

Factors influencing senior entrepreneurship in Chile. A GEM perspective

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Abstract

Objective: The aim of this research is to identify which are the internal factors that lead senior (+55 years) to entrepreneurship in Chile and its comparison with a selected group of Latin American countries.

Methodology: To achieve the previous goal, the analysis is based on the Adult Population Survey of the Global Entrepreneurship Monitor (GEM) of 2016 and uses a logistic regression model applying different variables on the TEA (Total early-stage Entrepreneurial Activity).

Results: The research shows that occupation, level of education, age, knowledge of other entrepreneurs and the entrepreneur's confidence in their own skills are key variables.

Limitations: These study does not consider the external perspective, which reflects how the environment influences entrepreneurial intentions.

Practical implications: Based on these results, governments can better understand what factors they should consider when configuring policies to support entrepreneurial activity in this demographic sector. Furthermore, this work contributes to the development of knowledge about senior entrepreneurship in the country and to the identification of best practices to be used in other countries.

Keywords: Senior entrepreneurship; GEM; Chile; Latin America; Silver economy.

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影响在智利高龄企业家的因素 ——从全球创业观察角度之分析

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文章摘要

研究目的: 本研究目的为确定哪些内在因素能助长智利的高龄人士（55岁以上）创业，并将其与一些选定的拉丁美洲国家进行比较。

分析方法: 为达到上述研究目标，我们根据2016年全球创业观察（GEM）的成人人口调查（APS）的数据进行了分析，并利用逻辑回归模型，对 TEA（早期创业活动指数）应用了不同变量。

研究结论: 研究结果显示，职业、教育程度、年龄、与其他企业家互相认识之关系，以及其对自身技能的肯定是组成高龄企业家的TEA的基本变量。

研究局限: 这项研究没有考虑到外在观点，皆因其反映环境如何影响创业意图。

实际应用: 这项研究的结果能让政府加深理解该年龄层的企业家，在制定支持创业的政策时能够更顾及该年龄层之创业者。此外，本研究还有助加深大众对国家高龄创业活动的知识，并有助人们建立可在其他国家实行的最佳政策。

关键词: 高龄创业、全球创业观察（GEM）、拉丁美洲、银发经济。

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1. Introduction

Senior entrepreneurship plays a relevant role in the development of countries, helping to job creation and unemployment reduction (Maâlaoui & Razgallah, 2019). The increase of entrepreneurship in this demographic sector has a direct impact on the wealth and well-being of societies. Then, it is important for governments and public institutions to understand and identify what are the factors that influence a senior person to initiate an entrepreneurial activity to develop the right policies and programs to foster activity in this age group. Although the ecosystem and the context are relevant in order to understand why new ventures fail or succeed (Brännback & Carsrud, 2019), this research is only focused on identifying the internal factors needed to increase probability of a senior person to become an entrepreneur.

Rouzet *et al.* (2019) consider that given increasing life expectancy and low fertility rates, in most developed and developing countries, the world population is ageing rapidly. Kartuzova (2020) states that, according to United Nations, the most important challenge for developed and developing countries during the 21st century, is increasing lifespans alongside fertility reduction. This has led to the maintenance of the health of the elderly and an increase in their work activity. Age has a major influence on whether an individual starts a new venture or not. Ratios of business start-ups between young and middle-aged individuals are similar, but this ratio falls sharply when people reach the age of 50 (Schott *et al.*, 2017). For example, entrepreneurial intentions are 32% for young age group, 24% for middle-age and 13% for seniors. In the case of TEA (Total early-stage Entrepreneurial Activity) values are 13% for young and middle-age groups and 7% for seniors. (Global Entrepreneurship Monitor, 2017).

The ageing of the population generates concerns from the point of view of the creation of companies, as it can mean a reduction in entrepreneurship (Cossette *et al.*, 2010). In this context, keeping older people in the labour force can have positive effects on the economy and health system. (Heimonen *et al.*, 2012; Weber & Schaper, 2017).

The entrepreneurial trend among older people appears to be on the rise, although there are differences by country and geographical area (Biron & St-Jean, 2019). The entrepreneurial intentions of older people differ greatly around the world. Among older adults, the regions of Sub-Saharan Africa and Latin America and the Caribbean lead the ranking in terms of entrepreneurial intentions. In Latin America, entrepreneurial intention in the 50+ age group is nearly one-third of older people surveyed by the Global Entrepreneurship Monitor (Schott *et al.*, 2017).

The last decade has seen an increase in interest in senior venture research, given the importance of this segment of population in the economic and social development of the economies to which they belong. Senior entrepreneurs are not only important for being creators of value and potential generators of employment, but also for ceasing to be recipients of subsidies and social welfare benefits. This type of entrepreneurship helps to ease the burden on social security systems and pension

funds, creating employment opportunities for non-employed people (Kautonen, 2008). In spite of being so important, mature age entrepreneurship is an understudied area of research (Ratten, 2019).

A growing ageing population implies a larger amount of old healthy people with time available, and human and financial capital to improve economic and social development. The potential this segment of individuals is in many occasions underused. One way of making the best use of them could be fostering senior entrepreneurship (Fachinger, 2019). In the same line of reasoning Bild (2018) states that seniors are very valuable as workforce and for entrepreneurship.

Latin American countries as well as Europe, the United States and other developed economies are under great pressure on their social security systems, due not only to an ageing population but also to decades of mismanagement of national social security funds. It is therefore important to identify the factors that lead older people that choose to start a business in the countries of the region. Identifying these generators can help to understand what policies are needed from governments to promote entrepreneurial activity in this demographic sector and thus create value to society.

