Senior entrepreneurship in Latin America: evaluation and support from entrepreneurship ecosystems approach

Emprendimiento senior en América Latina: evaluación y apoyo desde el enfoque de ecosistemas de emprendimiento

Empreendedorismo sênior na América Latina: avaliação e apoio a partir da abordagem de ecossistemas de empreendedorismo

Received 15 August 2023
Revised 10 November 2023
4 January 2024
Accepted 5 January 2024

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Abstract

Purpose – The purpose of this study is to make an exploratory analysis of the impact of the entrepreneurial ecosystem (EE) as defined by Acs *et al.* (2014) on opportunity-driven senior entrepreneurial activity in Latin America.

Design/methodology/approach – The research uses data from the Global Entrepreneurship Monitor and the Global Entrepreneurship and Development Institute of five Latin America countries (Argentina,

The authors acknowledge to the GEM Consortium and the very useful insights from the associate editor and two reviewers.

Management Research: Journal of the Iberoamerican Academy of Management
Emerald Publishing Limited
1536-5433
DOI 10.1108/MRJIAM-08-2023-1447

Brazil, Chile, Colombia and Mexico), providing a total of 15,019 observations of people that are 50+ years old, between the years 2013 and 2017. A multi-level logistic regression model was used to estimate the relation between the total entrepreneurial activity by opportunity of seniors and some EE indicators. A total of three equations were estimated on the data set described.

Findings – This research confirms the relevance of some elements of EE on senior entrepreneurship in Latin America. Entrepreneurial attitudes have a positive relationship with senior entrepreneurs, generating higher levels of entrepreneurial ventures. The combination of institutions that support these attitudes on the EE enhances senior entrepreneurial activity. It also demonstrates that a higher level of entrepreneurial education at postschool stages is relevant to increasing senior entrepreneurial activity.

Originality/value – This research makes some interesting contributions in the field of measuring the impact of EE on senior entrepreneurship by opportunity in developing countries, filling a literature gap. It allows us to glimpse some measures that policymakers could take to improve the entrepreneurial activity of this segment in the region, such as implementing programs that facilitate networking opportunities and mentorship, along with providing training in business and financial literacy.

Keywords Senior entrepreneurship, Entrepreneurial ecosystems, GEM, GEDI, Latin America, Entrepreneurship

Paper type Research paper

Resumen

Propuesta – El objetivo principal de esta investigación es realizar un análisis exploratorio del impacto del ecosistema emprendedor (EE) definido por Acs *et al.* (2014) en la actividad emprendedora por oportunidad entre individuos senior de América Latina.

Diseño/metodología/enfoque – Nuestra investigación utiliza datos del *Global Entrepreneurship Monitor* (GEM) y del *Global Entrepreneurship and Development Institute* (GEDI) de cinco países de América Latina (Argentina, Brasil, Chile, Colombia y México), proporcionando un total de 15.019 observaciones de personas que tienen +50 años, entre los años 2013 y 2017. Se utilizó un modelo de regresión logística multinivel para estimar la relación entre la Actividad Emprendedora Total por oportunidad de los seniors y algunos indicadores de EE. Se estimaron un total de tres ecuaciones en el conjunto de datos descrito.

Resultados – Esta investigación confirma la relevancia de algunos elementos de la EE en el emprendimiento senior en América Latina. Las actitudes emprendedoras son una gran influencia positiva, ya que generan niveles más altos de emprendimiento entre individuos senior. La combinación de instituciones que apoyan estas actitudes en la EE potencia la actividad emprendedora de los seniors. También demuestra que un mayor nivel de educación emprendedora en las etapas postescolares es relevante para aumentar la actividad emprendedora senior.

Originalidad – Esta investigación realiza algunas contribuciones interesantes en el campo de la medición del impacto de los Ecosistemas Emprendedores en el emprendimiento senior por oportunidad en países en desarrollo, cerrando una brecha en la literatura. Nos permite vislumbrar algunas medidas de políticas públicas para mejorar la actividad emprendedora de este segmento en la región, como la implementación de programas que faciliten las oportunidades de creación de redes y mentoría, junto con la capacitación en educación empresarial y financiera.

Palabras clave Emprendimiento Senior, Ecosistemas Emprendedores, GEM, GEDI, América Latina

Tipo de artículo Trabajo de investigación

Resumo

Proposta – O objetivo principal desta pesquisa é realizar uma análise exploratória do impacto do ecossistema empreendedor (EA) definido por Acs e colaboradores (2014) sobre a atividade empreendedora por oportunidade entre indivíduos seniores na América Latina.

Desenho/metodologia/abordagem – Nossa pesquisa utiliza dados do *Global Entrepreneurship Monitor* (*GEM)* e do *Global Entrepreneurship and Development Institute* (GEDI) de cinco países da América Latina

(Argentina, Brasil, Chile, Colômbia e México), fornecendo um total de 15.019 observações de pessoas com 50+ anos, entre os anos de 2013 e 2017. Um modelo de regressão logística multinivel foi utilizado para estimar a relação entre a Atividade Empreendedora Total por oportunidade dos idosos e alguns indicadores norte-americanos. Um total de três equações foi estimado no conjunto de dados descrito.

Resultados – Esta pesquisa confirma a relevância de alguns elementos da EA no empreendedorismo sênior na América Latina. As atitudes empreendedoras são uma grande influência positiva, pois geram níveis mais elevados de empreendedorismo entre os indivíduos seniores. A combinação de instituições que apoiam essas atitudes na EA potencializa a atividade empreendedora dos idosos. Mostra também que um nível mais elevado de educação empreendedora nas fases pós-escolares é relevante para aumentar a atividade empresarial sénior.

