focused on high technology and most are intermediate technology oriented, plus the 60% of the high-tech incubators are in Mexico City, Mexico, Jalisco, and Nuevo León (Gallegos et al. 2014). The process to access these business incubators and accelerators is usually very competitive and among the main in Mexico are: TecLean, Startup Mexico, Angel Ventures, Socialab, iLab, 500 Startups, Wayra, Smart Impact, Nxtp.Labs, Vrainz Accelerator, etc. With respect with the access to finance, in Mexico the Mexican Association of Private Capital (AMEXCAP[3]) gathers the most important investment funds available, these are more than 110 private capital firms among which the most important partners are: Gerbera Capital, Ideas y Capital, Ignia, InnoHub Mexico, Labcap, Mayan Capital Fund, MITA Ventures, Mountain Nazca, On Ventures, Promotora Social Mexico, Capital Invent, CyC Capital, Dalus Capital, DILA Capital, Dux Capital, Elevar Equity, ENTURE CAP, Finnovista, Fondo Chiapas, GC Capital, 500 Startups, Adoba Capital, ALEB Investments, ALLVP, Alt-Ventures, Angel Ventures Mexico, Anteris Capital, Banregio, BID Capital, and Cantera Capital.

Other key players of the Mexican entrepreneurial ecosystem are the universities. The education is vital to create an understanding of the entrepreneurship phenomena, to develop entrepreneurial capabilities, and to contribute to entrepreneurial identities and cultures at individual, collective and social levels (Rae, 2010). There is evidence (Mungaray et al. 2011) that the regions with the biggest growth are the ones capable of innovating in its institutions and the superior education institutions develop a central role in this process. In fact, most of the business incubators in Mexico are in universities: 204 in public, and 104 in private universities (Gallegos et al. 2014). Particularly in superior education institutions, there is a trend to expand the curricula and programs focused on entrepreneurship and new

---

[3] AMEXCAP's members have over US$32 billion in assets under management and invest in a broad range of sectors such as real estate, media and telecoms, wholesale and retail trade, financial services, healthcare, transportation, business services, infrastructure, and manufacturing. See more at: https://en.amexcap.com/nav/members/

venture creation which have been growing considerably (Kuratko, 2005), and it happens in both, private and public institutions. For *private institutions*, the list is led by the Tecnológico de Monterrey followed by Universidad Anáhuac, Instituto Tecnológico Autónomo de México, Universidad Iberoamericana, and Universidad Panamericana. For *public institutions*, the list is lead by Instituto Politécnico Nacional followed by Universidad Nacional Autónoma de México, Benemérita Universidad Autónoma de Puebla, and Universidad Popular Autónoma del Estado de Puebla.

Additionally, there are infrastructure facilitators in Mexico that are part of the entrepreneurial ecosystem. First, the coworking spaces with big players such as: WeWork, Iza Business Center, Impact Hub, 3er Espacio, CoWork, MixCo, Regus, Stratup Mexico, among others. Second, industrial parks that offer integral service real state offer of lands, industrial buildings, warehouses, and all with less formalities with all the basic services. Third, technological parks located in the primary routes to airports, seaports, and highways to host technology developers and researchers on renewable energies, nanotechnology, mechatronics, information technologies and telecommunications. Fourth, "technology at hand" players for different purposes like for equipment (Office Depot Mexico, Best Buy, etc.) or for software (CRMs, ERPs, BI, ECM, PM, HRM, ITSM, EFA, Cloud Servies, Online shopping, and online payment). Fifth, the logistics players such as: DHL, UPS, Federal Express, Envío Click, Pakke, and MexicoWeb. Sixth, legal advice like CoWorking BBVA, Apolo Service, Komenko, and Clye Abogados. Finally, associations and foundations that promote entrepreneurship in Mexico to foster new conditions that facilitate the business creation and development such as: ASEM, AMMJE, EmpreSer, Crea Emprendedoras Sociales, Fundación ProEmpleo, FUNDEMEX, Fundación E, and WADHWANI Foundation.

Based on the above, the main aim of this work is to contribute answering the following research question: *How does the key players (institutions) of the entrepreneurial ecosystem are shaping it and which is their role as fosters of the entrepreneurial activity?* Thus, this research intends to improve the understanding of the entrepreneurial ecosystem with three empirical studies. Firstly, through a study conducted using a qualitative analysis of experts' perceptions from data collected from the National Experts' Survey with nine open questions which provided a general overview of the Mexican entrepreneurial ecosystem finding the main factors that difficult the entrepreneurial activity, some others

that foster it, and finally some actions that can be taken to promote the entrepreneurial activity in Mexico. The second study carries a quantitative analysis of the entrepreneurial framework conditions measured by the NES with a special focus on measuring the regional differences from central to non-central regions in Mexico using non-parametric statistics. This involves contrasting the importance of regional policies in emerging Latin American countries designed to foster local new business creation and development. Thirdly, using Structural Equations Models (SEM) a study measures the relationship between *Entrepreneurial Education* against *Cultural and Social Norms* to determine how to create pro-entrepreneurship programs that are more efficient fostering the entrepreneurial activities in Mexico. The three empirical studies are carried out based on EE and regional development literature on emerging Latin American countries through the case of Mexico, using three different research methodologies. Through these empirical works, this doctoral dissertation seeks to contribute to a better understanding of the EE field.

1.2.   Research Structure

This doctoral thesis is structured in five chapters including the present. After this introduction, Chapter 2 evaluates using a qualitative overview, if the current practices of the key players of the Mexican entrepreneurial ecosystem are being well implemented. This research aims to answer the following research question: *Is there any difference between what it is measured with the EFC and what the experts perceive that is working and what should be different to foster better the entrepreneurial activity?* This type of study allows the construction of a general image of the current status of the EE in Mexico, while providing meaningful information to those who aspire to carry out EE research and for policy-makers. Therefore, this type of study is good to initiate this doctoral thesis because with it we found that even that most of the EFCs are embraced by government programs and policies, they are not well established to really foster the entrepreneurial activities. The results obtained from this qualitative analysis are subsequently linked to the quantitative analysis in Chapter 3. The Chapter 3 presents in a regional context the differences of experts' perceptions about the EFCs using non-parametric statistics. This empirical research implies one of the biggest data-gathering projects in emerging Latin American countries and contributes to the EE field generalizing and validating the issues related with location to exploit entrepreneurial opportunities since it replicates in Mexico a study conducted in Chile (Gulati,

2007; Amorós et al. 2013). This research fills the gap in the EE literature answering the following research question: *Does the entrepreneurial opportunities are the same within a country or if regional location matters for entrepreneurs in Mexico or Latin America?* It is one of the first academic research studies at the regional level in Mexico to study this phenomenon specifically, and therefore it represents a contribution to the emerging literature on entrepreneurship and regional development in the Latin-American context.

In Chapter 4, there is another quantitative analysis that tests the relationship between *Entrepreneurial Education*, and *Cultural and Social Norms* because those are the EFCs that help more in shaping the individual´s motivations. Chapter 4 presents the results of these tests based on *Structural Equations Models* (SEM) that aims to solve the following research question: *Is the entrepreneurial education, at all levels, positively influencing the cultural and social norms that help fostering entrepreneurial activities or is an inverse relationship?* The main reason to test these relationships is because there is an emerging trend to create pro-entrepreneurship educational programs, most of them at universities, but they are missed focus because they are assuming that education shapes culture. Therefore, this research should reduce the gap in the literature because the results show the role of cultural and social norms to create pro-entrepreneurship programs in Mexico and by consequence show that the location matters as well in the effort to homologize the entrepreneurial opportunities. Finally, Chapter 5 clarifies the main implications in public policies, programs and institutions. This final chapter presents the main conclusions of the Mexican entrepreneurial ecosystem as well as the implications for the academy and practitioners. This chapter also concludes with the limitations of this work and the future research lines. In **Figure 1** you can review how this thesis is structured. A compendium of the articles that compose this thesis are presented in the following **Table 2**.
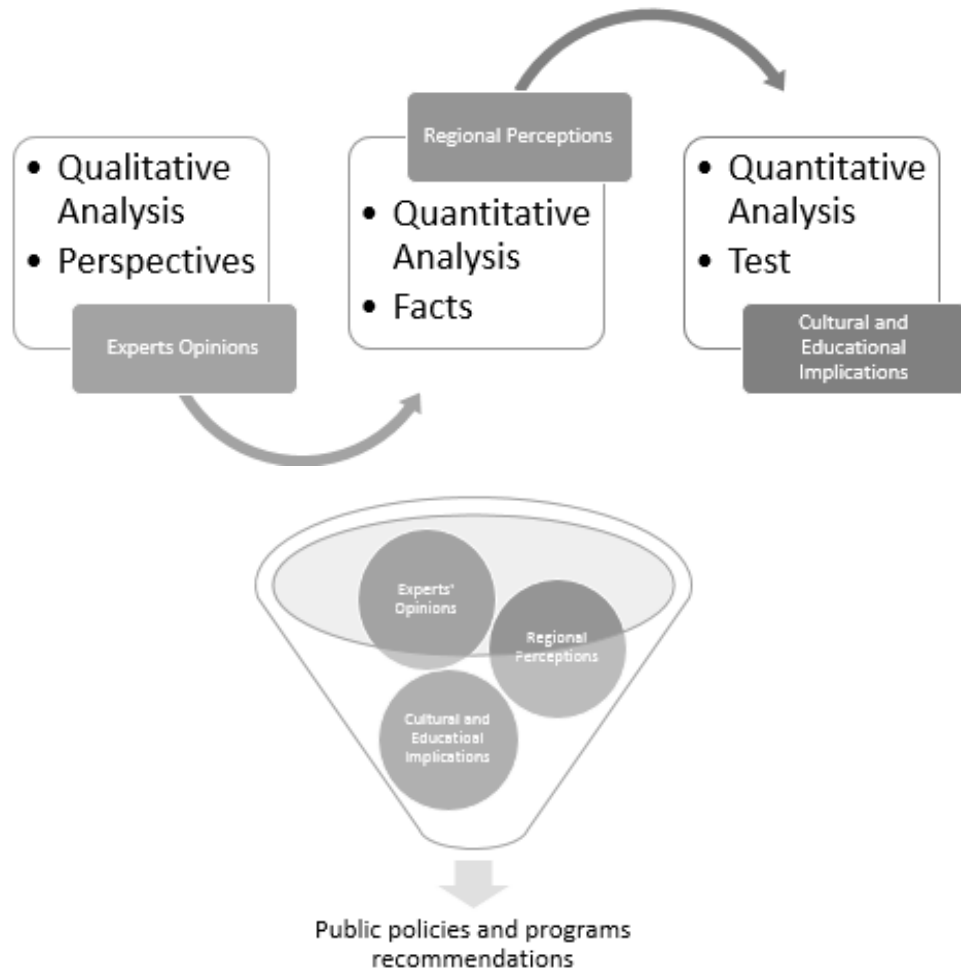
Figure 1 Structure of the doctoral thesis

Table 2 Resume of the structure of the dissertation

	Chapter 2	Chapter 3	Chapter 4
Contribution Title	**Entrepreneurial Ecosystem: Experts' Perspectives of Mexico**	**Regional Entrepreneurial Ecosystems in Mexico: A Comparative Analysis**	**The role of cultural and social norms to create pro-entrepreneurship educational programs in Mexico**
Presented/Published in	(2017) XXII Congreso Internacional de Contaduría, Administración e Informática.	(2019) Frontiers of Entrepreneurship Research 39th Babson College Entrepreneurship Research Conference (*Accepted*)	(2018) XXIII Congreso Internacional de Contaduría, Administración e Informática. (*Spanish version*)
Objective	This study identifies some factors that difficult the entrepreneurial activity, some others that foster it, and finally some actions that can be taken to promote the entrepreneurial activity in Mexico	The Entrepreneurial Ecosystem approach tries to understand the mechanisms behind new businesses creation and helps developing tools, governmental policies, and support systems that enhance entrepreneurship activities outcomes. To ensure a better understanding of those mechanisms this research aims to contrast the importance of regional policies in emerging economies designed to foster local new business creation and development.	Most of the empirical studies about entrepreneurial education are conducted in superior education institutions and barely at primary and secondary levels of education institutions. This research tests the relationship between entrepreneurial education and cultural and social norms using data from the National Experts" Survey of the Global Entrepreneurship Monitor.
Approach	Qualitative	Quantitative	Quantitative
Research Methodology	This study uses the Global Entrepreneurship Monitor, National Experts Survey applied to N=72 key informants in Mexico between the years of 2015 and 2016 and classifies one by one their answers into 20 different categories. In addition, the classification required personal interpretations and analysis.	This study uses one of the Global Entrepreneurship Monitor's surveys, the National Experts Survey, to a sample of N=675 key informants in Mexico at ten entities of which seven were categorized as non-centrally located. We used non-parametric statistics to compare the differences between centrally and non-centrally located experts.	Structural Equations Models (SEM) are employed with a pool of N=445 experts from data collected between 2015 and 2016 in Mexico.
Findings	The results show that financial support is one of the main factors that is an obstacle for new firm creation, public pro-entrepreneurship programs the main that foster it, and finally having better governmental policies could enhance entrepreneurship activities in experts' opinion.	The main results indicate that non-centrally located experts perceive their regions as in a worst position than centrally located experts in terms of government policies regulation, post-school education, commercial and physical infrastructure, but surprisingly in better position regarding financial access, general government policy, government programs, primary and secondary education, R&D transfer, market dynamism and openness, and cultural and social norms.	The presented results conclude that cultural and social norms are statistically significant over the entrepreneurial education at all levels, primary and secondary (b=0.377, SE=0.060, p<0.01), and superior (b=0.608, SE=0.066, p<0.01).
Originality/Practical Implications	This work has implications for policy-makers in Mexico and represents one of the first qualitative studies conducted in the field of Latin American entrepreneurial ecosystems.	These findings result on policy implications for all levels of government in Mexico which must prioritize the homologation of the opportunities for people whether they are in big cities or small cities. While the replication of a Chilean study (Amorós et al. 2013), contributes to the empirical literature of regional entrepreneurial ecosystems in emerging economies.	This work sets a better understanding of the relationship that the cultural and social norms have on entrepreneurial, and by consequence, it establishes a background in the field to conduct future research to achieve a consensus about this new perspective.

Source: Own elaboration.

Chapter 2

EMPIRICAL ISSUE I:
ENTREPRENEURIAL ECOSYSTEM: EXPERTS' PERSPECTIVES OF MEXICO

2.1. Introduction

Entrepreneurship has been known for serving an important function in the creation of jobs, economic growth, and the development of many geographic entities, from small villages to regions and even entire countries (Lour et al., 2014). Many of the empirical research has also outstand the role of entrepreneurship and the new business creation as a mechanism for the creation of jobs, innovation, and economic growth (Thurik and Wennekers, 2004). Some research in entrepreneurship mechanisms provides a better understanding of new firm's creation dynamics, and helps developing tools, public policies, and other support systems that can help improving the entrepreneurial ecosystems around the globe. There are many economic and non-economic factors that can influence entrepreneurship in that sense (De Clercq and Arenius, 2006; Levie and Autio, 2008; Frederick and Monsen, 2009), but the mix of all contributes to the creation of organizations and economic growth. The convergence between the academic development of entrepreneurship and its impact in the practice of it, is a research field that has given bird to projects like the *Global Entrepreneurship Monitor* (GEM) which recognizes the approach to the entrepreneurial ecosystem as the framework of the conditions needed to launch a business, which it defines as the *Entrepreneurial Framework Conditions* (EFCs) (Reynolds, 1999). The recognizing of the entrepreneurial ecosystem is a recent research approach, but the same recognition of the importance of entrepreneurship has unchained a transition to pay special attention in the policies that might help not only increasing the quantity of new business ventures, but also the quality of them (Stam, 2015).

In accordance with Fabre and Smith (2003), an entrepreneurial culture is needed in Mexico and it should not be about increasing entrepreneurial activity only, rather the challenge is about motivating and enabling people to pursue higher-value-added entrepreneurship. Even that Mexico shows an increasing positive trend in GEM's *Total Early-stage Entrepreneurial Activity* (TEA) indicator, and in the total entrepreneurship activity between the years 2010 to 2015 (Naranjo et al., 2016), most of the entrepreneurship is concentrated among low-risk, low-value-added endeavors that require minimum investment of capital (Fabre and Smith, 2003, p. 4), that means very low innovative new firms. Sargent and Matthews (2015) found empirically that Mexico is one of the lowest scored Latin American countries with high rates of early stage entrepreneurial activity but average or low rates of ambition and innovation among early stage entrepreneurs. Innovation is the key component by which better quality of

high-value-added entrepreneurial activities will increase the competitiveness of the Mexican economy and create the jobs that the country requires. In the case of Mexico, the innovation process is generated in an embryonic ecosystem in which the higher education institutions, research centers, government, financial entities, and companies should interact and participate in a coordinated complementary and systematic way (*Comité Intersectorial para la Innovación*, 2011, p. 10). Therefore, it is necessary the development of coordinated mechanisms between the factors to create a dynamic entrepreneurial ecosystem, but also the development of accountability mechanisms that allow the review and continuous improvement of the public policies.

The high-value-added entrepreneurship can be fostered both by encouraging business creation and encouraging the development and expansion of existing businesses (Fabre and Smith, 2003). Gobierno de la República (2013) published the *Program of Innovation Development 2013-2018*, where there are stated five factors for the low productivity of companies in Mexico which this research considered as main possible constrains of the entrepreneurial activity and would be tested. Those five factors are related with (1) financial sources and access to capital, (2) inadequate management and managerial skills, (3) insufficient productive and technological capacities, (4) lack of information relevant to decision-making, and (5) there is a little link between universities and research centers with businesses. Given that each country has different mix of those factors like policies, education systems, cultures, and many other factors that differ from one place to another, the GEM project defines and measures the EFC because they have a direct effect over the outputs and inputs of the entrepreneurial activity and so they are considered as the "rules of the game" (Amorós et al., 2013) or entrepreneurial ecosystem conditions which this research analyzes for the case of Mexico in general.

Supported by GEM data extracted from the *National Expert's Survey* (NES), the central objective of this research is to identify the main factors that difficult the entrepreneurial activity, some others that foster it, and finally some actions that can be taken to promote the entrepreneurial activity in accordance with a sample of Mexican experts. Our result could have implication for the design of better pro-entrepreneurship public policies. Indeed, this research provides a better understanding of the Mexican entrepreneurial ecosystem and proposes actions to homogenize and increase the entrepreneurial

opportunities taking into consideration the experts' perspective. Nevertheless, this study does not differentiate between necessity or opportunity driven entrepreneurial activities, but it provides the general status of the Mexican entrepreneurial ecosystem and with it some implications and future research insights in the final section.

2.2. Theoretical development: entrepreneurial ecosystems

The recent literature about entrepreneurial ecosystems is directed to the participants of the ecosystem, mainly entrepreneurial leaders and policy-makers, not too much for an academic audience (Stam, 2015). In the EE literature, the entrepreneurs are considered the central heart of an ecosystem, but successful entrepreneurial ecosystems have nine attributes according to Feld (2012). Other authors suggest less or more attributes/factors for entrepreneurial ecosystems (Reynolds et al. 2005; Isenberg, 2011; WEF 2013; Stam, 2015). **Table 3** shows the different sets of entrepreneurial ecosystems according to various sources and it helps to compare the propositions for a categorization process during the analysis of the *N=72* experts' surveys with which the authors concludes. Some of those propositions for the entrepreneurial ecosystem compositions are the same or similar in definition among the different sources like finance (Isenberg, 2011), Capital (Feld, 2012), Funding and Finance (WEF, 2013), Financial Support (Reynolds et al., 2005), and Finance (Stam, 2015), see the top of **Table 3** for additional reference. Therefore, this study considers the GEM Entrepreneurial Framework Conditions defined by Reynolds et al. (2005) as the conditions of an EE that englobe most of the other definitions whether they have more or less attributes than the nine EFCs, and the GEM project provides reliable measures of those EFCs across countries and across time.