The goal of this work is to identify the variables with more influence in the decision to start a new business among people over 55 years old in Chile, using data from the GEM Adult Population Survey (APS) for 2016, identifying the relationship between the most relevant internal factors for making the decision to start a business and the TEA of entrepreneurs over 55 years old. The research is focused on Chile, as there is little scientific literature analyzing the reasons for this group in that country.

The model applied will show that there are some types of factors (demographic, occupational, attitudes and perceptions) that influence in the probability to be a senior entrepreneur in Chile and also that there are differences in the type and probability of those factors among other countries in Latin America.

Chile is a unique example of economic development in Latin America and a very successful nation in terms of entrepreneurial activity and the progress of an ecosystem of entrepreneurs in the area (Cao & Shi, 2020; Startup Genome, 2017). Santiago is considered one of the more dynamic ecosystems in the region. Throughout the last decades, several reforms have been carried out to reduce the barriers to the development of new companies, implementing new programs and initiatives to improve the social perception of entrepreneurship and providing funding at a national level. Some initiatives such as Startup Chile or changes in the legal system to constitute “one-day companies” have enabled Chile to become a hub of entrepreneurship (Muñoz *et al.*, 2020), which has experienced significant growth in its activity (Amorós & Mandakovic, 2017).

1.1. The demographic, economic and social evolution in Chile

Chile is the second country in Latin America in terms of population ageing, after Uruguay (Oelckers, 2015). According to Senama (2013) this trend will continue, with

the number of older adults exceeding 20% by 2025. This publication indicates that, although older adults who are retired exceed 57%, many of them are in a position to remain economically active. A high percentage of pensioners suffer a significant reduction in their income upon retirement, receiving about one third of the salary received when they were active (Senama, 2013), other older adults lose their jobs before retirement, entering into a situation of poverty (Loreto, 2010). In addition, many find it difficult to get a new job due to age discrimination (Senama, 2013).

Given the limited opportunities provided by the labour market for older people, entrepreneurship is not only a good alternative, but can also help to reduce the poverty situation of older people on low incomes or without a retirement pension.

Given the demographic relevance of this segment of the population in Chile, support for senior entrepreneurship can contribute to increasing their income and improving their quality of life, as well as making them feel more useful and valuable, based on the contribution of their knowledge and experience to society.

Regarding the economic evolution of the country and according to the IMF World Economic Outlook database (IMF, 2018) the Chilean economy suffered a reduction in the prices of copper in 2011, starting a prolonged slowdown from which, the economy has been recovering in recent years. Average GDP growth between 2013-2019 was 2,6%, unemployment rate was around 6.5% and inflation rate was approximately 3% during the same period. Although macroeconomic indicators give the idea of a stable economy, some social protests have been occurring since October 2019, when demonstration against a rise in transit fares turned violent, and many Chileans took to the streets to protest against high cost of living and inequality (Meyer, 2020).

1.2. Entrepreneurship in Chile. A GEM perspective

The social value of entrepreneurship in Chile is very high. This is evidenced by the fact that three out of four adults state that entrepreneurship is an attractive career and that the social status of successful Chilean entrepreneurs is high (Guerrero & Servey, 2018). These figures are well above the average for Latin American and OECD countries. In addition, six out of ten Chileans indicate that successful entrepreneurs are frequently featured in the media.

In addition, the Chilean population has a very favorable perception of their attributes for entrepreneurship such as creativity (80%), entrepreneurial skills and knowledge (76%) and knowledge of entrepreneurs who act as a reference model (71%). Furthermore, there are other factors: the favorable role of the country's ecosystem in the entrepreneurial activity –the highest in Latin America–; the scarcity of work; the desire to increase income; a social purpose and family tradition, which contribute to the entrepreneurial intention of the Chilean adult population, being well above the average of the reference countries, standing at 58% in 2019, after ten years of continuous growth (Guerrero & Servey, 2018).

Among the limiting factors which make it difficult to put intentions into practice, it is worth highlighting the insufficient perception of business opportunities, the lack of proactivity to materialize this opportunity, the insufficient opportunities in the field of knowledge or the lack of previous experience, the inadequate conditions to exploit the opportunities based on the resources available and the environmental conditions in relation to the market in which it is undertaken (Guerrero & Servey, 2018).

The above factors explain why, despite the high level of entrepreneurial intention, the TEA has been established in recent years at around 25% (although in 2019 it has risen to 37%) (Guerrero & Servey, 2019). According to the Adult Population Survey (GEM, 2016) entrepreneurial intention in Chile for young people is 14%, for mid-age group is 20% and 10% for seniors. Regarding TEA for the young group is 6%, mid-age 11% and seniors 5%.

Various factors such as the difficulty of access to the labour market, the pension situation, migratory movements in recent years, low interest rates and efforts to consolidate the entrepreneurial ecosystem by the public administration are other elements which help to explain the remarkable increase in new entrepreneurs.

Despite the high entrepreneurial spirit, start-up companies face great difficulties in consolidating their business –only 10% of the adult population is involved in established businesses–. Various factors contribute to this, including the following: (a) a significant number of entrepreneurs are motivated by the absence of opportunities in the labour market –69% of entrepreneurship is by necessity–; (b) high concentration in commercial activities; (c) little attention to the international market; (d) innovative orientation which decreases with age.

The rest of the article is structured as follows: section 2 briefly reviews the literature on senior entrepreneurship, presenting the findings of the main empirical studies that address the impact of social, economic psychological and institutional factors on senior entrepreneurship, the role played by economic freedom and also by the quality of governance on entrepreneurial motivations; section 3 presents the methodology used, the sample surveyed, the variables and the econometric methods used; section 4 discusses our empirical results. The final sections discuss and conclude the study, identify limitations and indicate the implications of our results.

