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Preconditions for Innovative Entrepreneurship in Mexico

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**Dedication**

To my parents José and Margarita; my sister Margarita and brothers Eduardo, Francisco, and César; my wife Verónica, my children Adriana, Rodrigo and Elisa, and friends.

You were my main motivation for pushing through this work.

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# Preconditions for Innovative Entrepreneurship in Mexico

By

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## Abstract

This dissertation was written as a compendium of three articles:

### *Article 1. Opportunity Motivation and Growth Aspirations of Mexican Entrepreneurs: The Moderating Role of the Household Income*

Framed in the Theory of Planned Behavior, the second article analyzes the entrepreneurial growth aspirations in efficiency-driven economies and examines the interaction effect of household income on the relationship between opportunity entrepreneurship and entrepreneurial growth aspirations. We propose a growth aspirations model using GEM (Global Entrepreneurship Monitor) data, with two explanatory variables: increased wealth and independence, and a moderating variable (household income). Hypotheses were validated with the use of hierarchical regression, and we find that that opportunity motivation is positively related to the entrepreneurial intention to expand entrepreneurial business activities. A second interesting finding of this study is that the independent effects model infers that growth aspirations are significantly related to household income.

### *Article 2. Product Newness, Low Competition, Recent Technology, and Export Orientation as Predictors for Entrepreneurial Growth*

This study examines the contribution of how product newness, low competition, recent technology, and export orientation affect entrepreneurial growth aspirations moderated by financial capital. Based on a Global Entrepreneurship Monitor (GEM) sample of 512 Mexican new entrepreneurs, we use a hierarchical regression model to study the independent and interaction effects between these variables, and we apply a Chow breakpoint test and a CUSUMSQ (cumulative sum of squares of recursive residuals) test to analyze structural change and robustness. Our results suggest that achieving higher educational levels, acquiring recent technology, and product newness slightly increase the entrepreneurial growth ambition of the firm, and that financial capital positively moderates the impact of product newness and recent technology on growth aspirations. Besides this, we show that the interaction effect of financial capital with low competition and export activity on their growth aspirations is not crucial, and business angels tend to finance, primarily when the firm exports new products and services are facing a reduced number of competitors.

### *Article 3. Regional Efficiency Index for New Venture Creation and Job Generation*

This paper proposes an approach to the Resource-Based Theory within regions in which the configuration and composition of their resources may be used to describe their ability to generate entrepreneurial activity. The Mexican States were used as examples in this case in which the Resource-Based Theory was applied, in combination with the Data Envelopment Analysis, to construct a composite index that measured the efficiency of the Mexican States in their use of resources that the literature has shown as influential in new firm formation and employment creation. The index was then studied with a cluster analysis from the weights of resources to determine those that are the most important. The differences found between states and groups of states suggest that the effects of individual and specific resources on entrepreneurial efficiency are significant.

# Contents

Abstract	v
Chapter 1. Introduction	1
1.1 Motivation	1
1.2 Problem Statement and Context	1
1.3 Research Question	2
1.4 Solution Overview	2
Chapter 2. Opportunity Motivation and Growth Aspirations of Mexican Entrepreneurs: The Moderating Role of the Household Income	5
2.1 Introduction	5
2.2 Theoretical Framework	6
2.3 Methodology	11
2.4 Results and Discussion	14
2.5 Conclusions	18
Chapter 3. Product Newness, Low Competition, Recent Technology, and Export Orientation as Predictors for Entrepreneurial Growth Aspirations	19
3.1 Introduction	19
3.2 Theoretical Framework	20
3.3 Methodology	26
3.4 Results and Discussion	27
3.5 Conclusions	35
Chapter 4. Regional Efficiency Index for New Venture Creation and Job Generation.	37
4.1 Introduction	37
4.2 Theoretical Framework	38
4.3 Methodology	41
4.4 Results and Discussion	44
4.5 Conclusions	47
Chapter 5. Conclusions	49
5.1 Contributions	49
5.2 Conclusions	49
5.3 Future Research	51
References	52
Appendixes	62
Curriculum Vitae	65

## List of tables

1.1 Dissertation Structure	4
2.1 Descriptive Statistics	15
2.2 Correlation Matrix	16
2.3 Hierarchical Regression Results	17
3.1 Firms size in the sample.	28
3.2 Descriptive Statistics	28
3.3 Correlation Matrix	29
3.4 Hierarchical Regression Results	30
3.5 Entrepreneurial behavior and attitudes in Mexico in the Adult Population Survey	33
3.6 Total early-stage entrepreneurial activity (TEA) and established business ownership (EBO) results with the Chow Breakpoint Test	34
3.7 CUSUMSQ Data Results.	35
4.1 Entrepreneurial Regional Efficiency Index	45

## List of figures

1.1 Innovative Entrepreneurship	1
2.1 A conceptual model of the moderating role of household income on the relationship between opportunity motivations and entrepreneurial growth aspirations	11
2.2 Research Model Results	15
3.1 A conceptual model of the independent and interaction effects of financial capital, innovative behavior, and export orientation on entrepreneurial growth aspirations	25
3.2 Research Model Results	31
3.3 Cumulative sum of squares of recursive residuals (CUSUMSQ) contrast and data results for parameter stability.	34
4.1 Efficient and Non-Efficient States	46
4.2 Regional Cluster	46

# Chapter 1. Introduction

## 1.1 Motivation

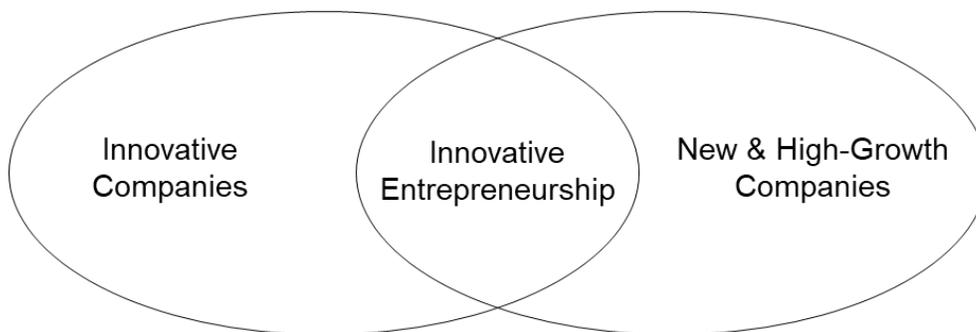
A genuine interest in helping to foster an innovative entrepreneurial mindset in the population of Mexico so that the country achieves the highest levels of prosperity that derive from it.

## 1.2 Problem Statement and Context

Innovation and entrepreneurship can be regarded as continuous and complementary processes sharing the same roots on Schumpeter (1934). Innovation is one of the sources of entrepreneurship, as innovation can be complemented with some other sources, such as the entrepreneurial intention to manage firms by family members (Saiz-Alvarez et al., 2020), waiting for opportunities at the right time (Rodriguez-Aceves et al., 2019), and the desire of causing social change. As entrepreneurship allows innovation to flourish, the combination of entrepreneurship and innovation creates a virtuous circle that benefits both the entrepreneur and their socio-economic environment.

Although both processes occur partly parallel and overlapping, the focus goes from innovation at the beginning of the process to entrepreneurship at the end of the process, that is, from novelty creation to value creation. Academics and policy makers have paid particular attention to innovative entrepreneurship as it can play an important role in contributing to economic development and help address key societal challenges. However, the desired benefits from entrepreneurship are mostly generated by a small number of innovative, high-growth ventures, whereas a vast majority of new ventures only experiencing moderate growth (Amorós et al., 2019). Based on extant literature, innovative entrepreneurship stems from the intersection of innovative companies, and new and high-growth companies (**Figure 1.1**).

Figure 1.1 Innovative Entrepreneurship



Source: The author.

Regarding innovative companies, the Global Competitiveness Report (GCI) prepared by the World Economic Forum (Schwab & Zahidi, 2020), ranks countries based on its weights the capacity of nations to deliver high levels of prosperity and economic wealth to their inhabitants. This fact, in turn, depends on how productively a country uses available economic resources. The GCI separates countries into three specific stages: innovation-driven, factor-driven, and efficiency-driven, each implying a growing degree of complexity in the firm. An innovation-driven economy is described by idiosyncratic producers and an extraordinary segment of services in the marketplace. The ability to produce innovative products and services at the global technology frontier using the most advanced methods becomes the dominant source of competitive advantage.

For an efficiency-driven country such as Mexico, notwithstanding a higher concentration of challenges at the efficiency enhancers' level, one can find important opportunities for boosting competitiveness in the areas of essential requirements and innovation and sophistication factors. As nations move into the innovation-driven phase, they can bear higher salaries and increasing standards of living if their organizations can compete by offering new or unique products and services in the market. At this phase, enterprises must compete by producing innovative goods with the help of very sophisticated and refined production processes rooted in knowledge and innovation.

In 2020, Mexico ranked 55th among the 131 economies featured in the Global Innovation Index of the World Intellectual Property Organization (Cornell et al, 2020), achieving high scores in six out of the seven index pillars: human capital & research, infrastructure, market sophistication, business sophistication, knowledge & technology outputs and creative outputs, which are above average for the upper middle- income group. Conversely, Mexico scores below average for its income group in one pillar, institutions. Compared to other economies in Latin America and the Caribbean, Mexico performs above average in all seven of the index pillars.

Regarding new and high-growth companies, the Global Entrepreneurship Monitor (GEM) Research Consortium has uncovered complex and non-trivial relationships between entrepreneurship and economic development. Entrepreneurial processes are undoubtedly linked with macroeconomic conditions, but detailed relationships may vary (e.g., as a function of economic development). Both the GEM data and that from other sources suggest that not all entrepreneurial activity similarly contributes to economic development. All entrepreneurial activity is important, but high-growth entrepreneurial activity is particularly so. Specifically, the importance of high-growth entrepreneurial activity for job generation has been increasingly emphasized.

Firms with high-growth trajectories should be associated with entrepreneurs with higher growth aspirations. Thus, knowledge of the determinants of growth aspirations of newly founded firms has become a primary focus for researchers, policy makers and other social enterprise organizations interested in scalable ways to drive innovative entrepreneurship and economic development. Even though high-aspirations entrepreneurship is rare, its contribution to expected job creation is significant.

In 2018, Mexico ranked 23 (out of 54 economies) in the establishment of new firms with a National Entrepreneurship Context Index (NECI) score of 5.21 (min = 1, max = 10) (Bosma & Kelley, 2019). The creation of new firms in Mexico has seen steady growth after the 2008 Global Economic Crisis and has been primarily impelled by 3-helix entrepreneurial schemes formed by private firms impelled by cultural and social norms (6.21, measured in a 9-point Likert scale, 1 = highly insufficient and 9 = highly sufficient),

government entrepreneurship programs (5.63), and higher education institutions (HEIs)(6.45). As a result, Mexico has more than doubled its early-stage entrepreneurial (TEA) rate compared to 2010 (10%) and is higher than both the average of the Latin American countries (19.9%) and efficiency-driven economies (15%). However, very few companies have achieved high or even moderate rates of growth. The last national report of 2015 shows that only 13.3% of companies in early activity expect to generate more than five jobs in the next five years, and if we consider those with high growth aspirations, that is, those that generate more than ten jobs and experience growth of more than 50% in jobs, only 4.6% of early-stage companies and 2.1% of established companies expect it (Moska et al., 2015).

Furthermore, the country presents serious regional variations in business density that affect economic development. Business density in Mexico as a whole is very low (i.e., 45.9). Within the country business density is relatively high in the poorest states of the south Pacific coast where job opportunities are lower and business ownership largely corresponds to self-employment and micro-enterprises in traditional sectors of the economy, while it is very low at the border with the United States, where the economy is dominated by FDI and large establishments. Therefore, there is a negative relationship at the state level between business density and income per capita, for the overwhelming majority of small businesses in Mexico are geared towards low-productive activities and the economically most dynamic states are driven by large multinational and national enterprises (Potter et al, 2013).

Much, therefore, remains to be done in the field of innovative entrepreneurship, including at state level.

### **1.3 Research Question**

What can the actors of the Mexican entrepreneurial ecosystem do to increase the growth aspirations of Mexican entrepreneurs and improve the entrepreneurial capacity of the states?

### **1.4 Solution overview**

Based on the previous argumentations, it is relevant to define the Mexican High Job Growth Entrepreneur Profile and build a Regional Efficiency Index for New Venture Creation and Job Generation, as preconditions for innovative entrepreneurship. The research was carried out through three independent but interconnected studies (**Table 1.1**):

#### *Mexican High Job Growth Entrepreneur Profile*

1. Determine the moderating effect of household income in the relationship between motivations and aspirations to grow.

To identify the determinants that might increase the growth aspirations of new entrepreneurs, in the framework of the Theory of Planned Behavior it was examined the interaction effect of household income on the relationship between opportunity motivations and entrepreneurial growth aspirations. It was proposed a model for growth

aspirations with two explanatory variables: increase-wealth and independence motivation and a moderating variable, namely household income, whose effect is to increase the positive impact of the motive variables upon growth aspiration.

2. Determine the moderating effect of financial capital in the relationship between innovation behavior and export orientation with aspirations to grow.

Based on innovation and internationalization theories, financial capital may reinforce the contribution of innovative behavior and international orientation to growth aspirations. Thus, it was proposed and empirically tested a model of growth aspirations through which it was analyzed the possibility to identify potential high growth entrepreneurs through its innovative behavior and export orientation in presence of financial capital.

### *Regional Efficiency Index for New Venture Creation and Job Generation*

3. Measure the efficiency in the use of regional resources for new venture creation and job generation.

In light of Resource based view extension to the region, it was applied the Data Envelopment Analysis (DEA) to build an Entrepreneurial Regional Efficiency Index to identify the regions with a more efficient use of their resources, not only for new venture creation but also for employment generation. The index was then used for a cluster analysis from the weights of resources to determine those that are the most important for new firm and employment creation.

**Table 1.1 Dissertation Structure**

Objective	Type	Level of Analysis	Theoretical Framework	Methodology	Variables	Sources	Article
High Job Growth Profile	Empirical	Individual (Motivations)	The Theory of Planned Behavior	Hierarchical Regression	<ul style="list-style-type: none"> <li>▪ Job Growth Aspirations</li> <li>▪ Increase-wealth</li> <li>▪ Independence</li> <li>▪ Household income</li> </ul>	Global Entrepreneurship Monitor	1
		Individual (Abilities and Opportunities)	Innovation and Internationalization Theories	Hierarchical Regression	<ul style="list-style-type: none"> <li>▪ Job Growth Aspirations</li> <li>▪ Product newness</li> <li>▪ Low competition</li> <li>▪ Recent technology</li> <li>▪ Export orientation</li> <li>▪ Financial capital</li> </ul>	Global Entrepreneurship Monitor The World Bank	2
Regional Efficiency Index	Empirical	Regional (Resources)	Resource-based View	Data Envelopment Analysis (DEA) Cluster Analysis	<ul style="list-style-type: none"> <li>▪ New firms</li> <li>▪ New Jobs</li> <li>▪ GDP</li> <li>▪ Labor Force</li> <li>▪ Human Capital</li> <li>▪ Existing companies</li> <li>▪ Number of Entrepreneurs</li> </ul>	INEGI	3

## **Chapter 2. Opportunity Motivation and Growth Aspirations of Mexican Entrepreneurs: The Moderating Role of the Household Income**

### **2.1 Introduction**

Traditionally, the entrepreneurial aspiration for growth has focused, among other factors, on how business growth is affected by Information and Communication Technologies (ICT)-based strategies, mainly through the application of e-commerce and ERP (Kujala & Halonen, 2018; Yan et al., 2019), ownership (Yang et al., 2019; Osnes et al., 2019), offshore outsourcing (Munjal et al., 2019; Rodeout & Gray, 2013), entrepreneurial education (Kariv et al., 2019), innovation (Briganto & Samson, 2019), and political connections (Widyanto et al., 2019; Castaño-Martínez et al., 2015). Training, networking, and trust have a positive effect on growth aspiration, and entrepreneurs use these practices in response to institutional deficiencies (inadequate educational systems, inefficient courts, and other formal institutions) (Lajqui & Krasniqi, 2017). Growth-aspiring entrepreneurs benefit simultaneously from strong government (in the sense of property rights enforcement), and smaller government, but are constrained by corruption (Estrin et al., 2013). This study contributes to the existing academic literature by theoretically examining the interaction effect of household income on the relationship between opportunity-based entrepreneurial motivations and business growth aspirations. We propose a model for growth aspirations with two explanatory variables: wealth increase and independent motivation, and a moderating variable, namely, household income, which has a positive impact on the motivation for growth.

Motivation is a necessary condition for achieving growth (Stenholm, 2011) and takes place under limited volitional control. Actions based on motivation are dependent on the perceived outcomes, abilities, and opportunities associated with the intended behavior (Delmar & Wiklund, 2008; Ajzen, 1991; Davidsson, 1991; Wiklund & Shepherd, 2003). We use the Theory of Planned Behavior in our study to determine entrepreneurship, as this theory is based on studying how entrepreneurial beliefs are defined by both subjective norms related to other people's expectations, and a perceived behavioral control linked to people's perceptions of their ability to perform a given behavior. In this sense, the Theory of Planned Behavior has been successful in predicting responses under limited volitional control (Ajzen, 1991; Wiklund & Shepherd, 2003; Doll & Ajzen, 1992).