Feld (2012) takes into consideration some internal factors (leadership and engagement) that are traits of the entrepreneur, like Baum et al. (2001) did, but also external factors of the ecosystem to explain the context in which entrepreneurship is develop. Meaning by ecosystem, the biological point of view, not literal, as the interaction of living organisms with the physical environment to make reference that entrepreneurship is carried out in communities with interdependent actors (Stam, 2015). On the other hand, the WEF (2013), enlisted eight pillars needed for an entrepreneurial ecosystem (see **Table 3**) where

some of them have the presence of dimensions like resources (human, financial and services), the formal institutions (government and regulatory framework), and informal (cultural support) that together make possible the entrepreneurial activity.

Table 3 Proposed sets of attributes/factors/conditions of entrepreneurial ecosystems

Reynolds et al. (2005) GEM EFC	Isenberg (2011)	Feld (2012)	WEF (2013)	Stam (2015)
Financial Support	Finance	Capital	Funding and Finance	Finance
Government Policy	Policy	Government	Government and Regulatory Framework	Networks
Government Programs	Human Capital	Network Density	Human Capital/ Workforce	Leadership
Entrepreneurial Education	Markets	Talent	Education and Training	Talent
R&D Transfer	Support	Leadership	Major Universities as catalysts	Knowledge
Commercial and Professional Infraestructure	Culture	Companies	Accesible Markets	Support services/ intermediaries
Internal Market Openess		Intermediaries	Support Systems/ Mentors	Formal Institutions
Physycal and Services Infraestructure		Support services	Cultural Support	Demand
Cultural and Social Norms		Engagement		Physical infraestructure
				Culture

Sources: (Reynolds et al. 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Stam, 2015)

Isenberg (2011) states apart from the six domains of an entrepreneurship ecosystem, that each entrepreneurship ecosystem is unique and adds the examples of Israel, Ireland, Taiwan and China ecosystems that evolved under certain conditions that were not necessarily the same for all. Indeed, Isenberg (2010) argues nine prescriptions for creating an entrepreneurship ecosystem departing from the

same idea about that each entrepreneurship ecosystem is unique so that is why the first of these nine prescriptions is about stop trying to replicate or copy Silicon Valley[4]. The Silicon Valley is under a unique set of circumstances that reinforce its success like the industries present, link with local universities, doctoral students, and the culture among other things. If it is already difficult to enforce people to pursue a career in entrepreneurship, and it is even more difficult to make them all succeed, then the hardest thing is to create an EE. Isenberg (2010) nine prescriptions to create an EE are:

i. Stop emulating Silicon Valley.
ii. Shape the ecosystem around local conditions.
iii. Engage the private sector from the start.
iv. Favor the high potentials.
v. Get a big win on the board.
vi. Tackle cultural change head-on.
vii. Stress the roots.
viii. Don't overengineer clusters; Help them grow organically.
ix. Reform legal, bureaucratic, and regulatory frameworks.

2.3. Methodology

2.3.1. Data Collection

Research in entrepreneurship ecosystems suggests differences to establish a consensus about the components of certain concept, but also "*entrepreneurship ecosystem*" is the prevalent theory for boosting entrepreneurship as an economic development strategy (Isenberg, 2014). Due to the difficulty to establish what exactly is successful entrepreneurial ecosystems (Isenberg, 2010), research about it is needed to propose better actions. The GEM consortium provides useful data from the measures the EFCs though the NES. The GEM teams' asses the quality of their entrepreneurship ecosystem through the NES (Herrington et al., 2017, p. 10). The NES monitors the factors considered to have a significant impact over entrepreneurial activity and this survey is administered to a minimum of 36 experts per year by participant country in the GEM project (Reynolds et al., 2005) where those experts are taken as a systematic sample of professors, researchers, investors or bankers, public policy makers, and sometimes additionally one or more are also entrepreneurs, but not everyone. These experts are asked to evaluate

---

[4] First place by the Global Startup Ecosystem Ranking, see https://startupgenome.com/all-reports/

the status of EFCs in their country/region's economies towards new business creation and development, independently if they are necessity or opportunity driven entrepreneurial activities (Reynolds et al. 2005).

Thus, we review the NES data from Mexico since it follows a worldwide standardized methodology implemented by GEM (Levie and Autio, 2008), and it has been used previously to propose the design of governmental policies that foster entrepreneurial activity (Amorós et al., 2013). The NES uses qualitative information mainly to measure the nine EFCs, but the instrument also includes nine open questions that are barely analyzed by researchers worldwide. Given that the objective of this article is to identify the main factors that obstruct the entrepreneurial activity, some others that foster it, and finally some actions that can be taken to promote the entrepreneurial activity. The authors used the open questions to conduct the analysis of the entrepreneurial ecosystem constrains in Mexico using data collected from 2015 to 2016 (2 years). Each year the experts were personally interviewed and asked to complete the NES self-administered survey in Spanish language where four of them were considered experts in one of the nine EFC, and between them at least one entrepreneur, at least two providers of the EFCs and at least one observer; such as an academic with specific expertise in the area (Reynolds et al. 2005; Amorós et al., 2013) which left us a sample of N= 72 experts in Mexico (4 experts X 9 EFC's= 36 respondents X 2 years= 72 respondents).

<div align="center">**Table 4** Sample composition (*N=72*)</div>

Sample Characteristics		Total	% of Total
Type of interview	Face to face	17	23.6%
	On line	54	75.0%
	By phone	1	1.4%
Primary EFC expert specialization	Financial support	8	11.1%
	Government policies	8	11.1%
	Government programs	8	11.1%
	Education and training	8	11.1%
	R&D transfer	8	11.1%
	Commercial and professional infraestructure	8	11.1%
	Market openess	8	11.1%
	Access to physycal infraestructure	8	11.1%
	Cultural and social norms	8	11.1%
Demographics	Average age	44.42	
	Male	44	61.1%
	Female	28	38.9%
Educational attainment	Primary	0	0.0%
	Secondary	0	0.0%
	Vocational professional	3	4.2%
	University/College	19	26.4%
	MA, PhD,…	50	69.4%
Expert Specialization	Entrepreneur	43a	86%b
	Investor, financer, banker	18	25.0%
	Policy maker	29	40.3%
	Business and support services provider	35	48.6%
	Educator, teacher, entrepreneurship researcher	27	37.5%

a Valid cases for each variable

b Percentage based on total valid cases for each variable

2.3.2   Sample Characteristics

Pooling the two-year data (2015 and 2016) the authors obtained a final sample of *N=72* valid cases. From them 8 experts for each EFC were obtained as expected according to the GEM methodology (Reynolds et al. 2005; Amorós et al., 2013) with an average age of 44.42 years where 44 (61.1%) experts were male and 28 (38.9%) female. The administration of the NES was conducted to 17 (23.6%) experts by face to face interview, 54 (75%) by online administrations, and 1 (1.4%) was conducted by phone. A further description of the principal characteristics of the sample is provided in **Table 4**. From the total sample, none of the experts had fewer educational attainments than vocational professional with 3 (4.2%) experts, a bigger sample of 19 (26.4) experts had "University/College" attainments and the rest of experts

with a biggest sample of 50 (69.4%) which were the majority had higher educational attainments like "MA, PhD ..." Regarding the experts specialization, a mix between the categories of the sample is possible since it is possible for example to have an expert that is entrepreneur but also a policy maker and even a business and support services provider as well. Many different mixes can be inferred from the expert specialization then in **Table 4** more detailed information of the sample is provided taking into consideration the valid cases for each variable that were considered in the data collection process.

2.3.3   Measures

The NES is divided into sections that evaluate nine categories: financial support, government policies, government programs, education and training, R&D transference, commercial and professional infrastructure, internal market openness, access physical infrastructure, and socio-cultural norms (Reynolds et al. 2005; Amorós et al., 2013). The standard NES includes from 5 to 8 questions for each EFC in a 9-point Likert scale (where 1= "Completely False" and 9= "Completely True") which most of the empirical studies uses to conduct research in different countries (Levie and Autio, 2008; Amorós et al., 2013). There are additional nine open questions of the standard NES which provide more qualitative data for analysis. This information is scarcely used. For this research, the authors use those nine open questions to analyze the experts' perspectives toward the entrepreneurial ecosystem in Mexico. From the nine open questions, the first three asked about factors and/or areas that are obstructing the entrepreneurial activities in their country, next three factors and/or areas that foster the entrepreneurial activities in their country, and finally the experts were asked for three actions that from their perspective can be taken to promote an improvement for the entrepreneurial activity outputs.

Thereupon, these answers are classified in 20 different categories, defined by GEM[5]. The categorization process helped to a deeper data qualitative analysis. Those 20 categories consist in: (1) Financial Support, (2) Government Policies, (3) Government Programs, (4) Education and Training, (5) R&D Transfer, (6) Commercial and Professional Infrastructure, (7) Market Openness, (8) Access to Physical Infrastructure, (9) Cultural and Social Norms, (10) Capacity for Entrepreneurship, (11)

---

[5] These categories are in line with the factor described by WEF (2013) and Isenberg (2014).

Economic Climate, (12) Workforce Features, (13) Perceived Population Composition, (14) Political, Institutional, and Social Context, (15) Economic Crisis, (16) Corruption, (17) Different Performance of Small, Medium, and Large Companies, (18) Internationalization, (19) Labor Cost Access and Regulation, and (20) Information. Additional authors' interpretation of the responses was done for the categorization and analysis.

2.3.4   Method

First, the responses were coded into the 20 categories previously listed in topics by the GEM team at the harmonization process of the NES databases, these is conducted accordingly with the issue highlighted by the original text response of the opened questions. Second, after the first step of conversion from text to numerical data, descriptive data and frequency tables were calculated to identify the main categories that experts selected as factors/areas that are obstructing and/or fostering the entrepreneurial activities in their country, and/or factors/areas that need actions to promote an improvement for the entrepreneurial activity outputs in accordance with experts' perspectives of Mexico's entrepreneurial ecosystem. Third, the authors reviewed all the responses of the sample to extract more specific information about what in each of the categories are the general constrains of the entrepreneurial ecosystem in Mexico and to propose solutions that enhance entrepreneurial activity. Finally, conclusions were given respectively for the creation of a successful entrepreneurial ecosystem in Mexico following some considerations from previous research about entrepreneurial ecosystems (Reynolds et al., 2005; Isenberg, 2010; Isenberg, 2011; Feld, 2012; WEF, 2013; Amorós et al., 2013; Isenberg, 2014; Stam, 2015).

2.4. Results

2.4.1.   Factors and/or areas that are obstructing the entrepreneurial activity

Experts were asked to mention, and explain if necessary, 3 factors/areas that from their perception are obstructing the entrepreneurial activity in their country (Mexico). The findings helped the

authors to conclude about the main factors/areas that need attention and conclude about the implications of proposals for further policies to construct a successful entrepreneurial ecosystem. First, beginning with the categorization process of the 72 responses from experts in Mexico the first finding was that the category of *Financial Support* got the most related answers with 45 (62.5%) from the sample. According to the WEF (2013) "Funding and Finance" is the most important pillar for growth/success of companies in Mexico. Both are different in names but the same in definition as the condition needed of financial services available for venture growth and creation. All the proposed sets of attributes/factors/conditions for successful entrepreneurial ecosystems in **Table 3** considered the availability of appropriate finance even though the authors name them differently. Also, it is consistent with the first factor that decreases productivity of companies in Mexico stated in the introduction which is related with financial sources and access to capital that present the problems of high interest rates, lack of information, and excessive warranties required by the banks (Gobierno de la República, 2013).

There are many aspects mentioned by the experts related to the category of *Financial Support*. The absence of enough capital and resources is affecting the entrepreneurial activity because experts said that there are not enough seed capital funds neither venture capital nor access to debt through banks. Indeed, the main problem detected is that in Mexico it is very difficult to capitalize entrepreneurial ideas and most of the entrepreneurs do not have access to all the capital they need to start their business, so they end up opening traditional business or nothing instead of high impact ventures. This explains the results from GEM when they measure the *Total Early-stage Entrepreneurial activity* (TEA) in different countries and results show higher TEA rates in economies with lower economic development like most of Latin American countries including Mexico, the Caribbean and in Africa, than in more develop economies like United States of America (Herrington et al., 2017, p. 8). Basically, in Mexico there are high levels of entrepreneurial activity, but it is important to have more innovative and high impact ventures to contribute the GDP and jobs creation. As Stam (2015) argues, we need to pay special attention to the policies that can help not only increasing the quantity of new business ventures, but also the quality of them. Some experts also mentioned the difficulties in the financial system to get a loan because bank credits are too expensive, difficult to access them and there is not enough offer for entrepreneurs. Even though, banks don't and should not lend to startups because that is not their business,

banks financial markets mature and directly impact the entire chain of investing (Isenberg, 2014). Some actions have to be taken to promote risk investments like seed funds, venture capital and angel investors over high impact entrepreneurship rather than all kinds of business ventures. Also, the financial system has to mature in order to offer more accessible loans to entrepreneurs which are already developing their businesses, but right now do not have fare interest rates and conditions to obtain loans and keep growing.

Another important category that more than half of the experts from the sample identified as obstruction of the entrepreneurial activity with their related answers was *Government Policies* with 37 (51.5%) from 72 respondents. Analyzing one by one the answers the authors found that inside this second category, most of the answers were specifically directed to bureaucratic problems that entrepreneurs face when trying to start a business. The procedures are complicated, slow and low cost-efficient which end on obstructing the entrepreneurs to develop their core business activities. The *government policies* should facilitate the creation and operation of new businesses as well as being easy to manage and accomplish for everyone. Some experts mention taxes and issues with fiscal policy in this category because according to them there should be incentives and special considerations for new business owners. Special considerations should be considered in the mid time the entrepreneurs settle their new business venture in the market and to compete against informal entrepreneurs that evade paying taxes. Trying to accomplish the same fiscal responsibilities that stablished companies puts on disadvantage the new business owners in accordance to experts' perceptions.

Sharing the third position of the categories identified by experts as obstructions of the entrepreneurial activity, we found from the answer's analysis: *Education and Training* and *Cultural and Social Norms* with 17 (23.6%) respondents each from the sample of 72 experts. The WEF (2013) stated both as the least important pillars to the growth success of a company in Mexico. Contrary for *education and training* findings through the qualitative analysis of answers, showed that the main constrain is related with the deficiency and scarcity of programs that prepare and capacitate entrepreneurs to face real life situations. The experts' perceptions regarding this category is that there should be more programs that impulse the creation of new businesses from primary and secondary levels of education (elementary, middle school and high school) to higher education (college/university). In the other hand,

cultural and social norms was identified as obstructing category of entrepreneurial activity in Mexico by experts, because there is a perception from them that there is a lack in the national culture that should push youth to be more proactive and to take the initiative for entrepreneurial projects. The Mexican culture is individualistic according to experts and that does not help fostering entrepreneurial activity neither taking risks. Mexicans also grow up in families where the custom is to go out and find a job even before having an education in some cases according to the socio economical context of each person. Fabre and Smith (2003) identified that building an entrepreneurial culture in Mexico is important, but the current status of it shows a lack of education relevant to entrepreneurship and it is an important cause of business failure in this country.

Capacity for entrepreneurship got 16 (22.2%) of expert's responses while *Corruption* got 15 (20.8%) from the total. The authors identified that *capacity for entrepreneurship* is related with some aspects found in the *cultural and social norms* answers, like culture as enhance for individuals to take the initiative to create new business ventures which also is an aspect found in the capacity for entrepreneurship, but the difference is that *capacity for entrepreneurship* analysis the individual aspects of the entrepreneurs and *cultural and social norms* analyses the general context where entrepreneurs grow up. Even though, other aspects emerge from the analysis of *capacity for entrepreneurship* such as the lack of planning, fear to failure, ignorance of support program, and more importantly the authors found several responses related with the lack of understanding and research of the market. Generally, the entrepreneurship in Mexico is for necessity than for recognition or finding of an opportunity in the market according to experts' perceptions. Both, *Education and Training* and *Capacity for entrepreneurship* are related with the second factor about inadequate management and managerial skills that decreases productivity of businesses (*Gobierno de la República*, 2013). For the other category, *Corruption* is also related with the context or environment where the entrepreneurs evolve. It is a constraint of competitiveness considered the most problematic factor for doing business recognized by experts from our sample and since it has gained in prominence especially in countries where recent scandals have exposed its economic costs, such as Brazil, Hungary, Italy, Mexico, and Spain (Schwab, 2015). In this case *corruption* is a significant risk for companies operating in Mexico because experts relate it to organized crime, bureaucracy and inefficiency of governmental programs.

A research conducted by Isenberg (2014) showed that according to some entrepreneurs interviewed, they recognized three challenges everywhere which were: access to talent, excessive bureaucracy and scarce early stage capital. This research is consistent with those finding because the previously mentioned categories identified as obstructions of the entrepreneurial ecosystem in Mexico by experts (*Financial Support, Government Policies, Education and Training, Cultural and Social Norms, Capacity for Entrepreneurship,* and *Corruption)* represented more than 20% of the sample responses each and some of them are complementary in content of the answers collected against the challenges entrepreneurs from Isenberg (2014) study mentioned. Isenberg (2010) argues as the ninth prescription to create a successful entrepreneurial ecosystem to reform legal, bureaucratic and regulatory frameworks. Those are the main aspects that experts identified as issues in all the categories mentioned before. Finally, the WEF (2013) states some government/regulatory policies as growth inhibitors for early-stage companies where the bureaucracy, lack of transparency, time delays/lengthy approval processes, lack of clarity/confusing, complexity, and regulatory uncertainty/changing regulations, are mentioned among others we found in the answers from experts.

The rest of the experts' responses were categorized as well, but none of those categories represented a final count of more than 20% which the authors considered that were not representative to be obstructions that require immediate improvement and actions. Those categories were: *Information: all responses related to this topic (18%), Economic Climate (14%), Government Programs (13.9%), Political, Institutional, and Social Context (11.2%), R&D Transfer (8.4%), Commercial and Professional Infrastructure (7%), Market Openness (7%), Different Performing of Small, Medium, and Large Companies (7%), Access to Physical Infrastructure (2.8%), Perceived Population Composition (1.4%), Labor costs, Access and Regulation (1.4%),* and *Work force Features (1.4%).* Both, *Economic Crisis* and *Internationalization* categories did not get responses related from experts which mean that does not need immediate action to create a successful entrepreneurial ecosystem in Mexico.

2.4.2. Factors and/or areas that are fostering the entrepreneurial activity

Later, experts were asked to mention and explain if necessary 3 factors/areas that from their perspective are fostering the entrepreneurial activity in their country (Mexico). Now, the first category

with the most related answers was *Government Programs* with 32 (44.4%) responses from the sample as a foster of entrepreneurial activity while before the same category got 10 (13.9%) of the responses when the question was about obstructions of the entrepreneurial activity. The authors identified from the qualitative analysis of each answer that experts recognize that there are federal and state programs that foster the entrepreneurial activities principally with funds for entrepreneurs. Though, those programs are difficult to enter and most of them are sectorial for specific activities the government sets as priorities leaving some entrepreneurial projects out without support. It exists in Mexico the National Institute of Entrepreneurship (INADEM) since 2013[6] created in support of the entrepreneurs and micro, small and medium companies, which creates and manage public funds through convocations for specific purposes like the creation and growth of businesses. Experts' perceptions of INADEM are mentioned as a government program that is helping the entrepreneurial activities in Mexico, but it still remains short of budget, with different priorities and not everyone can access to their public convocations. Even there are good programs that foster the entrepreneurial activities they also need to take some actions for improvement and more government programs should be created with other priorities because some entrepreneur cannot access the existing ones according to experts' perceptions. The experts mentioned also incubators and accelerators as part of the government programs that need attention, and both necessarily need to work together linking entrepreneurs with programs.