2. Literature review

In the study of entrepreneurial intention or the creation of companies by senior citizens, different approaches have been used from a social, economic or psychological perspective, or a combination of these. From a social perspective, the studies aim to analyze the influence that society might have on the intention to undertake or to initiate new ventures among the senior population. According to this approach older entrepreneurship is a social process and their interest in entrepreneurship is influenced by social context in which people live and work (Caines *et al.*, 2019). Research

from an economic perspective analyses the economic impact of new businesses created by older entrepreneurs, or seen in a different way, the effect of the economy on the activity of this group of entrepreneurs. From a psychological approach, the capital, –considered in human social and financial terms– that seniors have accumulated along the time, their personal lifestyle and family considerations are analyzed (Patel & Gray, 2006). Many studies use a multidimensional approach.

An important part of the research on senior entrepreneurs refers to who they are, what factors motivate them to try to start a business and how they proceed to create or acquire the business.

Given that studies on senior entrepreneurship are relatively recent, the definition of senior entrepreneurship by various authors does not show consistency (Biron & St-Jean, 2019). In the majority of research, senior entrepreneurs' definition is related to the group of age of which they are part. In this work, a definition is used in line with the categorization used by several authors (Rossi, 2009; Tornikoski *et al.*, 2012; Small, 2012), who define senior entrepreneurs as those people aged 55 or more, who decide to carry out an entrepreneurial activity.

There are different approaches to analyze the motivations and explanatory variables of the intentions of senior entrepreneurs. From a psychological perspective, in most research the main motivators belong to the “pull / push” dichotomy. The first one is associated to necessity and respond to negative motivations meanwhile the seconds respond to entrepreneurial opportunities. Among the pull factors can be considered the self-realization, the desire to increase income to get one most cherished goal, or to maintain a good personal and social activity level. (Wainwright *et al.*, 2015; Heimonen *et al.*, 2012; Matos *et al.*, 2018; Soto-Simeone & Kautonen, 2020; Weber & Schaper 2004). Negative motivational factors arise from dismissal or lack of satisfaction in their professional activities, causing conflicts between individual aspirations and reality (Harms *et al.*, 2014), reduction in wages and job stability (Weller *et al.*, 2018), or from situations where an alternative career does not generate enough income. Other factors that may motivate older people to become entrepreneurs are: their near environment (friends, labor colleagues, family members, etc.), previous labor experiences (Tervo, 2014), the opportunity of diminishing working hours, being physically active, changing the way they do and see things (Fraser *et al.*, 2009), to have an alternative to waged employment or diversify income away from risk (Caines *et al.*, 2019; Weller *et al.*, 2019), or increasing their working hours flexibility having more flexible working hours (Zissimopoulos & Karoly, 2007). Duhamel *et al.* (2016) demonstrate the existence of negative, non-linear relation, between the age of individuals and the entrepreneurial intention, and Kautonen *et al.* (2015) show that psychological age predicts better the entrepreneurial intention than real age.

Having more human capital facilitates entrepreneurship. Seniors have more work experience and technical and administrative skills to initiate entrepreneurial activity (Kautonen *et al.*, 2008; Weber & Schaper, 2004; Singh & DeNoble, 2003). The likelihood of entrepreneurship is higher for older adults who have undertaken in the past compared to those who have worked in activities that required less knowledge

and skills and whose wages were lower (Fuchs, 1982; Kautonen *et al.*, 2010). Social capital also plays a key role in promoting the entrepreneurial activity of seniors (Pilkova *et al.*, 2014). Networking facilitates senior entrepreneurship (Baucus & Human, 1995; De Bruin & Firkin, 2001).

Financial resources obtained throughout working life can boost senior entrepreneurship (Singh & DeNoble, 2003). In addition, Kibler *et al.* (2011) point out that there is a greater capacity to take risks with age, as they do not have economically dependent children.

The search for active ageing, which allows a balance between work, income and leisure time, is another factor facilitating entrepreneurship (Kibler *et al.*, 2012). This is related to keeping busy, earning additional income, selling products in line with personal values, making work and family care compatible, or developing voluntary activities.

From an external perspective, we study how the environment influences entrepreneurial intentions. For example, a period of recession (Biehl *et al.* 2014) or not having a pension plan (Wainwright & Kibler, 2013) increase the activity of senior entrepreneurs. Hantnan & Gimmon (2014) highlighted the positive effects of training on issues related to entrepreneurship among seniors. Pilkova *et al.* (2019) establish that a better environment, together with certain entrepreneurial characteristics of individuals, encourages seniors to start a business. Other studies show that the social perception and demography may influence the attraction of seniors to entrepreneurship (Hart *et al.*, 2004; Levesque & Minniti, 2011; Pilková *et al.*, 2016).

The context and related institutions can also facilitate –or hinder– senior entrepreneurship in a country. The existence of institutions that support it (Pilkova *et al.*, 2014), the social environment - family, close friends, etc. (Kautonen *et al.*, 2009) or an open culture towards seniors (Weber & Schaper, 2004; Kautonen *et al.*, 2011) can encourage seniors to develop entrepreneurial activities.

Kenny & Rossiter (2018) propose that the individual and contextual background of older people can influence their decision to undertake a business and that entrepreneurial experience, training and support contribute to reducing barriers and achieve better outcomes.

Finally, the promotion of the entrepreneurial spirit through education, from the beginning, without ignoring the elderly (Fernández & Rey, 2010), is another fundamental motivating factor for senior entrepreneurship.

Oelkers (2015) summarizes the most relevant barriers that affect senior entrepreneurship, considering the following (a) age discrimination; (b) problems related to human capital; (c) social capital; (d) health-related issues; (e) opportunity cost of entrepreneurship; (f) financial disincentives; (g) entrepreneurial context and related institutions; (h) entrepreneurial education.