Originalidade – Esta pesquisa faz algumas contribuições interessantes no campo da mensuração do impacto dos Ecossistemas Empreendedores no empreendedorismo sênior por oportunidade em países em desenvolvimento, fechando uma lacuna na literatura. Isso nos permite vislumbrar algumas medidas de políticas públicas para melhorar a atividade empreendedora desse segmento na região, como a implementação de programas que facilitem oportunidades de networking e mentoria, além de capacitação em negócios e educação financeira.

Palavras-chave Empreendedorismo Sênior, Ecossistemas Empreendedores, GEM, GEDI, América Latina

Tipo de papel Trabalho de pesquisa

1. Introduction

One of the most relevant challenges in terms of sociodemographic dynamics is the aging of the world population. In 2021, 24.5% of the world's population was over 50 years old, and the aging process is accelerating worldwide [United Nations (UN), 2022]. In this context, this specific dynamic not only brings challenges but also offers opportunities for people who, even older, could have more opportunities to continue being (economically) productive than previous generations. Inside this group of the older population, a subgroup that is attracting the attention of academia but also policymakers, are the individuals who decide to start a new business at a more advanced age. Even though some evidence demonstrates that the elderly population tends to reduce their entrepreneurial intention and activity, there is potential interest from a developmental perspective since there is a myriad of economic and social impacts of growing the senior entrepreneurship activity. Some relevant benefits associated with the increment of senior entrepreneurs are unemployment reduction (Kautonen *et al.*, 2015), the delay in the age of retirement (Kautonen *et al.*, 2017), thereby reducing pressure on social security systems and enabling governments to better address the demographic challenges associated with population aging (Amorós *et al.*, 2023).

Even though there is a wide consensus on the relevance of entrepreneurship in countries' economic growth and social progress (Audretsch and Belitski, 2021) and that entrepreneurship activity presents differences, depending on cultures (Kautonen, 2013) and regions (Vodâ *et al.*, 2020; Coduras *et al.*, 2018; Bosma and Schutjens, 2011), we know that not necessarily exits the conditions that promote and enhance entrepreneurship activities among different population groups. Cowell *et al.* (2018) highlight that entrepreneurial activities and entrepreneurs do not emerge in isolation but rather in a very integrated and complex system with multiple actors. Thus, the term "entrepreneurial ecosystems" has been used to refer to the conditions and frameworks in which entrepreneurship's life cycle takes place. Since its inception in recent years, the concept of entrepreneurial ecosystems (EE) has been the focus of increasing attention from academics, policymakers and practitioners (Acs *et al.*, 2017; Alvedalen and Boschma, 2017; Audretsch and Belitski, 2017; Auerswald, 2015; Autio *et al.*, 2018; Isenberg, 2011; Mack and Mayer, 2016; Motoyama and Knowlton, 2014; Spigel and Harrison, 2018; Stam, 2015; Stam and van de Ven, 2019).

In this research, we want to inquire into the relationship between the after-mentioned phenomena: how EE shape the specific focus of senior entrepreneurship activity in the Latin America region. Multiple studies show that a more developed EE enables regional entrepreneurial activity and value creation (Autio *et al.*, 2014; Fritsch, 2013). Much of the research about the impact of EE has taken place in developed economies. However, these EE models cannot be directly applied to developing economies (Cao and Shi, 2021) because of the existence of institutional and structural gaps as well as the scarcity of resources in those countries. Entrepreneurial initiatives found in developed economies could contrast with low or nongrowth entrepreneurship and self-employment initiatives that are more common in less developed economies, like in Africa or Latin America (Freire-Gibb and Gregson, 2019). Consequently, conducting specific research for the senior population in Latin America could be relevant to close this research gap. In this sense, Latin America is a region that is characterized by:

- Highly informal and regulated labor markets (Aguinis *et al.*, 2020; Kautonen, 2013);
- Governments facing strong pressure on their social welfare systems due to the inadequate management of funds over time, as well as their aging population;
- Retired people obtaining insufficient pensions, constituting a group at risk of social exclusion.

These factors provide a very interesting context to contrast the current research lines around senior entrepreneurship putting focus on emergent economies, but also with the theoretical lens of the influence of the institutional environment of EE.

For our empirical exercise, we make an exploratory analysis of the impact of the national EE indicators as defined by Acs *et al.* (2017) on senior entrepreneurial activity in five Latin American countries. We use individual-level data from the Global Entrepreneurship Monitor (GEM) and country-level data from the Global Entrepreneurship and Development Institute (GEDI). We operationalize senior entrepreneurs as individuals who start a business at +50 years old (Maritz and Eager, 2017; Tervo, 2014; Maâlaoui *et al.*, 2012).

Our main results show that the EE component related to entrepreneurial attitudes that could be operationalized like having social capital, a higher level of education, recognizing opportunities in the market, cultural support and perceiving having the skills to be an entrepreneur enhance the opportunity-driven new ventures stated by senior entrepreneurs. Contrary to our expectations, entrepreneurial abilities reduce the propensity to be engaged in senior entrepreneurship probably related to the difficulties to capture more sophisticated business models by this type of entrepreneurs. Finally, the entrepreneurial aspirations EE's component is not significant. This result is related to the fact that many seniors are dedicated to entrepreneurial activities with less growth aspiration in the Latin American context. Our research supports the relevance of the EE approach to understanding senior entrepreneurship in Latin America. This approach emphasizes the importance of considering the broader context and EE factors when studying senior entrepreneurship. By focusing on the interaction between macro and micro contexts, we can better understand how to enhance senior entrepreneurship opportunities and reduce age-related differences.