The second category with the most related responses was *Education and Training* with 30 (41.7%) responses of the total. This category was also mentioned as a constraint for entrepreneurial activity, but when analysis the answers the authors found differences. *Education and Training* as a constraint for experts referred to the absence of programs that impulse the creation of new businesses from primary and secondary levels of education (elementary, middle school and high school) to higher education (college/university). While the same category as a foster of entrepreneurial activity refers to the existing effort of higher education institutions to include and create entrepreneurship development programs. The experts mentioned that there are already many actions taken by universities to pursue innovation and entrepreneurship at their different career programs of specialization. Indeed, there are

---

[6] INADEM is a public organism decentralized of the Secretary of Economy

also some programs for high school level of education, but still there should be since primary education which was mentioned by experts. Including in this category the creation of communities for entrepreneurs and increasingly number of events schedules during the year to share knowledge and doing networking is a good foster of entrepreneurial activity according to experts' perceptions.

The third position corresponds to the *Government Policies* category with 24 (33.3%) of the responses from the sample as a foster of the entrepreneurial activity, but the same as *Education and Training* happened and this category was also identified as a constraint which required for this analysis a deeper review of the answers. As a constraint most of the answers were specifically directed to bureaucratic problems that entrepreneurs face when trying to start a business which experts defined as a lack of understanding of the entrepreneurial activities that need special policies in order to set them under equal opportunities as the established companies and not in disadvantage trying to accomplish the law in matter of fiscal policy and taxes. For that reason, as a foster of the entrepreneurial activity, not all *government policies* are constraints because some of them have improved in the regulatory framework that enables and facilitates entrepreneurs to work under equal opportunities against established companies. The experts recognized an improvement in some policies related to the strengthening of the entrepreneurial ecosystem like the fiscal policy and the ones related with social security systems for new business ventures in Mexico.

Finally, *R&D Transfer* is the last category with a response ratio above the 20%, with 21 (29.2%) total responses from the sample of experts. In this category the authors found mainly aspects respect to the role of business incubators and accelerators which allowed the link between education centers and finance through different services developed due to the network with companies and other institutions that facilitates the access to technology. In this case the evidence shows that for experts' perceptions there is a good link between universities and research centers with companies which is the fifth factor that decreases the productivity of businesses (*Gobierno de la República*, 2013), so special attention must be taken to increase it and/or maintain it at that level. The activities and convocations organized by the National Council for Science and Technology (CONACyT)[7] have been recognized as fosters of the

---

[7] Spanish abbreviation for *Consejo Nacional de Ciencia y Tecnología*

entrepreneurial activity in Mexico because it manages and promotes the research and development of scientific and technological projects. The impulse that is mentioned is related with public funds for technology-based entrepreneurship which helps the premise of a successful entrepreneurship is the one with higher quality of new business ventures instead of increasing the quantity only (Stam, 2015).

The rest of the expert's responses were categorized as well, but none of those categories represented a final count of more than 20% from the total which the authors considered that were not representative to be direct fosters of the entrepreneurial activity. Those categories were: *Capacity for Entrepreneurship (19.5%), Cultural and Social Norms (19.5%), Information: all responses related to this topic (16.7%), Work force Features (15.3%), Financial Support (12.6%), Market Openness (11.2%), Economic Climate (8.4%), Political, Institutional and Social Context (8.4%), Internationalization (7%), Access to Physical Infrastructure (4.2%), Perceived Population Composition (4.2%), Commercial and Professional Infrastructure (2.8%), Different Performing of Small, Medium and Large Companies (2.8%), Economic Crisis (1.4%),* and *Labor costs, Access and Regulation (1.4%).* In this case *Corruption* did not get a single related answer as a foster of entrepreneurial activity, but for the opposite side the categories with the less responses when asking for fosters are the ones that should be the contrary to be consider as constraints as well. Indeed, *corruption* is not a foster it is a constraint as the experts identified with 20.8% of the responses identified as related. Then, special attention should be paid to other categories not mention in further detail as the top fosters of the entrepreneurial activity as happened with *corruption*, but suggestions to take actions from experts' perceptions are provided in the next section of the results.

2.4.3. Actions that can be taken to promote the entrepreneurial activity

The experts proposed more actions for *Government Policies* with 55 (76.4%) of the responses from the sample than for other categories. This is the same category you can find as a constraint and as a foster of the entrepreneurial activity in Mexico at their respective sections. Finding were that there are already good policies that are fostering the entrepreneurial activity, but also it is a sensitive category because experts mentioned as a constraint that the *government policies* should facilitate the creation and operation of new businesses as well as being easy to manage and accomplish for everyone. Some other

experts mention taxes and issues with fiscal policy in this category because according to them there should be incentives and special considerations for new business owners. As a final result this section provides useful information from the experts' perspectives of actions that can be taken to keep growing a successful entrepreneurship ecosystem in Mexico. The experts were also asked to propose three actions that promote the entrepreneurial activity for their perspective.

Following in the same line of actions that can be taken related to *government policies* the authors found enough evidence that suggest the creation of a general "Law for Entrepreneurship". The law for entrepreneurship should include reducing bureaucracy in government dependencies that facilitates and simplifies how business are created and opened. The same law also should be very clear and include necessarily the structure of a tax reform that incentives the formal economy through a simplify taxation and with stimulates for entrepreneurs to accomplish them during the early-stages of their entrepreneurship without being in disadvantage against the informal economy or stablished companies. Additionally, the law for entrepreneurship should include regulations for the financial system to reduce the requirements to acquire financing as well as to reduce the interests' rates which are higher in Mexico than other countries. Some experts suggest the creation of a specialized in entrepreneurs' financial institution which can provide more customized services rather than general services like other institutions. As a separate action proposed is the diffusion of the new regulations, policies and programs to provide better access to more entrepreneurs that ignore them.

In *Education and Training* the experts mentioned that one constraint is that there should be educational programs since primary and elementary education until higher education, all the way through it, to prepare entrepreneur to face real life situations and change their mindsets for being more innovative and leaders that could be entrepreneurs in the future. Some experts even recognized that there are already some higher education institutions that are implementing well these changes of the model of education for their academic programs. That is the reason why again one of the main actions to promote the entrepreneurial activity in Mexico is related with including topics of entrepreneurship to all levels of education not only higher education. Actually, the experts mentioned that it is not only including it to lower levels of education but also expanding coverage and quality of it all the way until higher education

to achieve better quality of the entrepreneurial ventures along time. Another problem with entrepreneurial education identified is that the existing one sometime is not updated which is important for the entrepreneurs because it allows them to use the latest methodologies to detect opportunities and validate them in the market rather than only develop business plans and also to let them know about the available funds and programs that can be link with their business ideas in the future.

The actions proposed for *Financial Support* are closely related with one of the aspects mentioned that should include the general *Law for Entrepreneurship* as a *governmental policy* about the creation of a specialized-on entrepreneurs' financial institution. At least better interest rates should be considered for entrepreneurs and a wider offer of financial services that also support strategic sectors. One important issue is the requirements to get financing even when it is not seed capital and it is a loan because banks are very restrictive in those requirements for new business which as an action should be less. The actions for *governmental programs* are also related with *governmental policies* and *financial support* because they are complementary and make the government responsible for improving them. There are also *governmental programs* that are fostering the entrepreneurial activity like the INADEM, but it needs more budget to help more entrepreneurs, to capacitate the public servants, reduce bureaucracy, and to follow projects that benefit from them to calculate indicators of impact in the estates and federal as well which also should help to recognize the success stories. For experts' perceptions the *governmental programs* need as a result of public policies more advertising and distribution to keep increasing the number of support programs.

Ties between local communities, universities, companies and entrepreneurs should become stronger and more developed for the *R&D Transfer* in accordance to the majority of the experts. This tie is an action needed to foster higher-value-added business ventures among nascent entrepreneurs because they will have more access to new technologies and prepared for the research and development environment needed to create new businesses. The experts also considered important to follow successful entrepreneurship stories to motivate others to pursue an entrepreneurial career. In matter of intellectual property for *R&D transfer* it is special issue to foment the protection of knowledge generated through the research and development to exploit in the future the business opportunity like patents.

The authors found a relationship between the proposed actions for *Cultural and Social Norms* and the actions for *Capacity for Entrepreneurship*. For *cultural and social norms,* the experts suggested to change the mindset of individuals since they are youth to promote the entrepreneurial culture exposing them to success stories that might motivate them. While for *capacity for entrepreneurship* the some of the suggestions literally mentioned the promotion and creation of an entrepreneurial culture. Adding to *cultural and social norms* the citizen participation is core of the actions needed to impulse the entrepreneurial activity in Mexico. For the case of *capacity for entrepreneurship* experts add to encourage individuals to realize market research before opening new businesses and to promote the planning to avoid failure. Few of the experts said that the requirements of support programs for entrepreneurs should include the review of the experience of the entrepreneur in order to foster the projects with higher opportunities of success.

2.5. Conclusions and Limitations

The entrepreneurial ecosystem in Mexico can be successful if the right actions are taken in strategic areas that in the literature review the authors identified as attributes/factors/conditions needed for the development of entrepreneurial activities. Taking in consideration the models of entrepreneurial ecosystems in **Table 3** (Reynolds et al. 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Stam, 2015), the authors categorized the data collected between 2015 and 2016 from the nine open questions of the NES to assess the status of the entrepreneurial ecosystem (Herrington et al., 2017) forming 20 different categories. This research cannot determine whether it is a successful entrepreneurial ecosystem or not, but it accomplishes the objective of identifying the main factors that obstruction the entrepreneurial activity, some others that foster it, and finally some actions that can be taken to promote the entrepreneurial activity in accordance with Mexican experts that might result in better public policies. Also, we can conclude now that the five factors described as lowers of business productivity (*Gobierno de la República*, 2013) are well established because the experts' responses meet the criterion of them, but there is enough evidence to add one related with *Government Policies*. The factor of *government policies* must include the role of the regulatory framework, fiscal policy and taxation, and special

considerations to match the opportunities for economic competition between new and existing businesses. The authors found that *government policies* play a big role in the entrepreneurial ecosystem because they can control and influence other factors.

For the case of factors that are obstructing the entrepreneurial activity in Mexico five of the categorized responses were identified as the most urgent which as expected the top one was *Financial Support* followed by the mentioned *Government Policies, Education and Training, Cultural and Social Norms,* and *Corruption.* In the other side, the top factors fostering the entrepreneurial activity that this research identifies are *Government Programs, Education and Training, Government Policies* also, and *R&D Transfer.* Therefore, as you can appreciate *Government Policies* and *Education and Training* are repeated for both as obstructing factor and as a fostering factor, but they appear under different contexts. For the first one mentioned as an obstruction is referred to the bureaucracy involved to accomplish all requirements needed to operate a business like the fiscal policy while the same factor as a foster of the entrepreneurial activity refers to some policies that are working well reducing the bureaucracy for example to open a new business which now requires less time. For *Education and Training* what happened is that for experts there are already good support for entrepreneurship programs in higher education institutions, but the evidence shows that learning entrepreneurial skills such as detecting opportunities, management, leadership among others are important and should be taught since secondary levels of education until superior education.

Nevertheless, the efforts to foster entrepreneurial activities in Mexico should be refocused more on high-value-added growth opportunities of existing businesses and less on encouraging the formation of new businesses (Fabre and Smith, 2003), but these study limited to the experts' evaluations of the status of the EFCs in Mexico towards new business creation and development, independently if they are necessity or opportunity driven entrepreneurial activities. The study of Sargent and Matthews (2015) can serve as a reference for high-growth entrepreneurship in Mexico because they evaluate the characteristics of small and medium sized young companies selected by the global business accelerator, Endeavor. Indeed, this study must be taken as the base to understand the general settings of the Mexican entrepreneurial ecosystem without considering types of business trying to pursue.

2.6. Implications and Future Research

The findings of this research suggest taking in consideration all experts' responses about their perceptions of the entrepreneurial ecosystem in Mexico that a *General Law for Entrepreneurship* must be created to regulate the factors and make it a successful ecosystem. Mexico has a unique entrepreneurship ecosystem and policy makers must adequate the conditions that may foster the entrepreneurial activity instead of trying to replicate other ecosystems (Isenberg, 2010). This general law should include key points that experts mentioned like the creation of a financial institution for entrepreneurs that reduces requirements to obtain finance and lowers the interest rates, creation of programs for high-value-added entrepreneurship, fiscal policy with special considerations that match the opportunities against informal businesses and well established companies while it attracts the formal economy, and reduction of bureaucracy and corruption at government institutions. Finally, this research was conducted at an individual level of Mexico in general but future research should be done comparing the experts' perceptions by region selecting the cities that contribute most to the Mexican economy to compare if there is a difference and consider adequate state laws like if every city is a different ecosystem.

Also, we highlight the importance to focus on high-growth entrepreneurship in future studies because this study asses the general status of the Mexican entrepreneurial ecosystem from the perspectives of experts towards new business creation and development (Reynolds et al., 2005), independently the types of business and motivations of the entrepreneurs. These can be solved by selecting experts of high-growth firms in Mexico to conduct the study such as Sargent and Matthews (2015) did with Endeavor selected entrepreneurs to evaluate the characteristics of these type of firms. A major key point will be to evaluate first also the EFCs through the NES to identify important differences in the perceived entrepreneurial ecosystem in Mexico.

Chapter 3

EMPIRICAL ISSUE II:
REGIONAL ENTREPRENEURIAL ECOSYSTEMS IN MEXICO: A COMPARATIVE ANALYSIS

3.1. Introduction

Entrepreneurship from socio-spatial point of view is a local phenomenon. Despite the interdisciplinary approaches to entrepreneurship research like sociology (Sorenson and Audia, 2000), business (Dubini, 1989; Bahrami and Evans, 1995), or geography (Ritsilä, 1999; Malecki, 2018) where special focus has been made to the importance of the relationships between entrepreneurs and their local economic and social contexts (Cavallo et al., 2018), the regional perspective of entrepreneurship remains underdeveloped. Evidence shows that the impact of business creation and development over economic growth may be different across nations (Sternberg and Wennekers, 2005), may vary over time (Acs and Amorós, 2008; Henrekson and Johansson, 2008; Acs et al., 2009), and, therefore, may also have important differences across regions (Fritsch and Mueller, 2004; Amorós et al., 2013; Audretsch et al., 2017). This research aims to contribute to the analysis from the *Entrepreneurial Ecosystems (EE)* perspective to examine whether entrepreneurial framework conditions are the same within a country or if regional location matters for entrepreneurship activity.

The concept of EE has recently emerged to offer a systematic view of entrepreneurship activity (Cavallo et al., 2018). The EE approach tries to understand the mechanisms behind new firm creation dynamics and helps develop tools, public policies, and other support systems that enhance entrepreneurship activities outcomes. Therefore, the recent literature about EE has acquired special attention from the participants of the ecosystem, mainly entrepreneurial leaders and policy makers (Stam, 2015). In accordance with Spigel (2017), the EE is an umbrella concept that encompasses a variety of different perspectives on the geography of entrepreneurship rather than a coherent theory. Hence, the extant literature has also produced a considerable number of frameworks that describe the main components and key attributes of an EE (Kuratko et al., 2017). Naturally, entrepreneurs are considered to be the central heart of an ecosystem in all the frameworks, but scholars are still discussing how to measure EE to gain a comprehensive understanding of the subject matter (Reynolds et al., 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Mason and Brown, 2014; Stam, 2015; Cavallo et al., 2018). Indeed, several scholars have highlighted the need to understand entrepreneurship in broader settings, such as regional, temporal, and social arenas (Autio et al., 2014; Zahra et al., 2014; Colombelli et al., 2017).

From a regional approach, the local factors associated with innovative entrepreneurship are the basis of strong EE (Acs et al., 2014). Some empirical studies (Fritsch, 2013; Tsvetkova, 2015; Mack and Mayer, 2015; Spigel, 2017) have investigated from the context of EE the subsequent value creation at regional level that can be linked to Baumol's (1996, p.899) proposal that "entrepreneurial behavior changes direction from one economy to another in a manner that corresponds to the variations in the rules of the game". These "rules of the game" are shaped for local context. Due to the relevance of entrepreneurship in the creation of jobs, economic growth, and the development of many geographic entities from small villages to regions and even entire countries (Lour et al., 2014), the governments must focus on creating and improving policies and programs that foster and enhance entrepreneurial activities that attend to local and/or national priorities.

While some research (e.g., *Global Entrepreneurship Monitor* -GEM- reports, World Bank´s *Ease of Doing Business,* etc.) provides analysis of entrepreneurship context between countries, some other studies highlight the differences of the EE from city to city or region to region (Harrison and Leitch, 2010; Qian et al., 2012; Isenberg and Onyemah, 2016; Audretsch and Belitski, 2017). Even though the literature of EE is growing, there is still a lack of comparisons between regions of the same country in emergent economies. Therefore, this research contributes to the advance and understanding of the regional literature of EE, particularly in Latin American, by conducting a replication of a study from Chile (Amorós et al., 2013) in Mexico. Because issues like the mentioned government policies and programs among other necessary conditions can change their perceptions. This research deals with different experts' perceptions of EE from central to non-central regions to evaluate if entrepreneurs have the same opportunities no matter where they are in the country. The experts' perceptions are important because they possess a substantial range of background information and knowledge about the necessary conditions for entrepreneurship and they are selected based on reputation and experience (Reynolds et al., 2005). As described by Amorós et al. (2013) this research relies on data from the GEM national team and from Mexico using longitudinal data for 2015–2018. These data represent the largest data-gathering project in the field of entrepreneurship in Mexico. GEM data provides us an accurate measure of *Entrepreneurial Framework Conditions* as the "necessary oxygen of resources, incentives, markets, and supporting institutions to the growth of new firms" (Bosma et al., 2008, p. 40) and that this research

considers them to measure experts' perceptions of their local EE by 10 entities in Mexico. Because the entrepreneurial framework conditions are clearly related with Baumol's (1996) proposal and are consistent with several components of the EE (Reynolds et al., 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Mason and Brown, 2014; Stam, 2015; Cavallo et al., 2018), it is expected that different countries and regions have different entrepreneurial framework conditions and, by consequence, different perceptions about the efficiency and efficacy of their EE. We hypothesize that better evaluations about EE will come from regions that have better access to structural and systemic conditions to enhance entrepreneurship activities (Stam, 2015), generally economic center regions as the capital city.

The replication of the study conducted in Chile, which was one of the first regional studies about entrepreneurship conditions in a Latin American country, gave us the opportunity to explore and compare not only in terms of methodology but also in terms of contrasting the conceptual frameworks, not missing the lens of EE literature. We consider that doing this replication in the Mexican context is relevant for three reasons. (1) Mexico is the second largest economy in Latin America in terms of GDP and population below Brazil (the 15th largest economy in the world, the 10th most populated country according IMF 2018 data), and the third in terms of geographic area, below Brazil and Argentina. These characteristics make Mexico very attractive in terms of empirical settings and because it is a country that is growing in terms of entrepreneurship activities. (2) Conducting research on emerging economies, especially from Latin America, helps fill the gap in the literature about this region (López and Alvarez, 2018). (3) Both studies relied on data from the GEM project and use longitudinal data representing the largest data-gathering projects in the field of entrepreneurship in Latin America. The use of this data for replications that reinforce (or propose modifications) of previous studies helps validate the relevance of empirical and theoretical approaches (Gulati, 2007) but also helps in the generalizability and external validity of studies in different settings. The rest of the paper is as follows. Section 3.2 discusses the conceptualization of regional aspects of entrepreneurship. Sections 3.3 and 3.4 describe the methodology, the empirical exercise and results, respectively. Section 3.5 presents the discussion and gives some conclusions and implications for future research.