Kibler *et al.* (2011) identify age as one of the most important barriers. Kautonen (2012) indicates that one part of society considers that senior individuals should not be engaged in labor or economic activities. The same study highlights the perception of seniors as less flexible and committed and having more difficulties to cope with

technological changes. Kibler *et al.* (2012) show the doubts of some customers about the ability of the elderly to provide certain goods and services because of their age.

Although a relevant number of seniors are undertaking business related activities they have previously developed (Halabisky, 2012), they nevertheless lack the necessary entrepreneurial skills (Kautonen, 2012). According to Kadefors (2011), these skills are not up to date and therefore they have difficulties in their professional development, mainly in relation to the use of new technologies. Kibler *et al.* (2012) consider that whether a person can undertake and develop the necessary skills and knowledge will depend, among other factors, on the type of activities they developed in previous stages. Finally, Kautonen (2012) shows that barriers may arise between older people whose activity has been developed in a more traditional working culture.

Kibler *et al.* (2012) see social capital as a barrier to entrepreneurship for older people, as they have difficulties in establishing new networks. Additionally, these networks may become obsolete due to long periods of unemployment or retirement. Furthermore, according to Halabisky (2012), it is more difficult for seniors to develop new social skills.

People's health deteriorates with age, affecting their way of life and their chances of entrepreneurship. Older adults have less health and energy for entrepreneurship (Weber & Schaper, 2004). In the same way Singh & DeNoble (2003) state that as health deteriorates, the opportunity cost of entrepreneurship increases, making it more attractive to spend time on leisure. For similar reasons, Halabisky (2012) shows that seniors are less willing to engage in activities that generate long-term results.

In relation to wealth, increased wealth discourages senior entrepreneurship (Singh & DeNoble, 2003).

Various authors have made contributions in relation to the barriers generated by the entrepreneurial context and related institutions. Many people have worked for companies without being aware of the opportunities available for entrepreneurship (Halabisky, 2012). Adults have greater difficulty accessing information that seems to be designed for younger people (Kibler *et al.*, 2012). A high number of older people do not understand the legal aspects of starting a business, and need more support from institutions (Kibler *et al.*, 2011). Additionally, they require more labour flexibility and favorable taxation (Kautonen, 2012). In social environments in which there has never been an entrepreneurial experience, more difficulties are observed to undertake (Kautonen, 2008). According to the same author, in these circumstances, senior entrepreneurs feel insecure when their closest environment advises them not to undertake due to the risk they take. This, together with the lack of financial and social support, as well as the length of time needed to set up the business, discourages seniors from starting up on many occasions.

Finally, in relation to the barriers to entrepreneurship related to education, although many senior entrepreneurs think that they own the necessary knowledge and abilities to undertake, the absence of good mentors or coaches makes it difficult to start a business (Kautonen, 2012).

There is a vast literature that refers to the benefits of senior entrepreneurship as a reduction of the unemployment rate (Maritz, 2015; Kautonen *et al.*, 2015). Senior entrepreneurship may help to fight against older people unemployment and improve social and economic achievements if promotion mechanisms are implemented by governments. Governments need to push forward policies to promote and develop entrepreneurship for this group in the same way as they do for youth entrepreneurship (Figueireido & Paiva, 2018). It is important that governments can establish mechanisms that compensate for the deficiencies in assistance and training to the senior segment.

It has also been shown that those who have an entrepreneurial project tend to retire later compared to people who work in a dependent relationship (Kautonen *et al.*, 2017; Zhang, 2008). This leads us to identify that encouraging senior entrepreneurship can help governments of countries to face the demographic change they are suffering, which is a result of an ageing population in most countries and mainly in the most developed ones. People who are over 55 years old, not only have more professional experience, but also have access to a greater network of professional contacts, a high technical and managerial level, generally a more stable financial situation and face fewer risks (Kautonen, 2013; Patel & Gray, 2006), but have less intention than younger people of starting a new entrepreneurial activity (Kautonen, 2008). This means that the acceleration of population ageing may result in a general decline in entrepreneurial activity (Cossette *et al.*, 2010).

According to Kahn (2013), senior entrepreneurs are more successful than younger ones in creating new businesses. 70% of companies created by seniors live more than three years (this figure is only 28% for youngers). On the other hand, Kautonen *et al.* (2015) point out that age does not seem to have an effect on those who start up out of necessity.

Martin & Omraní (2019), on an analysis of eleven European countries, identified that the most important factors for senior entrepreneurs to start a new venture are those of the individual and the environment, such as the diffusion of technology, the skills and personal experience acquired, information about successful ventures and the ratio of other senior entrepreneurs, but they do not identify education as a relevant factor. Furthermore, Weber & Schaper (2004), state that the level of education in senior entrepreneurs is generally lower than in other demographic groups.

One possible explanation for this is that people with higher levels of education are more easily recruited by large companies, reducing their interest in becoming entrepreneur (Kautonen, 2008; Parker, 2004). For their part, Pilkova *et al.* (2014) found that older entrepreneurs tend to value more their previous work experience than the skills and the knowledge obtained through formal education.

Rehák *et al.* (2017) carried out an analysis of the factors affecting young and senior entrepreneurs in European countries and found that the differences are not very significant. The main difference is in the perception of having the skills to undertake a venture and they point out that programs aimed at establishing inter-generational skills can positively influence the creation of new ventures. In line with

these authors, Matricano (2018) has also identified that the differences are not very significant between young and senior entrepreneurs from the point of view of the use of human capital. Seniors more commonly assign a non-monetary value to their new ventures as it improves their flexibility and their life quality. Červený *et al.* (2016) made a comparison of factors influencing senior entrepreneurship in Eastern and Western European countries using GEM data and identified that demographic characteristics such as age, gender, occupation and income positively influence this demographic segment. They also observed and identified that Western European countries have a higher prevalence of senior entrepreneurship due to greater support from government programs and a greater ability to identify opportunities. Here we see the importance of context as a support for entrepreneurial activity and evidence for other countries that programs specifically aimed at this demographic segment can help to reach a higher rate of entrepreneurial activity.