Regarding motivations, people are primarily guided by opportunity entrepreneurship to increase wealth, and to achieve independence, recognition, and social status. Opportunity motives are also referred to as pull motives. Regarding economic wealth, it is the most critical factor affecting entrepreneurial growth preferences (Cassar, 2007). The desire for financial independence is the second most cited pull factor in starting a business (Shane et al., 1991; Kolvereid, 1996; Carter et al., 2003; Van Gelderen & Jansen, 2006). However, individuals may also be factor-driven by necessity, especially seen when there is a threat of unemployment, which forces people into self-employment (Storey, 1994). Necessity motives are also referred to push reasons, as a considerable number of startups are being created out of necessity. Besides, growing a firm is a much more a committed

act than establishing a new firm; thus, the Theory of Planned Behavior is better suited to explain growth aspirations rather than creation of startups.

Liquidity constraints are an essential element to disable entrepreneurs to carry out their business opportunities (Evans & Jovanovic, 1989; Holtz-Eakin & Smeeding, 1994). Therefore, securing funding may be necessary for achieving goal growth. As most entrepreneurs provide a substantial percentage of start-up capital, the household income is closely connected to financing startups. Access to personal wealth is a crucial barrier to entrepreneurial activity, and a lack of personal wealth typically restricts the scale of entrepreneurial activity engaged by the individual (Casson, 1982). Family characteristics imply the emergence of new firms, opportunity recognition, startup decisions, and resource mobilization (Aldrich & Cliff, 2003). Financial resources in the family are of great importance on entrepreneurial intentions (Raijman, 2001). Thus, high-income households are able to finance firms and the necessary resources for business growth.

In sum, opportunity-based motivation and household income are important determinants for growth aspirations, and thus, they have been targeted by several studies. Both have strong theoretical backgrounds and have obtained empirical support as predictors of growth aspirations. However, they have generally been studied separately and only rarely together in the same study. Household income may indirectly affect the attitudes, intentions, and behaviors to become entrepreneurs (Shapiro & Sokol, 1982). Entrepreneurs coming from high-income households place a higher demand for the quality of entrepreneurial opportunities. High-income households provide fertile environments for accessing high-quality opportunities because the social connectivity associated with financial wealth enables individuals from high-income households to see more entrepreneurial opportunities for growth (Dunn & Holtz-Eakin, 1996). Thus, the effect of opportunity-rooted motivations on entrepreneurial growth aspirations is moderated by higher household income. This work addresses this gap related to the entrepreneurial ambitions for business growth.

We outline in Section 2 the most relevant theories related to these issues, and we set several testable hypotheses. Section 3 describes the data and methodology. Section 4 shows the results that are discussed in Section 5. We end with conclusions.

## **2.2 Theoretical Framework**

### *2.2.1 The Theory of Planned Behavior and Entrepreneurial Growth Aspirations*

Entrepreneurial growth aspirations have been the subject of different labels and measures (Hermans et al., 2012) to examine the entrepreneurial willingness for growth (Cassar, 2007; Davidsson, 1991; Wiklund et al., 2009), where entrepreneurial culture has an important role to play. Willingness and entrepreneurial efforts measured by entrepreneurial intentions or aspirations (Kolvereid, 1992; Cliff, 1998; Dutta & Thornhill, 2008) strengthen business growth. Notably, the term 'ambitious entrepreneurship' studies the quality of the entrepreneurial activity, which refers to entrepreneurial initiatives and behaviors capable of boosting their firms along the lifespan of the company (Gundry & Welch, 2001; Guzmán & Santos, 2001).

There is a wide range of factors influencing individual decisions to become a growth-oriented entrepreneur, including: entrepreneurial demographic characteristics (gender,

age), wealth, household income, current working status, individual human capital (education, working experience), own perceptions towards entrepreneurship (opportunities recognition, fear of failure, entrepreneurial skills, and abilities), motivations (opportunity or necessity-driven entrepreneurship), and some institutional and macroeconomic factors, such as property rights, government activity, financial capital availability, inflation rate, and country risk (Autio & Acs, 2010; Pete et al., 2011; Estrin et al., 2013). The combination of these factors explains why entrepreneurs vary their intentions considerably for business growth (Kolvereid, 1992; Gundry & Welch, 2001), also showing a complicated relationship between growth intentions and firm growth (Stenholm, 2011) because economic, social, and psychological variables come together in the business creation process.

Business development is a prevalent dimension when researchers empirically capture entrepreneurial growth aspirations. Motivational theories provide a plausible explanation for the differences in growth rates between firms and are built on the premise that motivation affects behavioral choice, business longevity, and organizational effort. Thus, the psychological construct of motivation is essential, especially in research on entrepreneurship. Different entrepreneurial behaviors and abilities have important effects on the entrepreneurial process (Tominc & Rebernik, 2007), especially on firm growth (Delmar & Wiklund, 2008). Both microenterprises and SMEs, and the importance of owners' or managers' willingness to grow is likely to be relatively more significant than in large firms (Tominc & Rebernik, 2007). However, not all entrepreneurs are willing to make their business grow since they may expect some consequences of growth to be negative and in conflict with their goals (Storey, 1994).

The motivation for growth affects how SME managers make their choice to expand the firm, the willingness to sustain this decision over time, and the level of effort in the endeavor (Delmar & Wiklund, 2008). Motivation has to be relatively stable over time to affect firm growth. Managers working in SMEs are motivated generally to expand their firms during short periods to prioritize other goals and behaviors later. As a result, the motivation for growth is discontinuous (Delmar & Wiklund, 2008; Ajzen, 1991).

The strength of the relationship between motivation and behavior is affected by the individual degree of volitional control, that is, the ability to act on will (Delmar & Wiklund, 2008). The expansion of a firm is an example of a business behavior under limited voluntary control, as firms only grow when managers develop suitable strategies for growth, especially in international markets (Gruenhagen et al., 2018).

A new firm's growth may be under some volitional control, but it is unlikely to be under total volitional control (Wiklund & Shepherd, 2003). The combination of environmental constraints, low skills, and insufficient task comprehension diminishes behavioral motivation (Delmar & Wiklund, 2008). Therefore, managerial motivation has a positive effect on business growth, but this effect cannot be expected to be very large, as behavior is under limited volitional control, and the task of expanding a business can be regarded as complex and fuzzy (estrin et al., 2013), because it is a joint function of motivation and individual ability (Ajzen, 1991).

The Theory of Planned Behavior (Ajzen, 1991) considers limited volitional control. This well-established and validated psychological theory explains and predicts specific actions in particular contexts (Wiklund & Shepherd, 2003), and is regularly applied to different topics related to entrepreneurship. The Theory of Planned Behavior is an extension to the Theory of Reasoned Action complemented with aspects of individual

abilities, thus incorporating behaviors defined by limited volitional control. As expected, this theory outperforms the Theory of Reasoned Action in situations of limited volitional control (Netemeyer et al., 1991).

The core of the Theory of Planned Behavior is the role of intentions that captures motivational factors to influence behavior as an indication of how people are willing to act, and how much effort they plan to exert to behave (Wiklund & Shepherd, 2003). Generally, stronger behavioral intentions carry better performance (Ajzen, 1991) to distinguish between the attitude towards business growth, the degree others consider growth to be remarkable (subjective norm), and the belief entrepreneurs can achieve firm growth (perceived behavioral control). Together, they determine the entrepreneurial intention to pursue firm growth. Generally, a distinction can be made between what entrepreneurs want and what is possible to achieve, given some individual and environmental constraints guided by individual abilities, skills, and opportunities to make grow the firm.

According to the Theory of Planned Behavior, startups are volitional new businesses established to exploit business opportunities to create extrinsic and intrinsic benefits for entrepreneurs, only if they are oriented for business growth (Douglas, 2013). As a result, motivation has a positive effect on growth aspirations, but the effect is limited because firms' growth is under limited volitional control.

### *2.2.2 Opportunity Motives and Entrepreneurial Growth Aspirations*

A second theory for the analysis of entrepreneurial growth ambition is the Push-Pull Theory of Entrepreneurship (Kirkwood & Campbell-Hunt, 2007; Amit & Mueller, 1995; Gilad & Levin, 1986). Push factors are personal or external factors driven by necessity entrepreneurship (Verheul & Van Mill, 2011), and pull factors are those that draw people to start businesses – such as seeing opportunity entrepreneurship (Reynolds et al., 2002). In general, pull factors are found to be more prevalent than push factors (Segal et al., 2005; Shinnar & Young, 2008), especially in developing countries, as the push-pull framework of entrepreneurship focuses on an integrative analysis of forced (push) and voluntary (pull) factors that influence entrepreneurship (Zgheib, 2018).

Startup creation follows the combination of a dynamic pull effect when entrepreneurs consider startups as their mere source of profit and a dynamic push effect when startups generate social change (Uhlener & Thurik, 2007). To avoid this conflict, organizational wealth is needed. We define corporate wealth as the existence of financial surplus and cash-flow generation in an organization. A cash-flow generation is stronger when the competitive advantages generated in innovative enterprises guided by pull, push or mixed processes are organized as clusters (Hanushchak & Shcherbak, 2016).

Generally, people guided by necessity entrepreneurship have lower aspirational levels than entrepreneurs conducted by opportunity entrepreneurship (Reynolds et al., 2002), because entrepreneurs based on necessity are more likely to have limited access to human capital, financial capital, technology, and other resources (Uhlener & Thurik, 2007). Therefore, their potential for generating jobs is expected to be constrained. Necessity entrepreneurs are pushed by unemployment situations or dissatisfaction with their previous posts. For necessity-motivated entrepreneurs, their daily economic survival will depend strongly on the survival of their businesses, which may negatively affect the aspirations they have with their firm (Uhlener & Thurik, 2007).

In comparison, opportunity entrepreneurs are viewed as individuals who start a business to pursue market opportunities and have usually prepared their entry into self-employment on a more solid basis to start their firms in areas of particular expertise. These factors lead to a longer survival rate and higher business growth, as top growth entrepreneurs are more often found to be motivated by business opportunities and firm growth (Hessels et al., 2008).

In our work, we are interested in investigating the extent to which opportunity motives drive entrepreneurial growth ambition. We analyze the two most important types of start-up motivations identified in the literature: (a) increased wealth motivation, which involves reasons that describe the entrepreneurial intention to earn money and achieve financial security (Carter et al., 2003), and (b) the motivation for independence to explain that financial expectations and increased independence are positively related to aspirations for growth (Davidsson, 1991). Stimulated by a new panel survey focused on nascent entrepreneurs, the PSED (Panel Study of Entrepreneurial Dynamics) database also explores the mechanisms behind growth aspirations (Cassar, 2007; Kolvereid, 1992; Autio, 2005; Cassar, 2006). In particular, they link growth expectations with complementary determinants, such as social and financial capital (Shane, 2005), household income (Autio, 2005), and wealth-attainment motivation (Cassar, 2007), as there is a positive relationship between wealth-motivated entrepreneurs and high growth jobs (Uhlaner & Thurik, 2007). Hence, if entrepreneurs choose wealth, they expect a positive correlation for their aspiration to grow. As a result, hypothesis 1 can be drawn as follows:

**H1:** *Increasing wealth motivation augments entrepreneurial growth aspirations.*

Independence describes the entrepreneurial desire for freedom, control, and flexibility in the use of one's time (Shane, 2005; Birley & Westhead, 1994; Scheinberg & MacMillan, 1988). A key motivating factor in the decision to follow an entrepreneurial career is a desire for independence and control over one's working life (Kolvereid, 1996; Bradley & Roberts, 2004). Independence may be understood as the individual's intention to start a new venture that is primarily expected to make independent entrepreneurs while providing income and EBITDA (earnings before interests, taxes, depreciation, and amortization) capable of achieving the financial aspirations of the firm, although it allows for managers with incentives to overinvest in capital and to acquire excessive debt (Rozenbaum, 2019). When digital transformations accompany innovations, they enhance value creation in products and services offered in the market to create digital dividends and foster entrepreneurship (Galindo-Martín et al., 2019).

Startups created for entrepreneurial independence give rise to a relatively broad category needed to include the goal of analyzing different entrepreneurial lifestyles to pursue some entrepreneurial preferred leisure activities, hobbies, and avocations (Storey, 1994). The motivation for independence leads the individual to try harder because every effort generates a direct personal benefit, which leads to the generation of new opportunities to grow. Different lifestyle firms provide their owners with the opportunity to follow a particular lifestyle while earning a living (Barringer, 2000). We argue that entrepreneurs endowed with a strong sense of independence are motivated to expand their firms. Hence, if entrepreneurs choose greater independence, we also expect a

positive relationship for their aspiration to grow. As a result, hypothesis 2 can be drawn as follows:

**H2:** *Entrepreneurial independence increases entrepreneurial growth aspirations.*

### *2.2.3 The Moderating Role of Household Income*

Individuals coming from high-income families may be interested in more lucrative business opportunities than low-income individuals, as entrepreneurs endowed with enormous financial wealth will intend to achieve a higher standard of living (Bhide, 2000). Higher socioeconomic wealth provides more considerable financial resources, which allow entrepreneurs to undertake larger size venturing before using external sources of funding. Besides, the opportunity cost of being a nascent entrepreneur measured by the household income has a positive effect on growth aspirations (Shane, 2005), especially in high-income groups, where high expectation entrepreneurial activity is overrepresented (Autio, 2005). Household income was shown to be a particularly strong predictor emphasizing the importance of financial assets and social capital for entrepreneurial growth expectations (Estrin et al., 2013).

However, if no or only low levels of resources are available, growth is difficult to achieve regardless of whether motivation exists. The Theory of Planned Behavior has been successful in predicting behaviors under limited volitional control. The effect of opportunity motivations on growth aspirations is a function of the extent to which the individual can decide at will to attempt to perform the behavior, and the probability that is trying to complete the action will lead to a successful outcome. Behavioral control, in turn, is influenced by the individual's access to resources and opportunities to exert the behavior (Wiklund & Shepherd, 2003; Doll & Ajzen, 1992; Shane et al., 1991). Therefore, in predicting entrepreneurial growth aspirations, it is essential to assess the specific resources and opportunities that may affect growth.

We suggest household income may have a moderating effect on the relationship between opportunity motives and entrepreneurial growth aspirations for several reasons. First, entrepreneurial households tend to have a greater incentive than employee households to generate considerable sums of household income, both because of their need to offset substantial earnings risks and also to reduce the requirement for costly external finance (Gentry & Hubbard, 2004; Parker et al., 2005). Unlike employees with regular salary payments and some confidence in job continuity, entrepreneurs face a considerable risk that future lump sums may not accrue due to the high potential for downturns in business fortunes. Hence, the incentive to earn money and save is much stronger in entrepreneurial households than in employee households. In practice, therefore, entrepreneurs have both the means and the motive to accumulate wealth and, given the opportunity, will do so (Carter, 2011).

Second, household income is an essential determinant of one's social class, so high-income households may have stronger motives to increase their financial wealth and attain independence, and they, therefore, may get to see better entrepreneurial growth opportunities. This creation of startups is stronger when entrepreneurs make use of their savings to create and grow the company from 3F (family, friends, and self-financing) schemes without relying on external financing. Third, it may be that high-income households are only better able to act on business opportunities they see by mobilizing

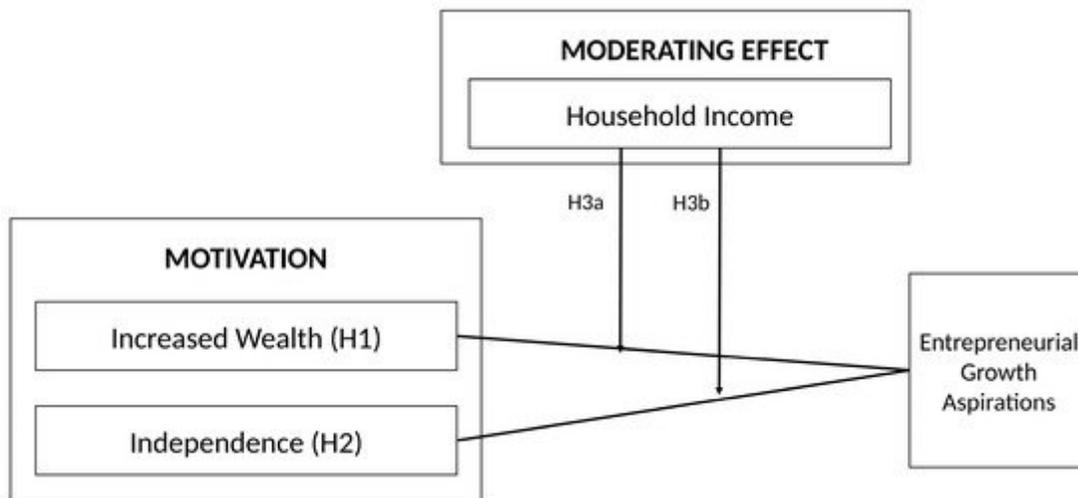
their household wealth for the pursuit of their opportunity motivations. Fourth, high household income may also create a stronger expectation for individual autonomy, lifestyle, and freedom, the pursuit of which could then be reflected in entrepreneurial growth aspiration (Nandamuri & Gowthami, 2013). As a result, Hypotheses 3a and 3b can be drawn as follows,

**H3a:** *Household income positively moderates the effect of increased wealth motive on entrepreneurial growth aspirations.*

**H3b:** *Household income positively moderates the effect of independence motive on entrepreneurial growth aspirations.*

To identify the determinants that might increase the growth aspirations of new entrepreneurs, we propose and empirically test a motivation-based model of growth aspiration (**Figure 2.1**).