3.2. Theoretical development: regional aspects of entrepreneurship

From the various definitions of EE, we can distinguish the ones that mention explicitly the regional or local aspects of entrepreneurship-related geography (Spilling, 1996; Neck et al., 2004; Cohen, 2006; Mason and Brown, 2014; Stam, 2015; Mack and Mayer, 2015; Spigel, 2017) from the ones that do not (Van de Ven, 1993; Isenberg, 2011; Roberts and Eesley, 2011; Qian et al., 2012; Acs et al., 2014; Audretsch and Belitski, 2017; Auerswald and Dani, 2017; Bruns et al., 2017; Kuratko et al., 2017). For example, Spigel (2017, p. 50) defines EE as a combination of social, political, economic, and cultural elements within a region that support the development and growth of innovative start-ups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures, highlighting the regional aspect of the elements and actors. According to Bruns et al. (2017, p.1) the "EE is a multidimensional set of interacting factors that moderate the effect of entrepreneurial activity on economic growth" with a more general definition. Both types of definitions are consistent with the presence of dynamic elements or factors although they may not be the same in this definition.

Hence, we identify two interesting avenues to improve knowledge about the "boundaries" of EE: (1) analyze in depth the local–regional geographic level in the EE literature and (2) move to a consensus in the academic research about whether geography is a relevant factor of EE. The first avenue is related with identifying the precise boundaries of an ecosystem, which may be an impossible task (Iansiti and Levien, 2004) and it is easier to consider each country as an independent EE due to the remarkable differences in local economic and social contexts. In fact, the EE literature has been criticized for its poor clarity concerning the level of analysis (Stam, 2015), but empirical research at the city level (Saxenian, 2006; Mack and Mayer, 2015; Spigel, 2017) demonstrates the importance of location. For the second avenue, this research considers the entrepreneurial framework conditions of the GEM as the correct EE factors measurements as it is the world's foremost study of entrepreneurship (Reynolds et al., 2005).

The regional level of analysis of the EE must not be confused with other related concepts that consider location in the regional development literature like industrial districts, regional industrial clusters, regional and/or national innovations systems (Marshall, 1920; Pyke et al., 1990; Delgado et al.,

43

2010; Arikan and Schilling, 2011), all of which are predecessors of EE research (Acs et al., 2017), but there are some similarities with the regional development literature (Cavallo et al., 2018). It is considered useful to analyze EE by drawing on regional development mechanisms, such as district, urban, and localization economies (Acs et al., 2017). From the natural perspective of regions, geography provides boundaries that affect economic growth because of factors affecting like the development of transportation routes and natural resources availability that encourage firms to establish in specific regions where manufacturing costs are minimized (Marshall, 1895; Weber, 1909). Although the high-tech firms can deal with high-value inputs and outputs, so the location factor may not be decisive (Cooper, 1993); but thinking of a start-up firm, other factors take bigger importance at that early stage like access to financial support and highly qualified human capital. For the case of qualified human capital, the levels on rural areas are significantly lower on average than in urban regions (Mueller et al., 2008; Van Stel and Suddle, 2008). This phenomenon may result in more people and firms moving to urban regions (Amorós et al., 2013) where the biggest city is generally the capital of the country and its surroundings. However, governments must prioritize the homologation of the opportunities for people whether they are in big cities or small cities. The small cities must be able to engage in several strategies to overcome their limitations and create vibrant entrepreneurial communities (Roundy, 2017).

For their study, Amorós et al. (2013) divided the regions in two, central and peripheral, whereas this research divides the regions in central and non-central. The peripheral regions were selected concerning the effect of distance to the economic core which means the opposite of central and the non-central regions because this research considers also the distance to the center (Mexico City), plus demographic (total population) and economic indicators (regional GDP and its share on the national GDP). The literature highlights several advantages of central location that include highly educated people, a larger potential market, and knowledge spillovers from universities and research institutions explained by the agglomeration effect (Todling and Wazenbock, 2003; Van Stel and Suddle, 2008). These advantages could be considered attractive for an entrepreneur but tend to decrease the attention from peripheral regions and some core activities like investment (Roberts and Barley, 2004; Saxenian, 2006). Indeed, this explains why governments try to foster entrepreneurial activities in peripheral regions by offering special incentives to attract investments and entrepreneurs to those regions (Frenkel et al.,

2003). In practice, governments can only interfere in EE by creating and improving policies and programs, but still there are other factors that would change the desired effects explaining why many pro-entrepreneurship programs are not effective (Lerner, 2009). However, there is evidence that entrepreneurship policy should stimulate economic growth as a necessary condition for employment generation and poverty alleviation (Edoho, 2016).

Therefore, considering the mentioned regional aspects of entrepreneurship and the fact that urbanized regions are mostly economically stronger (Cannarella and Piccioni, 2006), this paper aims to contribute to the EE literature at a regional level, particularly in Latin America, by analyzing the significant differences between the *centrally located experts* (CE) evaluations and the *non-centrally located experts* (NCE) on different EE in Mexico. In this context, we explore the perceptions and provide recommendations that may help foster entrepreneurial activities in both regions of Mexico, central and non-central. Consequently, this research has policy implications that will be discussed later.

3.3. Study area and research methodology

3.3.1. The Mexican Context

Mexico is one of the biggest countries in the world in terms of total area with 1,964,375 sq. km (15th position worldwide) of which 1,943,945 sq. km are of land area and 20,430 km of coastline (CIA, 2018). Mexico is also the 11th largest economy in the world and the second largest in Latin America (World Bank, 2018). Mexico's geographical location in North America, bordering the Caribbean Sea and the Gulf of Mexico, between Belize and the United States, and bordering the North Pacific Ocean, between Guatemala and the United States, makes of Mexico a good case for this kind of study because it is also the only Latin American country in North America. Specifically, the target locations of this study are 10 out of 32 entities in Mexico. For the purposes of data collection, in this study, non-central regions are those located at the sub-national/regional levels in the Northwest (Chihuahua), Northeast (Nuevo León and San Luis Potosí), Southeast (Yucatán), and West (Guanajuato, Jalisco, and Zacatecas) of Mexico, and central regions are those located in the metropolitan areas of Mexico City, Puebla, and Querétaro. The capital of Mexico, Mexico City, is the 4th largest city in the world (United Nations, 2018)

and accounts for 7% of the country's population and 40% of the economic activity. Puebla, with five percent of the country's population, is a conurbation–metropolitan area located only 138 km from Mexico City; Querétaro is part of the West region but it's close in distance at 238 km to Mexico City and comprises two percent of the country's population and economic activity, so we included it as "central".

NCEs reside and operate at the sub-national level in the northwest, northeast, southeast, and west of Mexico; these regions are more than 350 km from Mexico City. The northern regions have been related to higher levels of economic development and comprise the largest land area; with close commercial relations with United States (U.S.), its main economic activities are related to agriculture, cattle raising, logging, mining, and manufacturing of food, glass, beer, wood, steel, footwear, etc. The western regions are geographically diverse and include valleys, mountain chains, and coastal plains; its main economic activities are related to agriculture, cattle raising, fishing, logging, mining, and industries such as textiles, footwear, petrochemistry, sugar, tequila, and food. The southeastern regions are big land areas surrounded by water and its main economic activities are related to agriculture (with limitations), cattle raising, logging, and fishing. The central region concentrates most of the political, cultural, and economic activities of Mexico, although Mexico City is one of the smallest entities of the country in land area; its main economic activities are related to agriculture, cattle raising, logging, mining, and industries such as textiles, food, transportation, automotive, petrochemistry, footwear, wood, cement, rubber, oil, machinery, etc. Summarizing, many natural resource-based industrial sectors are the most prevalent elements that contribute to the Mexican economy, and that there is an influence of the geography on the economic development which is given through the human capital (Esquivel, 2000). These geographic differences in local economic and social contexts explain the heterogeneous behavior of the peripheral versus central regions (Amorós et al., 2013) that this research considered. The economic, geographic, and demographic profiles provide a clear distinction between central versus non-central regions (see Appendix A).

In terms of economic participation, the seven entities from the non-central regions contributed the 24% to the national GDP, and the three entities from the central regions contributed the 20% of the national GDP (INEGI, 2018; World Bank, 2018). Politically, when the ex-president of Mexico, Enrique

Peña Nieto (EPN), took up his six-year mandate (2013–2018) he decreed the creation of the National Institute of Entrepreneurship (INADEM) on January 14, 2013. The INADEM was an administrative division decentralized from the Ministry of Economy in Mexico that, in summary, would regulate and create governmental policies and programs that could increase the contribution of new and existing firms to economic development and social welfare (Official Journal of the Federation of Mexico, January 14, 2013). This means that the INADEM was the main regulator of the EE in Mexico during the sample period (2015–2018); however, this research must consider that in a four-year period (2014–2018), the Mexican government reduced the budget for entrepreneurial programs of INADEM by 59% (González, September 20, 2018). Recently, the incoming government of Andres Manuel López Obrador (AMLO), whose mandate will last another six years (2019–2024), announced the dissolution of the INADEM in 2019 (Saldaña, December 24, 2018). As a result of the analysis of the comparison between central versus non-central regions in terms of the EE, this study has several implications for Mexico's regional and national public policies, which are presented at the end of the paper.

3.3.2. Data description

The Global Entrepreneurship Monitor provides consistent data to develop an empirical study using the *National Experts' Survey*, one of the worldwide standard questionnaires of the GEM methodology (Levie and Autio, 2008). The National Experts' Survey provides information about the entrepreneurial framework conditions defined by Reynolds et al. (2005) and are consistent with several components of EE, e.g., financial support, government policies (general and regulation), government programs, entrepreneurial education (primary and secondary, and post-school), R&D transfer, commercial and professional infrastructure, internal market (dynamics and openness), access physical infrastructure, and cultural and social norms. The National Experts' Survey uses information based on informed judgments of experts regarding the status of each entrepreneurial framework condition in their own countries and/or regions. National and regional experts were selected based on reputation and experience with EE. Nevertheless, the GEM Mexico national team tried to ensure that experts with a substantial range of background and knowledge were chosen in each region, the same happens with GEM teams by country. Although, the national teams were responsible for using their own networks and contacts within Mexico

to select four individuals that were experts for each of the nine entrepreneurial framework conditions (Reynolds et al., 2005) by entity by year; technically, the samples are of convenience.

In the case of Mexico, since 2015, there has been a specific regional approach that follows other countries like Chile, Germany, Spain, and the UK. The GEM Mexico National team has replicated the National Experts' Survey on each of the previously defined regions within the country. Each year, the key informant experts were personally interviewed and asked to complete the National Experts' Survey self-administered questionnaire. As described in the GEM methodology (Reynolds et al., 2005) and the original study that we want to replicate (Amorós et al., 2013), these experts were selected following a strict protocol:

- Every year, regional sub-teams were instructed to select at least four experts considered particularly knowledgeable in each of the general entrepreneurial framework conditions (nine entrepreneurial framework conditions times four experts = 36 respondents). Each team has a list with more than 36 experts because if some of them cannot complete the interview because they are active professionals, another key informant who has similar experience and knowledge could replace them.

- The expected four respondents per category consisted of the following characteristics: at least one entrepreneur, at least two suppliers of the entrepreneurial framework conditions, and at least one observer, such as an academic with specific expertise in the area. In some cases, there were more than 36 respondents and central regions were repeated at least for two years (see Appendix B).

- Selection criteria for regional interviews were related to their regional location and the repercussion of their business or professional activity in the local economic development of the sub-national regions.

- Once contacted with a detailed explanation of the GEM project, virtually all experts agreed to participate in the interview and to complete the questionnaire. For subsequent years, the regional teams were encouraged to contact experts from previous years as respondents for the self-completed questionnaire. The typical rotation was around 25% of new experts each year.

Table 5 Sample composition (*N=675*)

Sample Characteristics		Total	% of Total	CE	% of Total	NCE	% of Total
Demographics	Average age	44.7	years	46.9	years	43.2	years
	Male	492[a]	72.9%[b]	210	78.9%	282	68.9%
	Female	183	27.1%	56	21.1%	127	31.1%
Educational attainment	Vocational professional	14	2.1%	6	2.3%	8	2.0%
	University/College	206	30.5%	77	28.9%	129	31.5%
	MA, PhD…	455	67.4%	183	68.8%	272	66.5%
Primary EFC expert specialization	Financial support	77	11.4%	31	11.7%	46	11.2%
	Government policies	73	10.8%	28	10.5%	45	11.0%
	Government programs	72	10.7%	28	10.5%	44	10.8%
	Education and training	77	11.4%	30	11.3%	47	11.5%
	R&D transfer	77	11.4%	32	12.0%	45	11.0%
	Commercial and professional Infrastructure	75	11.1%	31	11.7%	44	10.8%
	Market openness	72	10.7%	29	10.9%	43	10.5%
	Access to physical Infrastructure	76	11.3%	29	10.9%	47	11.5%
	Cultural and social norms	76	11.3%	28	10.5%	48	11.7%
Expert specialization	Entrepreneur	393	58.2%	154a	57.9%b	239a	58.4%b
	Investor, financer, banker	135	20.0%	55	20.7%	80	19.6%
	Policy maker	233	34.5%	91	34.2%	142	34.7%
	Business and support services provider	331	49.0%	124	46.6%	207	50.6%
	Educator, teacher, entrepreneurship researcher	249	36.9%	92	34.6%	157	38.4%

CE=Centrally located experts, NCE=Non-Centrally located experts

a Valid cases for each variable

b Percentage based on total valid cases for each variable

3.3.3. Sample characteristics

The pool of data covered the period of four years, 2015–2018, of regional National Experts' Survey surveys in Mexico with a total of *N* = 675 experts, 266 centrally located (CE), and 409 non-

centrally located (NCE). The CE comprises individuals that live and develop their entrepreneurship activities in Mexico City, Puebla, or Querétaro. The NCE are those who live and develop their entrepreneurship activities at the sub-national levels in seven different entities, namely, Chihuahua, Guanajuato, Jalisco, Nuevo León, San Luis Potosí, Yucatán, and Zacatecas. A description of the entire sample and the two sub-samples, CE and NCE, is provided in **Table 5**. Tests were conducted to evaluate similarities of the samples. Pearson's chi-squared test revealed that the samples were not significantly different except for the gender composition between CE and NCE.

3.3.4. Measures

The National Experts' Survey is divided into sections that evaluate nine general categories: financial support, government policies, government programs, entrepreneurial education, R&D transfer, commercial and professional infrastructure, internal market, physical infrastructure, and cultural and social norms. Empirical studies (Levie and Autio, 2008, p. 248) have shown that government policies, entrepreneurial education, and the internal market present two sub-divisions each. Hence, in total, there are 12 entrepreneurial framework conditions to evaluate. These 12 factors are measured using multi-item scales that contained between two to eight questions. The questions are answered on a nine-point Likert scale (where ''completely false'' = 1 and ''completely true'' = 9). The standard National Experts' Survey has 82 questions that also measure other items related to the entrepreneurial environment in the country (region). The complete National Experts' Survey is available on the GEM project web page (www.gemconsortium.org)[8].

---

[8] Also, see Reynolds et al. (2005) and Amorós et al. (2013) for an extended explanation of GEM's NES questions.

Table 6 Scale reliability

Scales	Number of Items	Cronbach's Alpha
Financial support	8	0.794
Government policy: general	3	0.834
Government policy: regulation	4	0.803
Government programs	6	0.865
Entrepreneurial education: primary and secondary	3	0.881
Entrepreneurial education: post school	3	0.834
R&D transfer	6	0.845
Commercial infrastructure	5	0.867
Internal market: dynamics	2	0.935
Internal market: openness	4	0.810
Physical infrastructure	5	0.805
Cultural and social norms	5	0.888

Replicating the same procedures described by Amorós et al. (2013), this research measured the internal consistency of each entrepreneurial framework condition using the Cronbach's alpha measure[9]. Cronbach's alpha is commonly used to indirectly indicate the degree to which a set of items from a test or survey measures a single unidimensional latent construct. Based on the assumption that inter-correlation among specific questions (each section of the National Expert Survey) measures the same construct, this statistical indicator tells us if it is possible or not to apply a variable reduction procedure like the use of means or other component measures (like factor analysis or principal component analysis). The theoretical range of the Cronbach's alpha is 0–1. Cronbach's alpha test was applied for each of the

---

[9] Alpha was developed originally to test the reliability of psychometric tests (Cronbach, 1951). It is used in many social sciences to test the reliability of scales that come from standard surveys.

12 entrepreneurial framework conditions[10]. Results of these analyses are presented in **Table 6**. As it is possible to observe, most of the alpha coefficients are above the recommended 0.70 (Nunnally, 1978), providing evidence of acceptable reliability and consistent with the cross-national use of the National Experts' Survey. As a result, we can use variable reduction procedures to analyze the 12 entrepreneurial framework conditions as described in the next section.

3.3.5. Method

The methodology to analyze differences between CE and NCE had the same two main steps. We follow strictly the same procedures described in Amorós et al. (2013). The first was to calculate summarizing variables of the entrepreneurial framework conditions using *principal component analysis* (PCA) and the second to evaluate differences between the perceptions of experts located in central versus non-central regions. As previously described, we first calculate the Cronbach's alpha for each of the 12 entrepreneurial framework conditions and then proceed to the PCA. The PCA is a useful because it is a well-established statistical standard tool in modern data analysis[11] for examining complex data that can help us reduce dimensionality by using a linear combination of optimally weighted observed variables (orthogonal components[12]) (Stevens, 1992; Dunteman, 1994; Lagona and Padovano, 2007). The result of PCA is a set of summarizing new constructs that contain most of the variation within the data (Jolliffe, 2002). Indeed, in a previous internal consistency validation process of the total questionnaire, we proceed to do Bartlett and Kaier–Meyer–Olkin (KMO) tests to check that the coefficients of the potential new variables are different than zero. The KMO statistic was 0.902, above the 0.5 acceptable, indicating that the PCA was viable with our sample (Dziuban and Shirkey, 1974); in addition, we obtained a high level of significance (*p < 0.01)* from the Bartlett (below 0.5) (Tobias and Carlson, 1969). For this research as well as for Amorós et al. (2013), the PCA was preferred because it calculates the linear combination of original variables (questions from the National Experts' Survey) into a new variable; in

---

[10] Alpha's calculus procedures are continually improved (Zinbarg et al., 2005) and the most common statistical software use the latest procedures. In our case, we used SPSS V. 24.

[11] PCA was mainly developed by Hotelling (1933) but, like many multivariate methods, it was not widely used until the advent of statistical computer software. In our case, we use SPSS V. 24.

[12] For comprehensive technical explanations, mathematical proofs, and PCA linear algebra see Shlens (2009).

this case, the 12 new entrepreneurial framework condition values per expert account for as much information and variation exhibited in the original variables as possible (Hair et al., 1995).

Once we calculate the PCA, we test the differences between the perceptions of the CE and NCE, thus, normality tests were conducted to determine if the values obtained from the experts' responses were normally distributed. The results of these tests (Kolmogorov–Smirnov and Shapiro–Wilk) revealed that most of the 12 entrepreneurial framework conditions considered were not normally distributed for both groups. Therefore, the Mann–Whitney U non-parametric test for means comparisons was selected as the most appropriate method to compare between both groups (Amorós et al., 2013). The Mann–Whitney U test has been reported as considerably more efficient and robust than the t-test when sample distributions are not normal (Conover, 1998).

3.4. Results

The results of the Mann–Whitney U test are reported in **Table 7**. In total, two significant differences were found between the two groups about the studied entrepreneurial framework condition: Government Programs ($z = -2.613, p = 0.009$), and R&D transfer ($z = -2.009, p = 0.045$) were perceived to be more favorable in non-central regions. Then, NCE had also better perceptions than their CE counterparts with regard the general government policy as well as government programs, which means that the government had higher priorities at the local level of government to support new businesses. For instance, the INADEM concentrated on specific sectors of the economy out of the main central economic activities (Official Journal of the Federation of Mexico, January 14, 2013), and the local governments had their own budgets to support other types of programs, which increased the perceptions of NCE.