Most of the research work on senior entrepreneurship focuses on European countries, especially England, Finland and France (Biron & St-Jean, 2019). This is due to the large increase in the number of older people in these countries compared to other developed countries. According to Kautonen (2013) there are differences in entrepreneurial activity between different cultures and therefore there will be differences between different regions and countries. This points to the importance of analyzing each region and specifically each country to identify potential differences and needs.

Based on the review of literature and given the lack of analysis in developing countries and especially in Latin America, this research focuses on identifying the internal factors which lead to entrepreneurial activity in the demographic segment of people over 55 in Chile, comparing it with a group of representative countries in Latin America. The identification of these factors is a first step towards establishing an initial basis of analysis which will allow for the development of appropriate policies to promote entrepreneurial activity in this demographic sector in Chile. Furthermore, knowing the factors that influence senior entrepreneurship in this country, this work contributes to make comparisons with other countries and regions, in order to apply best practices from more advanced countries in the development of senior entrepreneurship and also contribute to the development of knowledge of senior entrepreneurship in the country.

3. Methodology

The methodology applied to carry out the analysis is based on logistic regression models. The fundamental objective of this technique is to determine how the probability of a certain event occurring is influenced by the presence or absence of different factors and the value of these factors.

The model used in this research estimates the relationship between the binomial dependent variable TEA of senior people, and a set of independent variables

–obtained from the GEM–, applying a GLM (Generalized Linear Model) model, using the R Studio software package for all Latin American countries. The parameters were estimated using the Wald z-statistics and the model selection was made using the Akaike Information Criterion. The goodness-of-fit methods applied were Chi-square calculation, loglikelihood, p-value and Pseudo R2 (McFadden’s). The correlation between the independent variables was tested and does not represents a problem. Once the model has been identified for all Latin American countries, the same process has been carried out, but including the control variable by country to identify the differences in the model for each one of the countries, and the model for Chile has been selected for in-depth analysis.

The logistical model tested was as follows:

Equation 1

$$TEA = \beta_0 + \beta_1 *Occupation + \beta_2 *Education + \beta_3 *Income\ level + \beta_4 *Age + \beta_5 *Gender + \beta_6 *Knows\ an\ entrepreneur + \beta_7 *Perceived\ skills + \beta_8 *Perceived\ opportunities + \beta_9 *Fear\ of\ failure + \beta_{10} *Intrapreneurship + \beta_{11} *Business\ Angel + \epsilon$$

The logistic model allows identifying the logarithm of the probability of belonging to each group of the TEA (entrepreneur or not) and therefore identifying which are the factors that have a greater statistical incidence on the dependent variable TEA. Once the model was obtained, for the case of Chile, the logarithmic transformation of equation 1 was carried out to express it as a linear function of the probability of each factor so that the TEA becomes “1”.

This model helps to answer the question of what factors are necessary for entrepreneurship to occur in the senior demographic sector, and how much each of these factors affects the probability of entrepreneurship. Other authors have followed a similar methodology. For example, Holienka *et al.* (2016) apply this model to identify factors affecting TEA by distinguishing between TEA by necessity and opportunity in Visegrad Group countries. In contrast to this, the present work focuses on a first analysis of global entrepreneurial activity, beyond the “push” or “pull” elements that may motivate it. Another difference is that this analysis focuses on Chile as a case study and its comparison with other Latin American countries, as there are no similar works in the literature in this region. Mancilla & Amorós (2012) also use a logit model, with data from the GEM in Chile, to analyze how certain conditions in the socio-cultural framework –the fear of failure and the presence of role models– as well as some other sociodemographic control variables, affect the probability of individuals becoming entrepreneurs.

The analysis is based on data from the Global Entrepreneurship Monitor (GEM), the largest academic study on entrepreneurship, that annually monitors the attributes and activities of individual entrepreneurs in dozens of participating countries. Data from the GEM’s Adult Population Survey (APS) for 2016 –the last year in which it was made public– were taken from eight of the most representative countries in Latin America in terms of GDP (Argentina, Brazil, Chile, Colombia, Ecuador,

Mexico, Peru and Uruguay) and the responses of individuals aged 55 and over who did not have a venture older than 3.5 years (42 months) were selected. The APS survey is conducted every year and collects information at the individual level from representative samples using standardized surveys.

Standard GEM variables related to TEA (who are individuals actively involved in creating a business or owning a new business that is less than 42 months old) have been used for the analysis. These individuals participate in one of the two initial phases of the entrepreneurial process. These are:

- Entrepreneurs who have put in resources to start a new business, but have not paid salaries for more than three months (Nascent entrepreneurs).
- Entrepreneurs who have passed the first stage and have paid salaries for more than three months, but have less than 42 months of seniority (New business owners).

A sample derived from the APS has thus been created for the eight Latin American countries identified for the year 2016, and a total of 4,149 observations have been obtained, distributed as follows (Table 1).

Table 1. Number of observations by country

Country	Number of observations
Argentina (AR)	259
Brazil (BR)	268
Chile (CH)	2.072
Colombia (CO)	251
Ecuador (EC)	387
Mexico (MX)	316
Peru (PE)	147
Uruguay (UY)	449
Total	4.149

Source: Authors.

The explanatory variables included in the model are as follows (Table 2).