**Figure 2.1** A conceptual model of the moderating role of household income on the relationship between opportunity motivations and entrepreneurial growth aspirations.



Source: The authors.

## 2.3 Methodology

The Global Entrepreneurship Monitor (GEM) dataset provides unique information on entrepreneurs' characteristics, ranging from standard socio-demographic characteristics to more specific entrepreneurial traits, perceptual, and attitudinal variables. We can also distinguish between the opportunity and necessity-driven entrepreneurship and high and low growth aspiration ventures. For this study, we will focus on opportunity-driven and growth-oriented entrepreneurship.

The data used in this paper were collected through the National Adult Population Survey (Reynolds et al., 2005). We merged cross-sectional data from all years that the GEM project has been conducted in Mexico (2001, 2002, 2005, 2006, 2008, 2010, 2011, 2012, 2013, and 2014). The GEM data examine entrepreneurial activity while capturing the broadest possible range of business creation activities. Thus, we can distinguish between individuals who are actively involved in setting up a business (nascent), those who are currently owner-managers of a new firm (new), and those who are owner-managers of established business (established).

In this study, we selected the individuals defined as new entrepreneurs, which are those who are currently owner-managers of a business that has paid salaries, wages, or any other payments to the owners for more than three months, but not more than 42 months (814 new entrepreneurs). This category adequately serves the purpose of our study because growth aspirations refer to firms already in existence. The new firm category also provides excellent coverage of the current level of employment used in defining our dependent variable, so this leads to a valid sample of 191 new entrepreneurs.

According to the Mexican Institute of Statistics (INEGI), between 350 and 400 thousand new firms in the country are being created each year, but half-close the first year and only 10 percent will last more than five years. In 10 years, there will be a population of around 80 thousand new firms, considering that this number the optimal sample size is determined by

$$n = \frac{z^2 pqN}{e^2 (N - 1) + pqz^2} \quad (1)$$

where:

- n Size of the random sample
  - z Critical value of the standard normal for a confidence level (z = 1.96). In this study, the confidence level is 95 %
  - e Error (0.08)
  - N Annual population size (80,000)
  - pq Degree of heterogeneity. With absolute uncertainty (p = q = 0.5), this value maximizes.
- Under the above expression, the minimum sample size required is 150 units (95% confidence level), and our final sample was 191.

### 2.3.1 Entrepreneurial Growth Aspirations

According to GEM, opportunity-driven entrepreneurs are those who, despite being able to obtain employment, choose instead to start their own business. An exciting but small sub-segment of opportunity-driven entrepreneurs is made up of individuals who aspire to create a growth-oriented firm. GEM's data on growth expectations of new entrepreneurs are measured in terms of the number of jobs to be created within the next five years. This variable is continuous. As the distribution was biased, a natural logarithm of expected jobs was used.

### *2.3.2 Opportunity Motives*

Respondents in the GEM Adult Population Survey were first asked to indicate whether they are involved in a start-up to take advantage of a business opportunity or because they have no better choices for work. When they indicate to take advantage of a business opportunity, this is considered an opportunity motive, and when they point to have no better choices for work, they are classified as necessity-motivated entrepreneurs. Next, opportunity motivated entrepreneurs were asked to indicate the most crucial motive for pursuing this opportunity, which includes the following elements: increased wealth, independence, maintain income, none of them, and do not know. Based on these questions, we use the indicators which account for the 92% incidence of the entrepreneurial motives:

- (a) Increased wealth motive: the new entrepreneurs declare that their purpose of becoming an entrepreneur was to increase their income, yes = 1.
- (b) Independence motive: the new entrepreneurs declare that their motivation to become an entrepreneur was to obtain greater independence, yes = 1.

### *2.3.3 Household Income*

This GEM variable categorizes household income in tertiles according to national distribution (lowest 33%, middle 33%, top 33%). An annual income of the entire household, including the respondent, must be assured. Among new entrepreneurs, high-expectation activity occurs among individuals who belong to the highest third in the household income segment. Thus, we use a dummy variable that indicates whether the entrepreneur declares that their household income is in the upper third.

### *2.3.4 Controls*

Several control variables are included in the analysis. Age mean-centered; Gender (Male = 1); Education (primary, secondary, postsecondary, and graduate experience); Fear of Failure (yes = 1); Current jobs (we controlled for the individual's current number of employees to capture idiosyncratic variation in initial conditions when analyzing influences on growth expectations. Necessity (the share of entrepreneurs that indicate participation in entrepreneurial activity primarily because they have no other options for work, yes = 1); Industry structure (as a methodological control, we controlled the GEM established business ownership rate (EBO); and Year dummies, the year dummy takes the value 0 for the year 2001 and the value 1 for the years 2002, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2014. We have chosen these years, primarily because of two main reasons: (a) the availability of GEM data in Mexico, so there is discontinuity over the years, and (b) this series of years coincides with the ruling in Mexico of the National Action Party, which led to a political change for the first time in 70 years.

The hypotheses were tested using hierarchical regression analysis. The hierarchical approach is necessary to examine whether an interaction effect exists. This fact will be the case if the interaction term gives a significant contribution over and above the individual predictor effects model (Cohen & Cohen, 1983).

## 2.4 Results and Discussion

This study takes an essential step towards an increased understanding of entrepreneurial growth aspiration. A substantial part of this paper focused on investigating the extent to which opportunity motivation and household income are related to entrepreneurial aspiration in new Mexican firms. We used the Theory of Planned Behavior as a framework from which we empirically investigated the effects of start-up motives on entrepreneurial growth aspirations and the moderating role of household income.

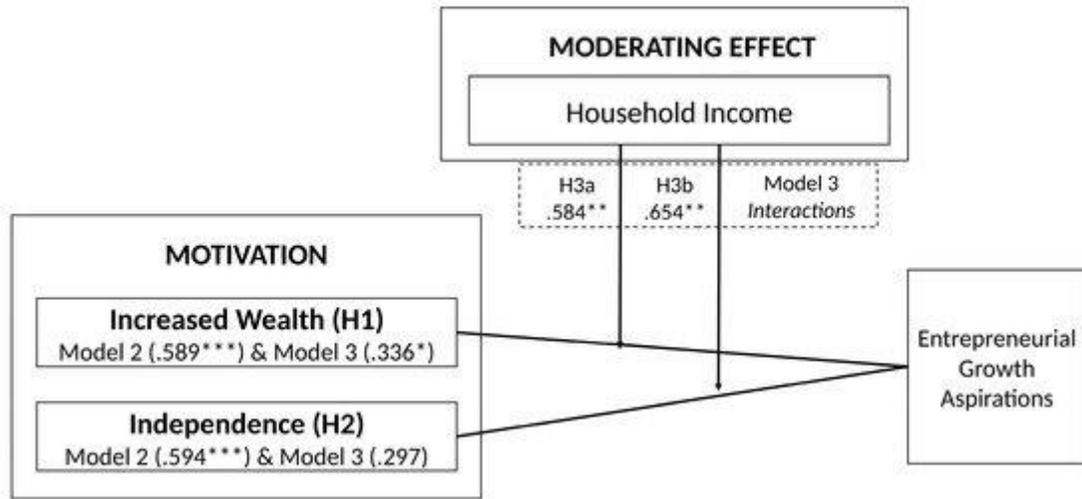
The Theory of Planned Behavior suggests that intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; and these intentions, together with perceptions of behavioral control, account for considerable variance in actual conduct (Wiklund & Shepherd, 2003).

New entrepreneurs with high growth aspirations should be associated with established firms with higher growth trajectories. Previous studies show a positive relationship between growth intention and firm growth (Doll & Azjen, 1992; Cliff, 1998; Dutta & Thornhill, 2008; Baum et al., 2001; Bellu & Sherman, 1995; Kolvereid & Bullbag, 1996; Saemundsson, 2003; Bagozzi & Warshaw, 1992). Thus, knowledge of the determinants of growth expectations of newly founded firms has become a primary focus for researchers, policymakers, and other social enterprise organizations interested in scalable ways to drive economic development.

**Table 2.1** shows descriptive statistics. Male entrepreneurs represent 48% of the sample, 9% have the graduate experience, 24% say they have a fear of failure, 49% belong to high households, 86% are opportunity-driven (54% have an increased wealth motive and 31% an independence motive), and 23% are necessity driven. Correlations of the indicator variables used in the model are presented in **Table 2.2**.

To investigate potential multicollinearity problems, we calculated variance inflation factors (VIF) for all our variables. We found no indication of multicollinearity problems since all our variables are well below the agreed level of 10. Research model results are shown in **Figure 2.2**.

**Figure 2.2** Research Model Results



Notes: \* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Source: The authors.

**Table 2.1** Descriptive Statistics.

	Mean	Standard Deviation	Min	Max
Age mean centered	-1.7454	8.32748	-21.34	35.66
Gender	0.4800	0.501	0	1
Education	0.0900	0.293	0	1
Fear of fail	0.2400	0.429	0	1
Current Jobs	2.5490	3.581	0	69
Necessity	0.2304	0.422	0	1
GEM EBO rate	4.0317	1.029	0.40	5.80
Increased wealth motive	0.5400	0.499	0	1
Independence motive	0.3100	0.465	0	1
Household income	0.4900	0.501	0	1
Increased wealth motive x Household income	0.2400	0.429	0	1
Independence motive x Household income	0.1800	0.388	0	1

Legend: GEM (Global Entrepreneurship Monitor), EBO (Established Business Owners). Source: The authors.

**Table 2.2** Correlation Matrix.

	AMC	G	E	F	N	EBO	HI	IM	IWM	CJ
AMC	1									
G	-0.022	1								
E	-0.080	0.181	1							
F	-0.006	-0.029	-0.142	1						
N	0.017	-0.024	0.036	-0.046	1					
EBO	-0.024	-0.005	0.022	-0.019	-0.061	1				
HI	-0.020	0.066	0.118	-0.079	-0.011	-0.080	1			
IM	0.038	0.053	0.097	-0.100	-0.076	0.093	0.109	1		
IWM	-0.085	0.093	0.069	0.062	0.126	-0.019	-0.065	-0.729	1	
CJ	-0.049	0.171	0.170	-0.042	-0.084	0.066	0.139	-0.080	-0.020	1

*Legend:* AMC (Age mean-centered), G (Gender), E (Education), F (Fear of fail), N (Necessity), EBO (GEM EBO rate), HI (Household income), IM (Independence motive), IWM (Increase wealth motive), CJ (Current Jobs); *Source:* The authors.

As no value exceeds 0.8, the correlation matrix results show a weak degree of correlation between all the studied elements. Concerning age (column 1), calculated using the age mean-centered, the correlation matrix displays meager ( $< 0.10$ ) correlation rates, which indicates that senior entrepreneurs (men and women) have a reduced incentive to start a business. With regards to gender (column 2), correlations are also low, and there are no substantial differences between the values, being education the highest correlation value (0.181), followed by current jobs (0.171), which shows that higher educational levels and current jobs both slightly increase the entrepreneurial growth ambition.

Regarding education (column 3), the highest correlation value is shown between education and current jobs (0.170), which shows a small relationship between the level of studies achieved and the jobs obtained. The fear of fail (column 4) shows a low and negative correlation with household income (-0.079), indicating that entrepreneurs slightly reduce their fear of failure when they undertake business. Regarding necessity entrepreneurship, the highest value in column 5 (0.126) shows that entrepreneurs tend to increase their economic wealth. Household income (column 7) has the strongest correlation with current jobs (0.139), which shows that family income comes primarily from the salary and wage earned in the current job. Related to the motivation for independence (column 8), the highest value (0.729) is found when independence is correlated with economic wealth, as individuals endowed with independent earnings are the only ones capable of being employed.

As seen in **Table 2.3**, the authors have used hierarchical regression to analyze three models formed by control variables only (model 1), control variables and predictors (model 2), and control variables, predictors, and interactions with financial capital (model 3). The control variables age, male, education, fear of failure, current jobs, necessity, GEM business owner-manager rate, and year dummies were first entered in a base model reported in **Table 2.3**, column 1. This model explains a statistically significant share of the variance of the growth aspiration-dependent variable ( $R^2 = 0.22$ ,  $p < 0.001$ ).

**Table 2.3** Hierarchical Regression Results.

	Model 1	Model 2	Model 3
<i>Control Variables</i>			
Age mean centered	-0.042	-0.094	-0.097
Male	0.268	0.121	0.120
Fear of failure	0.000	0.078	0.109
Education	0.228	-0.214	-0.153
Current Job	0.059***	0.041***	0.046***
Necessity	0.042	0.028	0.043
GEM EBO rate	-0.049	-0.005	-0.014
<i>Predictors</i>			
Increased wealth motive (H1)		0.589***	0.336*
Independence motive (H2)		0.594***	0.297
Household income		1.758***	1.214***
<i>Interactions</i>			
Increased wealth x household (H3a)			0.584**
Independence x household (H3b)			0.654**
Constant	2.262	0.615	0.792
N	191	191	191
F	3.928	27.358	24.925
R <sup>2</sup>	0.220	0.710	0.730

Notes: \*p < 0.10; \*\*p < 0.05; \*\*\*p < 0.01 Year dummies were included for the years 2002, 2005, 2006, 2008, 2010, 2011, 2012, 2013 and 2014. Source: The authors.

The predictor variables were entered in the second model: increase wealth and independence motives. The results are reported in column 2 of the table. The predictors' effects model makes a significant contribution over and above the base model ( $R^2 = 0.71$ ), where the change in R-squared is statistically significant ( $p < 0.001$ ). Within the model, the findings suggest that both wealth and independence have a statistically significant influence on growth aspirations, but the independence results for this effect are nonsignificant (0.297), while the interaction effect is positive and significant (0.654,  $p < 0.01$ ), H2 is supported for those entrepreneurs situated in the higher-income levels only. Thus, hypotheses H1a and H1b are supported.

The addition of the interaction terms in the third model gives an explanatory contribution over and above the individual predictor effects model (Column 3). Explained variance increases by 0.71 to 0.73, and the growth is statistically significant at  $p < 0.10$ . This fact suggests that interaction effects are indeed present. Examining the regression coefficients of the interaction terms, it is evident that household income positively moderates the relationship between independence and growth aspiration and the relationship between increased wealth motive and growth aspiration. Therefore, hypotheses H2a and H2b are also supported.

Even though explained variance coefficients are high, we found no outlier influencing the sample. Overall, the results of our empirical exercise support our prediction that people for whom increasing wealth is the prime motive for becoming self-employed tend to be job growth-oriented, which suggests that such a purpose is needed for these types of entrepreneurs to achieve the financial gains that they desire. We also find evidence that independence motive contributes to variation. According to our expectations, household income appears to magnify the effects that increased wealth and independence motives have on growth aspiration.

## 2.5 Conclusions

This study contributes to the existing academic literature by analyzing entrepreneurial growth aspirations in efficiency-driven economies and empirically examining the moderating effect of household income on the relationship between opportunity motivations and entrepreneurial growth aspirations. Consistent with previous findings and others' assumptions, we found that opportunity motivation is positively related to the entrepreneur's intention to expand their business activities. Given the relationship between the increased wealth motive and independence motives concerning aspiration rates, the results of this study also suggest that it is rewarding for policymakers to devote attention to the enhancement of aspiration levels among these entrepreneurs. In Mexico, entrepreneurship policies are already shifting their focus from seeking to increase the number of entrepreneurs to improve the quality of entrepreneurship, which is reflected in the policy focus on high growth entrepreneurship. This fact is an advantage since increased wealth and independence are the two most popular start-up motives that we take into account in our study.

Another interesting finding of this study is that the independent effects model infers that growth aspirations are significantly related to household income. When we jointly consider growth aspirations, opportunity motivations, and household income, we find that household income does indeed play a role – it magnifies the influence that motives have on growth. Given that household income provides more significant opportunities, our findings reinforce the notion from the Theory of Planned Behavior that not only is motivation necessary for behavior, but so are resources and opportunities.

Due to the importance of new firm formations to most economies, such research has important practical implications. For academics, future research should seek to explore the various ways in which policymakers can stimulate people to start their businesses to pursue material gains and or independence. For policymakers, our results suggest that promoting a higher prevalence of the increased wealth and independence motives in the population of entrepreneurs seems to be a somewhat advantageous avenue when aiming to support a higher rate of ambitious entrepreneurship. Furthermore, our results imply that they should be aware that entrepreneurs motivated to start a firm to strive for independence are likely to have a high aspiration for their business and therefore are probably the ones making a significant contribution to the country's employment creation and economic growth.