Table 7 Mann-Whitney U test results

Scales	Group	Valid cases	Mean	Standard deviation	Mean ranges	Mann-Withney U	Z
Financial Support	CE	266	3.95	1.25	327.93	51719.5	-1.084
	NCE	409	4.06	1.28	344.55		
Government policy: general	CE	266	4.70	2.04	323.58	50562.5	-1.549
	NCE	409	4.95	2.07	347.38		
Government policy: regulation	CE	266	3.89	2.04	344.92	52557.0	-0.743
	NCE	409	3.73	1.87	333.5		
Government programs	CE	266	4.93	1.75	313.7	47933.0	-2.613***
	NCE	409	**5.29**	1.74	353.8		
Entrepreneurial Education: primary and secondary	CE	266	2.87	1.55	327.65	51643.0	-1.117
	NCE	409	3.07	1.78	344.73		
Entrepreneurial Education: post school	CE	266	5.65	1.71	348.27	51664.0	-1.104
	NCE	409	5.51	1.80	331.32		
R&D transfer	CE	266	4.03	1.61	319.31	49426.0	-2.009**
	NCE	409	**4.30**	1.63	350.15		
Commercial Infrastructure	CE	266	4.72	1.89	341.46	53477.0	-0.372
	NCE	409	4.66	1.76	335.75		
Internal market: dynamics	CE	266	4.86	2.31	335.03	53606.0	-0.321
	NCE	409	4.93	2.14	339.93		
Internal market: openness	CE	266	3.77	1.53	328.45	51855.5	-1.027
	NCE	409	3.93	1.63	344.21		
Physical Infrastructure	CE	266	6.62	1.67	348.54	51593.0	-1.133
	NCE	409	6.47	1.71	331.14		
Cultural and Social norms	CE	266	5.40	2.00	334.2	53387.0	-0.408
	NCE	409	5.47	1.91	340.47		

* $p<0.1$, ** $p<0.05$, *** $p<0.01$ (two tailed)

These results also reflect the relevance and effectiveness of having regional-based policies and programs (Amorós et al., 2013) and to consider each region as an independent EE. Nevertheless, with respect to the regulation of governmental policies, we found the opposite perceptions being worst for NCE; thus, local governments are lacking control of the policies and programs they did well. On the other hand, R&D transfer had surprisingly better significant perceptions of NCE than from CE which means that even though most of the best universities are centrally located, there is still good level of

university research at non-central regions and there is probably a significant number of scientific parks, firms, and entrepreneurs conducting high-level R&D.

For the rest of the entrepreneurial framework conditions, even though there are no significant differences, it is interesting to discuss how some experts' perceptions are better for non-central regions compared with central ones. Financial support had better perceptions from the NCE than from CE and this entrepreneurial framework condition includes issues such as the perception of enough debt and equity funding available, and sufficient funding from private individuals, venture capitalists, initial public offerings (IPOs), and government subsidies, which we were expecting to be better in central regions like many Latin American countries (Romani et al., 2009; Amorós et al., 2013).

Regarding entrepreneurial education, our findings showed that at primary and secondary levels, the perceptions were slightly better at NCE as well; however, at the post-school level, the perceptions were better at central regions. These are very well explained by the agglomeration effect in regional development literature that says urban regions ("central" in our case) include among others, a higher density of highly educated people and knowledge spillovers from universities and research institutions (Todling and Wazenbock, 2003; Van Stel and Suddle, 2008). This means that most (if not all) the best universities are centrally located. Evidence shows that 60% of the university business incubators are in Mexico City, Mexico, Jalisco, and Nuevo León (Gallegos et al. 2014).

The expected disparity of infrastructure (Amorós et al., 2013) also is not evident in the Mexican case, where the NCE had better perceptions than CE in commercial and physical infrastructure. On the presidential mandate in Mexico of EPN, during which all our sample was collected, public investment in infrastructure declined by 24% (Migueles, August 8, 2018b) representing lower infrastructure projects at the non-central regions because the central regions are always of higher priority due to the population density and economic contribution. Basically, the quality, costs, and accessibility to basic utilities and communication services for new and growing firms, issues that include specific perceptions regarding the adequate support for new and growing firms provided by the available physical infrastructure (roads, utilities, communications, etc.), and the providers of commercial and business services like lawyers,

accountants, consultants, economists, market analysts, survey vendors as well as entrepreneurs that need them (Reynolds et al., 2005), was weaker for the NCE perceptions.

The internal market showed differences more favorable for NCE than for CE regarding more perceived market dynamism and openness. The better market dynamism could be explained because a small incremental change in central regions can be unnoticed by the population; however, in non-central regions, any change in the market can be critical for many actors including new and growing firms (Amorós, et al. 2013). Market openness, which has to do with more researchers at universities, business associations, chambers of commerce, and government agencies related to the economy and its development, is more accessible and available at non-central regions than ever before. There is evidence in Latin America that entrepreneurship support programs and goods market efficiency are the factors that positively influence the creation of university spin-offs (Montiel-Campos, 2018), informing us to expect more business creation in non-central regions where there are established universities with entrepreneurship support mechanisms for the case of Mexico.

Finally, in our study, we found better perceived the cultural and social norms by NCE than for CE. There are studies that consider the cultural and social norms as a significant influence present in local communities (Wach, 2015) that can change the way business in conducted and forcing firms to adapt to local socio-cultural requirements. We can interpret it also as people living in non-central regions who find greater motivation and there are aspirational factors involved with culture, probably if there is a case of a local successful entrepreneur then more people would like to pursue an entrepreneurial opportunity while in central regions it is more difficult to be amazed by small successes. All these results should revive the debate about the need to understand EE in a broader range of settings (Autio et al., 2014; Zahra et al., 2014; Colombelli et al., 2017) by considering the important dimension of geography and how central versus non-central regions inside a country differ in terms of economic and social contexts, including entrepreneurship.

3.5. Discussion

According to the United Nations (2018), 55% of the world's population lives in urbanized areas; for North America this is 82% and for Latin America and the Caribbean this is 81%. Mexico is no

exception. Consequently, the three entities in our sample that constitute the central region are comparable to the sum of the seven entities from the defined non-central regions in terms of population and contribution to the national GDP. Mexico (like many other Latin American countries, for example, Chile) has historically highly concentrated socio-economic and political areas, particularly around the capital of the country. With the exponential expansion of the Mexico City metropolitan area over the last 20 years, the creation of a "Megalopolis" that includes other cities around Mexico City (which is our focus of analysis and includes Puebla and Querétaro), makes very relevant the study and comparison between non-central locations and the main metropolitan area of the country. Hence, we were expecting better perceptions from central regions that have better access to systematic and structural conditions to enhance entrepreneurship activities (Stam, 2015) and because small cities may not have some of the same key components as EE in large urban centers (Roundy, 2017). In the non-central regions, most of the entrepreneurial framework conditions derived also from the agglomeration effects (Todling and Wazenbock, 2003; Van Stel and Suddle, 2008). Nevertheless, our findings indicate that *NCEs perceive their regions as in a worse position than CE in terms of government policies regulation, post-school education, and commercial and physical infrastructure but, surprisingly, in a better position regarding financial access, general government policy, government programs, primary and secondary education, R&D transfer, market dynamism and openness*, and *cultural and social norms*. Those eight entrepreneurial framework conditions were better perceived by NCE versus four entrepreneurial framework conditions that were better perceived by CE. In contrast with Amorós et al. (2013), where five entrepreneurial framework conditions were better perceived by NCE and seven entrepreneurial framework conditions were better perceived by CE, we highlight that the results show an inverse proportion with most of the best perception levels of entrepreneurial framework conditions at non-central regions in Mexico, rather than in central regions like the case of Chile. Better results were expected in central regions for financial support, as an example (Amorós et al., 2013). Because the central areas of a country contain many of the financial industry activities (Romani et al., 2009), our results are very relevant. Our main findings contribute to the debate that not all policies or entrepreneurship programs fit all contexts; thus, it is always relevant to understand the specific (regional) nature of the systematic and structural conditions where entrepreneurship activities flourish. However, we highlight that each

country must focus its efforts on the homologation of the entrepreneurial opportunities in all regions. The replication in Mexico of the study in Chile (Amorós et al., 2013) helped us to continue understanding this regional approach in the EE literature and to validate the relevance of continuing testing empirical studies in different settings (Gulati, 2007) that led to fill the gap in the literature to generalize and validate that location matters for entrepreneurs in Mexico, Chile, Latin America, and virtually all other countries.

3.5.1 Implications

This paper has implications for policy makers and contributes to the underdeveloped field of entrepreneurship in non-central regions of emerging economies in Latin America and to the EE literature through the case of Mexico, showing how its government has prioritized non-central entrepreneurship with higher perceived levels by the NCE about government policies and programs. These are explained by the fact that not all policies or entrepreneurship programs fit all contexts (regions), implying that policy makers have to understand the specific (regional) nature of the systematic and structural conditions that enhance entrepreneurial activities. One example is the creation of the INADEM which affected the experts' perceptions having it as a regulator of the EE that was responsible to increase the contribution of new and existing firms to the economic development and social welfare (Official Journal of the Federation of Mexico, January 14, 2013), and showed an evident decentralization strategy. Consequently, to contribute to the homologation of entrepreneurial opportunities from big to small cities, it is very important to have policies that promote the decentralization of commercial and physical infrastructure accompanied with better regulation of all the governmental policies, and to incentivize universities to establish their facilities at non-central regions or at least improve the attraction of students to those regions.

In the coming years, the dissolution of the INADEM in 2019 (Saldaña, December 24, 2018) could change all these perceptions about the regional EE in Mexico. However, the new government has also announced plans to decentralize the economy from Mexico City by moving first some State Secretaries and 2.5 million people out (Migueles, 2018a) and providing an attractive scenario to conduct further research. However, increasing the number of interviewed experts by each entity and adding more

regions would help increase the reliability of the National Experts' Survey and the results to continue contributing to the most recent EE literature.

3.5.2 Limitations and future research

Following Amorós el al. (2013), this research contributes to the under-explored field of entrepreneurship in Latin America and specific the case of Mexico. Our work has some limitations that are relevant for future research. The procedure to select experts following GEM´s methodology was not random. This could cause some biases but, as previous research highlights, in many Latin American countries there are not harmonized indices or measures that approximate to EE dynamics. In our case, the key informants' expert information could describe "the unique situation of entrepreneurship within their own country" (Reynolds et al., 2005: 224). Like the case of Chile, a number of Mexican experts' year-by-year validate the feasibility of the entrepreneurial framework conditions constructs that is also consistent with the rest of the countries that participate on GEM project. As GEM methodology remarks, many of the interviewees came from the most important sectors inside the economic activity of the country from both central and non-central regions. Many experts, such as public policy officials or academics working in higher education institutions, add an important contribution to validate our findings. Further research could increase the number of experts and adding more regions in Mexico would help to increase the reliability of National Experts' Survey and the results. Finally, this replication, with different context settings and under the lens of EE emergent literature, adds value to previous regional entrepreneurship research. We suggest following the replication of this study to other larger emergent economies like BIRCS[13] economies or other emergent economies that are part of the OECD. As Amorós et al. (2013 p. 129) state, "expanding the cohort to additional countries, either elsewhere in Latin America or on other continents will corroborate the effects of different entrepreneurial framework conditions on peripheral and central regions around the world." We also believe that replicate studies also contribute to expanding entrepreneurship knowledge and, in general, enhance the transparency of economics and management studies[14] (Honig et al., 2018).

---

[13] The acronym BRIC stands for Brazil, Russia, India, and China. BRICs maintain policies and develop institutions that are supportive of growth (see Wilson and Purushothaman, 2003).

[14] All data and procedures are full available under request to the authors.

Appendix Chapter 3
Appendix A: Mexican geography and demographic indicators

Table 8 Mexican demographic indicators

Region	Male	Female	Total a/	Regional GDP b/		% National GDP
Non-Centrally located						
Chihuahua	1,759,753	1,809,726	3,569,479	$	706,773	3.02%
Guanajuato	2,832,687	3,032,090	5,864,777	$	914,368	3.90%
Jalisco	3,853,584	4,026,955	7,880,539	$	1,466,416	6.26%
Nuevo León	2,550,573	2,581,365	5,131,938	$	1,559,139	6.66%
San Luis Potosí	1,321,029	1,402,743	2,723,772	$	450,391	1.92%
Yucatán	1,030,107	1,072,152	2,102,259	$	300,411	1.28%
Zacatecas	771,809	809,766	1,581,575	$	197,171	0.84%
Total	14,119,542	14,734,797	28,854,339	$	5,594,669	**23.88%**
Centrally located						
Mexico City	4,259,051	4,726,288	8,985,339	$	3,409,016	14.55%
Puebla	2,949,444	3,233,876	6,183,320	$	715,143	3.05%
Querétaro	995,355	1,048,496	2,043,851	$	484,806	2.07%
Total	8,203,850	9,008,660	17,212,510	$	4,608,965	**19.68%**

a/ 2015 population and economic indicators in Mexico by selected locations

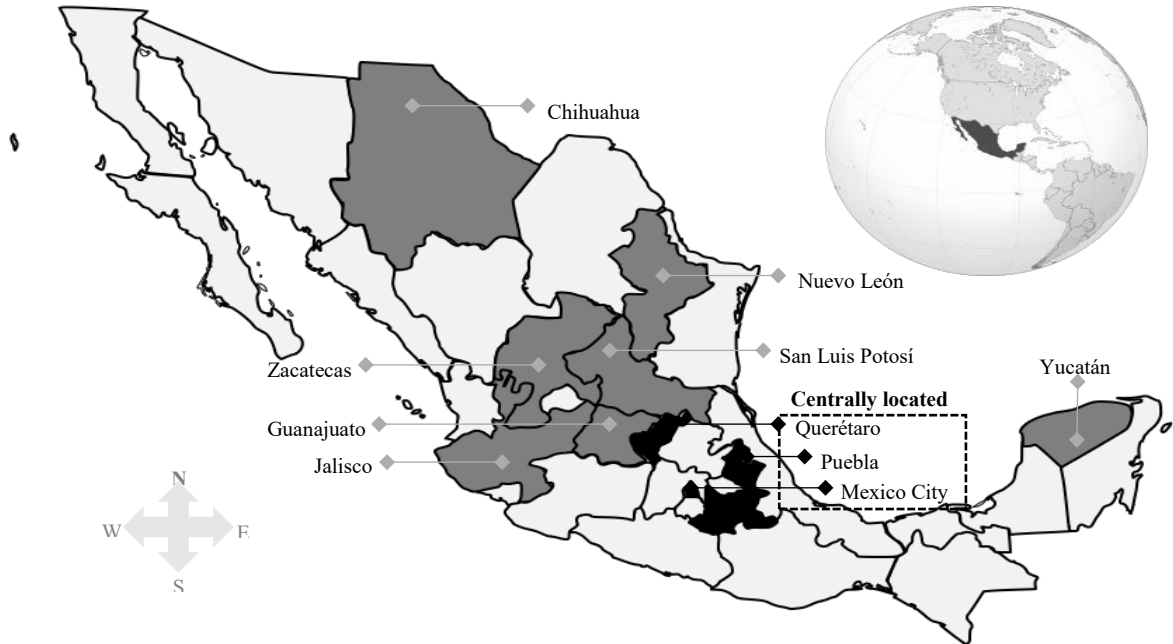b/ Millions of Mexican pesos (2017 current prices)

Figure 2 Mexican geography distribution

Appendix B: Experts characteristics and numbers per region

Some examples of people that can act (or be adequate) as an expert in each entrepreneurial framework condition:

1. *Financing*: bankers, public managers of financial programs or subsides, venture capitalists, business angels, entrepreneurs, or business people in general.
2. *Policies*: public charges related to economics and enterprises environment, with taxes, development agencies, or entrepreneurs subject to these policies.
3. *Programs*: public charges related to government programs, public agencies, business associations, development agencies, entrepreneurs, and people to whom the programs are addressed.
4. *Education*: all types of professors/teachers (school, college, university, professional or vocational education), public charges related with education or entrepreneurs.
5. *R&D transfer*: personnel of industry, innovation, development and growth public or private agencies, scientific parks personnel, university researchers, engineers, some types of entrepreneurs.
6. *Commercial and business services*: lawyers, accountants, advisors/consultants, economists, market analysts, survey vendors, entrepreneurs that need them, providers of them in general.

7. *Market openness*: market analysts, some researchers at universities or business schools, business associations, chambers of commerce, government agencies related to the economy and its development, entrepreneurs.

8. *Physical infrastructure*: all types of businesses and enterprises providers (gas, water…), engineering, real estate, government agencies related to infrastructure, industrial parks, entrepreneurs.

9. *Cultural and social norms*: business associations, press, media in general, customers, providers, sociologists, entrepreneurs, foundations, trade unions.

Table 9 Primary entrepreneurial framework condition specializations sub-samples by region

Location	Financial Support	Government Policies	Government Programs	Education and Training	R&D transfer	Commercial and Professional Infrastructure	Market Openness	Access to Physical Infrastructure	Cultural and Social norms	Total
Chihuahua	4	4	5	4	4	4	4	5	6	40
Guanajuato	17	16	15	17	16	16	17	17	19	150
Jalisco	4	4	4	4	4	5	4	4	4	37
Mexico City	8	8	8	9	9	9	8	8	8	75
Nuevo León	4	5	4	4	4	4	4	4	4	37
Puebla	9	8	8	9	8	9	9	8	8	76
Querétaro	14	12	12	12	15	13	12	13	12	115
San Luis Potosí	4	4	4	4	4	4	4	4	4	36
Yucatán	9	8	8	9	9	7	6	9	7	72
Zacatecas	4	4	4	5	4	4	4	4	4	37
Total	77	73	72	77	77	75	72	76	76	675

Chapter 4

EMPIRICAL ISSUE III:

THE ROLE OF CULTURAL AND SOCIAL NORMS TO CREATE PRO-ENTREPRENEURSHIP EDUCATIONAL PROGRAMS IN MEXICO

4.1. Introduction

In a recent approach, entrepreneurial education has obtained special attention by researchers hoping to develop better pro-entrepreneurship programs that may result in higher entrepreneurial activity outputs of students. Therefore, universities gather the ideal conditions to conduct studies for this subject of interest. Universities need to become more entrepreneurial by changing, among other factors, their culture and helping students and faculty members to develop their entrepreneurial mindsets and entrepreneurial actions (Fayolle and Redford, 2014). Even, the links between culture and entrepreneurship are still not sufficiently well-established or explored (Wach, 2015), universities aim to expand the curricula and programs focused on entrepreneurship and new venture creation which have been growing considerably (Kuratko, 2005). Thus, a better understanding of the phenomena related to how entrepreneurial education impacts the students is needed. *This article focuses on the role of cultural and social norms over the individual's mindset analyzing whether the entrepreneurial education, at all levels, influences the entrepreneurial culture and social norms that help to foster entrepreneurial activities and the inverse relationship*. The results have practical implications for the creation of pro-entrepreneurship programs at all levels of educational institutions and contribute to the empirical literature of entrepreneurial education and culture.

The culture by its own is one of the main determinants, among others, of the entrepreneurial activities undertaken in different countries. Nevertheless, it needs further exploring to yield a more extensive understanding of the role of the social aspects of entrepreneurship (Wach, 2015). Also, a greater understanding of the relationship between cultural norms versus entrepreneurial activity is important because of its implications for national and regional development and growth (Krueger et al. 2013). Most of the related empirical studies (Coduras et al. 2008; Arteaga Cervantes et al. 2016) focus on the entrepreneurial intentions of students in superior education institutions or in the effects of the culture over the entrepreneurial intentions and activities (Meek et al. 2009; Wennberg et al. 2013; Khadhraoui et al. 2016). Only a few studies consider both, education and culture, to test its relationship analyzing the degree of influence of the educational institutions to create an entrepreneurial culture which by consequence can change people's mindsets improving their entrepreneurial intentions through education (Osiri et al. 2013; Afriyie and Boohene, 2014).