Table 2. Variables included in the model

Variable	Description	Type	Values
Age	Age of the individuals	Continue	+55 years old
Gender	Gender of the individuals	Category	Man=1; Woman=2
Occupation	Type of occupation of individuals.	Category	1- Full Time/Part Time 2- Only Part-Time 3- Retired 4- Homemaker 5- Student 6- Not working 7- Other
Education	Individuals' level of education.	Category	0- Pre-primary 1- Primary education 2- Lower secondary 3- Upper secondary 4- Post-secondary (Non-tertiary) 5- First stage of tertiary education 6- Second stage of tertiary education
Income level	Individuals' household income level.	Category	Low, Medium, High
Knows an entrepreneur	Knows someone personally who has started a venture in the last two years.	Binomial	No=0; Yes=1
Perceive opportunity	Perceive good opportunities to start a new venture in his community in the near future.	Binomial	No=0; Yes=1
Perceive skills	Believe in having the knowledge, skills and experience necessary to start a new venture.	Binomial	No=0; Yes=1
Fear to fail	Fear of failure that will prevent a person from undertaking a venture.	Binomial	No=0; Yes=1
Intrapreneur	Active as an Intrapreneur in the last 3 years	Binomial	No=0; Yes=1
Business Angel	Active as an informal investor in the last 3 years	Binomial	No=0; Yes=1

Source: Modified from the GEM by the authors.

4. Results

Following the methodology detailed in the previous section, Table 3 shows the results of the model applied to Chile. Annex I shows the results for every country and for all of them together.

Table 3. Results of the logistics model for Chile

Chile						
	Estimate	Std. Error	z value	Pr(> z)		Marginal Probability
(Intercept)	-1.09257	0.87546	-1.248	0.212031		
Occupation						
Only Part-Time	-0.86862	0.41796	-2.078	0.037685	*	-0.0435473
Retired	-1.12952	0.24687	-4.575	4.75e-06	***	-0.0660922
Homemaker	-0.95112	0.34941	-2.722	0.006487	**	-0.0481079
Not working	-1.48775	0.53091	-2.802	0.005074	**	-0.0598569
Education						
Lower secondary	0.84026	0.37066	2.267	0.023394	*	0.0773122
Upper secondary	0.68815	0.33785	2.037	0.041663	*	0.0554215
First stage of tertiary	0.87688	0.33691	2.603	0.009249	**	0.0757998
Second stage of tertiary	0.90175	0.41061	2.196	0.028086	*	0.0598569
Age						
Age	-0.04174	0.01237	-3.375	0.000738	***	-0.002904
Other variables						
Knows an entrepreneur (Yes)	0.66879	0.14224	4.702	2.58e-06	***	0.051924
Perceive skills (Yes)	1.71183	0.21418	7.993	1.32e-15	***	0.114434
Intrapreneur (Yes)	-0.71272	0.33144	-2.150	0.031527	*	-0.037881
Model fit statistics						
Df	2071					
AIC	1366					
Chi-square	294.38					
Log-likelihood	-664.05					
p-value	1.618223e-52					
Pseudo R2	0.18144					

Source: Authors.

The first column of Table 3 shows the direction of the relationship between each independent variable and the TEA, while the last column indicates the increase in the probability of undertaking generated by that variable.

The results of the analysis show that occupation negatively affects the probability of carrying out an entrepreneurial activity. It can be seen that the most negative values are among those who are retired or do not have an occupation. It can also be seen that the older the person is, the less entrepreneurial activity and the lower the

probability of becoming an entrepreneur. With regard to education, all levels have a positive effect on entrepreneurship. Also, knowing an entrepreneur who has undertaken a venture in the last two years and believing that they have the knowledge, skills and experience necessary to start a new venture are variables which positively affect the probability of becoming an entrepreneur. With regard to gender, the analysis shows that in the case of Chile, there is no statistical relevance of this variable to the TEA. It should be noted that having been active as an Intrapreneur in the last three years has a negative influence on the probability of becoming an entrepreneur, as well as the notable increase in the probability of undertaking generated by the perception of having the necessary skills.

5. Discussion

Annex 1 shows the results of the model applied to all the Latin American countries analyzed, using the country category as a control variable. The summary in Table 4 shows the factors influencing entrepreneurial activity in each of the countries and the total for Latin America (LA).

Table 4. Summary of factors influencing TEA by country

	AL	ARG	BRA	CHL	PER	COL	ECU	MEX	UY
Occupation	-	-	-	-		-	-		-
Education	+			+					
High income level			-						
Woman	+		+						
Age	-			-			-		-
Knows an entrepreneur	+	+		+		+		+	
Perceive opportunities	+				+		+	+	
Perceive skills	+		+	+		+			+
Intrapreneur	+			-				+	

Source: Authors.

When analyzing the differences between Chile and the other countries in the region, and in line with what Kautonen (2013) suggests, it can be seen that there are differences between the factors that influence each of the countries analyzed. It is important to highlight that the variables which are most commonly repeated are “occupation”, “knows an entrepreneur”, “perceives opportunity” and “perceives skills” and in the case of Chile, more significant variables are observed than in the other countries.

The analysis reflects 0,29% annual decrease in TEA after age 55, which is in line with the results of other research works which show that there is less entrepreneurial activity at a higher age (Coduras *et al.*, 2018). That is, people perceive that they have less available time as they grow older, and there is an opportunity cost of time (Lévesque & Minniti, 2006). On the other hand, occupation negatively affects the likelihood of undertaking an entrepreneurial activity as it takes away flexibility to devote time to entrepreneurship (Kautonen, 2012) or having an occupation does not allow observation of the opportunities available for entrepreneurship (Halabisky, 2012). Although dissatisfaction with work activity, dismissal, or insufficient resource generation could lead workers to seek entrepreneurship (Weber & Schaper, 2004), it can be seen that the most negative values are among those who are retired or have no occupation.