Additionally, our findings highlight the importance of addressing the challenges within the EE in emerging economies. This includes exploring ways to integrate senior entrepreneurs into the digital transformation, securing more investments to bridge financial gaps and providing knowledge and mentorship support. Furthermore, it is crucial to

develop government and private sector initiatives to support senior entrepreneurs, with a specific focus on gender-inclusive programs.

The article is structured as follows: Section 2 reviews the literature on senior entrepreneurship and EE, summarizing the main research about the concept and measurement of EE and the characteristics of EE in developing countries. The main hypotheses of this research are also established; Section 3 explains the methodology used, the sample studied, the variables and the econometric methods used; Section 4 details the empirical results of the model; the final Sections 5 and 6 include the discussion and conclusions of the study, identify the limitations and indicate the implications of the results.

2. Literature review

Given the objectives of this research and the gap detected in the literature regarding the relationship between the EE and senior entrepreneurship in developing countries, a review of the theoretical framework on senior entrepreneurship and EE in general, and specifically in Latin America, is carried out below.

2.1 Motivations of senior entrepreneurship

Senior entrepreneurs' definition is usually based on their age range. We choose to use the criteria of some authors (Efrat, 2008; Kautonen, 2013; Patel and Gray, 2006) who consider senior entrepreneurs as those people who start a business with 50 years or more. Entrepreneurial activity could contribute to reducing senior unemployment (Kautonen *et al.*, 2015) and to social and economic development. Seniors provide a greater network of contacts, greater technical knowledge and financial stability, which implies less risk (Kautonen, 2013) and higher success rates (Kahn, 2013); however, their entrepreneurial intention is lower. According to Oelckers (2015), among the difficulties they face in becoming an entrepreneur are age discrimination, problems related to their health or their human and social capital, a higher opportunity cost, financial disincentives and insufficient entrepreneurial training and education.

Reynolds *et al.* (2002) distinguished between opportunity and necessity entrepreneurs. The former is associated with the detection of business opportunities (Velilla *et al.*, 2018) and generally motivated by their desire for independence and success (Tyszka *et al.*, 2011), developing new products (Cassar, 2007), being their own boss or wanting more economic independence (Guerrero and Serey, 2019). Senior entrepreneurship by opportunity is based on their experience and capabilities (Kautonen *et al.*, 2011), a need for independence, desire for social inclusion (Wainwright *et al.*, 2015; Weber and Schaper, 2004). Necessity entrepreneurship originates from job loss, lack of income from other sources (Shane, 2009; Valdez and Richardson, 2013) or nonexistence of other satisfactory employment options (Angulo-Guerrero *et al.*, 2017). Other factors that may motivate seniors to start a business are the individual's environment (such as family and friends), experience related to previous jobs (Tervo, 2014), the possibility of reducing working hours, keeping active or having more flexible work schedules to improve their live quality (Zissimopoulos and Karoly, 2007; Matricano, 2018). Zhu *et al.* (2022) state that some authors consider seniors pursue new venture creation as an *active aging* lifestyle to achieve *aging well, increasing* life satisfaction.

Senior entrepreneurs are affected by internal and external factors (Leporati *et al.*, 2021). The former includes sociodemographic variables (occupation, income, education or gender) or their attitudes and perceptions. External factors are related to the EE and are explained in the following section.

Considering the internal factors, occupation negatively reduces the probability of becoming an entrepreneur, as it reduces the flexibility to devote time to create a venture

(Kautonen, 2012) and does not allow observing the existing entrepreneurial opportunities (Halabisky, 2012). Furthermore, Oelckers (2015) and Singh and DeNoble (2003) consider their preference for leisure time could be an opportunity cost and a barrier to entrepreneurship.

Income level is strongly related to entrepreneurial activity (Block and Sandner, 2009; Van der Zwan and Hessels, 2013). Singh and DeNoble (2003) consider that higher income levels reduce entrepreneurial activity by necessity and encourage it by opportunity. Older people can take more risks because they have more disposable income and fewer financial obligations (Kibler *et al.*, 2011; Singh and DeNoble, 2003). Consequently, they would have more resources available to invest in market opportunities and become entrepreneurs.

Opportunity entrepreneurs are often characterized by higher educational levels (Block and Sandner, 2009) as this facilitates opportunity identification (Sánchez, 2011). Coduras *et al.* (2018) found that, in developing countries, individuals who attained higher education have a higher propensity for entrepreneurship. Senior entrepreneurs have lower education than other younger segments (Weber and Schaper, 2004), which may be partially originated because people with higher educational levels are recruited by large firms instead of starting a venture (Kautonen, 2008). Pilková *et al.* (2014) found that for older entrepreneurs, professional experience was more important than skills or knowledge acquired through educational systems. Chen *et al.* (2022) found that women show less likelihood of engaging in opportunity-driven senior entrepreneurship than males for several reasons, such as a lack of relevant entrepreneurial knowledge and skills, as well as social networks with other entrepreneurs.

The ability to identify opportunities, having the right skills and experience, and knowing other entrepreneurs are factors that increase entrepreneurial activity in different European countries (Vodâ *et al.*, 2020; Coduras *et al.*, 2018). Older people have more technical and managerial skills and professional experience to start entrepreneurship (Weber and Schaper, 2004; Kautonen *et al.*, 2011). Along the same lines, entrepreneurial training and education outside the formal educational system enhance entrepreneurial skills and increase the probability of entrepreneurship.