Nevertheless, there is considerably more to learn about an entrepreneur's growth aspiration. We have taken an important step; however, we must point out some limitations: the nature of the cross-sectional GEM dataset; even though dummies were introduced, the period of time is too long, and economic conditions may vary; the exclusion of less common motives that may influence growth aspirations; and the relative coarse-grained measurement of purposes. As future lines of research, we suggest the size of household income as the proxy variable of financial capital be strengthened by a multi-item operationalization, as well as the assessment of country culture and income level since they may stem from individual differences in opportunity-driven entrepreneurship, motives, and their combination. Finally, another line of research may be the extension of this study to other countries and to thus undertake a comparative study.

# Chapter 3. Product Newness, Low Competition, Recent Technology, and Export Orientation as Predictors for Entrepreneurial Growth Aspirations

## 3.1 Introduction

With a NECI (National Entrepreneurship Context Index) score of 5.21 (min = 1, max = 10) calculated by the Global Entrepreneurship Monitor (GEM), the most important study on entrepreneurship in the world, Mexico ranked 23 in 2018 (out of 54 economies) in the establishment of start-ups. The creation of new firms in Mexico has seen steady growth after the 2008 Global Economic Crisis and has been primarily impelled by 3-helix entrepreneurial schemes formed by private firms impelled by cultural and social norms (6.21, measured in a 9-point Likert scale, 1 = highly insufficient and 9 = highly sufficient), government entrepreneurship programs (5.63), and higher education institutions (HEIs)(6.45). As a result, Mexico has more than doubled its early-stage entrepreneurial (TEA) rate compared to 2010 (10%) and is higher than both the average of the Latin American countries (19.9%) and efficiency-driven economies (15%) (Bosma & Kelley, 2019).

Entrepreneurs search for sustainable long-term business development by launching and leading high-growth firms in terms of job creation, wealth generation, and the development of effective entrepreneurial role models to maximize firm performance (Forth & Bryson, 2019; Nowinski & Haddou, 2019), especially when entrepreneurs increase their perceived behavioral control (Fellnhofer, 2017) and imitate reputed and successful entrepreneurs (Diegoli & Gutierrez, 2018). High-growth firms surge when they dispose of opportunity-based entrepreneurs, have large amounts of information, and are broad-market oriented (Kim & Park, 2019; Bosma et al., 2011; Mahmood et al., 2019). Business growth accelerates when both working performance and efficient management are satisfactory, and entrepreneurial competencies achieve a critical set of optimal input mix (Peters et al., 2018). International markets also speed up firms' growth because they open new business opportunities (Verheul & Van Mill, 2011). As a result, entrepreneurs seek global markets when they (a) have products or services suitable for exportation; (b) face small or immature domestic markets; (c) have intense local and regional competition; and (d) desire to leverage substantial investments in their firms. Consequently, organizations involved in exporting activities are more likely to grow (Kolvereid, 1992; Terjesen & Szerb, 2008), so there is a growing trend in the literature on entrepreneurship that unites international business and entrepreneurship (Perenyi & Losoncz, 2018).

In this study, we find that it is easier to identify potentially high-growth firms, only if they combine innovative behavior, product newness, export orientation, entrepreneurial growth aspirations, new technology, and financial capital. Skills development and new competencies related to creative practice reduce perceived risks and challenges generated during organizational growth (Slevin & Covin, 1997). When perceived threats reduce, and entrepreneurial leadership emerges, firms grow, enhancing the intangible resources of a territory (Trequattrini et al., 2019), especially when new business opportunities arise (Amit et al., 1995; Lumpkin & Dess, 1996; Shane & Eckhardt, 2003). This business effect is only moderated by the entrepreneurial culture of the firm

(Capelleras et al., 2019). Also, growth-oriented entrepreneurs emphasize innovation, technological change, and organizational development as critical elements for business development (Gundry & Welsch, 2001) and leadership, which has a positive influence on other entrepreneurs by enhancing two dimensions of psychological empowerment: meaning and impact (Miao et al., 2018). These findings suggest that the attitude for entrepreneurial growth is moderately attributable to the entrepreneurial and innovative behavior of the firm.

In this changing process, finance plays a vital role. The amount of financial capital available to support strategic endeavors impacts entrepreneurial decisions and affects ventures' growth. Both innovation and the mode of entry into international markets require high levels of financial resources for business development (Wiklund & Shepherd, 2003; Brighthouse & Nakos, 2004). However, little consideration has been given to the indirect relationship between financial capital and new ventures' growth (Gilbert et al., 2006). Thus, we argue that financial capital reinforces both innovation and exports, which increases entrepreneurial growth aspirations.

This paper contributes to the literature through the analysis of the entrepreneurial growth aspirations of the firm in an efficiency-driven economy and the possibility to identify potential high-growth entrepreneurs through their innovative behavior and export orientation in the presence of financial capital. This study is relevant in a context where the number of entrepreneurs is increasing in Mexico, and there is a shortage of venture capital in the nation. Section 2 outlines the theoretical framework and the hypotheses derived from it. Section 3 describes the empirical analysis based on hierarchical regression. Section 4 presents the results and discussion. The paper ends with conclusions related to financial capital, innovative behavior, and export orientation as predictors for sustainable development moderated by financial capital.

### **3.2 Theoretical Framework**

Since 2004, the World Economic Forum ranks countries based on its Global Competitiveness Report (GCI), which integrates the macroeconomic and the micro/business aspects of competitiveness into a single index. The report weighs the capacity of nations to deliver high levels of prosperity and economic wealth to their inhabitants. This fact, in turn, depends on how productively a country uses available economic resources. The GCI separates countries into three specific stages: innovation-driven, factor-driven, and efficiency-driven, each implying a growing degree of complexity in the firm.

An innovation-driven economy is described by idiosyncratic producers and an extraordinary segment of services in the marketplace. The ability to produce innovative products and services at the global technology frontier using the most advanced methods becomes the dominant source of competitive advantage.

Factor-driven economies are susceptible to exchange rate fluctuations, especially in third-world countries, economic cycles, and commodity prices. Underlying factor conditions, such as low-cost labor and unprocessed natural resources, are the dominant basis of competitive advantage and exports. In efficiency-driven economies, substantial investment in efficient infrastructure, business-friendly government administration, strong investment incentives, improving skills, and better access to investment capital allow

significant improvements in productivity. A country's advantage comes from producing more advanced products and services more efficiently.

For an efficiency-driven country such as Mexico, notwithstanding a higher concentration of challenges at the efficiency enhancers' level, one can find important opportunities for boosting competitiveness in the areas of essential requirements and innovation and sophistication factors (Hausmann et al., 2010). As nations move into the innovation-driven phase, they can bear higher salaries and increasing standards of living if their organizations can compete by offering new or unique products and services in the market. At this phase, enterprises must compete by producing innovative goods with the help of very sophisticated and refined production processes rooted in knowledge and innovation.

Previous research suggests that entrepreneurial role models boost entrepreneurial attitudes (Fellnhöfer & Puumalainen, 2017) and set four prerequisites for firm growth: abilities, knowledge, willingness, and business opportunities. As a result, we define sustainable business development as the set of business strategies based on knowledge, innovation, entrepreneurial capacity, and the skills of the company's internal stakeholders to maximize value in the product and/or service offered in the market with the double goal of satisfying customers and preserving the environment. Sustainable business development is the result of entrepreneurial goal-directed behavior, intention being an essential predictor for firm growth (Saemundsson, 2003; Wiklund et al., 1997). Managerial skills are needed for pointing and obtaining other growth-related assets, such as organizational strategies, human resources, good relations with stakeholders, financial resources (Barney, 1991; Sexton & Bowman-Upton, 1991; Wernerfelt, 1984), and administrative skills (Brown & Kirchoff, 1997; Gibb & Davies, 1990; Penrose, 1959). Market changes offer business opportunities for growth based on strategies performed by firms or individuals (DiMaggio & Powell, 2000; Scott, 1995); thus, these opportunities derive from external business environments and are an exogenous factor for firm's growth, where both innovative behavior and product newness have an essential role to play.

Sustainable business development directly depends on sustainable management, defined by the formulation, implementation, and evaluation of both environmental and socioeconomic sustainability-related decisions and actions (Starik & Kanashiro, 2013; Nawaz & Koç, 2019).

### *3.2.1 Innovative Behavior, Product Newness, and Entrepreneurial Growth Aspirations*

Innovative market changes offer new growth opportunities (Brown & Kirchoff, 1997; Tang et al., 2019) supported by the combination of product newness, original market-product strategies, and business policies focused on satisfying market niches. These elements provide additional revenue and growth opportunities to the firm (Gundry & Welsch, 2001; Cho & Pucik, 2005; Kirzner, 1997; Zhang et al., 2018), especially in regions and nations endowed with a high-approval entrepreneurial environment (Wyrwich et al., 2016). However, it may be impossible for the firm to exploit business opportunities if the organization suffers from financial restrictions. To take advantage of business opportunities or to adjust business actions, entrepreneurs need to focus their firms on constant renewal and rethinking of the firm (Gundry & Welsch, 2001; Bauer et al., 2018; Gifford & McKelvey, 2019; Moreno & Casillas, 2008; Stevenson & Jarillo, 2007; Hamel, 2000) to increase their market niche through business innovation.

Firms may renovate their processes, join new markets, adjust the procedure of production resources, and host innovative products and services to the market (Hamel, 2000) when taking advantage of growth opportunities, or developing the abilities required for growth (Kim & Mauborgne, 2005; Langerak & Hultink, 2006). Creative behavior is a measure to adapt and adjust the firm to secure business continuity, where coworkers' feedback is more critical than supervisors' response to increasing innovative actions (Eva et al., 2019; Noh & Lee, 2019; Santos & Alvarez-González, 2007; Subramanian & Nilakanta, 1996).

Literature shows that enhancement in the capability to implement new products in the market is positively associated with firm performance, human resources abilities, and business growth (Scott, 1995; Hamel, 2000; Kim & Mauborgne, 2005; Langerak & Hultink, 2006). Similarly, innovative internal capabilities, such as process improvement, firm performance, organizational growth, and profitability (Chaston & Mangles, 1997; Damanpour, 1991; Wolff & Pett, 2006; Yasuda, 2005), determine investment in the firm. Likewise, external technology acquisitions may even enhance this effect (Martin-Rojas et al., 2019; Tsai & Wang, 2008), especially when practitioners and employees carry out skills, motivation, and opportunity-enhancing jobs (Ogbonnaya & Messersmith, 2019) guided by business-focused personality traits (Som & Suradi, 2019).

When firms grow through internal mechanisms, ventures use innovative product development and marketing practices to identify and develop products to capture prospective clients. Businesses innovate to offer a new (or improved) product or service in the market (Amason et al., 2006). Both innovations (new and incremental) are essential to the venture, but both elements have differing implications for growth performance. For new ventures, initial product entries have the most definite potential to increase the venture's market share (Banbury & Mitchell, 1995; Robinson, 1990). Once a firm is established, human resources are essential for organizational sustainability (Mohd Zawawi & Abd Wahab, 2019), defined as the adoption of a business model to create value that is consistent with the long-term safeguarding and improvement of environmental, social, and financial capital (Wales, 2013). Even then, research suggests that firms endowed with novel products achieve a better position for higher success (Bruton & Rubanik, 2002). Innovation practices, such as the development of new products and services, have a positive and direct effect on business growth (Stenholm, 2011) that is influenced directly by behavior (affective, behavioral, cognitive), direction (change, adapt, disengage), and time (Eager et al., 2019). As a result, we hypothesize that

**H1:** *Product newness has a positive impact on the entrepreneurial growth aspirations of the firm.*

### **3.2.2 Business Competition and Entrepreneurial Growth Aspirations**

Another measure of product uniqueness is the competition level. Well-positioned market niches with increasing customer demands are more worthy than highly saturated markets endowed with full competition (Eager et al., 2019). The goal of a firm is to be competing both in blue oceans (Wiklund, 1998) and purple oceans (Saiz-Alvarez & Colvin-Diez, 2015) to sustain organizational growth, as opposed to red oceans defined by high competition. We expect that a firm facing less competition will have more opportunities to grow, as opposed to a firm facing intense competition in red oceans.

The attitude toward entrepreneurial growth may be partially attributable to the innovative conduct of the firm. However, a reduction in the perceived uncertainty and the increase of expected positive outcomes related to creative practice enhance the organizational aspirations for growth. To date, there is no consensus about the role of innovation regarding high expectations for business growth. Goals for growth go together with wishes in terms of innovation, exports, foreign investment, and the amount of capital needed to grow (Amit et al., 1995; Stuart, 2000), but high levels of innovation do not necessarily coincide with business growth aspirations (Bosma & Shutjens, 2009; Hessels et al., 2008). As a result, we hypothesize that

**H2:** *Low competition has a positive effect on the entrepreneurial growth aspirations of the firm.*

### *3.2.3 Technology and Entrepreneurial Growth Aspirations*

These ideas highlight the importance of how technology-based strategies maintain the internal innovation level for new ventures' growth (Dowling & McGee, 1994). Research suggests that the combination of new products and services, frequency of products and services upgrades, and the use of external technology sources, patents, copyrights (Zahra & Bogner, 1999), advanced technologies (Siegel et al., 1993), and technologically advanced partners make significant contributions for new ventures' growth.

These results show that the role of innovation to reach entrepreneurial success requires additional research, as it is still unclear whether innovation is a prerequisite for strengthening business aspirations and expectations for growth (Hermans et al., 2012). As a result, we hypothesize that

**H3:** *Recent technology has a positive effect on the entrepreneurial growth aspirations of the firm.*

### *3.2.4 Export Orientation and Entrepreneurial Growth Aspirations*

As trade is becoming increasingly important in the global economy, firms need a minimum internationalization degree to be active in many markets with the final goal of innovating for sustainable business growth (Kyläheiko et al., 2011). Especially in some high-tech industries, a firm producing innovative products with a limited domestic market is forced to be internationalized. This internationalization process is low, on average, in factor-driven economies, but increases with economic development (Bosma et al., 2012). Export orientation represents an aspect of globalization that measures trade flows, foreign direct investment, trade barriers, portfolio investment, and capital restrictions. Sometimes, export orientation is an essential dimension of the entrepreneurial growth aspirations of the firm (Mattsson et al., 2019).

However, not only multinationals are internationally oriented, as new and smaller firms are, using the latest technologies for increasingly broadening the scope of their business. Exporting is the first and most common step for a firm's international expansion (Xiao & Park, 2019; Oh et al., 2019; Fornes & Cardoza, 2019), including new foreign ventures (Kylähenko et al., 2011). An increasing number of startups pursue global markets (Prashantham & Floyd, 2019; Sun et al., 2019; Li et al., 2018), especially in Asia

and Europe. The growing significance of early internationalizing firms (international new ventures) challenges traditional internationalization perspectives (Rialp et al., 2005; Jiang & Holburn; 2019). Global new enterprises benefit from reductions and subsidies to reduce international transportation costs and investment barriers, with the final goal of increasing foreign trade and R&D (Purkayastha et al., 2019; Lee et al., 2019). As a result, there is a positive relationship between exports with entrepreneurial growth aspirations and expected business growth (Hsu, 2019). As a result, we hypothesize that

**H4:** *Export orientation has a positive effect on the entrepreneurial growth aspirations of the firm.*

### *3.2.5 The Interaction of Financial Capital, Innovative Behavior, and Export Orientation on Entrepreneurial Growth Aspirations*

Financial capital influences the employment for growth performance of nascent firms. A high level of financial capitalization is outstanding because entrepreneurs buy time to execute strategic objectives successfully, and this enables entrepreneurs to either undertake more ambitious strategies or change their course of business action. As a result, financial capitalization empowers entrepreneurs to meet the financing demands required to sustain business growth (Filatotchev & Piesse, 2009).

The demand for financial resource requirements varies by the type of strategic initiative a venture undertakes. Financial and knowledge-based resources are particularly necessary for supporting significant strategic initiatives carried out by entrepreneurs (Fang et al., 2018). Innovation activities, for example, can require high levels of financial resources. Similarly, international expansion can be a costlier endeavor than just expanding domestically because of substantially higher transportation and transaction costs and higher business expectations. In short, firms wishing for rapid growth need higher levels of financial resources.

Financial capital provides the flexibility needed to support the firm's strategic endeavors and to investigate how entrepreneurs have to accumulate financial wealth to benefit their startups. Recent contributions on aspirations for business growth suggest that ambitious entrepreneurs raise finance to support their expectations (Mole & Levy, 2012) and to obtain financial resources from savings, family, and friends, but soon require additional funds to finance their business growth, and entrepreneurs with less innovative technologies tend to use their savings for growth. For more innovative technologies, financial capital often comes from external sources of capital, such as banks or venture capitalists. Similarly, exportations involve the discovery and exploitation of business opportunities abroad and require substantial quantities of money and other resources, which are often limited in new ventures.