With respect to education, all levels have a positive effect on entrepreneurship, unlike Weber & Schaper (2004) who suggest that lower levels of education have a higher probability of becoming entrepreneurs. The results show that, in the case of Chile, it may be that higher levels of (tertiary) education also have a higher probability of becoming entrepreneurs than average levels of education which can be seen as recruitment tools for large companies or dependent work. This differs from other studies (Parker, 2004; Kautonen, 2008; Pilková *et al.*, 2014) and therefore requires further analysis to identify the reasons for it in this country. It is important to note that in other countries in the region, as we can see in Table 4, education is not a statistically relevant variable.

The fact that the variables “know an entrepreneur” and “perceive the skills” are variables which positively affect the probability of becoming an entrepreneur in the case of Chile, is in line with other work which identifies factors which influence entrepreneurship in other regions (Coduras, 2018; Červený, 2016; Holienka, 2016). It can be seen that the perception that one possesses the necessary skills to become an entrepreneur provides the highest marginal probability (0.11) to become an entrepreneur.

Table 4 also shows that the variable “intrapreneur” affects negatively the probability of becoming an entrepreneur. It might depend on various contextual determinants whether entrepreneurs go behind their aspirations working for a company or starting up a new venture. At a micro level, the intention to startup a new venture of intrapreneurs is generally greater than that of other employees. However, at a macro (national) level intrapreneurship would be a substitute of independent entrepreneurship, depending on the level of economic development: there is a positive effect of economic development (per capita income) on the opportunity cost of independent entrepreneurship (Lucas, 1978). However, these results for Chile at macro level contradict this reasoning, showing patterns more aligned to those of high income than those of low-income economies (Bosma *et al.*, 2011). This would be related to various causes such as the nature of the intrapreneur of the older age segment, or the labor market institutions, among others. This deserves to be matter of further focus in future studies.

Finally, unlike what other authors suggest, in this case, no increased incidence of male sex on TEA can be observed (Weber & Schaper, 2004; Kautonen, 2008).

6. Limitations

This model is based on data from a single source (GEM) and is limited by the amount of data from that source. In addition, the data included do not consider differences between the various entrepreneurial ecosystems that individuals may face. In line with what was suggested in point 3 of this document, it is also left for further research to investigate the reasons that drive entrepreneurial activity in the region (for example, out of necessity or opportunity) and to cross-check with the variables analyzed in this work.

7. Conclusions and future areas of research

This paper has analyzed the importance for governments in both developed and developing countries of being able to increase the rate of entrepreneurship in the older demographic segment in order to reduce the pressure on social welfare systems, while ensuring sustainability. In the same way, an increase in this rate reduces the pressure of this population segment on the labour market and has the potential to complement public employment policies and corporate practices of diversity and inclusion, in its demographic component.

In the case of Chile, this study helps to identify the internal factors that lead senior entrepreneurs in this country to undertake entrepreneurial activity, whether out of necessity or opportunity. These factors must be considered when carrying out any government promotion policy to encourage senior entrepreneurship.

A first conclusion is that the regional context, the higher entrepreneurial rate observed in Chile for tertiary education levels, combined with the perception that the necessary knowledge, skills and experience are available, may suggest a high level of empowerment of the Chilean entrepreneur. In the same way, “the knowledge of other entrepreneurs” can be registered, which could suggest a friendly social and cultural environment for entrepreneurship, constituting a factor that may have different implications which should be studied in the future.

Secondly, although the indicators determining the importance of the entrepreneurial ecosystem in Chile are favorable and higher than the rest of Latin American countries, they are still below the average levels of OECD countries (Guerrero & Servey, 2020). In Chile, on the one hand, physical infrastructure, government programs and social and cultural standards are the main elements that promote the entrepreneurial ecosystem, but on the other hand, financial support, R+D transfer mechanisms and education are elements that do not contribute to the development of this ecosystem (Guerrero & Servey, 2020). Analyzing the results of the model and the environment, it can be seen that promoting education at all levels and more specifically training in

entrepreneurship is a fundamental task for producing entrepreneurial activity for the seniors as, in this particular ecosystem, education increases the probability of being an entrepreneur. There seem to be room for an increased public policy focus in this field. Obviously, the results of investment in education are not immediate, and must be measured over time, but the educational policies developed by the government related to increasing the training of adults with training cycles that are related to entrepreneurship, innovation and sources of funding, can have a positive influence on the entrepreneurial rate of seniors.

In turn, the greater activity of this segment (highly qualified and empowered) could suggest the importance of its participation in the knowledge economy, where the competences and skills demanded by the market (often through ad-hoc or freelance contractual formats) usually exceed the availability of the supply, constituting a market factor that would contribute to a greater activity of senior professionals. If this were the case, there would be an incentive for training, reskilling and upskilling, in line with policies aimed at promoting lifelong learning throughout life (LLL). Thus, for example, Continuing Education and Adult Education would become public policy tools to promote senior entrepreneurship.

Thirdly, the negative effect of being intrapreneur on the probability of becoming entrepreneur, should be focus on further research, as it could be caused by various different factors whose knowledge might be of interest for a better understanding of the senior entrepreneurship (and general entrepreneurship) in Chile.

Finally, a further analysis needs to be carried on the field of gender, specially to understand the potential of the gender equality policies for entrepreneurship creation in the country (Guerrero & Serey, 2020).