2.2 Entrepreneurial ecosystem

2.2.1 Entrepreneurial ecosystems: concept and measurement. The concept of the EE has generated much attention among academics, practitioners and policymakers during the past decade (Stam, 2015). They seek to understand the context faced by entrepreneurs in different territories (Spigel, 2017; Acs *et al.*, 2017) and what agents and factors enhance productive entrepreneurship (Stam, 2015). There is no shared definition of an EE, although it is generally accepted that an EE is a community of multiple stakeholders that evolve simultaneously and provide an environment that favors the creation of new businesses in a region. EE involves several mutually interconnected elements that facilitate innovation and the growth of new ventures (Aulet, 2008; Brush, 2014; Isenberg, 2010). They include aspects such as culture, finances, human capital, institutional support, infrastructures and markets for new services and products (WEF, 2013; Isenberg, 2011). EE is dynamic and formed by actors and institutions that are interconnected, influencing each other simultaneously (Acs *et al.*, 2017; Spiegel, 2017), including incubators as intermediary players enabling ecosystem activity (Theodoraki *et al.*, 2018, 2022).

Stam and Spigel (2016) propose a three-level model whose main components are system and context conditions, outputs (entrepreneurial activity) and outcome (creation of value-added). Mason and Brown (2014) consider that an EE is formed by the interconnection of

entrepreneurial actors, organizations, institutions and processes that connect, intermediate and govern results in an entrepreneurial environment.

Other research considers that ecosystems can facilitate or make entrepreneurial activity difficult. For instance, the existence of entrepreneurs, the existence of financing systems and a culture that tolerates failures facilitates the creation of companies. An ecosystem in an environment of corruption or without technical standards hinders it (Stam and Bosma, 2015). Therefore, countries and regions, as well as governments and other institutions, are making efforts to develop unique entrepreneurial activities (Isenberg, 2010; Stam and Spigel, 2016).

Despite the increased interest in the measurement of EE and its impact on entrepreneurial activity and the economy, it is both at an early stage and controversial as well (Stam and Van de Ven, 2019). Multiple studies show that a more developed EE enables regional entrepreneurial activity and value creation (Autio *et al.*, 2014; Fritsch, 2013), but none of these have been conducted for the senior population in Latin America, which represents a relevant research gap.

Stam and Van de Ven (2019) use a system framework to study EE, constructing an EE index to examine its quality. In their model, the EE consists of ten elements and outputs, which are based on two main concepts: resource endowment and institutional factors. The result of this ecosystem is the creation of new value through productive entrepreneurship.

Acs *et al.* (2014) developed a methodology to quantitatively identify higher-quality EE at a national level. They consider that entrepreneurial activity is the result of the dynamic interaction of entrepreneurial attitudes, capabilities and aspirations of individuals, which take place embedded in an institutional context. Because of these interactions, new business is created and resources are allocated. These measurements, denominated GEDI, are formed by three subindices that measure entrepreneurial attitudes, capabilities and aspirations, which are supported by 14 pillars. Each one of these pillars contains an institutional and an individual variable corresponding to the macro and micro aspects of entrepreneurial activity and consequently measures the quality of the EE.

The entrepreneurial attitudes subindex (ATT) is related to how a country thinks about entrepreneurship. At the individual level, it measures opportunity recognition, skill perception, access to other entrepreneurs and a better career status, whereas at the institutional level, it is economic freedom and property, tertiary education quality, country risk, agglomeration and corruption perception.

The entrepreneurial abilities subindex (ABT) refers to the important characteristics of entrepreneurs that help to determine if new ventures will have growth potential. At the individual level, it covers the motivation, technological, education and competition levels, and at the institutional level, it covers governance, technology absorption, labor market and competitiveness.

The third subindex, entrepreneurial aspirations (ASP), is about the qualitative nature of entrepreneurial activity. On the individual level, it identifies new products and new technology development, high growth, export orientation and informal investment, whereas at the institutional level, it considers tech transfer, research and development level, economic complexity and the depth of the capital markets.

2.2.2 The entrepreneurial ecosystem in developing countries. Cao and Shi (2021) consider that the EE models of advanced economies cannot be directly applied to developing countries since the latter face three fundamental restrictions:

(1) the presence of institutional gaps;

(2) scarcity of resources; and

(3) structural gaps.

Khanna and Palepu (2006) consider that institutional gaps take place when specialist intermediaries, established contract enforcement mechanisms or regulatory systems, are insufficient or absent. Arruda *et al.* (2013) identified constraints in Brazil in institutions (knowledge creation and diffusion, regulatory system, entrepreneurial culture and capabilities or financial access). Júnior *et al.* (2016) established that the biggest problem in the Brazilian EE the inadequate cooperation between entrepreneurs and the educational system. Guerrero and Urbano (2017a), observed in the Mexican EE a negative effect on entrepreneurial activity derived from negative institutional conditions. They include the role of the government (insufficient support, inadequate taxes and large bureaucracy), society (extortion or impunity) and informal markets. Due to reasons of this type, business creation tends to be associated with enterprises of low quality in an environment with institutional gaps and more oriented toward necessity-driven entrepreneurship. Situations of uncertainty, absence of formal rules or poor compliance with laws are often partially compensated by the creation of trust networks or by securing new resources with loans or government contracts (Ahlstrom and Bruton, 2006; Bruton *et al.*, 2013). Some studies point to the role of institutional intermediaries within emerging economies entrepreneurial ecosystems (EEEE) as an instrument to fill institutional gaps. For example, the Startup Chile program connects government funds with startups (Gonzalez-Uribe and Leatherbee, 2014).