Literature leads us to ask if significantly higher growth aspirations of new entrepreneurs result from the interaction effect between external financial capital, innovative behavior, and export orientation. We argue that high financial capital reinforces innovation behavior, export orientation, and entrepreneurial growth aspirations. Consequently, the main hypothesis and four secondary hypotheses H5 are suggested:

- Main hypothesis

**H5:** *Financial capital moderates positively the effect of product newness, low competition, recent technology, and export orientation on entrepreneurial growth aspirations.*

- Secondary hypotheses

**H5a:** *Financial capital moderates positively the effect of product newness on entrepreneurial growth aspirations.*

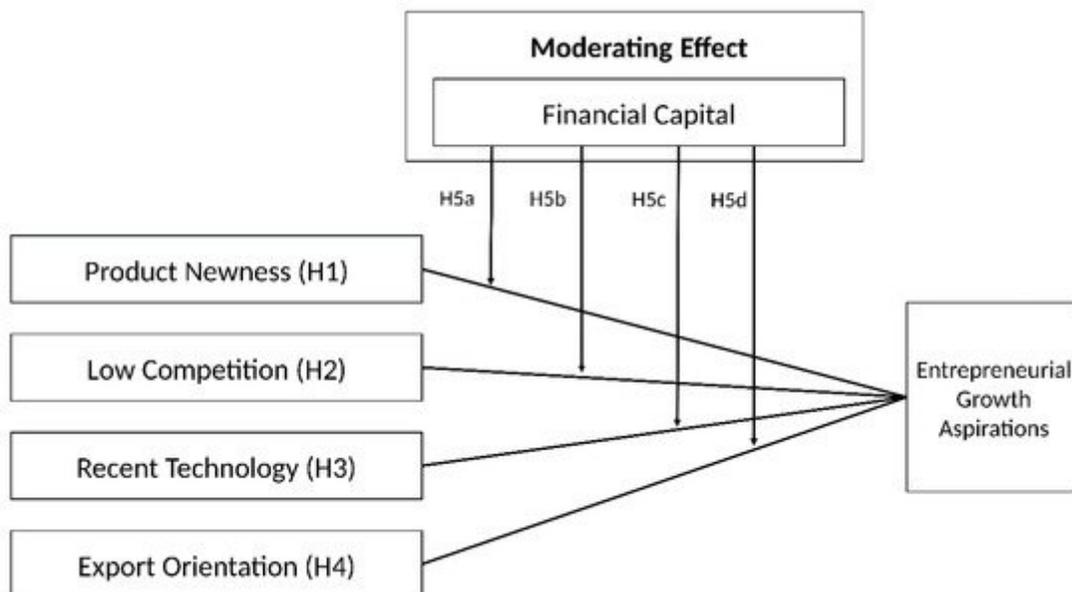
**H5b:** *Financial capital moderates positively the effect of low competition on entrepreneurial growth aspirations.*

**H5c:** *Financial capital moderates positively the effect of recent technology on entrepreneurial growth aspirations.*

**H5d:** *Financial capital moderates positively the effect of export orientation on entrepreneurial growth aspirations.*

We propose and empirically test an innovative behavior and export-oriented model of growth aspirations to identify the determinants that might increase the growth aspirations of Mexican new entrepreneurs, as shown in **Figure 3.1**.

**Figure 3.1.** A conceptual model of the independent and interaction effects of financial capital, innovative behavior and export orientation on entrepreneurial growth aspirations.



Source: The authors.

### **3.3 Methodology**

To test these hypotheses, we use a sample of 512 Mexican new entrepreneurs drawn from the national adult population survey (APS) of the Global Entrepreneurship Monitor (GEM) surveys for the 2001–2014 period. We have chosen these years, according to GEM data availability in Mexico, because they coincide with the ruling of the National Action Party, which led to an entrepreneurial-oriented change for the first time in 70 years in Mexico, as it was partly focused on encouraging entrepreneurship and business creation. In the study, we use young firms as our proxy for entrepreneurial entry. This category serves the purpose of our study well because growth aspirations refer to firms established in the market. Also, young firms provide good coverage of the current level of employment used in our dependent variable.

#### *3.3.1 Entrepreneurial Growth Aspirations*

According to GEM, opportunity-driven entrepreneurs start their businesses, instead of searching for employment. An interesting but small subsegment of opportunity-driven entrepreneurs is made up of individuals who aspire to create growth-oriented firms. GEM data on growth expectations for new entrepreneurs is measured in terms of the number of jobs to be created within the next five years and is defined by similar firms in size, so there is no size effect of job creation. This is a continuous variable. As the distribution is biased, in our study we use a natural logarithm of expected jobs.

#### *3.3.2 Innovative Behavior*

Innovative behavior is evaluated from both perspectives of the market and industry in three ways: customer-, competitor-, and technology-orientated innovation. We use three indicators (dummy variables) for a new venture's innovativeness. First, an indicator is used to reflect a venture's new product/service offered to customers (Product Newness) (Yes, code 1; No, code 0). Second, we apply an indicator to analyze when entrepreneurs perceive that few competitors offer the same product or service in the market (Low Competition) (Yes, code 1; No, code 0). Third, we study if firms use available technologies aged less than one year (Recent Technology) (Yes, code 1; No, code 0).

#### *3.3.3. Export Orientation*

Export orientation assesses the extent to which entrepreneurs sell their products and services to foreign customers. This element is coded 1 for new ventures with at least 1% of foreign customers and coded 0 for new ventures with domestic customers only.

#### *3.3.4. Financial Capital*

In our study, financial capital is measured as the ratio of domestic credit granted to the private sector compared to GDP, as defined by the International Monetary Fund's International Financial Statistics. This measure has been used by Klapper et al. (2010), as a proxy to measure financial capital. Regarding entrepreneurship, financial capital targeted at entrepreneurship is measured as the average of the scores (5-point Likert

scale) on six questions (In my country: (a) there is sufficient equity funding available for new and growing firms; (b) there is sufficient debt funding available for new and growing firms; (c) there are sufficient government subsidies available for new and growing firms; (d) there is sufficient funding available from private individuals (other than founders) for new and growing firms; (e) there is sufficient venture capitalist funding available for new and growing firms; and (f) there is sufficient funding available through initial public offerings (IPOs) for new and growing firms) that capture whether financial capital is projected into a corporation aimed at entrepreneurship (Reynolds et al., 2003). This construct evidences good construct reliability (Bowen & De Clercq 2008).

### 3.3.5. Controls

Previous elements have linked entrepreneurs and firms regarding entrepreneurial growth intentions. The following elements are potential explanatory variables for new entrepreneurs' differing growth aspirations: Age (squared and mean-centered); Gender (Male = 1, Female = 0); Education (Tertiary = 1, Secondary and Primary = 0); Skills & Knowledge (Skills and Knowledge to start a business = 1, No Skills and Knowledge = 0); Business angels, defined as investments on startups during the past 3 years only (Yes = 1, No = 0); Current jobs (Yes = 1, No = 0); Industry structure (Yes = 1, No = 0); and Year dummies (Year 2001 = 0, Years 2002–2014 = 1). We have chosen these years, according to GEM data availability in Mexico, and because these years coincide with the ruling of the National Action Party, which led to an entrepreneurial-oriented change for the first time in 70 years in Mexico, as it was partly focused on encouraging entrepreneurship and business creation. Besides this, as a methodological control, we include in our analyses the GEM established business ownership (EBO) rate.

The hypotheses were tested using hierarchical regression analysis. The hierarchical regression approach is necessary since an interaction effect exists, but it is only relevant if the interaction term gives a significant contribution over and above the individual predictor effects model.

## 3.4 Results and Discussion

To calculate the sample size, we used the following formula

$$n = \frac{z^2 pqN}{e^2 (N - 1) + pqz^2} \quad (1)$$

where:

- $n$  Size of the random sample
- $z$  Critical value of the standard normal for a confidence level. In this study, the confidence level is 95% ( $z = 1.96$ )
- $e$  Error (0.05)
- $N$  Population size (200,000)
- $pq$  Degree of heterogeneity. With absolute uncertainty ( $p = q = 0.5$ ), this value maximizes.

Under the above expression, the minimum sample size required is 384 units (95% confidence level), and our sample reached 512 units, so the sample used is representative and valid as GEM data was used. Related to entrepreneurship, the GEM classifies firms in three groups: startup businesses (nascent entrepreneurs), new firms (up to 3.5 years old), and established firms (more than 3.5 years old). The combination of nascent and new firms is called TEA (Total Early-stage Entrepreneurial Activity). In this study, these 512 Mexican businesses are new firms only, so there is no size effect in the sample (**Table 3.1**).

**Table 3.1** Firms size in the sample.

Micro (1–10)	Small (11–50)	Medium (51–100)	Large (>100)	TOTAL
510	2	0	0	512

Source: The authors.

**Table 3.2** shows descriptive statistics (mean and standard deviation, SD), and **Table 3.3** displays the correlation matrix. The control variables of age, gender, education, skills and knowledge, business angels, skills, current jobs, and GEM established business ownership (EBO) rate were first entered in a base model (Model 1) with no predictors and no interactions, as reported in column 1 (**Table 3.3**). This model 1 explains a statistically significant share of the variance of the growth aspirations dependent variable ( $R^2 = 0.12, p < 0.001$ ).

**Table 3.2** Descriptive statistics. (GEM = Global Entrepreneurship Monitor, EBO = established business ownership).

	Mean	SD
Age	37.36	10.998
Gender	0.50	0.50
Education	0.07	0.256
Skills & Knowledge	0.84	0.371
Business Angels	0.22	0.418
Current jobs	2.793	2.442
GEM EBO rate	3.8988	1.21075
Product newness	0.27	0.442
Low competition	0.24	0.425
Recent technology	0.04	0.184
Export orientation	0.49	0.500
Financial capital	26.8429	4.25

Legend: SD (Standard Deviation). Source: The authors.

**Table 3.3** Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12
1 Age	1											
2 Gender	0.009	1										
3 Education	-0.05	0.155	1									
4 Skills & Knowledge	-0.043	0.025	0.06	1								
5 Business Angels	-0.004	0.102	0.09	0.036	1							
6 Current jobs	-0.018	0.130	0.162	0.008	0.013	1						
7 GEM EBO rate	-0.084	0.082	0.100	0.057	0.114	0.091	1					
8 Product newness	-0.04	0.049	0.181	-0.12	0.047	-0.04	0.067	1				
9 Low competition	0.034	0.009	0.171	-0.126	0.009	0.008	0.027	0.363	1			
10 Recent technology	-0.027	-0.062	-0.052	-0.173	-0.027	-0.01	0.017	0.245	0.193	1		
11 Export orientation	-0.080	0.004	0.204	0.072	0.022	0.085	0.146	0.498	0.466	0.195	1	
12 Financial capital	0.054	0.121	0.382	0.048	0.067	0.086	0.36	0.238	0.167	0.007	0.206	1

Source: The authors.

The results shown in the correlation matrix display the entrepreneurial reality in Mexico. No value exceeds 0.8, which shows a weak degree of correlation between all the analyzed elements. Concerning age (column 1), the matrix displays meager correlation rates. Contrary to developing countries, such as Mexico, developed nations' seniors are more driven by opportunity than necessity entrepreneurship and are primarily internally motivated (Perenyi et al., 2018), as they have the skills, financial resources (Saemundsson, 2003), and time available to contribute to economic activity (Maritz et al., 2015). With regards to gender (column 2), correlations are also low, and there are no substantial differences between the values, education being the highest correlation value (0.155), which shows that higher educational levels slightly increase entrepreneurial growth ambition.

Regarding education (column 3), the highest correlation value is shown between education and financial capital (0.382), which shows that investors and lenders rely on educated entrepreneurs when they grant loans. Skills and knowledge (column 4) are mainly correlated with export orientation (0.072), which shows that more knowledge and skills in international markets help, among other factors, to expand the company abroad. Managerial skills are less correlated with financial capital (0.048) and business angels (0.036). As expected, business angels (column 5) are more correlated with financial capital (0.067) and product newness (0.047) having the tendency to finance preferably new products and services in the market, primarily when firms export new products and services abroad (0.498, column 8) resulted from low competition (0.466, column 9). Regarding employment (column 6), the highest correlation value lies in the financial capital (0.086) followed by export orientation (0.085) since part of the capital obtained or generated in the company is destined to the creation of jobs as organizations grow. Business growth that accelerates when the firms open to new foreign markets.

As seen in **Table 3.4**, the authors have used hierarchical regression to analyze three models formed by control variables only (model 1), control variables and predictors (model 2), and control variables, predictors, and interactions with financial capital (model 3).

Regarding model 1, only three control variables have a statistically significant influence on entrepreneurial growth ambition: business angels (0.258,  $p < 0.01$ ), gender (0.200,  $p < 0.05$ ), and current jobs (0.116,  $p < 0.01$ ) which shows that the entrepreneurial growth ambition is mainly fed by the capital contributed by business angels and, to a lesser extent, by gender and work creation.

**Table 3.4** Hierarchical regression results.

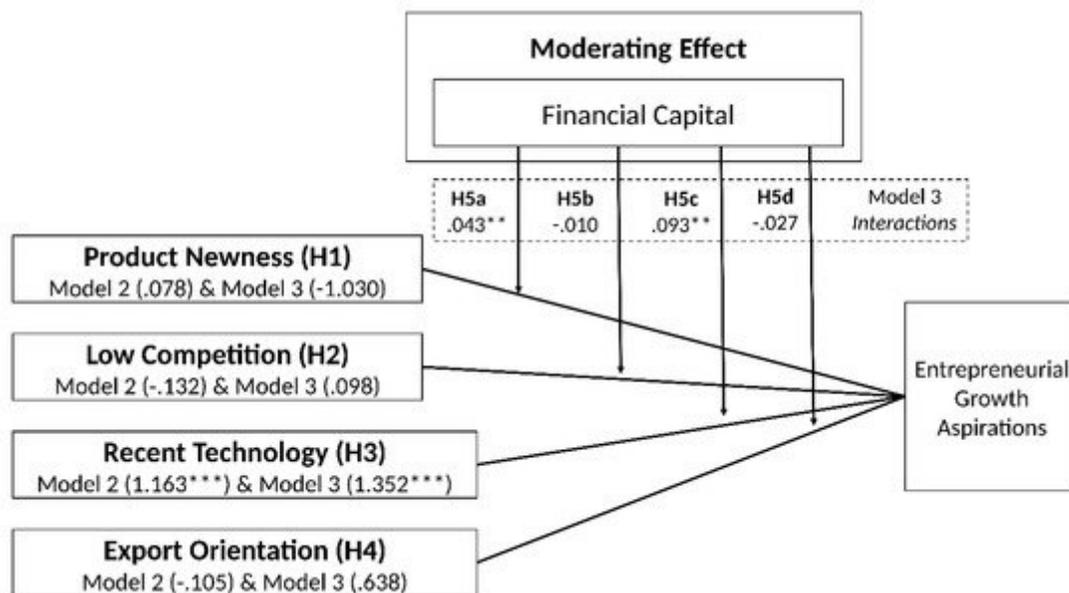
	Model 1	Model 2	Model 3
<b>Control Variables</b>			
Age	-0.001	-0.001	0.001
Gender	0.200 **	0.219 ***	0.227 ***
Education	0.010	0.101	0.051
Skills & Knowledge	-0.195	-0.115	-0.860
Business Angels	0.258 ***	0.257 ***	0.263 ***
Current jobs	0.116 ***	0.113 ***	0.113 ***
GEM EBO rate	0.054	0.057	0.055
<b>Predictors</b>			
Product newness (H1)		0.078	-1.030
Low competition (H2)		-0.132	0.098
Recent technology (H3)		1.163 ***	1.352 ***
Export orientation (H4)		-0.105	0.638
Financial capital (FC)		0.000	0.001
<b>Interactions</b>			
Product newness x FC (H5a)			0.043 **
Low competition x FC (H5b)			-0.010
Recent technology x FC (H5c)			0.093 **
Export orientation x FC (H5d)			-0.027
Constant	0.786	0.716	0.632
N	512	512	512
F	8.063	7.597	6.453
R <sup>2</sup>	0.12	0.17	0.19

Legend: GEM (Global Entrepreneurship Monitor), EBO (Established Business Owners). \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; Year dummies were included for every year. Source: The authors.

In model 2, recent technology is the only statistically significant variable as a predictor (1.163,  $p < 0.01$ ) and has a positive sign, which shows a direct relationship between recent technology and the entrepreneurial growth ambition. This positive impact strengthens when the acquisition and adaptation of brand-new technology into the firm reinforces other elements related to the effective implementation of this technology, such as excellent managerial skills, efficient adaptation costs, and real-time technical collaboration with providers. This direct relationship continues in model 3, where the recent technology is a significant variable, as a predictor (1.352,  $p < 0.01$ ) interacted with financial capital (0.093,  $p < 0.05$ ). There is no evidence that product newness, low competition, export orientation, and financial capital have a predictor effect relationship with entrepreneurial growth aspirations.

Besides recent technology, the second statistically significant variable in model 3 is product newness only when interacting with financial capital (0.043,  $p < 0.05$ ). Product newness also has a positive sign, so this element increases the entrepreneurial growth ambition of the firm. According to these findings, both product newness and recent technology have a direct impact on entrepreneurial growth ambition, as financial capital interacts with innovative behavior, at least partly, by adapting current technology. Results are shown in **Figure 3.2**.