Thus, this research studies the direct relationship between *entrepreneurial education* and *cultural and social norms* defined as part of the Entrepreneurial Framework Conditions (EFCs) by the Global Entrepreneurship Monitor (GEM) and both are reliable scales heavily utilized in the development of national analysis and reports as well as specialized cross-national analyses (Reynolds et al. 2005). Structural Equation Models (SEM) were used as a technique to analyze the gathered information as an effort to achieve a consensus about which of these scales is dependent of the other since there is a lack in the literature to determine it and a better understanding has practical implications to create more efficient pro-entrepreneurship education programs. This EFCs are measured year by year in participant countries with the standardized NES of the GEM for which previous studies using principal component analysis (Amorós et al. 2013) provide evidence that for the case of *entrepreneurial education* the scale is sub-divided in two: *primary and secondary*, and *superior* (college/university). The fact that most of the empirical studies about entrepreneurial education are conducted in universities (Coduras et al., 2008; Osiri et al. 2013; Afriyie and Boohene, 2014; Arteaga Cervantes et al..2016) supports the relevance of this research since we considered the *entrepreneurial education* at *primary and secondary* levels as well as *superior* to explore the relationship against *cultural and social norms*.

4.2. Theoretical development

4.2.1. Entrepreneurial education

For this research entrepreneurial education refers to the extent to which training in creating or managing small, new, or growing businesses are incorporated within the educational system at all levels. According to the GEM, there are two distinct sub-dimensions for this EFC: (1) *primary and secondary* school level and (2) *superior* (vocational-professional, college or university) entrepreneurship education and training (Amorós et al., 2013). The entrepreneurship education will equip the students with the skills necessary to be self-reliant (Afriyie and Boohene, 2014). We found that according to experts the education and training in entrepreneurship must be provided since primary and secondary levels to foster better the quality of new business ventures but also to change people's mindsets. Dev et al., (2011) suggest that an individual who receives a basic entrepreneurship education program achieves better

competences in administrative terms and is more likely to engage in an entrepreneurship activity in the future than the one who does not receive it. Under the same vein of educational research, Fabre and Smith (2003) proposed that even if education is a key determinant to become an entrepreneur on the individual set, it can also create an entrepreneurial culture in the ecosystem where it is given, in fact, they used the ecosystem of Mexico to conduct their research.

Following the same research interests, Paço et. al. (2015) focused on studying the learning process of the individuals, for them the behavior can be learned through two types of processes, formal and informal. In the environment of entrepreneurial education most of the empirical studies (e.g., Coduras et al., 2008; Osiri et al., 2013; Afriyie and Boohene, 2014; Arteaga Cervantes et al. 2016) have been conducted at universities because they apply formal processes and by consequence are easy to measure. In contrast, informal processes tend to be more complex for its nature to incorporate cultural and social norms. Some of the existing studies (e.g., Afriyie and Boohene, 2014; Osiri et al., 2013) consider both types of processes, education as formal and culture as informal, like important factors of entrepreneurship. The education is vital to create an understanding of the entrepreneurship phenomena, to develop entrepreneurial capabilities, and to contribute to entrepreneurial identities and cultures at individual, collective and social levels (Rae, 2010). There is evidence (Mungaray et al. 2011) that the regions with the biggest growth are the ones capable of innovating in its institutions and the superior education institutions develop a central role in this process. Hence, the following hypothesis was established:

H1: *Entrepreneurial education has a positive influence on the cultural and social norms in Mexico.*

4.2.2. Cultural and social norms

Refers to the extent in which existing cultural and social norms encourage, or do not discourage individual actions that may lead to new ways of managing businesses or economic activities and may, in turn, lead to a greater dispersion of the personal wealth and income (Amorós et al. 2013). Some empirical studies (e.g., Wach, 2015) consider the cultural context as a significant influence in the way of managing a business, forcing the adaptation of a firm activity to socio-cultural requirements present

in each local community. A supportive culture can lead to social legitimation making the entrepreneurial career more valued and socially recognized in that culture, creating by consequence a favorable institutional environment (Krueger et al. 2013) resulting in more people willing to try to start their own ventures, irrespective of their personal beliefs and attitudes (Etzioni, 1987).

The cultural norms and practices are known for shaping individuals' entrepreneurial behaviors, such as international orientation, start-up attempts and innovative activities (Shane 1993; Bowen and De Clercq 2008). While education provides hard skills, culture provides soft skills, but according to Paço et. al. (2015), both can shape an individual's behaviors. A culture that shares more pro-entrepreneurial values and patterns of thinking would lead to more individuals showing psychological traits and attitudes consistent with pro-entrepreneurship (Krueger 2000, 2003). Hofstede (2001) described culture as *collective programming of the mind that distinguishes the members of one group or category of people from another*. That is why the pro-entrepreneurship culture and social norms can be defined as the mindset that entrepreneurs share that can be learned within a community like the case of the educational institutions that have formal learning processes. Hence, the following hypothesis was established:

H2: *The cultural and social norms have a positive influence on entrepreneurial education in Mexico.*

4.3. Methodology

4.3.1. Data collection

The GEM consortium provides useful data from the measures of the EFCs though the NES. The national GEM teams evaluate the quality of their entrepreneurship ecosystem through the NES (Herrington et al. 2017, 10). The NES monitors the factors considered to have a significant impact over entrepreneurial activity and this survey is administered systematically to a minimum of 36 experts per year by participant country in the GEM project (Reynolds et al., 2005) where those experts are taken as a systematic sample of professors, researchers, investors or bankers, public policy makers, and sometimes additionally one or more are also entrepreneurs, but not everyone. Thus, we reviewed the NES data of Mexico since it follows a worldwide standardized methodology implemented by GEM (Levie and Autio, 2008). The instrument was administrated to a total sample of N=445 experts between

2015 and 2016. The NES uses qualitative measures (9-point Likert scales) for the scales we were testing, *entrepreneurial education* and *cultural and social norms,* both consider as part of the necessary conditions for entrepreneurship, among other 7, within the entrepreneurial ecosystem's context.

4.3.2. Sample Characteristics

The study considered two years of data, 2015 and 2016, obtaining a final sample of *N=445* from which at least 48 experts for each EFC were obtained following the GEM methodology (Reynolds et al. 2005; Amorós et al., 2013) with an average age of 44 years, where 319 (71.7%) experts were male and 126 (28.3%) female. The administration of the NES was conducted to 104 (23.4%) experts by face to face interviews, 339 (76.2%) by online administrations, and 2 (0.4%) were conducted by phone. A more detailed description of the principal characteristics of the sample is provided in **Table 10**.

From the total sample, the experts with *vocational professional* educational level were 14 (3.1%), a larger sample of 143 (32.1%) experts had *University/College* attainments and the rest of the experts with the largest sample of 288 (64.7%) had higher educational attainments like *MA, PhD*. Regarding the expert's specialization, a mix between the categories of the sample is possible since it is possible for example to have an expert that is *entrepreneur* but also a *policy-maker* and even a *business and support services provider* as well. Many different mixes can be inferred from the expert's specializations that can be reviewed in **Table 10**. More detailed information of the sample is provided taking into consideration the valid cases for each variable that were considered in the data collection process.

Table 10 Sample composition (*N=445*)

Sample Characteristics		Total	% of Total
Type of interview	Face to face	104	23.4%
	Online	339	76.2%
	By phone	2	0.4%
Primary EFC expert specialization	Financial support	49	11.0%
	Government policies	49	11.0%
	Government programs	48	10.8%
	Education and training	51	11.5%
	R&D transfer	51	11.5%
	Commercial and professional infrastructure	50	11.2%
	Market openness	50	11.2%
	Access to physical infrastructure	49	11.0%
	Cultural and social norms	48	10.8%
Demographics	Average age	44	
	Male	319	71.7%
	Female	126	28.3%
Educational attainment	Primary	0	0.0%
	Secondary	0	0.0%
	Vocational professional	14	3.1%
	University/College	143	32.1%
	MA, PhD,…	288	64.7%
		289	
Expert specialization	Entrepreneur	a	64.9%b
	Investor, financer, banker	97	21.8%
	Policy maker	174	39.1%
	Business and support services provider	236	53.0%
	Educator, teacher, entrepreneurship researcher	187	42.0%

a Valid cases for each variable

b Percentage based on total valid cases for each variable

4.3.3. Measures

The NES is divided into sections that evaluate nine EFCs: (1) Financial support, (2) Government policies, (3) Government programs, (4) Entrepreneurial Education, (5) R&D transference, (6) Commercial and professional infrastructure, (7) Internal market openness, (8) Access to physical infrastructure, and (9) Cultural and Social Norms (Reynolds et al. 2005; Amorós et al., 2013). The standard NES includes from 5 to 8 questions for each EFC in nine-point Likert scale (where 1= "Completely False" and 9= "Completely True") which most of the empirical studies uses to conduct

research in different countries (Levie, J., and Autio, E., 2008; Amorós et al., 2013). There are additional nine open questions of the standard NES which provide more qualitative data for analysis. For this research, the quantitative data of the corresponding sections that evaluate the (4) *Entrepreneurial Education* and (9) *Cultural and Social norms* was employed.

4.4.4. Method

It was conducted an exploratory analysis in two steps: (1) confirmatory factor analysis and (2) SEM in SPSS Amos. For the first step (1) to build a measurement model (Kline, 1998) the confirmatory factor analysis was important to analyze the fit of the model with the NES data for *entrepreneurial education* and *cultural and social norms*. Once confirmed the fit of the model with the CFI index (close to 1) and RMSEA<0.1, the second step was viable. In the second step (2) the SEM was tested in SPSS Amos (v. 22) for both hypotheses.

4.4. Results

The CFI index showed a value of 0.953, very close to 1, so it was considered as an acceptable value (MacDonald and Marsh, 1990). The RMSEA index resulted in 0.087, which was also considered an acceptable fit (Browne and Cudeck, 1993). For the second part of the analysis, it was tested with SEM the relationship between *cultural and social norms* against *entrepreneurial education*. The results presented in **Figure 3**, show that *superior* education level is statistically significant against culture (*b*=0.52, SE= 0.065, *p<0.01*). For the case of *primary and secondary* education levels, the results did not show being statistically significant. Hence, the first hypothesis (**H1**) was not accepted because the *p*-values of the SEM were not statistically significant in all levels of education.
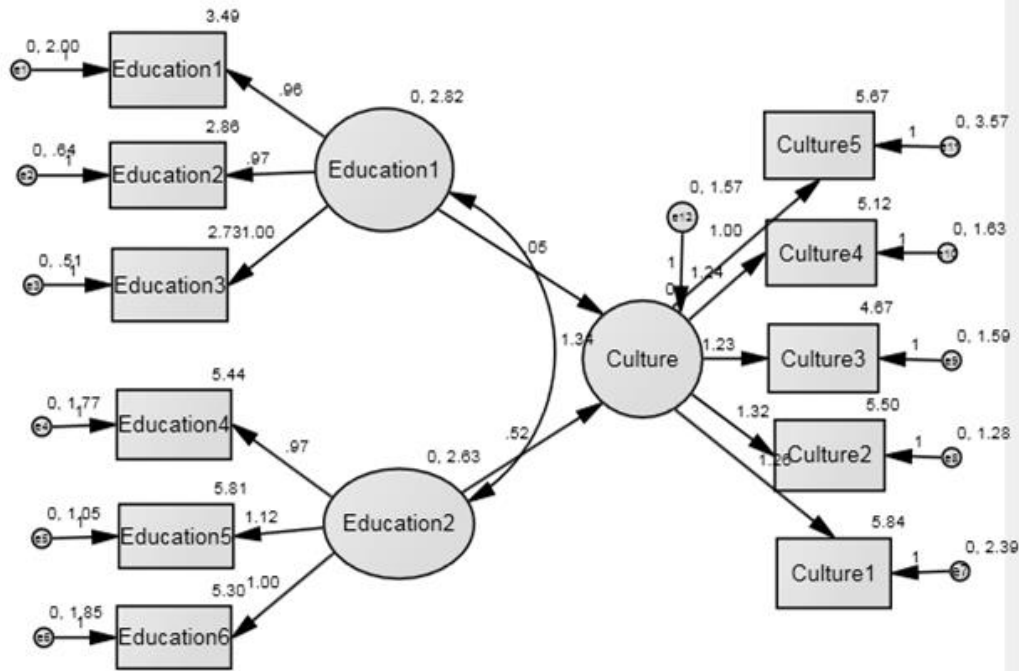
Figure 3 SEM of entrepreneurial education against cultural and social norms.

To continue the exploratory analysis, another SEM was used to test the inverse relation between *cultural and social norms* and *entrepreneurial education*. In **Figure 4** the results of these analyses show that cultural and social norms are statistically significant at all levels of entrepreneurial education, *primary and secondary* ($b=0.377$, SE=0.060, $p<0.01$), and *superior* ($b=0.608$, SE=0.066, $p<0.01$). Hence, the second hypothesis (**H2**) *was not rejected proving statistically that the EFC of entrepreneurial education is dependent on the cultural and social norms*. The results of this research show that in Mexico there is an influence of the cultural and social norms on the entrepreneurial education which by consequence can moderate the people's behavior. This means that the pro-entrepreneurship education programs are not considering that people have already acquired, through informal processes, certain behavior patterns that mold their mindsets. Particularly in superior education institutions, there is a trend to expand the curricula and programs focused on entrepreneurship and new venture creation which have been growing considerably (Kuratko, 2005), but most of the program directors and researchers are assuming that with the education they can create a culture. Universities should adapt constantly to its media to produce the knowledge that the industry requires, but also to provide people with the skills and

knowledge that the businesses and institutions claim (Ibarra Colado, 2005). Therefore, the results allow concluding that to create pro-entrepreneurship education programs the location matters, because the culture consists of collective programming of the mind that distinguishes one group of people from the other (Hofstede, 2001) like the Mexican culture from other cultures. These findings have practical implications because instead of trying to replicate successful pro-entrepreneurship education programs from foreign institutions, academic directors should focus on adapting to the programs to the local cultural and social norms at all educational levels.
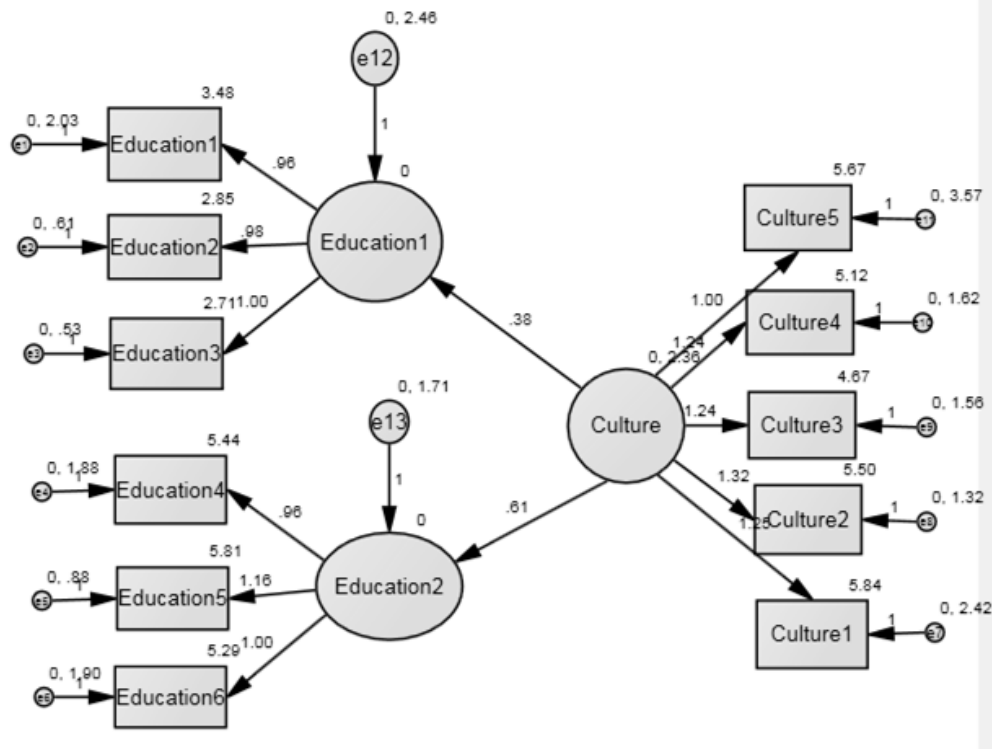

Figure 4 SEM of cultural and social norms against entrepreneurial education

4.5. Discussions and Limitations

In the field of entrepreneurial education researchers naturally assume that through entrepreneurial education the entrepreneurial intentions of students can be improved because the academic institutions create an entrepreneurial culture (Osiri et al. 2013; Afriyie and Boohene, 2014). An example of this is that most of the empirical studies in this field are conducted at universities (Coduras et al. 2008; Arteaga Cervantes et al. 2016). Results from the SEM analyses indicate that the

field can be studied from the perspective of primary and secondary levels of entrepreneurial education, but not limited to superior level (vocational, college or university). Even that universities aim to expand the curricula and programs focused on entrepreneurship and new venture creation (Kuratko, 2005) it is important to understand the phenomena of how teaching entrepreneurship works. There is evidence (Arciga, 2007) that the teaching practice under the socio-cultural dimension enables practitioners of it to evaluate the reality and to detect the continuity factors to make an educational transformation. Therefore, this article sets a better understanding of the relationship that the cultural and social norms have on entrepreneurial, and by consequence, it establishes a background in the field to conduct future research to achieve a consensus about this new perspective. Nevertheless, this study employees the standard measurements of the GEM's NES for both constructs, entrepreneurial education, and cultural and social norms, that may have limitations regarding the evaluation of specific pro-entrepreneurship programs of interest for educational institutions.

4.6 Implications and Future Research

This study aims to contribute in a greater understanding of the relationship between cultural norms versus entrepreneurial activity because of its implications for national and regional development and growth (Krueger et al. 2013). Therefore, it has practical implications mainly for educational institutions, from primary to superior education, because these results suggest the need to re-formulate the programs focused on entrepreneurship adjusting them to the local cultural and social norms. Although, further research must consider also the role of location and longitudinal studies, from primary to superior education, to generalize these results. It can contribute to understanding if time plays an important role to learn and foster entrepreneurship. In Mexico, there is not any special pro-entrepreneurship program for primary or secondary education institutions by the time this research was conducted (February 2019), but the evidence shows (Alvarez et al. 2006) the presence of entrepreneurial programs for superior education institutions. In fact, most of the business incubators in Mexico are in universities, 204 in public and 104 in private universities (Gallegos et al. 2014). Particularly in superior education institutions, there is a trend to expand the curricula and programs focused on entrepreneurship

and new venture creation which have been growing considerably (Kuratko, 2005), and it happens in both, private and public institutions. For *private institutions*, the list is led by the Tecnológico de Monterrey followed by Universidad Anáhuac, Instituto Tecnológico Autónomo de México, Universidad Iberoamericana, and Universidad Panamericana. For *public institutions*, the list is lead by Instituto Politécnico Nacional followed by Universidad Nacional Autónoma de México, Benemérita Universidad Autónoma de Puebla, and Universidad Popular Autónoma del Estado de Puebla. Therefore, considering all this evidence, the Tecnológico de Monterrey is a great subject of study since it offers secondary education as well and it has university campuses at 31 locations in Mexico.

Chapter 5

FINAL REMARKS

5.1. Main Conclusions

The *Entrepreneurial Ecosystem* (EE) is a field of research that has grown and evolved significantly, and the debate is still open on several critical points (Cavallo et al. 2018). To add relevant knowledge to the field, this doctoral dissertation has the aim to reflect about theoretical and empirical issues that have been controversial within the field. Although, there are several key players identified at the Chapter 1 of this thesis most of them are embraced under the EE theory where the federal government resulted as the main institution that influences other key players (government dependencies, financial players, education institutions, infrastructure facilitators, associations, and business incubators/accelerators) through government policies and programs. Therefore, the contributions of this work follow empirical methodologies focusing on the gap in the literature where little is known about how an EE can be studied, evaluated and measured (Cavallo et al. 2018).