Resources scarcity is a challenge for the EEEE. Despite advances in digitization, certain resources remain location-specific (venture capital (VC), business angels and specialized human resources). The inadequacy of these resources can hinder the development of the EEEE. Resource scarcity is higher in developing countries. According to Guéneau *et al.* (2023), when there is a lack of resources, strong cohesiveness and closeness allow for collaboration among actors and are related positively to entrepreneurial activity. Cao and Shi (2021) point out four key resources that hinder the development of entrepreneurial activities: human capital (Aidis *et al.*, 2008), financial (Wu *et al.*, 2016), knowledge (Goswami *et al.*, 2018) and physical infrastructure (Sheriff and Muffatto, 2015). Lack of financial resources may come from a lack of confidence in VC or private investment or shortage of bank credit or government funds or lack of networking with authorities or institutional gaps, as well as fear of failure. As a result, the main sources of financing are own savings and accumulated profits, generating a significant financial gap in developing countries. There are also gaps in the labor force in emerging economies. There is a lack of highly innovative and knowledgeable entrepreneurs and a shortage of skilled employees. This is because the benefits of entrepreneurial activity are negatively affected by gaps in institutions in developing economics, and, in addition, the opportunity cost of creating a venture increases for people with higher education (Smallbone and Welter, 2001).

Following this reasoning, Cao and Autio (2018) consider that people with higher human capital have a higher probability of working for others than becoming entrepreneurs. The knowledge gap is evidenced in situations such as a lack of experimentation with more advanced business models, lean entrepreneurship and a lack of mentoring experiences. Sometimes mentors do not have previous entrepreneurial experience (Goswami *et al.*, 2018), which is a problem because, in many cases, entrepreneurs in emerging economies tend to gain knowledge through informal processes such as mentoring. Lack of international or multinational company experiences also reduces the possibility of having higher quality training. In response to resource gaps in EEEE, policymakers tend to prioritize meeting basic needs by improving market failures with tax incentives or subsidies (Wang *et al.*, 2017). In this case, having contact networks with resource providers is vital for entrepreneurs to get resources.

Empirical studies based on the triple helix model show that the cooperation of agents may positively impact innovation in emerging economies such as Mexico (Guerrero and Urbano, 2017b). Services related to mentoring are positive for entrepreneurial activity in countries such as Chile (Gonzalez-Uribe and Leatherbee, 2014).

Structural gaps in EEEE are related to the lack of high-level entrepreneurial support institutions (educational organizations, accelerators or VCs). The lack of private support institutions implies a greater role of governments in EEEE, which must play a key role as a provider of resources (licenses, permits, physical infrastructure, investment in human resources and innovation).

For the above reasons, relational networks play a more key role in EEEEs than in advanced economies. These networks tend to be more informal due to the weakness of formal institutions and are key for entrepreneurs to obtain critical resources.

During the past decades, there has been an important extension of policies and programs devoted to increasing entrepreneurial activity. However, duplication, discoordination and misalignment of programs and actors have generated a waste of the resources dedicated (Sheriff and Muffatto, 2015).

In an examination of entrepreneurial policies in Latin America, Kantis and Federico (2012) found three relevant elements of their entrepreneurial systems: as a synthesis of what was discussed up to now, we may generally accept that:

(1) ecosystems are spatially based;

(2) entrepreneurial activity is an outcome; and

(3) there are several factors involved (institutional, economic and sociocultural) (Brown and Mason, 2017).

Additionally, most research highlights that several factors are in some way financially, socially or emotionally supportive of entrepreneurs (Spigel and Harrison, 2017). However, there is no consensus on attributes, catalysts (policymakers or entrepreneurs) or outcomes (startups, productive firms, well-being, large growth) (Brown and Mason, 2017; Spiegel, 2017; Stam and Spigel, 2016). There is not much agreement regarding the metrics (Acs *et al.*, 2014, 2017; Stam and Spigel, 2016).

2.3 Formalization of our hypotheses

After analyzing the arguments related to the motivations to engage in senior entrepreneurship activity, we may consider that there is a positive relation between the quality of the Latin American EE (measured through the three subindices of the GEDI) and senior entrepreneurial activity. We emphasize specifically the opportunity-driven motivation that, as we discussed previously, could be a relevant entrepreneurship activity in the context of developing economies, EEEE, and the senior population. Additionally, we consider that GEDI, even with some limitations (Acs *et al.*, 2014), is a very good proxy for our further empirical exercise, to measure the dynamics of EEEE, because the data are harmonized, comparable in our time frame and provides enough evidence in our specific analyzed countries. Consistently with our entrepreneurship ecosystem framework based on the GEDI approach, we state three hypotheses:

H1. There is a positive relationship between entrepreneurial attitudes (as measured by GEDI) and senior entrepreneurial activity by opportunity in Latin America.

H2. There is a positive relationship between entrepreneurial capabilities (as measured by GEDI) and senior entrepreneurial activity by opportunity in Latin America.

H3. There is a positive relationship between entrepreneurial aspirations (as measured by GEDI) and senior entrepreneurial activity by opportunity in Latin America.

3. Research methodology

Our research uses data from two main sources, the GEM and the GEDI. The GEM is a worldwide project that conducts standardized surveys on individual-level variables. It uses a conceptual framework that considers the entire venture life cycle (Reynolds *et al.*, 2005). We use the National Experts Survey (NES) and the Adult Population Survey (APS). As we described previously, the Global Entrepreneurship and Development Index from GEDI reflects the multidimensional nature of new ventures and is composed of three subindexes that collect individual and institutional factors. Table 1 describes these elements (Acs *et al.*, 2014, 2017).