**Figure 3.2** Research Model Results.



Notes: \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Source: The authors.

The moderating effects of financial capital found in this study offer a new perception of the connection between innovative behavior and growth aspirations. As new firms face constant uncertainty and environmental change and struggle against the competition, both financial capital and recent technology seem to help firms in taking advantage of discovering opportunities for growth.

Examining the regression coefficients of the interaction terms, it is evident that financial capital moderates the relationship between product newness and growth aspirations and between recent technology and growth aspirations, but not in the case of the interaction of low competition and growth ambition, and export orientation and growth aspiration.

These results seem to claim causality, as there is a direct relationship between significant causes (product newness and recent technology) and the final effect (entrepreneurial growth aspirations), as the combination of product newness and recent technology (X) increases entrepreneurial growth aspirations (Y). Three commonly

accepted conditions must hold to the claim that X causes Y: functional relationship between cause and effect, non-spuriousness (for a relationship between X and Y to be non-spurious, there must be a Z that causes both X and Y, so that the relationship X and Y vanishes once Z is controlled) (Suppes, 1970), and time precedence (for X to cause Y, X must precede Y in time, causing in such time precedence a causal asymmetric relationship. As a result, while  $X_t$  causes  $Y_{t+k}$ , it is not possible that  $Y_{t+k}$  causes  $X_t$ ) (Kenny, 2014) By fulfilling these conditions, in our model the combination of product newness and recent technology (X) increases entrepreneurial growth aspirations (Y).

Contrary to what happens in our model, if causality either runs from Y to X or runs both ways (simultaneity) is only when the endogeneity problem emerges. The endogeneity problem arises when the explanatory variables and the error term are correlated in a regression model, leading to biased and inconsistent estimates (Li, 2016). Endogeneity surges in the presence of simultaneity, measurement error, and omitted variables caused by excluded fixed effects and selection (Antonakis, 2014).

To avoid the endogeneity problem, we have used GEM data in our study, because GEM surveys are randomized, which is a failsafe way to eliminate endogeneity, as important sources of endogeneity are the omitted variables bias, caused by omitting fixed effects, omitting selection, and the problem of simultaneity (Antonakis, 2014). All the prevailing econometric remedies to address the endogeneity problem, the Generalized Method of Moments (GMM) has the most significant correction effect on the bias, followed by instrumental variables (IV approach), fixed effects models, lagged dependent variables, and the addition of more meaningful control variables, firm fixed effects, and year fixed effects (Li, 2016), but to mitigate the endogeneity problem, more and more researchers consider firm fixed effects to control for time-invariant firm-specific information (Dang et al., 2018).

Related to the endogeneity problem, firm size affects the independent and dependent variables simultaneously, and it is a more crucial firm characteristic than other control variables (Dang et al., 2018). It is, therefore, advisable to avoid a sharp disparity in the firm size of the companies analyzed. For that reason, of the three groups of companies used in GEM, startup businesses (nascent entrepreneurs), new firms (up to 3.5 years old), and established firms (more than 3.5 years old), we have analyzed new firms only. The reason for this choice is that, inside the TEA, they are the most numerous in the Mexican business reality.

The endogeneity problem can also be driven by unobservable CEO/entrepreneur characteristics. To diminish this problem, Coles and Li (2013) find that CEO/entrepreneur fixed effects capture managerial ability, human capital, and risk aversion, and combined with observable attributes, supply 80–90% of explained variation in managerial delta (the sensitivity of managerial wealth to stock price) and vega (the sensitivity of expected managerial wealth to stock volatility). Unobserved manager attributes deliver a high proportion of explained variation in the dependent variable for executive wealth-performance sensitivity, board independence, the board size, and sensitivity of expected executive compensation to firm risk (Coles & Li, 2016).

### *Robustness*

Regarding structural change, we have used a Chow breakpoint (year 2008) test using GEM data (**Table 3.5**), as there is no parameter instability, the error terms  $u_{1t}$  and  $u_{2t}$  are independently distributed, and in the subperiod regressions are normally distributed with the same (homoscedastic) variance  $\sigma^2$ , that is,  $u_{1t} \sim N(0, \sigma^2)$  and  $u_{2t} \sim N(0, \sigma^2)$  to obtain the

restricted residual sum of squares ( $RSS_R$ ) for the time period 2001–2014 with df (degrees of freedom) =  $n_1 + n_2 - k$ , where  $k$  is the number of parameters estimated, restricted to not different subperiod regressions ( $\lambda_1 = \gamma_1$  and  $\lambda_2 = \gamma_2$ ). Since the two sets of samples are deemed independent, we can add  $RSS_1$  (2001–2008) and  $RSS_2$  (2009–2014) to obtain the unrestricted residual sum of squares ( $RSS_{UR}$ ) with  $df = n_1 + n_2 - 2k$  to study if the First Global Financial Crisis that began in 2008 after the Lehman Brothers bankruptcy and tightening of the conditions for granting financial capital to companies has caused a structural change in both TEA (Total Early-Stage Entrepreneurial Activity) and EBO (Established Business Ownership) in Mexico.

**Table 3.5** Entrepreneurial behavior and attitudes in Mexico in the Adult Population Survey.

Year	Total Early-Stage Entrepreneurial Activity (TEA)	Established Business Ownership (EBO)
2001	17.91	5.83
2002	12.40	1.49
2003	n.d.	n.d.
2004	n.d.	n.d.
2005	5.91	1.89
2006	5.26	2.27
2007	n.d.	n.d.
2008	13.09	4.94
2009	n.d.	n.d.
2010	10.45	0.42
2011	9.62	3.03
2012	12.11	4.67
2013	14.83	4.18
2014	18.99	4.48

n.d.: No data available; Source: Adapted from the GEM (Global Entrepreneurship Monitor) database.

The Chow test affirms that with no structural change then, the  $RSS_R$  and  $RSS_{UR}$  should not be statistically different. Therefore, if we form the following ratio:

$$F = \frac{(RSS_R - RSS_{UR})/k}{RSS_{UR}/(n_1 + n_2 - 2k)} \sim F_{[k, (n_1 + n_2 - 2k)]}$$

We apply the Chow Breakpoint Test (breaking point = 2008) to observe if there are no breaks at specified breakpoints (null hypothesis). The results obtained are shown in **Table 3.6**.

**Table 3.6** Total early-stage entrepreneurial activity (TEA) and established business ownership (EBO) results with the Chow Breakpoint Test.

	TEA	EBO		TEA	EBO
F-statistic	0.921393	0.407969	p-value F(1,8)	0.365218	0.540853
Hannan–Quinn Criteria	59.73239	41.45015	Akaike Criteria	60.39626	42.11402
Schwarz Criteria	61.00143	42.71919			

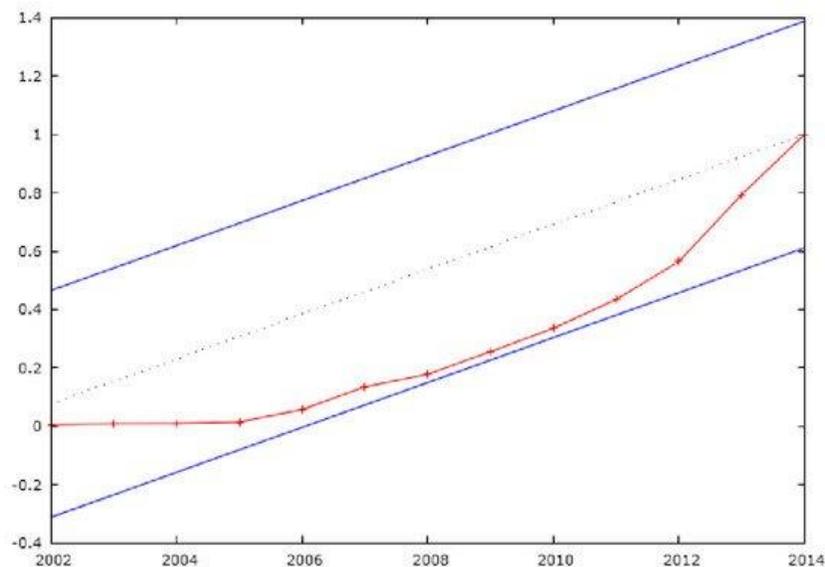
Source: The authors.

As the Chow breakpoint (Year 2008) test of structural change for GEM TEA data is  $F(1,8) = 0.921393 < qF(0.95,1,8) = 5.3177$  and  $F(1,8) p\text{-value} = 0.365218 > 0.05$ , we accept the null hypothesis. As a result, no structural change is observed, and the GEM TEA data is robust and structurally stable. Similarly, as the Chow breakpoint (Year 2008) test of structural change for GEM EBO data is  $F(1,8) = 0.407969 < qF(0.95,1,8) = 5.3177$  and  $F(1,8) p\text{-value} = 0.540853 > 0.05$ , we also accept the null hypothesis. As a result, no structural change is observed, and the GEM EBO data is robust and structurally stable.

Finally, it is fruitful to analyze the stability of the parameters to show robustness. To do this, we use a CUSUMSQ (cumulative sum of squares of recursive residuals) contrast for parameter stability at a 95% confidence level (**Figure 3.3** and **Table 3.7**). The aggregate sum of squares of recursive residues allows observing non-random deviations from their average value line. Mathematically,

$$W_t = \frac{\sum_{j=k+1}^t w_j^2}{\sum_{j=k+1}^T w_j^2} \quad t = k + 1, \dots, T \quad E \left[ \frac{t-k}{T-k} \right] \quad (3)$$

**Figure 3.3** Cumulative sum of squares of recursive residuals (CUSUMSQ) contrast and data results for parameter stability.



**Table 3.7** CUSUMSQ data results.

Year	CUSUMSQ	Year	CUSUMSQ
2001	0.000	2008	0.178
2002	0.005	2009	0.256
2003	0.009	2010	0.335
2004	0.010	2011	0.434
2005	0.014	2012	0.565
2006	0.057	2013	0.793
2007	0.135	2014	1.000

Source: The authors.

As the plot of cumulative sum of squares of recursive residuals (red curve) is always inside the critical bounds (lower limit and upper limit) at 5% significance level, the parameters are stable.

### 3.5 Conclusions

This paper contributes to academic debate through the analysis of entrepreneurial growth aspirations and the possibility of identifying potential high growth entrepreneurs through its innovative behavior and export orientation in the presence of financial capital. We argue financial capital may reinforce the contribution of both innovative behavior and international orientation to growth aspirations. To identify the determinants that might increase the growth aspirations of new entrepreneurs, we propose and empirically test a model of growth aspirations based on innovation and internationalization theories.

From the viewpoint of entrepreneurship and SME development, the challenge for Mexico is, therefore, to move in the coming years from an efficiency-driven to an innovation-driven economy, which is characterized by a stronger presence of innovative small businesses and is associated with the transition towards an upper-income economy. This fact is particularly remarkable for the Mexican states, which need to nurture their local economies beyond the mere attraction of foreign direct investment through the efficient use of its resources, and the promotion of high impact entrepreneurship.

This study takes an essential step toward an increased understanding of entrepreneurial growth ambition. A substantial part of this study focuses on researching how innovative entrepreneurial behavior, export orientation, and financial capital are related to the entrepreneurial aspirations in new firms. Specifically, we have empirically investigated the moderating role of financial capital on the relationship between innovative behavior and growth aspirations, and between export orientation and growth aspirations in Mexican new firms. While there is no consensus on the variables affecting the entrepreneurial growth ambition, we have concluded that the entrepreneurial ambition for business growth depends on product newness only if it interacts with financial capital and recent technology.

The first insight we can provide based on our findings is that product newness moderated by financial capital slightly increases (0.043,  $p < 0.01$ ) entrepreneurial growth aspirations of the firm. This process of entrepreneurial change is stronger when business

angels invest in the firm, as they tend to finance preferably new products and services in the market, primarily when the firm exports new products abroad resulted from the low competition. As a result, investors and lenders only rely on educated entrepreneurs when they grant loans.

The second insight is that recent technologies moderated by financial capital also increases (0.093,  $p < 0.01$ ) the entrepreneurial growth aspirations of the firm. Brand new technology increases competitiveness, helps to open new markets, tends to decrease operating costs, and optimizes productive and commercial processes carried out by firms. These positive effects are being reinforced when the human capital is more specialized, as higher educational levels slightly increase the entrepreneurial growth ambition, as educated human resources expect higher salaries and faster professional careers. This situation is more visible in large companies, and especially in business groups, where labor mobility is greater, and the implementation of technology is fast, in general. Therefore, there is a direct relationship between recent technologies and entrepreneurial growth ambition.

Although skills and knowledge are needed to strengthen entrepreneurship, especially early-stage entrepreneurship, and innovation, empirical results show that business strategies should not be targeted at entrepreneurship in general but should be based on innovative entrepreneurs focused on product newness and recent technology.

In the interactive role of financial capital and innovative behavior on entrepreneurial growth aspirations, it has been assumed that new business objectives match with the owner's goals, which cannot be accurate in entrepreneurial clusters. Besides this, market development and growth opportunities can vary considerably in different industries and nations, so the moderating role of financial capital may change.

However, there is growing evidence that certain types of entrepreneurs matter more than others when it comes to fostering long term economic growth. High impact entrepreneurs are the individuals that launch and lead companies with above-average growth in terms of job creation and wealth creation. As their firms grow and add new jobs, they develop innovations, generate millions in wealth, and act as role models for the next generation of young people in their countries. These entrepreneurs represented only a small minority of entrepreneurial activity. Established firms with high growth trajectories should be associated with new entrepreneurs endowed with higher growth aspirations.

Given these positive economic effects, it is advisable for the public administration to support the adoption of new technologies in the firms by applying tax reductions and subsidies, especially to startups, as happens in many countries worldwide. A complementary strategy should be to incentivize the creation of 4-helix entrepreneurial ecosystems, formed by the interaction of HEIs, the public administration, firms, and NGOs (non-governmental organizations) to incentive both product newness and recent technology with the help of innovation and entrepreneurship through the implementation of public-private initiatives.

Finally, these conclusions lead us to establish two proposals for future research. First, to extend this research based on entrepreneurship to selected efficiency-driven countries to compare them by applying a longitudinal study, and second, to increase the scope of this study to include the aspirations of growth for nascent and established entrepreneurs.

## **Chapter 4. Regional Efficiency Index for New Venture Creation and Job Generation**

### **4.1 Introduction**

It has been acknowledged in academic literature that interest in regional new business formation has three motivations. The first is that there are wide variations in rates of new business formation within the same country and that in many instances it is the more prosperous regions that have higher formation rates. The second reflects an expectation that the creation of new businesses enhances job generation, raises productivity and incomes, and lowers unemployment. A third motivation is based on the observation that most new businesses are set up by local people so that they can be regarded as an element of a region's endogenous economic potential (Fritsch & Storey, 2014).

Recent research concluded that regional resources are among the most important conceptual domains that explain the nature and progress of entrepreneurship (West & Bamford, 2005). However, little has been done to examine the efficiency in the use of regional resources for new venture creation and job generation. A theory that draws on these conceptual domains is the Resource-Based View of the Firm (RBV). A basic assumption of RBV work is that one might describe productive factors in use as having intrinsically differential levels of efficiency. The high returns of efficient firms cannot be attributed to an artificial restriction of output or to market power. Neither do they depend upon uniqueness or even rarity in the absolute sense. It is theoretically possible for rents to be earned by a number of equally efficient producers, so long as an efficiency differential remains between them and other producers (Peteraf, 1993). It is the task of management to utilize a resource stock and extract the most productive services from it in transforming inputs into outputs.

Several RBV extensions have been made to the economy (Mathews, 2002) and the region (Mitra, 2000; Lawson, 1999; Hervás & Albors, 2007; West III et al. 2008) in connection with entrepreneurship. Mathews (2002) describes the RBV of the economy where there are, on the one hand, the activities conducted by firms, which transform inputs into outputs and, on the other hand, there is a configuration of resources. What is of interest is the adaptive capacity of such an economy, in terms of its abilities to generate new resource configurations. The resource economy is where resource recombination occurs and new enterprises are created through new combinations of existing resources, adapted to new perceived needs or opportunities. Lawson (1997) points out that regional competences emerge and reproduce from interactions of agents where some systems of interactions are better, more competent, at facilitating some kind of outcomes than are others. His work supports the notion that the relative performance of regions as well as the relative performance of firms is merely the superficial expression of a deeper competition over competences; that competences not only span products but firms themselves at any point of time; and that firms, like products, may only be the temporary expression of a region's competences.

A region's economic development effort has a similar relationship to the development of a competitive advantage since resource positions and configurations can

be used to characterize a region's ability to generate entrepreneurial activity. Thus, regions must compete for new business development relative to other regions by leveraging their resources, in much the same manner as companies compete in a marketplace for consumers (West et al., 2008). In light of RBV extensions, in this paper we argue that an efficient combination of regional resources related to new venture creation can lead some regions to be more successful in entrepreneurial development than others. Taking all the Mexican states as a sample, we apply the Data Envelopment Analysis (DEA) to build an *Entrepreneurial Regional Efficiency Index* to identify the regions with a more efficient use of their resources, not only for new venture creation but also for job generation. The index is then used for a cluster analysis from the weights of resources to determine those that are the most important for new firm and job generation.