The Latin American region, in general, has been characterized throughout its history by the existence of low dynamic, highly regulated and highly informal labour markets (David *et al.*, 2020). The transformation of labour increases the pressure on the market, particularly on the population segment of older people, one of its high-risk groups. In this framework, the promotion of senior entrepreneurship has a high impact for the economy and the society, which makes it essential to have a better understanding of its nature and characterization, in order to generate a legal framework and far-reaching public policies in each country of the region. Precisely, as reflected in this work, the understanding of the particularities of each single market are essential inputs for the policy design.

Declaration of conflicts of interest

The authors declare that they have no conflict of interest in relation to the research, authorship or publication of this work.

Annex

Annex 1. Results of the logistics model for each of the countries analyzed and Latin America

	Estimate	Std. Error	z value	Pr(> z)	
Mexico					
(Intercept)	-4.1541	0.5695	-7.295	2.99e-13	***
Knows an entrepreneur (Yes)	1.3766	0.5757	2.391	0.0168	*
Perceive opportunity (Yes)	1.0631	0.4663	2.280	0.0226	*
Intrapreneur (Yes)	1.3894	0.5975	2.325	0.0201	*
Df	315				
AIC	145.91				
Chi-square	25.76				
Log-likelihood	-66.95				
p-value	9.901242e-05				
Pseudo R2	0.1613687				
Colombia					
(Intercept)	-2.2153	0.4609	-4.807	1.53e-06	***
Retired	-2.2684	0.7600	-2.985	0.00284	**
Homemaker	-2.5613	1.0393	-2.464	0.01372	*
Knows an entrepreneur (Yes)	0.8315	0.3735	2.226	0.02598	*
Perceive skills (Yes)	1.2646	0.4873	2.595	0.00946	**
Df	250				
AIC	212.43				
Chi-square	51.41				
Log-likelihood	-98.21				
p-value	7.620665e-09				
Pseudo R2	0.207444				

Annex 1. (*Continuation*)

	Estimate	Std. Error	z value	Pr(> z)	
Ecuador					
(Intercept)	4.92618	1.55059	3.177	0.00149	**
Homemaker	-1.17841	0.44063	-2.674	0.00749	**
Age	-0.10331	0.02536	-4.074	4.62e-05	***
Perceive opportunity (Yes)	0.83695	0.28966	2.889	0.00386	**
Df	386				
AIC	331				
Chi-square	45.85				
Log-likelihood	-158.49				
p-value	3.169185e-08				
Pseudo R2	0.1263				
Peru					
(Intercept)	-1.9754	0.4885	-4.044	5.25e-05	***
Perceive opportunity (Yes)	1.2805	0.5402	2.371	0.0178	*
Df	146				
AIC	135.8				
Chi-square	16.46				
Log-likelihood	-61.87				
p-value	0.005638				
Pseudo R2	0.1174				
Brazil					
(Intercept)	-1.9481	0.5067	-3.845	0.000121	***
Retired	-2.6780	0.7739	-3.460	0.000539	***
High income level	-1.0227	0.5083	-2.012	0.044210	*
Gender (Woman)	1.0122	0.4121	2.456	0.014049	*
Perceive skills (Yes)	1.1153	0.4588	2.431	0.015057	*
Df	267				
AIC	183.59				
Chi-square	67.73				
Log-likelihood	-80.79				
p-value	1.211461e-10				
Pseudo R2	0.29536				

Annex 1. (Continuation)

	Estimate	Std. Error	z value	Pr(> z)	
Argentina					
(Intercept)	-1.9237	0.3494	-5.505	3.68e-08	***
Retired	-2.6725	0.7653	-3.492	0.000479	***
Knows an entrepreneur (Yes)	1.2856	0.4951	2.597	0.009418	**
Df	258				
AIC	127.3				
Chi-square	32.42448				
Log-likelihood	-56.67084				
p-value	1.352766e-05				
Pseudo R2	0.2224				
Uruguay					
(Intercept)	1.05691	3.22343	0.328	0.7430	
Age	-0.10011	0.04885	-2.049	0.0404	*
Perceive skills (Yes)	2.61503	1.04507	2.502	0.0123	*
Df	448				
AIC	110				
Chi-square	20.0833				
Log-likelihood	-52.2893				
p-value	4.35478e-05				
Pseudo R2	0.1611				
América Latina					
(Intercept)	-0.873445	0.670063	-1.304	0.192395	
Occupation					
Only Part-Time	-0.790356	0.240057	-3.292	0.000993	***
Retired	-1.615959	0.192046	-8.414	< 2e-16	***
Homemaker	-1.426332	0.239103	-5.965	2.44e-09	***
Other	-1.203551	0.340508	-3.535	0.000408	***
Education					
Primary	0.945538	0.279901	3.378	0.000730	***
Lower secondary	0.569418	0.291747	1.952	0.050967	.
Upper secondary	0.728158	0.271615	2.681	0.007344	**
Post-secondary	0.690657	0.299629	2.305	0.021164	*
First stage tertiary	1.045728	0.276811	3.778	0.000158	***
Second stage tertiary	1.048932	0.358848	2.923	0.003466	**

Annex 1. (*Continuation*)

	Estimate	Std. Error	z value	Pr(> z)	
Gender					
Woman	0.301086	0.105060	2.866	0.004159	**
Age					
Age	-0.046811	0.009599	-4.877	1.08e-06	***
Knows an entrepreneur (Yes)	0.585211	0.103045	5.679	1.35e-08	***
Perceive opportunity (Yes)	0.478411	0.102628	4.662	3.14e-06	***
Perceive skills (Yes)	1.309301	0.136530	9.590	< 2e-16	***
Intrapreneur (Yes)	-0.623616	0.267993	-2.327	0.019966	*
Df	4148				
AIC	2589.1				
Chi-square	517				
Log-likelihood	-1276.541				
p-value	2.02e-110				
Pseudo R2	0.1827				

Source: Authors.

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