The GEM's APS provides a total of 15,019 observations from 50+ years old individuals from five countries from Latin America (Argentina, Brazil, Chile, Colombia and Mexico) between the years 2013 and 2017. These countries were selected because they have the highest GDP in the region (they represent almost 70% of the Latin American GDP) and showed data consistency. Table A1 shows the descriptive statistics for the data set.

Total early-stage entrepreneurial activity (TEA) indicator by opportunity from the APS is the dependent variable. It is given the value "1" when a senior (+50 years) is either actively involved in starting a business or owning and managing a new one for up to 3.5 years (Bosma *et al.*, 2021).

In addition, relevant control variables were included at the individual level from the APS – income level, education level, occupation, gender and perceived entrepreneurial skills – and at the country level – postsecondary entrepreneurial education. This last variable is extracted

Table 1. The pillars of the GEDI model

Subindex (3As)	Pillars	Individual variable	Institutional variable
Entrepreneurial attitudes (ATT)	Opportunity perception	Opportunity recognition	Freedom
	Startup skills	Skill perception	Education
	Risk acceptance	Risk perception	Country risk
	Networking	Knows entrepreneurs	Agglomeration
	Cultural support	Career status	Corruption
Entrepreneurial abilities (ABT)	Opportunity startup	Opportunity motivation	Governance
	Technology absorption	Technology level	Technology absorption
	Human capital	Education level	Labor market
	Competition	Competitors	Competitivenes
Entrepreneurial aspirations (ASP)	Product innovation	New product	Tech transfer
	Process innovation	New technology	Science
	High growth	Gazelle	Finance and strategy
	Internationalization	Export	Economic complexity
	Risk capital	Informal investment	Depth of capital market

Source: Acs *et al.* (2017)

from the NES and is obtained because of a survey of experts in each country that determines to which extent training in creating or managing SMEs is incorporated within the education and training system in higher education such as vocational, college and business schools. Table 2 shows the description of the variables that we introduced in our model.

A multilevel logistic regression model was used. A total of three equations were estimated on the data set described. The multilevel logistical models tested are the following:

$$TEA(OPP) = \beta_0 + \beta_1 * ATT + \beta_2 * Income\,level + \beta_3 * Education\,level + \beta_4 * Occupation + \beta_5 * Perceives\,skill + \beta_6 * Gender + \beta_7 * EDU2 + b * Countries + \varepsilon \quad (1)$$

Variable	Description	Type	Values	Source
Dependent variable				
TEA_OPP	Total early-stage entrepreneurial activity by opportunity	Binomial	No = 0; Yes = 1	APS
Independent variables				
ATT	Entrepreneurial attitudes	Continuous	Between 0 and 100	GEDI
ABT	Entrepreneurial abilities	Continuous	Between 0 and 100	GEDI
ASP	Entrepreneurial aspirations	Continuous	Between 0 and 100	GEDI
Controls				
Income level	Individuals' household income level.	Category	Low, medium, high	APS
Education level	Individuals' level of education.	Category	0-Primary level 1-Secondary level 2-Postsecondary 3-Graduate experience	APS
Occupation	Type of occupation of individuals.	Category	0-Non occupied 1-Full-time/part-time	APS
Gender	Gender of the individuals	Category	0-Man 1-Woman	APS
Perceives skills	Believes in having the knowledge, skills and experience necessary to start a new venture	Binomial	No = 0; Yes = 1	APS
EDU2	Entrepreneurial education at postschool stage: the extent to which training in creating or managing SMEs is incorporated within the education and training system in higher education such as vocational, college and business schools (country level)	Continuous	Between 0 and 5	NES
Country	Country of the observation (individual level)	Category	AR – Argentina BR – Brazil CL – Chile CO – Colombia MX – Mexico	APS

Source: GEM project and GEDI

Table 2. Variables included in the model

$$TEA(OPP) = \beta_0 + \beta_1 * ABT + \beta_2 * Income\ level + \beta_3 * Education\ level + \beta_4 * Occupation + \beta_5 * Perceives\ skill + \beta_6 * Gender + \beta_7 * EDU2 + b * Countries + \varepsilon \quad (2)$$

$$TEA(OPP) = \beta_0 + \beta_1 * ASP + \beta_2 * Income\ level + \beta_3 * Education\ level + \beta_4 * Occupation + \beta_5 * Perceives\ skill + \beta_6 * Gender + \beta_7 * EDU2 + b * Countries + \varepsilon \quad (3)$$

This model helps to answer which factors from the context are related to the probability of being a senior entrepreneur by opportunity. Other studies follow a similar methodology (Holienka *et al.*, 2016; Torres-Marín *et al.*, 2020; Amorós *et al.*, 2023), but our model differs in the use of variables from the GEDI as context/institutional variables that encourage entrepreneurial activity for seniors in Latin America. Running three models helps to avoid the multicollinearity identified when running a model with the three subindexes included.

4. Results

Tables 3 to 5 show the results of the model. Table A2 shows the correlation matrix for the data set.