After this introduction, the rest of the paper is organized as follows: In the second section, the Literature Review presents how the RBV relates to efficiency, regions, and entrepreneurship. The third section, Methodology, explains the DEA that gives rise to the Entrepreneurial Regional Efficiency Index. In the fourth section, the results are reported, and groups of states are formed according to the importance of their resources in the index. The paper ends with the conclusions, limitations and suggestions for future research.

## **4.2 Theoretical Framework**

### *4.2.1 Resource-Based View of the Firm and Efficiency*

The Resource-Based View of the Firm (RBV) has traditionally been focused on the generation of competitive advantage at the firm level. The theory attempts to describe those fundamental factors that generate a sustainable competitive advantage. Its basic premise is that the heterogeneous resources that are difficult to transfer or imitate can be a source of this competitive advantage (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991; Dierickx & Cool, 1989; Wernerfelt, 1984; Peteraf, 1993; Teece et al., 1990; Andrews, 1997; Chandler, 1990, Penrose, 1959).

Under this theory, firms are defined in terms of their productive resources (Penrose, 1959), and explains the firm's competitive advantage is based on combining and making use of the resources available or of those that can be developed (Foss et al., 2007). The theory defines firm resources as "*all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm.*" (Barney, 1991), and proposes that a firm has a competitive advantage when it creates a successful strategy based on firm resources that cannot be duplicated by a current or potential competitor. The theory states that a resource must be rare, valuable, inimitable, and non-substitutable to confer an advantage. When resources are valuable for firms, they enable firms to achieve above-average profits or higher market share versus competitors in their industries. Over time, a competitor may be able to duplicate a firm's strategic resources or develop different resources that allow it to attain an advantage.

A basic assumption of RBV work is that the resources bundles and capabilities underlying production are heterogeneous across firms (Barney, 1991). One might describe productive factors in use as having intrinsically differential levels of efficiency. Some are superior to others. Firms endowed with such resources are able to produce

more economically and/or better satisfy customer wants. The high returns of efficient firms cannot be attributed to an artificial restriction of output or to market power. Neither do they depend upon uniqueness or even rarity in the absolute sense. It is theoretically possible for rents to be earned by a number of equally efficient producers, so long as an efficiency differential remains between them and other producers (Peteraf, 1993).

RBV is a theory of management which is concerned with maximizing the creation of value through discovering new activities, rather than appropriating as much value as possible (through cost cutting) from a given set of activities – in keeping with the best of current treatments of the management function (Ghoshal et al., 1999). The disposition of resources within firms is the outcome of entrepreneurial action, or it is bequeathed from earlier resource combinations (Galunic & Rodan, 1998). It is the task of the entrepreneur to assemble a bundle of resources and to capture synergies so that revenues generated (returns from sale of outputs net of costs of inputs) exceed rents paid on the resources utilized; this is the task of producing positive entrepreneurial profits. It is the task of management to utilize such a resource stock and extract the most productive services from it in transforming inputs into outputs. The range of goods and services to be produced with the services provided by such a resource stock cannot be known in advance; it is a matter of discovery, a process of learning, where the outcome depends on the management's knowledge, experience, and capacity for imaginative experiment. Thus, management has the task of rationalizing the resource base in order to capture synergies. Yardstick to measure management performance is then its efficiency in developing, and adapting, the routines needed to put in motion the firm's resource stock (Ghoshal et al., 1999).

#### *4.2.2 A Resource-Based View of the Region*

Mathews (2002) has developed the notion of the RBV of the economy. In his work, he argues that the RBV, while making some welcome progress in accounting for the heterogeneity of firms (in terms of the distinctiveness of their resources and associated capabilities), has nevertheless stopped short of taking its insights into the wider economy. The RBV remains anchored to a view that sees firms developing their resources internally, ignoring the wider aspects of resource exchange. A focus on resources themselves, as fundamental entities, and their production and exchange in the wider economy, is needed to clear away these conceptual obstacles. The evolutionary economics, for its part, discusses the evolution of firms, technologies, markets, or organizational “routines” – but rarely discusses the evolution of resources in general, with some important exceptions (Winter, 1995). Yet resources can be taken as a generalization in a certain sense of all these entities. Likewise, the literature on entrepreneurship, with important exceptions, has remained detached from strategic concerns and has instead focused on equilibrium-returning features of the process. It is only recently that scholars have sought common ground (McGrath & MacMillan, 2000).

Mathews (2002) states that the resource economy may be characterized as the dual of the mainstream, neoclassical “goods and services” economy. As pointed out by Wernerfelt (1984), products and resources are two sides of the same coin. By this is meant that they describe two facets of the same reality, namely a process of production of goods and services. In the economy as a whole, there are on the one hand the activities conducted by firms, which transform inputs into outputs; the terms used to describe these

processes are the familiar ones of inputs, outputs, costs and prices. The object of analysis is to determine for any given set of inputs and outputs a set of prices that will clear all markets, i.e., produce an equilibrium balance between supply and demand. In the resource economy, on the other hand, the object of interest is the configuration of resources, i.e., their distribution in heterogeneous and distinctive bundles, within and between firms. What is of interest is the adaptive capacity of such an economy, in terms of its abilities to generate new resource configurations, and the evolutionary pathways along which such resource configurations develop. These resources, in totality, account for the production of goods and services that are described in mainstream economics (Mathews, 2002).

There is no representative firm in the resource economy; the point is to model firms in all their heterogeneity, starting with their different resource endowments, and moving on to the dynamics of the processes through which these resource endowments may be changed (extended, contracted) through the development of routines and the interrelations between firms (Eliasson, 1984). From the resource perspective, novelty in the economy is generated principally through resource recombination. Entrepreneurial initiative created new activities, whose profitability then attracted imitators, and so the resource distribution in the economy is shifted. The resource economy is where resource recombination occurs. New enterprises are created through new combinations of existing resources, adapted to new perceived needs or opportunities. The new combinations are assembled not by managers but by entrepreneurs or corporate promoters; it is the entrepreneur/promoter who establishes the firm's initial business strategy based on the particular combination of resources assembled (Mathews, 2002).

In a similar effort of theory extension, Lawson (1997) argues there is good ground for extending what he calls The Competence Theory of the Firm to analysis of the region, where the region is understood as a defined geographically productive system. He points out that competences emerge and reproduce from interactions of agents where some systems of interactions are better, more competent, at facilitating outcomes than are others. In his work, he recasts Rumelt's points in terms of regional competences: *the relative performance of regions as well as the relative performance of firms is merely the superficial expression of a deeper competition over competences; competences not only span products but firms themselves at any point of time; firms may only be the temporary expression of a region's competences*. As an example, he cites the Cambridge high technology cluster that recorded a large volume of high technology employment growth of all UK counties between 1980 and 1996. According to Lawson, Cambridge, as a region, had a significant capability for taking new ideas to market via the process of new start-ups.

#### 4.2.3 Entrepreneurial Regional Efficiency

For several years a number of authors have noted the importance of the regional environment in explaining the formation of new firms. Empirical studies have shown that entrepreneurial activity may depend on a variety of factors such as demand, labour force, human capital, industry structure, and entrepreneurial culture (Armington & Acs, 2002; Lee et al., 2004; Sutaria & Hicks, 2004; Fritsch & Mueller 2005; Brixey & Grotz, 2007; Naude et al., 2008; Audretsch et al., 1999; Andersson & Koster, 2011; Bosma & Schutjens, 2011; Dahl & Sorenson, 2012; Fritsch, 2013; Fritsch & Storey, 2014; Bosma &

Sternberg, 2014; Kibler et al., 2014; Westlund et al., 2014). These studies help to identify resources that directly, or indirectly, contribute to new venture creation.

Other studies have shown that the first contribution of entrepreneurship is, naturally, the number of jobs created directly by it (Baptista et al., 2008; Birch, 1979; Fritsch & Mueller, 2005; Van Stel & Storey, 2004). Researchers who have studied the relationship between new venture creation and economic growth at a regional level have operationalized the economic growth with the variable of new employment generation (Acs & Armington, 2004; Audretsch & Fritsch, 1994; Birch, 1987; Fritsch, 1997; Kirchhoff et al., 2002; Van Stel & Storey, 2004).

Both, RBV and efficiency empirical approaches to regional entrepreneurship have been applied separately. For example, Hervás and Albors (2007) translated RBV to the territory to understand which are the cluster's resources and capabilities and evaluates whether a cluster's unique set of resources and capabilities could influence a cluster's performance. Research was applied to leading European ceramic tile clusters located in Spain (Castellon) and Italy (Emilia-Romagna); and West et al. (2008) applied RBV to study entrepreneurship in two regions of Latin America: Chiapas (Mexico) and Athens (Costa Rica). Their findings suggest that each region may develop an idiosyncratic resource position giving the potential for long-term sustainable advantage. Charnes et al. (1989) used Data Envelopment Analysis (DEA) -a non-parametric technique also referred as the non-parametric frontier efficiency approach-, to evaluate and plan the economic development of 28 Chinese cities; and Sutter and Stough (2009) employed it for an analysis of entrepreneurial regional relative efficiency in U.S. metropolitan areas. Moreover, the weights of a DEA efficiency index have been used in several studies to present the significance of the factors involved (Roll & Golany, 1993; Cook & Kress, 1990). The idea behind is that the most favourable factors tend to show a greater weight, which also represents the marginal contribution of the factor (Kao & Hung, 2008).

In light of the literature review, we argue that regional resources associated to new venture creation can lead some regions to be more successful in entrepreneurial development than others and that each region that is not in the efficiency frontier could improve its entrepreneurial ability from resources that contribute most to create new firms and employment. To measure the efficiency in the use of the entrepreneurial capability we suggest a DEA based "Entrepreneurial Regional Efficiency Index".

### **4.3 Methodology**

DEA models based on the quantities used for inputs and those produced in outputs (Charnes et al., 1978) determine the best practices, by comparing the Decision-Making Unit (DMU) selected with all possible lineal combinations of the rest of the units in the sample, in order to use them subsequently to define an empirical production frontier. The efficiency of each unit analysed is measured in terms of the distance to the frontier. It is important to highlight that both inputs and outputs may be expressed in either monetary terms or in physical units. This characteristic is a significant advantage of this technique over others.

Unlike traditional methods based on ratios, in which the search for overall performance evaluation measurements generally forces the a priori establishment of weighting of outputs and inputs, DEA models provide this measurement of overall

efficiency without the need for establishing a priori weights. In fact, it is the methodology itself that assigns them, with the weighting employed for one DMU generally being different to that used for another.

#### 4.3.1 DMUs and input/output variables

The initial step in the analysis was the definition of the DMU's. In this study, the 32 Mexican states represented the individual units to be analysed. The second step was the selection of output and input variables. Our output measures are new firms and the employed personnel. By combining RBV with the DEA, the determinant environmental factors for new venture creation, which refer to the resources available to the states, were incorporated as input variables: gross domestic product, labour force, human capital, existing companies, and number of employers.

In Mexico, state statistics are available from the National Institute of Statistic and Geography (INEGI, from its name in Spanish,). Particularly, the data used in this paper for new and existing business were collected by means of the Economic Census conducted each five years, so the analysis covered the average data sets of the 2009 census. It has also been considered in the selection of inputs that they were not correlated.

##### Outputs

- *New firms*: INEGI sets the observation unit to the "Economic Units" which are defined as: "*The statistical units on which data are collected, which are primarily engaged in some type of permanent business activity, combining actions and resources under the control of a single entity owner or controller to carry out production of goods and services, whether or not for commercial purposes.*"
- *Employment*: The Economic Census also provides information on the employment generated by new economic units by the variable of the total of employed persons, comprised of staff employed directly by the company as well as outside workers provided by other entities and who worked for the economic unit. Employment, as defined, can be permanent, casual or unpaid personnel.

##### Inputs

- *Labour force*: Considered one of the leading indicators for entrepreneurial activity, the *economically active population* variable is taken from data provided by the National Survey of Occupation and Employment of the INEGI.
- *Gross domestic product*: Entrepreneurs are more willing to start their firms in places of high demand. A useful number to estimate this demand is the gross domestic product (GDP) from the INEGI.
- *Number of employers*: The literature review shows that a region with many entrepreneurs has a greater propensity for creating new firms. The number of employers reported by the INEGI was used as a variable of an approximation of the entrepreneurial culture.
- *Human capital*: Human capital is generally measured by the educational level of the labour force. The INEGI provides this information under the heading "Employed population with secondary and higher education".

- *Existing companies:* Given that almost 99% of the companies in Mexico are micro and small (OECD, 2007), the total inventory of economic units by state reported in the Economic Censuses conducted by the INEGI was used as an industry structure variable of the small firms in the economy.

#### 4.3.2 DEA Model

The last stage involved in applying a DEA model is the selection of an appropriate DEA model. The output-oriented model has been chosen because it is considered to be the most appropriate for the prevailing state conditions as it prioritises the maximisation of outputs based on the available inputs. Secondly, it is a radial model. Third, when comparing different states, ratio analysis assumes constant returns to scale because it is supposed that performance does not depend on the size of states. To determine the maximum potential output of each state, the following model was used:

$$(1) \text{Max}_{\mu, \nu} \theta_0 = \sum_j v_j x_{j0}$$

Subject to:

$$(2) \sum_i \mu_i y_{i0} = 1$$

$$(3) \sum_i \mu_i y_{ik} - \sum_j v_j x_{jk} \leq 1 \text{ for all } k=1, 2, \dots, n$$

$$(4) \mu_i \geq \theta$$

$$(5) v_j \geq \theta$$

Where:

$\theta_0$  = the efficiency score of the DMU 0 under analysis.

$n$  = number of DMUs under analysis.

$I$  = number of outputs.

$J$  = number of inputs.

$Y_k = y_{1k}, y_{2k}, y_{ik}, y_{Ik}$  is the vector of outputs for DMU  $k$  with  $y_{ik}$  being the value of output  $i$  for DMU  $k$ ;

$X_k = x_{1k}, x_{2k}, x_{jk}, x_{Jk}$  is the vector of inputs for DMU  $k$  with  $x_{jk}$  being the value of input  $j$  for DMU  $k$ ; and the vector on multipliers respectively set on  $Y_k$  and  $X_k$  where  $i, j$  = the respective weights for output  $i$  and for input  $j$ .

The entrepreneurship index will show a value equal to or greater than 100%. A state is efficient in the use of its resources if it has a rate of 100% and all slack variables are zero. In this case, the state obtains the maximum possible business creations from available resources. An index greater than 100% reflects that the state could increase entrepreneurship and job generation without altering its current level of resources.

Once the index was obtained, it was interesting to group the states based on the weight of their inputs. In this paper, the Cluster Analysis was applied to distinguish the differences of the 32 states with respect to the contribution of efficiency in the utilisation of the inputs. First, Ward's Minimum Variance was used to find the preliminary clusters, based on distribution components. Next, the number of clusters was determined by the cut-off of the hierarchical tree.

#### 4.4 Results and Discussion

The Economic Census of 2009 showed an average of 363,447 new economic units with employment of 740,657 people. The state that created the most companies was Estado de México followed by Veracruz and Puebla. The state with the least number of new firms was Baja California Sur, with Campeche and Colima following. On the employment side, the state with the most jobs generated by the new firms was the State of Veracruz followed by Puebla and Ciudad de México. The states that were the least generators of employment were Baja California Sur followed once again by Campeche and Colima. As forecasted, the country did not show a uniform distribution in new venture creation and new employment.

According to the DEA, a state will have an index of 100% if it is efficient, which denotes the efficient use of its resources in forming new firms and creating employment. However, a synthetic index value above 100% indicates the potential increase in the state's available outputs, given its accessible inputs. For example, a state that presents a rate of 120% would mean that it could increase two outputs by 20% without increasing the level of observed inputs. The data in **Table 4.1** and **Figure 4.1** show the main results in synthetic form. Of the 32 states, only 13 are efficient in the use of their available resources, and these 13 represent only 41% of the total number of Mexican states.

In view of the RBV, there are some interesting observations to be pointed out on the entrepreneurial capability throughout the country. Of the six states bordering the U.S., only Chihuahua showed high efficiency. Oaxaca and Guerrero, two of the Southern states that as a group are generally considered poor, showed high efficiency in the use of their resources. Chiapas, also in the south, almost succeeded in achieving this efficiency. The states with the largest metropolitan areas in the country, Jalisco, Nuevo León and Ciudad de México, had low efficiency in their utilisation of resources despite being among the states where more new firms and jobs were created. Likewise, Baja California Sur and Colima, states that generate less business and employment, turned out to have high efficiency in their utilisation of resources. This evidence the differences in the efficiency of resource use and thus its capacity for new venture creation and employment generation.