The first of these contributions shown in Chapter 2 has been developed with a strong qualitative orientation, which examines the Mexican experts' perceptions to provide a general overview of the entrepreneurial ecosystem at this country. This research served as a departure point to identify the main factors that obstruct (*Financial Support*, *Government Policies, Education and Training, Cultural and Social Norms,* and *Corruption)* the entrepreneurial activity in Mexico, some others that foster it (*Government Programs, Education and Training, Government Policies* also, and *R&D Transfer)*, and finally some actions that can be taken to promote the entrepreneurial activity. The results of this study show that *government policies* play a big role in the entrepreneurial ecosystem because they have the ability to control and improve other entrepreneurial conditions. Although, the government policies are highlighted as fosters but also as obstructs of the entrepreneurial activities showing a difference in the perceptions indicating heterogeneity in the opportunities. Also, the efforts to foster entrepreneurship in Mexico should be refocused more on high-value-added growth opportunities of existing businesses and less on encouraging the formation of new businesses (Fabre and Smith, 2003). Finally, all the qualitative analyzes performed in the categorization process of the experts' answers suggest that this chapter provides a complete informative overview of the current status of the Mexican entrepreneurial ecosystem and by consequence it contributes to the progress of EE literature.

On the other hand, in Chapter 3 this work presents an extensive revision of 675 key informants' responses of the GEM NES in Mexico located at ten entities of which seven were categorized as non-central location. This study used non-parametric statistics to compare the differences in perceptions between centrally and non-centrally located experts with the objective to analyze if the entrepreneurial opportunities are the same for everyone in Mexico. Therefore, this study constitutes one of the biggest data-gathering projects among Chile (Amorós et al. 2013) and contributes to the understanding of regional EE in emerging Latin American countries. It also implies the replication and adaptation of the study in Chile (Amorós et al. 2013) which helped us to validate the relevance of continuing testing empirical studies in different settings (Gulati 2007) that led to fill the gap in the literature to generalize and validate that location matters for entrepreneurs in Mexico, Chile, and Latin America. Nevertheless, we were expecting better perceptions from central regions (Amorós et al. 2013; Stam 2015) and our results have shown that for the case of Mexico most of the entrepreneurial framework conditions are better perceived at non-central regions. Consequently, in order to improve the understanding and further progress of EE research this study conducts a critical discussion of these findings considering the status of the Mexican entrepreneurial ecosystem assessed on Chapter 2.

Finally, Chapter 4 of this thesis presents an empirical study that tests the relationships between *entrepreneurial education* and *cultural and social norms* using data from the National Experts' Survey of the Global Entrepreneurship Monitor. The objective of this study was to investigate if the entrepreneurial education, at all levels, influences the entrepreneurial culture and social norms that help to foster entrepreneurial activities and its inverse relationship. This study departs from the point that the links between culture and entrepreneurship are still not sufficiently well-established or explored (Wach, 2015), and the universities aim to expand the curricula and programs focused on entrepreneurship and new venture creation which have been growing considerably (Kuratko, 2005). Although, in the field of entrepreneurial education, researchers naturally assume that through entrepreneurial education the entrepreneurial intentions of students can be improved because the academic institutions create an entrepreneurial culture (Osiri et al. 2013; Afriyie and Boohene, 2014). According to the findings of these study, we conclude that cultural and social norms are statistically significant over the entrepreneurial education at all levels. Therefore, these findings provide in this sense a rich evidence from experts'

perceptions involved in the EE to the debate on the influence of institutions on entrepreneurial opportunities.

5.2. Academic and Practical Implications

The academic implications of this work are, firstly in Chapter 2, a deeper understanding of the factors involved in the EE beyond the entrepreneurial framework conditions of the GEM and other known sets of attributes/factors/conditions (Reynolds et al. 2005; Isenberg, 2011; Feld, 2012; WEF, 2013; Stam, 2015). The presentation of a general overview of the status of the Mexican entrepreneurial ecosystem contributes to the EE academic research and has practical implications for policy-makers since the results show that the government is a natural moderator that needs to adequate the conditions that foster most the entrepreneurial opportunities (Isenberg, 2010), and proposes the creation of a "*General Law for Entrepreneurship"* as a tool to reach these adequations. Secondly, in Chapter 3 an ambitious data-gathering project has been carried out in Mexico, from which a critical analysis of the differences that experts perceive was conducted to provide a better understanding of regional EE. This study provides several practical implications on policies for all levels of government in Mexico which must prioritize the homologation of the opportunities for people whether they are in big cities or small cities. While this study establishes an antecedent of the replication of the Chilean study (Amorós et al. 2013) contributing to the empirical literature of regional entrepreneurial ecosystems in emerging Latin American economies.

Finally, one third empirical issue presented in Chapter 4 of this thesis contributes first, to the entrepreneurial education literature on entrepreneurship programs and entrepreneurial culture by testing in two ways the relationships between entrepreneurial education and cultural and social norms. Secondly, it contributes to the entrepreneurial ecosystems' literature through the case of Mexico by using the data measures of the entrepreneurial framework conditions of the GEM for these tests. In addition, this research implicates one of the first empirical studies in a field where the links between culture and entrepreneurship are still not sufficiently well-established or explored (Wach, 2015). In Mexico, there is not any special pro-entrepreneurship program for primary or secondary education institutions by the

time this study was conducted (February 2019), but evidence shows (Alvarez et al. 2006) the presence of entrepreneurial programs for superior education institutions. Therefore, the practical implications have been derived from the empirical results of this study to the academics involved in the creation of curricula and programs focused on entrepreneurship and new venture creation which have been growing considerably in universities (Kuratko, 2005), but also implies a reconfiguration of the programs at primary and secondary levels.

The three empirical studies of this thesis have practical implications and are directed mainly to entrepreneurs and the policy-makers in Mexico with additional recommendations for emerging Latin American countries. Chapter 2 has contributed to reaffirm the importance of mechanisms and institutions that serve an important function as fosters of the entrepreneurial activities, but still there are plenty of improvements and changes to avoid at least the obstruction of the entrepreneurial activities. For example, the corruption is a latent issue that affects the institutions and the perceptions of the government policies and programs although, the same are well perceived by different experts in different locations which means that there is not an homologation of the processes nor priorities for regional development. Indeed, the corruption has gained prominence especially in countries where recent scandals have exposed its economic costs, such as Brazil, Hungary, Italy, Mexico, and Spain (Schwab, 2015). In this case, the corruption is a significant risk for companies operating in Mexico because experts relate it to organized crime, bureaucracy and inefficiency of governmental policies and programs. It has been such a big problem in Mexico that the next federal government needs to address immediately, after Enrique Peña Nieto (EPN) whose period was from 2013 to 2018.

Chapter 3 is more related with the mandate of EPN in Mexico and the practical implications are more clear because he announced since day one the foundation of the INADEM[15] which affected the experts' perceptions having it as a regulator of the EE that was responsible to increase the contribution of new and existing firms to the economic development and social welfare (Official Journal of the Federation of Mexico 2013, January 14th). His measures showed an evident decentralization strategy confirmed by the empirical analysis conducted at regional levels where most of the entrepreneurial

---

[15] Spanish acronym for the National Institute of Entrepreneurship.

framework conditions were better perceived at non-central regions. Therefore, to contribute in the practice to the homologation of entrepreneurial opportunities from big to small cities, it is very important to have policies that promote the decentralization of commercial and physical infrastructure accompanied with better regulations of all the governmental policies, and to incentive universities to establish their facilities at non-central regions or at least improve their student's attraction from those regions.

Consequently, this work recognizes the role of educational institutions to provide education and training in the EE context. Therefore, Chapter 4 considers that universities need to become more entrepreneurial by changing, among other factors, their culture and helping students and faculty members to develop their entrepreneurial mindsets and entrepreneurial actions (Fayolle and Redford, 2014), but this implies to start understanding how the location matters because the cultural and social norms are different, and they have a significant influence on entrepreneurial education from primary to superior education. Finally, the consideration of the cultural and social norms to create pro-entrepreneurship educational programs has practical implications for the Mexican entrepreneurial ecosystem because in Chapter 2, 41.7% of the experts identify the entrepreneurial education as a constrain of the entrepreneurial activity referring to the absence of programs that impulse the creation of new businesses from primary and secondary levels of education (elementary, middle school and high school) to superior education (college/university). In Mexico, there is not any special pro-entrepreneurship program for primary or secondary education institutions by the time this study was conducted (February 2019), but evidence show (Alvarez et al. 2006) the presence of entrepreneurial programs for superior education institutions they might need a reconfiguration considering the local culture of where the institution is teaching courses. Indeed, the experts in Chapter 2 recognized that the entrepreneurial education is also an essential foster of the entrepreneurial activities in the Mexican entrepreneurial ecosystem that needs improvement like the suggested with the Chapter 4 findings.

5.3. Limitations and Future Research Lines

The limitations of this work are divided according to each of the contributions. Chapter 2 provides a general overview of the Mexican entrepreneurial ecosystem. However, several limitations must be considered. First, while the research presents a complete qualitative analysis, an important amount of information can be omitted because the process of categorization of responses depended on the personal interpretations and the GEM pre-definition standards. Second, the use of qualitative analysis software was considered as a reliable alternative to conduct this study, but the bad capture of the information of the nine open questions in the database was a constrain. Likewise, this study was conducted at the individual level of Mexico in general, but future qualitative research should consider the experts' perceptions by region, like Chapter 3, selecting the cities that contribute most to the Mexican economy to compare if there is a difference and consider adequate state laws like if each city is a different ecosystem.

Chapter 3 shows the regional differences of experts' perceptions of the EE, but from a quantitative analysis. This study presents limitations on the coverage of the data because it only represents 10 out of 32 entities that conform Mexico, and for some of them a bigger sample can contribute to increase the reliability of the scales. Also, all this study was conducted under the government of EPN so, in the future another study with a different government will improve more our understanding of entrepreneurial ecosystems and regional development because each government implies different economic strategies that affect the entrepreneurial activities. Additionally, the replication of the Chilean study (Amorós et al. 2013) resulted in an adaptation of the regions derived of the geographic distribution and the incorporation of demographic indicators. Although, this study was limited to emerging economies in Latin America, but to increase the knowledge on regional development literature we suggest following the replication of this study in BRIC[16] economies because Mexico is one

---

[16] The acronym BRIC stands for Brazil, Russia, India, and China. BRICs maintain policies and develop institutions that are supportive of growth, see Wilson & Purushothaman (2003).

of the few comparable countries to the BRICs although it was excluded for being already a member of the OECD[17].

Finally, Chapter 4 was based on an exploratory study to define the direction of the relationship between entrepreneurial education and cultural and social norms evaluated by key informants of the entrepreneurial ecosystem in Mexico. The methodology followed in this chapter establishes a background in the field to conduct future research to achieve a consensus about this new perspective, and it can be replicated in different settings to generalize and validate the findings (Gulati, 2007) because it is difficult to generalize outside Mexico with only these findings. Therefore, future research must consider also the role of location and longitudinal studies, from primary to superior education. In summary, Chapter 4 underlies in the main research question of this thesis determining the shaping role of one of the EE institutions to another and provides insights of how to improve it to foster entrepreneurial activities. Hence, an extension of this work would be, for example, to elaborate studies that measure the impacts of each of the entrepreneurial framework conditions in a regional context, and to compare the ways in which the governments of different countries can regulate the institutions to influence entrepreneurial activities. Also, studying each of the key player's impact on the entrepreneurial activities can contribute to understand more about entrepreneurial ecosystems beyond the processes that underlie the institutional theory.

---

[17] The acronym OECD stands for Organization for Economic Co-operation and Development. The OECD is an intergovernmental economic organization with 36-member countries, founded in 1961 to stimulate economic progress and world trade, see https://www.oecd.org/about/

REFERENCES

Acs, Z. J., Amorós, J. E., Bosma, N., and Levie, J. (2009). From entrepreneurship to economic development: Celebrating ten years of Global Entrepreneurship Monitor. *Frontiers of Entrepreneurship Research*, 29 (16), Article 1. http://digitalknowledge.babson.edu/fer/vol29/iss16/1

Acs, Z. J., and Amorós, J. E. (2008). Entrepreneurship and competitive dynamics in Latin America. *Small Business Economics*, 31 (3), 305–322. https://doi.org/10.1007/s11187-008-9133-y

Acs, Z. J., Autio, E., and Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43 (3), 476–494. https://doi.org/10.2139/ssrn.2008160

Acs, Z. J., Stam, E., Audretsch, D. B., and O'Connor, A. (2017). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, 1–10. https://doi.org/10.1007/s11187-017-9864-8

Afriyie, N., and Boohene, R. (2014). Entrepreneurial Education and Entrepreneurial Culture among University of Cape Coast Students in Ghana, *Athens Journal of Education*, Vol. 1, No. 4 309-321.

Alvarez, R.D., DeNoble, A.F., and Jung, D. (2006). *Educational Curricula and Self-Efficacy: Entrepreneurial Orientation and New Venture Intentions among University Students in Mexico*, in Craig S. Galbraith, Curt H. Stiles (ed.) Developmental Entrepreneurship: Adversity, Risk, and Isolation (International Research in the Business Disciplines, Volume 5) Emerald Group Publishing Limited, pp. 379 - 403

Amorós, J. E., Felzenstein, C. and Gimmon, E. (2013). Entrepreneurial opportunities in peripheral versus core regions in Chile, *Small Business Economics* Vol 40, pp. 119-139. http://dx.doi.org/10.1007/s11187-011-9349-0

Arciga, B. E. (2007). La enseñanza superior como una práctica socio-cultural, *Revista de la Educación Superior,* Vol. 36 (141).

Arıkan, A. T., and Schilling, M. A. (2011). Structure and governance in industrial districts: implications for competitive advantage. *Journal of Management Studies*, 48(4), 772–803. https://doi.org/10.1111/j.1467-6486.2010.00951.x

Arrieta, A., Costa, G., Cruz, M., Coronel, F., and Peña, I. (2017). *Tecnolatinas: Latin America riding the technology tsunami*, Inter-American Development Bank.

Arteaga Cervantes, A.L., Mexicano Ojeda, M.A., and González Martínez, R. (2016). *Intención emprendedora en estudiantes de la licenciatura de administración en una institución de educación superior.* Conference Paper: XXI Congreso Internacional de Contaduría, Administración e Informática.

Audretsch, D. B., and Belitski, M. (2017). Entrepreneurial ecosystems in cities: establishing the framework conditions. *The Journal of Technology Transfer*, 42 (5), 1030–1051. https://doi.org/10.1007/s10961-014-9381-8

Audretsch, D. B., Obschonka, M., Gosling, S. D., and Potter, J. (2017). A new perspective on entrepreneurial regions: linking cultural identity with latent and manifest entrepreneurship. *Small Business Economics*, 48 (3), 681-697.

Auerswald, P. E., and Dani, L. (2017). The adaptive life cycle of entrepreneurial ecosystems: the biotechnology cluster. *Small Business Economics*, 1–21. https://doi.org/10.1007/s11187-017-9869-3

Autio, E., Kenney, M., Mustar, P., Siegel, D., and Wright, M. (2014). Entrepreneurial innovation: The importance of context. *Research Policy*, 43 (7), 1097–1108. https://doi.org/10.1016/j.respol.2014.01.015

Bahrami, H., and Evans, S. (1995). Flexible re-cycling and high-technology entrepreneurship. *California Management Review*, 37 (3), 62–89. https://doi.org/10.2307/41165799

Bassols Batalla, Á., and Batalla, A. B. (1982). *Recursos naturales de México; teoría, conocimiento y uso* (No. 04; HC54, B3 1982.).

Baum, J. R., Locke E. A., and Smith, K. G. (2001). A Multidimensional Model of Venture Growth, *The Academy of Management Journal*. Vol. 44 (2), 292-303.

Baumol, W. J. (1996). Entrepreneurship: Productive, unproductive and destructive. *Journal of Business Venturing*, 11 (1), 3–22. https://doi.org/10.1016/0883-9026(94)00014-X

Bosma, N., Jones, E., Autio, and Levie, J. (2008*). Global Entrepreneurship Monitor, 2007 executive report*. Wellesley, MA, London, UK: Babson College and London Business School.

Bowen, H. P., and D. De Clercq (2008). Institutional Context and the Allocation of Entrepreneurial Effort, *Journal of International Business Studies* 39: 1 –21.

Browne, M. W., and Cudeck, R. (1993). *Alternative ways of assessing model fit*. Sage focus editions, 154, 136-136.

Bruns, K., Bosma, N., Sanders, M., and Schramm, M. (2017). Searching for the existence of entrepreneurial ecosystems: a regional cross-section growth regression approach. *Small Business Economics*, 49 (1), 31–54. https://doi.org/10.1007/s11187-017-9866-6

Cannarella, C., and Piccioni, V. (2006). Dysfunctions and suboptimal behaviors of rural development networks. *International Journal of Rural Management*, 2 (1), 29–57. https://doi.org/10.1177/097300520500200102

Cavallo, A., Ghezzi, A., Colombelli, A., and Casali, G. L. (2018). Agglomeration dynamics of innovative start -ups in Italy beyond the industrial district era. *International Entrepreneurship and Management Journal*, 1–24.

Christaller, W. (1966). *Central places in Southern Germany*. Englewood Cliffs, NJ: Prentice–Hall, Inc.

CIA (2018). *The World Factbook*. Central Intelligence Agency. https://www.cia.gov/library/publications/resources/the-world-factbook/

Coduras, A., Urbano, D., Rojas, A., and Martínez, S. (2008). The Relationship between University Support to Entrepreneurship with Entrepreneurial Activity in Spain: A Gem Data Based Analysis, *International Advances in Economic Research*, 14 (4), 395-406. http://dx.doi.org/10.1007/s11294-008-9173-8

Cohen, B. (2006). Sustainable valley entrepreneurial ecosystems. *Business Strategy and the Environment*, 15 (1), 1–14. https://doi.org/10.1002/bse.428

Colombelli, A., Paolucci, E., and Ughetto, E. (2017). Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems. *Small Business Economics*, 1–17. https://doi.org/10.1007/s11187-017-9957-4

Comité Intersectorial para la Innovación (2011). *Programa Nacional de Innovación*. México, D.F.: Comité Intersectorial para la Innovación.

Conover, W. J. (1998). *Practical nonparametric statistics.* New York: John Wiley & Sons, p. 16.

Cooper, A. C. (1993). Challenges in predicting new firm performance. *Journal of Business Venturing*, 8, 241-253. https://doi.org/10.1016/0883-9026(93)90030-9

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16 (3), 297–334. http://dx.doi.org/10.1007/BF02310555

De Clercq, D., and Arenius, P. (2006). The role of knowledge in business start-up activity, *International Small Business Journal,* 24 (4), 339–358.

Delgado, M., Porter, M. E., and Stern, S. (2010). Clusters and entrepreneurship. *Journal of Economic Geography*, 10 (4), 495–518. https://doi.org/10.1093/jeg/lbq010

Dev K., D., Li, J. and Merenda, M. (2011). Fostering entrepreneurship: Impact of specialization and diversity in education, *International Entrepreneurship Management Journal*, 7 (2), pp.163-179.

Dubini, P. (1989). The influence of motivations and environment on business start-ups: Some hints for public policies. *Journal of Business Venturing*, 4 (1), 11–26. https://doi.org/10.1016/0883-9026(89)90031-1

Dunteman, G. H. (1994). Principal component analysis. In M. S. Lewis-Beck (Ed.), *Factor analysis and related techniques* (pp. 157–245). London: Sage.

Dziuban, C. D., and Shirkey, E. C. (1974). When a correlation matrix is appropriate for factor analysis? Some decision rules. *Pychological bulletin*, 81 (6): 358-361. http://dx.doi.org/10.1037/h0036316

Edoho, F. M. (2016). Entrepreneurship paradigm in the new millennium: A critique of public policy on entrepreneurship, *Journal of Entrepreneurship in Emerging Economies*, 8 (2), pp.279-294, https://doi.org/10.1108/JEEE-08-2015-0043

Esquivel, G. (2000). Geografía y desarrollo económico en México. *English translation: Geography and economic development in Mexico.* Inter-American Development Bank.