Our results show that the ATT variable has a positive relationship with the opportunity entrepreneurial activity for seniors in Latin America (ME = 0.002; $p = 0.01$). This result supports *H1* as seniors seem to be related by the components of the ATT pillar, such as opportunity and skills perception, risk acceptance, social capital and cultural support. On the individual level, senior entrepreneurs seem to be also related to the self-perception of the environment, their skills to start a business and the closeness to their network of contacts who are entrepreneurs. On the institutional level, economic freedom, level of general

Table 3. Logistic multilevel model results for opportunity-based senior entrepreneurs-ATT

	Est	*ME*	Std dev	*P*>|*z*|	Sig
ATT	0.010	0.002	0.003	4.67E-03	**
Controls					
Income level: low	Ref.				
Income level: medium	0.392	0.030	0.076	4.67E-03	***
Income level: high	0.599	0.045	0.076	2.35E-07	***
Education: nonprimary/primary	Ref.				
Education: secondary	0.335	0.027	0.073	5.26E-06	***
Education: post-secondary	0.447	0.039	0.084	1.10E-07	***
Education: graduate	0.550	0.053	0.132	3.28E-05	***
Occupation: full-time or part-time	−0.361	−0.025	0.060	1.58E-09	***
Perceive skills (yes)	1.575	0.106	0.080	2.00E-16	***
Gender (women)	−0.255	−0.018	0.057	7.39E-06	***
EDU2	0.462	0.037	0.149	2.00E-03	**
Cons.	−5.476		0.497	2.00E-16	***
Country					
Var.	0.011		0.106		

Notes: Number of obs. = 15,019; Number of groups = 5; Log likelihood = −4590.7 ; Prob > chi2 = 0.000; Adjusted R2 (McFadden) = 0.24220812; AIC = 9205.5; BIC = 9296.9; Sig. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source: Own elaboration

	Est	*ME*	Std dev	*P*>|*z*|	Sig
ABT	0.009	−0.003	0.007	2.00E-16	***
Controls					
Income level: low	Ref.				
Income level: medium	0.390	0.041	0.076	2.69E-07	***
Income level: high	0.598	0.064	0.076	4.51E-15	***
Education: non primary/primary	Ref.				
Education: secondary	0.339	0.339	0.074	4.35E-06	***
Education: postsecondary	0.457	0.457	0.084	6.10E-08	***
Education: graduate	0.556	0.556	0.133	3.05E-05	***
Occupation: full-time or part-time	−0.361	−0.361	0.060	1.58E-09	***
Perceive skills (yes)	1.578	1.578	0.080	2.00E-16	***
Gender (woman)	−0.255	−0.255	0.057	7.28E-06	***
EDU2	0.391	0.391	0.171	2.21E-02	*
Cons.	−5.165		0.533	2.00E-16	***
Country					
Var.	0.022		0.148		

Notes: Number of obs. = 15,019; Number of groups = 5; Log likelihood = −4593.1 ; Prob > chi2 = 0.000; Adjusted R2 (McFadden) = 0.23800149; AIC = 9210.1; BIC = 9301.5; Sig. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source: Own elaboration

Table 4. Logistic multilevel model results for opportunity-based senior entrepreneurs – ABT

	Est	*ME*	Std dev	*P*>|*z*|	Sig
ASP	0.007	0.000	0.005	1.14E-01	
Controls					
Income level: low	Ref.				
Income level: medium	0.396	0.031	0.076	1.85E-07	***
Income level: high	0.599	0.046	0.076	4.17E-15	***
Education: nonprimary/primary	Ref.				
Education: secondary	0.337	0.027	0.074	4.88E-06	***
Education: postsecondary	0.458	0.039	0.084	4.47E-08	***
Education: graduate	0.551	0.051	0.133	3.66E-05	***
Occupation: full-time or part-time	−0.360	−0.025	0.060	1.84E-09	***
Perceive skills (yes)	1.577	0.106	0.080	2.00E-16	***
Gender (woman)	−0.255	−0.018	0.057	7.53E-06	***
EDU2	0.384	0.033	0.179	3.18E-02	*
Cons.	−5.112		0.551	2.00E-16	***
Country	0.02605		0.1614		
Var.					

Notes: Number of obs. = 15,019; Number of groups = 5; Log likelihood = −4592.7 ; Prob > chi2 = 0.000; Adjusted R2 (McFadden) = 0.24137989; AIC = 9209.4; BIC = 9300.8; Sig. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Source: Own elaboration

Table 5. Logistic Multilevel Model Results for Opportunity-based Senior Entrepreneurs – ASP

education and reduction of corruption are factors that also are related to senior entrepreneurship activity.

In the case of the ABT variable, it has a negative impact on seniors (ME = −0.003; $p = 0.01$). This result rejects *H2* as it seems that seniors' motivations, technology absorption, human capital and competition negatively reduce the probability of starting a new venture. On the individual

level, the technology level seems to be a factor negatively impacting the probability of starting a new venture for seniors, as they are probably not catching up with the minimum technological knowledge required to start a venture in these markets. At the institutional level, labor markets could be influencing the negative effect of this pillar, as corporate jobs could be a destiny for seniors who have some technological skills and higher levels of education.

The ASP variable seems not to be relevant for seniors, thus rejecting *H3*. This result suggests that product and process innovation, growth, internationalization, and risk capital do not have a relationship with the creation of new ventures for seniors. On the individual level, innovation in products and processes seems not to be relevant for seniors, indicating a potential lack of competitive advantages in their ventures. At the institutional level, a lack of proper technological transfer programs, economic complexity in the region and the lack of financial support could be reasons that make the ASP pillar irrelevant for seniors.

Control variables included in the model seem to be representative and relevant and follow the literature about seniors in developing countries. Higher-income levels and higher levels of education seem to be drivers for senior entrepreneurship, as having a better sociodemographic position in Latin American countries makes seniors more aware of opportunities in the market. In addition, perceiving having the skills to be an entrepreneur also contributes to the increase of venture creation. Being a woman seems to be negatively associated with the creation of new ventures in these countries, validating other studies that reflect the same idea (Brush *et al.*, 2018; Chen *et al.*, 2022).