As mentioned above, once the coefficients of each state's efficiency in using its resources to form new firms and create jobs were obtained, it was interesting to classify the states into homogeneous groups based on the best utilized inputs. This was done using a cluster analysis applied to the weights the DEA assigned to each of the inputs and outputs (known as virtual weights). Half-linkage clustering between groups allowed categorizing the 32 states into 5 groups (**Figure 4.2**). The first group consists of 18 states, which are characterized by a high weight in the resource "number of existing economic units". The second group consists of three states characterized by a high weight in the resource "gross domestic product". The resource "employed population with secondary and higher education" carried a high weight in the third group, containing six states. The fourth group, consisting of four states, was characterized by a high weight in the factor "economically active population". Finally, the fifth set includes one state that was characterized by an absolute weight on the resource "number of employers."

Table 4.1. Entrepreneurial Regional Efficiency Index

State	Index	Weights				
		Economically Active Population	Gross Domestic Product	Number of Employers	Employed Persons with Higher Education	Existing Economic Units
Aguascalientes	100.00%	0	0	0	0	1
Baja California Sur	100.00%	0	0.03	0.32	0	0.64
Campeche	100.00%	0	0	0.4	0.59	0.01
Chihuahua	100.00%	0	0	0	1	0
Colima	100.00%	0	0.91	0	0	0.09
Guerrero	100.00%	0	0.6	0.02	0	0.38
Hidalgo	100.00%	0	0	0.28	0.33	0.39
México	100.00%	0.04	0.04	0.01	0.03	0.88
Oaxaca	100.00%	0	0.48	0	0.52	0
Puebla	100.00%	0	0.16	0	0.84	0
Quintana Roo	100.00%	0	0.01	0	0	0.99
Tabasco	100.00%	0.17	0	0	0	0.83
Tlaxcala	100.00%	0	0	1	0	0
Veracruz	100.07%	0.99	0.01	0	0	0
Chiapas	105.58%	0.74	0.26	0	0	0
Guanajuato	106.17%	0	0	0	0.44	0.56
Michoacán	111.84%	0	0.03	0	0.97	0
Yucatán	113.65%	0	0.23	0	0.06	0.71
Tamaulipas	116.53%	0	0	0	0	1
Querétaro	120.88%	0	0	0	0	1
Nayarit	121.90%	0.02	0.1	0	0	0.87
Sonora	126.06%	0	0	0	0	1
Nuevo León	126.57%	0	0	0	0	1
Morelos	126.80%	0.1	0.5	0	0	0.4
Durango	130.90%	0	0	0	0	1
Baja California	131.06%	0	0	0	0	1
Coahuila	134.37%	0	0	0	0	1
Jalisco	134.44%	0.8	0	0	0	0.2
Sinaloa	135.33%	0	0	0	0	1
Zacatecas	143.68%	0	0.12	0	0.88	0
San Luis Potosí	144.18%	0.2	0	0	0	0.8
Distrito Federal	179.15%	1	0	0	0	0

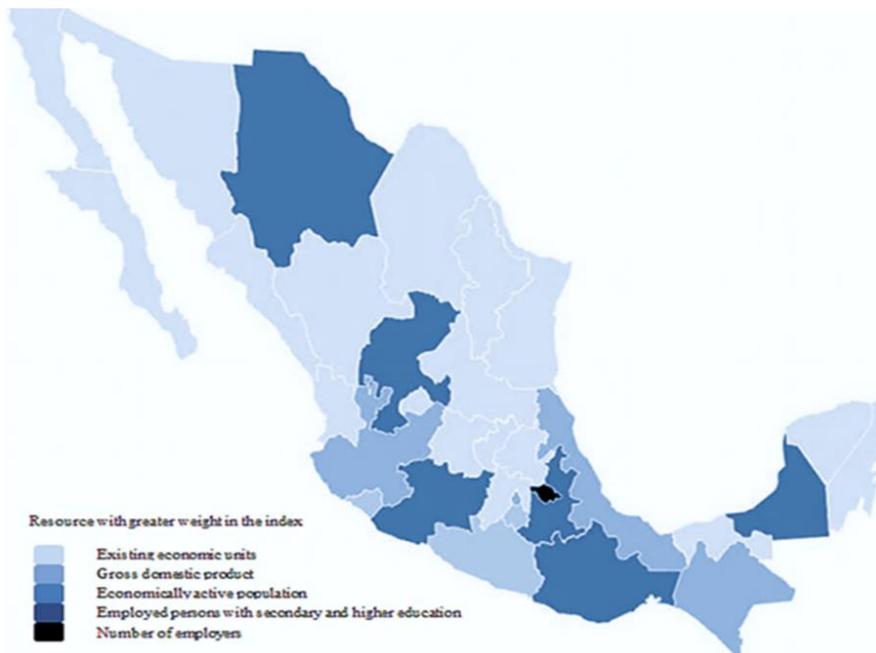
Source: The authors.

Figure 4.1 Efficient and Non-Efficient States



Source: The authors.

Figure 4.2 Regional Cluster



Source: The authors.

Of the 13 states that were efficient in their use of resources, six were characterized by a high weight in the resource "existing economic units" and four in the resource "employed population with secondary and higher education." No efficient state was characterized by a high weight in the resource "economically active population", and only one had high weight in the resource, "number of employers". It is distinctive that all states bordering the United States were characterized by a high weight in the resource "number of existing economic units". The exception to this was Chihuahua, whose highest weight factor was "working population with secondary and higher education", but this was the only resource among these Border States that was efficiently used.

Based on this analysis, it is possible to confirm that, for each state, these are the most important resources for the formation of new firms and job generation. These differences between states and groups of states suggest that the effect of individual and specific resources on entrepreneurial capability is significant.

#### **4.5 Conclusions**

Taking all the Mexican states with their regional resources as a sample, this paper contributes to the current literature by providing a better understanding of entrepreneurship in emerging countries. An innovative contribution of the study is the application of the RBV to the region as well as the use of the Data Envelopment Analysis to construct a synthetic index of regional entrepreneurial efficiency. This allowed the measurement of the efficiency of the Mexican states for both the formation of new firms and the generation of employment.

Through this technique it was possible to prove that the ability to facilitate new venture creation and generate employment depends on the degree of efficiency in the use of the resources available to each of the states. Additionally, a cluster analysis was incorporated in the methodology in order to group the states based on the resources that resulted most important for the formation of new firms and the generation of employment. The findings suggest that each state that is not in the efficiency frontier could improve its entrepreneurial ability from resources that contribute most to create new firms and employment.

From this paper is possible to derive some academic and public policy recommendations: First, state resources explain the nature of the entrepreneurship, and, therefore, that there exists the potential for improvement. Second, these resources permit the designing of entrepreneurial strategies with the advantage of having the unique context that each state must face. Third, each state's ability to generate new business and employment depends primarily on a resource for which policies should be established to maintain or increase it. The findings also suggest that both, scholars and those responsible for local economic development, should pay more attention to the importance of the regional environment for enhancing the conditions for the creation of new firms and jobs.

One limitation of a methodological nature that must be mentioned has to do with the frequency of information updates. While data for all state variables can be found for every year, information for economic units who just started operations are obtained only every five years when economic censuses are conducted. Additionally, the country does not have a record with data of business failures because there are no mechanisms at present that require businesses to report closures. Although the number of companies who fail is essential for obtaining a clear and complete picture of entrepreneurial activity in a country, the lack of this information should not be a deterrent to continue research for an analysis.

In this work, it was possible to derive several lines of future research. The first would be that if state resources for new venture creation in the long-term could be increased, how much should their levels for maximum potential output increase. A second line of analysis could discuss the results of a cluster analysis in terms of strategic groups, a business concept that could be adapted to the regional environment as was the RBV. It would also be worthwhile to lower the level of the analysis to metropolitan areas from which could be possible to obtain certain information compatible to that used in this work.

## **Chapter 5. Conclusions**

### **5.1 Contributions**

Given the importance of innovative entrepreneurship for economic progress, this research contributes to the academic debate by:

1. The analysis of innovative entrepreneurship in an efficiency-driven economy and its contribution to the transition into an innovation-driven economy, in a context where the number of entrepreneurs is increasing, such as in Mexico.
2. The possibility to identify potential high job growth entrepreneurs through their motivations, innovative behavior, export orientation, and the moderating effect of household income and financial capital, when there is a shortage of venture capital in the nation.
3. The development of a synthetic index that measure the efficient use of state resources not only for new venture creation but also for job generation, with the possibility to identify the local resource that most contributes to the efficiency.

### **5.2 Conclusions**

From the viewpoint of entrepreneurship and SME development, the challenge for Mexico is, therefore, to move in the coming years from an efficiency driven to an innovation driven economy, which is characterized by a stronger presence of innovative small businesses and is associated with the transition towards an upper-income economy. This is particularly true for its states which need to nurture the local economy beyond the mere attraction of foreign direct investment through the promotion of innovative entrepreneurship and the efficient use of its resources.

Growth is significantly based on the mindset of the entrepreneur. A decision to grow must be accepted first, followed by the whole array of activities to be undertaken. Policymakers should consider that mindsets are different and that many different cultural, economic, and social factors influence their formation. The policy aim should change cultural perception, which might be done through the educational system.

Our results suggest that promoting a higher prevalence of the increase-wealth and independence motives in the population of entrepreneurs seems to be a somewhat advantageous avenue when aiming to support a higher rate of ambitious entrepreneurship. Furthermore, our results imply that entrepreneurs motivated to start a firm to strive for independence are likely to have a high aspiration for their business and therefore are probably the ones making a significant contribution to the country's employment creation and economic growth.

It is necessary that supportive measures not to be targeted at entrepreneurship in general but be more focused and selective towards those individuals motivated for growth and with high household income. Targeting increases the efficiency of support measures. Focusing resources on a small group of ambitious entrepreneurs – i.e., where they are most needed and where they can produce the best results – is more effective than more generalized support. By applying support only to growth firms, the total requirements, and its cost, are reduced. This increases efficiency as a sufficient impact is made with limited resources.

In the interactive role of financial capital and innovative behavior on entrepreneurial growth aspirations, it has been assumed that new business objectives match with the owner's goals, which cannot be accurate in entrepreneurial clusters. Besides this, market development and growth opportunities can vary considerably in different industries and nations, so the moderating role of financial capital may change.

Although skills and knowledge are needed to strengthen entrepreneurship, especially early-stage entrepreneurship, and innovation, empirical results show that business strategies should not be targeted at entrepreneurship in general but should be based on innovative entrepreneurs focused on product newness and recent technology.

Based on our findings, product newness moderated by financial capital slightly increases entrepreneurial growth aspirations of the firm. This process of entrepreneurial change is stronger when business angels invest in the firm, as they tend to finance preferably new products and services in the market, primarily when the firm exports new products abroad resulted from the low competition. As a result, investors and lenders only rely on educated entrepreneurs when they grant loans.

Another insight is that recent technologies moderated by financial capital also increases the entrepreneurial growth aspirations of the firm. Brand new technology increases competitiveness, helps to open new markets, tends to decrease operating costs, and optimizes productive and commercial processes carried out by firms. These positive effects are being reinforced when the human capital is more specialized, as higher educational levels slightly increase the entrepreneurial growth ambition, as educated human resources expect higher salaries and faster professional careers. This situation is more visible in large companies, and especially in business groups, where labor mobility is greater, and the implementation of technology is fast, in general. Therefore, there is a direct relationship between recent technologies and entrepreneurial growth ambition.

To achieve the necessary progress from an efficiency driven to innovative driven economy, the governmental activities to promote innovative entrepreneurs play a vital role. Since innovative behavior has partly a positive effect on growth aspirations, creating favorable environment for promoting innovative entrepreneurship should be a policy measure targeted at growing firms. The costs, extensive expenditure of sparse resources, time lag, as well as the related uncertainties related to expected outcomes, should be considered when assessing the performance of growth aspired and innovative small firms.

Thus, it is also needed to establish a broad-based entrepreneurial policy that focuses on providing the correct access to financial capital to owner-managers.

The findings also suggest that both, scholars and those responsible for local economic development, should pay more attention to the importance of the regional resources for enhancing the conditions for the creation of new firms and jobs. State resources explain the nature of the entrepreneurship, and, therefore, that there exists the potential for improvement. These resources permit the designing of entrepreneurial strategies with the advantage of having the unique context that each state must face.

Each state that is not in the efficiency frontier could improve its entrepreneurial capability from resources that contribute most to create new firms and employment. So, each state's ability to create new business and employment depends primarily on a resource for which policies should be established to maintain or increase it.

### **5.3 Future Research**

From this study, it is possible to derive several lines of future research. One would be that if state resources for new business creation in the long-term could be increased, how much should their levels for maximum potential output increase. A second line of analysis could discuss the results of a cluster analysis in terms of strategic groups, a business concept that could be adapted to the regional environment as was the RBV. It would also be worthwhile to lower the level of the analysis to metropolitan areas from which could be possible to obtain certain information compatible to that used in this work.

Future research should also seek to explore the various ways in which policy makers can stimulate people to start their own businesses with the aim to pursue material gains. We suggest the size of household income as the proxy variable of financial capital be strengthened by a multi-item operationalization, as well as the assessment of country culture and income level since they may stem from individual differences in opportunity-driven entrepreneurship, motives, and their combination. Another line of research may be the extension of this study to selected efficiency-driven countries to compare them by applying a longitudinal study, and, finally, to increase the scope of this study to include the growth aspirations of nascent and established entrepreneurs.

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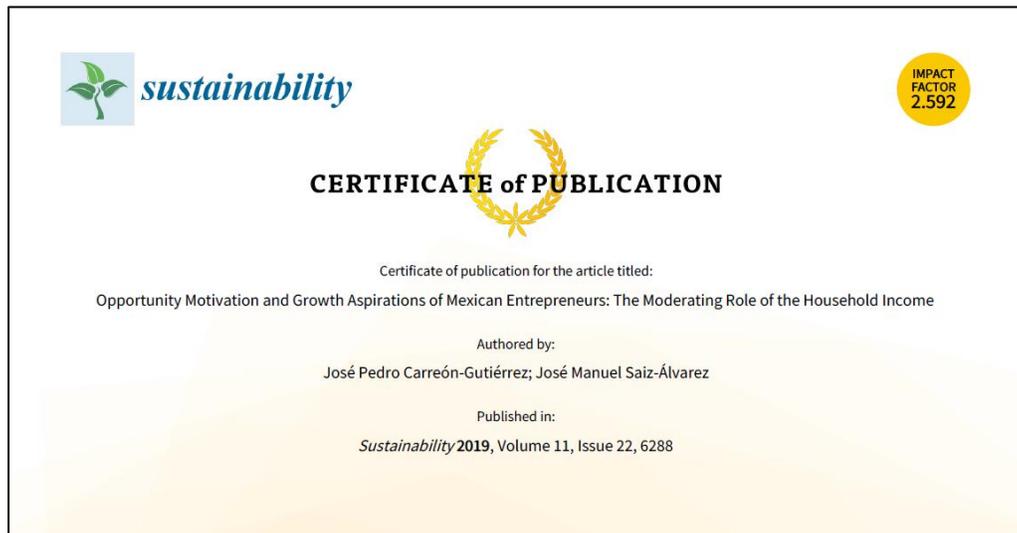
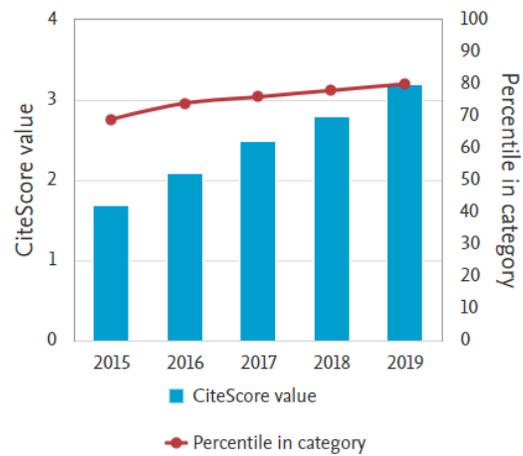
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# Appendixes

## 1. Articles Published in Sustainability Journal (Scopus Q2).

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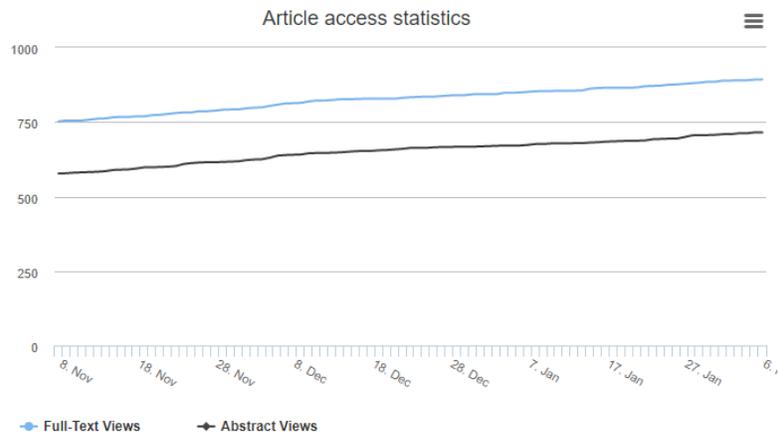
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