Etzioni, A. (1987). Entrepreneurship, Adaptation and Legitimation: A Macro-Behavioral Perspective, *Journal of Economic Behavior & Organization* 8 (2): 175– 189.

Fabre, F., and Smith, R. (2003). *Building an entrepreneurial culture in Mexico*. Prepared for Nacional Financiera, SNC under a Grant from US Trade and Development Agency.

Fayolle, A., and Redford, D.T. (2014) *Handbook on the Entrepreneurial University*, Edward Elgar Publishing: USA.

Feld, B. (2012). *Startup communities: Building an entrepreneurial ecosystem in your city.* John Wiley & Sons.

Frederick, H., and Monsen, E. (2009). New Zealand's perfect storm of entrepreneurship and economic development, *Small Business Economics*. http://dx.doi.org/10.1007/s11187-009-9234-2

Frenkel, A., Shefer, D., and Roper, S. (2003). Public policy, locational choice and the innovation capability of high-tech firms: A comparison between Israel and Ireland. *Papers in Regional Science*, 82, 203–221.

Fritsch, M. (2013). New business formation and regional development: A survey and assessment of the evidence. *Foundations and Trends® in Entrepreneurship*, 9 (3), 249–364. http://dx.doi.org/10.1561/0300000043

Fritsch, M., and Mueller, P. (2004). Effects of new business formation on regional development over time. *Regional Studies*, 38 (8), 961–975. https://doi.org/10.1080/0034340042000280965

Gallegos, R., Grandet, C., and Ramirez, P. (2014). *Los emprendedores de TIC: Recomendaciones de política pública para su nacimiento, crecimiento y consolidación.* Instituto Mexicano para la Competitividad, A.C.

Gobierno de la República (2013) *Plan Nacional de Desarrollo 2013-2018: Programa de Desarrollo Innovador 2013-2018*. México, D.F.: Secretaría de Economía.

González G., S. (2018, September 20th). Presupuesto del Inadem se redujo 59% desde 2014. *English translation: INADEM's budget reduces 59% since 2014.* La Jornada. https://www.jornada.com.mx/ultimas/2018/09/20/presupuesto-del-inadem-se-redujo-59-desde-2012-7946.html

Gulati, R. (2007). Tent poles, tribalism, and boundary spanning: The rigor-relevance debate in management research. *Academy of Management Journal*, 50 (4), 775–782. https://doi.org/10.5465/amj.2007.26279170

Hair, J. F., Anderson, R. E., Tatham, R. L. and Black, W. C. (1995). *Multivariate data analysis: With readings*, (4th ed.). New Jersey: Prentice Hall Inc.

Harrison, R. T., and Leitch, C. (2010). Voodoo institution or entrepreneurial university? Spin-off companies, the entrepreneurial system and regional development in the UK. *Regional Studies*, 44 (9), 1241–1262. http://dx.doi.org/10.1080/00343400903167912

Henrekson, M., and Johansson, D. (2008). *Gazelles as job creators: A survey and interpretation of the evidence*. Research Institute of Industrial Economics, Stockholm Working Paper 733.

Herrington, M. and Kew, P. (2017). *Global Entrepreneurship Monitor: 2016/17*. Global Report.

Honig, B., J. Lampel, J. A. C. Baum, M. A. Glynn, R. Jing, M. Lounsbury, E. Schüßler, D. G. Sirmon, A. S. Tsui, J. P. Walsh, and A. van Witteloostuijn (2018). Reflections on Scientific Misconduct in Management: Unfortunate incidents or a normative crisis? *Academy of Management Perspectives*. https://doi.org/10.5465/amp.2015.0167

Hotelling, H. (1933). Analysis of a complex of statistical variables into principal components. *Journal of Educational Psychology,* 24 (6), 417-441.

Iansiti, M., and Levien, R. (2004). Strategy as ecology. *Harvard Business Review*, 82 (3), 68–81.

Ibarra Colado, E. (2005). Origen de la empresarialización de la universidad: el pasado de la gestión de los negocios en el presente del manejo de la universidad, *Revista de la Educación Superior.* Vol. XXXIV (2) No. 134, pp. 13-37.

INEGI. (2018) PIB y Cuentas nacionales de México. *English translation: GDP and National accounts of Mexico.* Instituto Nacional de Estadística y Geografía.

Isenberg, D. (2011). *The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship*. Presentation at the Institute of International and European Affairs.

Isenberg, D. J. (2010). The big idea: How to start an entrepreneurial revolution, *Harvard Business Review*, 88 (6), pp. 41–50.

Isenberg, D. J. (2011). Introducing the entrepreneurship ecosystem: Four defining characteristics, Forbes. Available at: https://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics/#2908bd75fe8e (accessed 25 April 2017).

Isenberg, D. J. (2014). What an entrepreneurship ecosystem actually is?, Harvard Business Review, Available at: https://hbr.org/2014/05/what-an-entrepreneurial-ecosystem-actually-is (accessed 26 April 2017).

Isenberg, D., and Onyemah, V. (2016). Fostering Scaleup Ecosystems for Regional Economic Growth (Innovations Case Narrative: Manizales-Mas and Scale Up Milwaukee). *Innovations: Technology, Governance, Globalization,* 11 (1-2), 60–79. https://doi.org/10.1162/inov_a_00248

Jolliffe, I. T. (2002). *Principal component analysis* (2nd ed.). New York: Springer.

Khadhraoui, M., Plaisent, M., Lakhal, L., and Bernard, P. (2016). The Impact of Entrepreneurial Culture Dimensions on Entrepreneurial Intention: A Cross Cultural Study, *Universal Journal of Management* 4(12): 685-693. http://dx.doi.org/10.13189/ujm.2016.041205

Kline, R. B. (1998). Software review: Software programs for structural equation modeling: Amos, EQS, and LISREL, *Journal of psychoeducational assessment*, 16 (4), 343-364.

Krueger, N. F. (2000). The Cognitive Infrastructure of Opportunity Emergence, *Entrepreneurship Theory and Practice* 24 (3): 5–23.

Krueger, N. F. (2003). *The Cognitive Psychology of Entrepreneurship.* In Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction, edited by Z. J. Acs, and D. B. Audretsch, 105 – 140. London: Kluwer.

Krueger, N., Liñán, F., and Nabi, G. (2013). Cultural values and Entrepreneurship, *Entrepreneurship and Regional Development,* Vol. 25, Nos. 9 –10, 703–707. DOI: http://dx.doi.org/10.1080/08985626.2013.862961

Kuratko, D. F., Fisher, G., Bloodgood, J. M., and Hornsby, J. S. (2017). The paradox of new venture legitimation within an entrepreneurial ecosystem. *Small Business Economics*, 49 (1), 1–22. https://doi.org/10.1007/s11187-017-9870-x

Kuratko, Donald F. (2005). The emergence of entrepreneurship education: Development, Trends, and Challenges, *Entrepreneurship Theory and Practice*, 577-597.

Lagona, F., and Padovano, F. (2007). A nonlinear principal component analysis of the relationship between budget rules and fiscal performance in the European Union. *Public Choice*, 130, 401–436. https://doi.org/10.1007/s11127-006-9095-z

Lerner, J. (2009). *Boulevard of broken dreams: Why public efforts to boost entrepreneurship and venture capital have failed—and what to do about it*. Princeton: Princeton University Press.

Levie, J., and Autio, E. (2008). A theoretical grounding and test of the GEM model. *Small Business Economics*, 31 (3), 305–322. https://doi.org/10.1007/s11187-008-9133-y

Luor, T., Lu, H., Yu, H., and Chang, K. (2014). Trends in and contributions to entrepreneurship research: a broad review of literature from 1996 to June 2012. *Scientometrics*, 99 (2), 353-369. https://doi.org/10.1007/s11192-013-1203-5

Mack, E. A., and Mayer, H. (2015). The evolutionary dynamics of entrepreneurial ecosystems. *Urban Studies*, 53 (10), 2118–2133. https://doi.org/10.1177/0042098015586547

Malecki, E. J. (2018). Entrepreneurs, networks, and economic development: A review of recent research. Reflections and Extensions on Key Papers of the First Twenty-Five Years of Advances (*Advances in Entrepreneurship, Firm Emergence and Growth, Vol. 20)*, 71-116. https://doi.org/10.1108/S1074-754020180000020010

Marshall, A. (1895). *Principles of economics* (3rd ed.). London: Macmillan.

Marshall, A. (1920). *Industry and trade: a study of industrial technique and business organization; and of their influences on the conditions of various classes and nations.* Macmillan.

Mason, C., and Brown, R. (2014). Entrepreneurial ecosystems and growth oriented entrepreneurship. *Final Report to OECD*, Paris, 30(1), 77–102.

McDonald, R. P., and Marsh, H. W. (1990). Choosing a multivariate model: Non-centrality and goodness of fit. *Psychological bulletin*, 107(2), 247.

Meek, W.R., Pacheco, D.F., and York, J.G. (2009). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context, *Journal of Business Venturing.* http://dx.doi.org/10.1016/j.jbusvent.2009.09.007

Migueles, R. (2018a, July 31th). *AMLO's decentralization plan will move 2.7 million people out of Mexico City.* El Universal. http://www.eluniversal.com.mx/english/amlos-decentralization-plan-will-move-27-million-people-out-of-mexico-city

Migueles, R. (2018b, August 8th). Gasto en inversión pública cayó 24% en sexenio de Peña Nieto. *English translation: Public investment expense felt down 24% in the mandate of Peña Nieto.* El Universal. https://www.eluniversal.com.mx/cartera/finanzas/gasto-en-inversion-publica-cayo-24-en-sexenio-de-pena-nieto

Montiel-Campos, H. (2018). University spin-offs creation in the Latin American region: An exploratory study, *Journal of Entrepreneurship in Emerging Economies*, 10 (3), 386-408, https://doi.org/10.1108/JEEE-02-2018-0011

Mueller, P., Van Stel, A., and Storey, D. (2008). The effects of new firm formation on regional development over time: The case of Great Britain. *Small Business Economics*, 30 (1), 59–71. https://doi.org/10.1007/s11187-007-9056-z

Mungaray, A., Ramos, J., Plascencia, I. and Moctezuma, P. (2011). Las instituciones de educación superior en el sistema regional de innovación de Baja California, *Revista de la Educación Superior,* Vol. 40 (158).

Naranjo, E.E., Campos, M.E. and López, L.N., (2006). *Global Entrepreneurship Monitor: Reporte Nacional 2015 México*.

Neck, H. M., Meyer, G. D., Cohen, B., and Corbett, A. C. (2004). An entrepreneurial system view of new venture creation. *Journal of Small Business Management*, 42 (2), 190–208. https://doi.org/10.1111/j.1540-627X.2004.00105.x

Nunnally, J. (1978). *Psychometric theory* (2nd ed.). New York: McGraw–Hill.

Official Journal of the Federation of Mexico (2013, January 14th). DECRETO por el que se reforman, adicionan y derogan diversas disposiciones del Reglamento Interior de la Secretaría de Economía. *English translation: DECREE by which are reform, add, and derogate diverse dispositions of the*

Internal Reglament of the Secretary of Economy. Estados Unidos Mexicanos. Presidencia de la Repúbica. http://dof.gob.mx/nota_detalle.php?codigo=5284609&fecha=14/01/2013

Osiri, J.K., McCarty, M.M., and Jessup, L. (2013). Entrepreneurial culture in Institutions of Higher Education: Impact on Academic Entrepreneurship, *Journal of Entrepreneurship Education*, Volume 16, Special Issue.

Paço, Arminda do et. al. (2015). Entrepreneurial Intentions: Is Education Enough?, *International Entrepreneurship and Management Journal*, 11 (1), 57-75.

Pyke, F., Becattini, G., and Sengenberger, W. (1990). *Industrial districts and inter-firm co-operation in Italy.* International Institute for Labour Studies.

Qian, H., Acs, Z. J., and Stough, R. R. (2012). Regional systems of entrepreneurship: the nexus of human capital, knowledge and new firm formation. *Journal of Economic Geography*, 13 (4), 559–587. https://doi.org/10.1093/jeg/lbs009

Rae, David (2010). Universities and enterprise education: responding to the challenges of the new era, *Journal of Small Business and Enterprise Development*, 17 (4), 591-606.

Reynolds, P. D., Bosma, N., Autio, E., Hunt, S., Bono, N. D., Servais, I., et al. (2005). Global Entrepreneurship Monitor: Data collection design and implementation 1998–2003. *Small Business Economics*, 24 (3), 205–231. https://doi.org/10.1007/s11187-005-1980-1

Reynolds, P. D., Hay, M., and Camp, S. M. (1999), *Global Entrepreneurship Monitor: 1999 executive report*, Kansas City, MO: Kauffman Foundation.

Ritsilä, J. J. (1999). Regional differences in environments for enterprises. *Entrepreneurship and Regional Development,* 11 (3), 187–202. https://doi.org/10.1080/089856299283164

Roberts, E. B., and Eesley, C. E. (2011). Entrepreneurial impact: The role of MIT. *Foundations and Trends® in Entrepreneurship*, 7 (1–2), 1–149. http://dx.doi.org/10.1561/0300000030

Roberts, M. J., and Barley, L. (2004). *How venture capitalists evaluate potential venture opportunities*, publication no. 9-805-019. Boston: Harvard Business School.

Romani, G., Atienza, M., and Amorós, J. E. (2009). Financing entrepreneurial activity in Chile: Scale and scope of public support programs. *Venture Capital*, 11 (1), 55–70. https://doi.org/10.1080/13691060802351230

Roundy, P. T. (2017). "Small town" entrepreneurial ecosystems: Implications for developed and emerging economies, *Journal of Entrepreneurship in Emerging Economies*, 9 (3), 238-262, https://doi.org/10.1108/JEEE-09-2016-0040

Saldaña, I. (2018, December 24th). Será en 2019 la extinción de ProMexico y el INADEM. *English translation: In 2019 will be the extinction of ProMexico and INADEM.* El Universal. https://www.eluniversal.com.mx/cartera/sera-en-2019-la-extincion-de-promexico-y-el-inadem

Sargent, J. and Matthews, L. (2015). High-Growth Entrepreneurship in Mexico, *Latin American Business Review,* 16: 143-163, https://doi.org/10.1080/10978526.2015.1045813

Saxenian, A. (2006). *The new argonauts: Regional advantage in a global economy*. Cambridge, MA: Harvard University Press.

Schwab, K. (2015) *The Global Competitiveness Report 2015 – 2016*: World Economic Forum, Geneve.

Shane, S. (1993). Cultural Influences on National Rates of Innovation, *Journal of Business Venturing* 8: 59–73.

Shane, S. A. (2003*). A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar Publishing.

Shane, S., and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review,* 25 (1), 217–226. https://doi.org/10.5465/amr.2000.2791611

Shlens, J. (2009). *A tutorial on principal component analysis*. Version 3.01 Systems Neurobiology Laboratory, Salk Institute for Biological Studies on line: http://www.snl.salk.edu/*shlens/

Sorenson, O., and Audia, P. G. (2000). The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States, 1940–1989. *American Journal of Sociology*, 106 (2), 424–462. https://doi.org/10.1086/316962

Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice*, 41 (1), 49–72. https://doi.org/10.1111/etap.12167

Spilling, O. R. (1996). The entrepreneurial system: On entrepreneurship in the context of a mega-event. *Journal of Business Research*, 36 (1), 91–103. https://doi.org/10.1016/0148-2963(95)00166-2

Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies,* 23 (9), 1759–1769. http://dx.doi.org/10.1080/09654313.2015.1061484

Sternberg, R., and Wennekers, S. (2005). Determinants and effects of new business creation using Global Entrepreneurship Monitor data. *Small Business Economics*, 24 (3), 193–203. https://doi.org/10.1007/s11187-005-1974-z

Stevens, J. (1992). *Applied multivariate statistics for the social sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Szelenyi, L. S. (2002) Tutorial para la asignatura Geografía Económica de México. México: Fondo editorial FCA.

Thurik, R., and Wennekers, S. (2004). Entrepreneurship, small business and economic growth, *Journal of Small Business and Enterprise Development*, 11 (1), 140–149.

Tobias, S., and Carlson, J.E. (1969) Brief report: Barlett's test of sphericity and chance findings in factor analysis. *Multivariate Behavioral Research*, 4 (3): 375-377. https://doi.org/10.1207/s15327906mbr0403_8

Todling, F., and Wanzenbock, H. (2003). Regional differences in structural characteristics of start-ups. *Entrepreneurship and Regional Development*, 15 (4), 351–370. https://doi.org/10.1080/0898562032000058923

Tsvetkova, A. (2015). Innovation, entrepreneurship, and metropolitan economic performance: empirical test of recent theoretical propositions. *Economic Development Quarterly*, 29 (4), 299–316. https://doi.org/10.1177/0891242415581398

United Nations. (2018). *2018 Revision of World Urbanization Prospects*. New York: United Nations.

Van de Ven, H. (1993). The development of an infrastructure for entrepreneurship. *Journal of Business Venturing*, 8 (3), 211–230. https://doi.org/10.1016/0883-9026(93)90028-4

Van Stel, A., and Suddle, K. (2008). The impact of new firm formation on regional development in the Netherlands. *Small Business Economics*, 30 (1), 31–47. https://doi.org/10.1007/s11187-007-9054-1

Villegas Mateos, A. O. and Amorós Espinosa, J. E. (2017). *Entrepreneurial Ecosystem: Experts' Perspectives of Mexico*. XXII Congreso Internacional de Contaduría, Administración e Informática. UNAM: Mexico. September 27-29. http://congreso.investiga.fca.unam.mx/docs/xxii/docs/9.07.pdf

Villegas Mateos, A. O. and Amorós Espinosa, J. E. (2018). Probando mediante SEM la relación entre educación y entrenamiento contra cultura y normas sociales pro-emprendimiento – evidencia de México. *English translation: Testing through SEM the relation between pro-entrepreneurship education and training versus cultural and social norms – evidence of Mexico*. XXIII Congreso Internacional de Contaduría, Administración e Informática. UNAM: Mexico. October 3-5. http://congreso.investiga.fca.unam.mx/docs/xxiii/docs/7.08.pdf

Wach, K. (2015). Impact of cultural and social norms on entrepreneurship in the EU: Cross-country evidence based on GEM survey results, *Zarządzanie w Kulturze*, 16, z. 1, s. 15–29. https://doi.org/10.4467/20843976ZK.15.002.3037

Weber, A. (1909). U¨ber den Standort des Industrien. Tu¨bingen: University of Tu¨bingen. *English Translation: Alfred Weber's Theory of the Location of Industries.* Chicago: University of Chicago Press, 1929.

WEF (2013). *Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics*. World Economic Forum: Davos.

Wennberg, K., Pathak, S., and Autio, E. (2013). How culture moulds the effects of self-efficacy and fear of failure on entrepreneurship, *Entrepreneurship & Regional Development,* Vol. 25, Nos. 9 – 10, 756–780, http://dx.doi.org/10.1080/08985626.2013.862975

Wilson, D., and Purushothaman, R. (2003). Dreaming with BRICs: the path to 2050. *Goldman Sachs Global Economics Paper*, 99, 1-24.

World Bank. (2018) *World Banks national accounts data, and OECD National Accounts data files*. The World Bank Group. https://data.worldbank.org/indicator

Zahra, S. A., Wright, M., and Abdelgawad, S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal*, 32 (5), 479–500. https://doi.org/10.1177/0266242613519807

Zinbarg, R., Revelle, W., Yovel, I., and Li, W. (2005). Cronbach 's, Revelle's, and McDonald's: Their relations with each other and two alternative conceptualizations of reliability. *Psychometrika*, 70 (1), 123–133. https://doi.org/10.1007/s11336-003-0974-7