5. Discussion

As previously discussed, many authors address the importance of developing EE to start a new venture in Latin America (Guerrero and Urbano, 2017b; Gonzalez-Uribe and Leatherbee, 2014; Freire-Gibb and Gregson, 2019; Saiz-Álvarez and Coduras-Martínez, 2020). The results obtained in the previous section address three main aspects. First, entrepreneurial attitudes (ATT) are factors that could have a major positive relationship with senior entrepreneurs, generating higher levels of senior entrepreneurial ventures. This is in line with what other authors suggest about individual attitudes (Leporati *et al.*, 2021; Coduras *et al.*, 2018) as having access to better social capital, a higher level of education to recognize opportunities in the market, cultural support and perceiving having the skills to be an entrepreneur seem to be relevant individual attitudes and perceptions. Regarding the institutional level, our findings are in line with other authors (Guerrero and Urbano, 2017a; Khanna and Palepu, 2006; Júnior *et al.*, 2016; Stam and Bosma, 2015) who support that the higher level of corruption or lack of economic freedom or quality of education are important barriers to develop entrepreneurial activity in developing countries. Second, the entrepreneurial abilities subindex (ABT) is negatively relevant for senior entrepreneurs. This can be explained due to the difficulties of seniors in creating new ventures in sectors with higher technological innovation, competition, or regulation, or in regions where the level of governmental taxes is high. This is in line with what other authors suggested about this age group (Kautonen, 2012). In addition, generally, human capital positively affects the creation of new ventures that are highly innovative and require a highly educated and trained workforce (Vodâ *et al.*, 2020; Coduras *et al.*, 2018). However, from the labor market perspective, in Latin America, formal education seems to be used as a recruiting tool for corporations (Kautonen, 2008). This seems to be happening to seniors in this region, negatively affecting entrepreneurial activity. Third, entrepreneurial aspirations (ASP) are not relevant for senior entrepreneurs in Latin America. This finding could be related to the idea captured in the literature of seniors dedicating to entrepreneurial activities with less growth and having more funding difficulties (Brush *et al.*, 2018).

A higher level of entrepreneurial education at the postschool stage (EDU2) is relevant for seniors, increasing the probability of starting a new venture by opportunity; meanwhile, at previous stages, it did not seem to be effective. This is also a relevant finding that may have policy implications in terms of the design of educational programs that effectively promote venture creation in this segment. This finding requires further research to understand its effect on seniors.

These results highlighted two relevant implications for the study of EE and its impact on senior entrepreneurship in Latin America: first, our research reinforces existing evidence from other studies about the validity of a systems approach to understanding EE. This systemic approach to the EE has important theoretical and practical implications for senior entrepreneurship in Latin America as it leads academics and policymakers to be more sensitive to the macro context of entrepreneurship. Often, the context is considered exogenous and excluded from the theoretical framework. However, this approach implies that context should be the specific focus of research to understand how to improve senior entrepreneurship by opportunity and reduce existing age group differences.

Second, it highlights the need to specifically address existing problems in the EE in emerging economies for academics and policymakers (Cao and Shi, 2021). It is worth considering whether it is possible to incorporate the senior collective into more dynamic and competitive business models that could include digital transformation, as well as the need to help them overcome the difficulties posed by the scarcity of resources in their economies, cover the financial gaps with the presence of more international investors, or their knowledge gaps, with high-quality mentors, accelerators or investment organizations. It is also worth considering the development of government support programs aimed at the senior collective – with specific programs for the female gender – as well as supporting private entities to support successful business models.

6. Conclusion

Our research confirms the relevance of the impact of EE on senior entrepreneurship in Latin America, a region that is not specifically studied in the literature, and opens the opportunity to contrast some theoretical assumptions (Aguinis *et al.*, 2020). Using the GEDI framework because of its empirical linking with our data and model, we identified that the entrepreneurial attitudes (ATT) variable appears as a very relevant aspect for seniors, creating a proper context for entrepreneurial ventures in this segment. Conversely, entrepreneurial abilities (ABT) show some challenges and constraints, particularly in terms of technological adaptation for seniors. Entrepreneurial aspirations (ASP), show no relevance and lack of alignment and support from the institutional perspective for this age segment.

Practical implications from our research are related to the need to develop EE for seniors, taking into consideration the implementation of robust and dynamic strategies aimed at optimizing the entrepreneurial landscape for seniors. Educational programs, particularly those oriented to develop specific entrepreneurial skills at advanced stages, emerge as an important factor for seniors. Furthermore, the implementation of mechanisms that allow for better technology absorption and technology transfer for this age segment, together with accessibility to essential resources, financing and mentorship, are imperative for supporting seniors in the journey of starting a new venture within the context of digital transformation.

Finally, it allows us to glimpse some measures that policymakers could consider to improve the entrepreneurial activity of the senior segment, considering the specific differences for this group in the region. Governments need to consider a comprehensive set of measures from institutional, organizational and individual perspectives. At the institutional level, fostering gender equality can be promoted through the development of supportive regulations, norms and cultural institutions. For instance, implementing

programs that facilitate networking opportunities, mentorship and access to funding tailored to senior women entrepreneurs can help reduce the gender gap. Ensuring equal access to education for women, along with providing training in business and financial literacy, is essential for empowering female entrepreneurs. This area requires more development and should be considered for future research.

Like many studies, this research has some limitations considering the geographical area reviewed (only five countries in Latin America) and the period analyzed (only five years). Also, there are some disparities in the number of observations among countries selected as some countries dedicate more resources to take bigger samples and are, in some cases, more geographically distributed. We should also consider that some variables affect the entrepreneurial activity of seniors, which are not included in the model. In addition, how the ecosystem is measured is controversial (including the GEDI limitations), and variables were measured at the country level. Further studies can consider other EE measures that are emerging in academic and practitioner literature. Finally, it can be argued that seniors also influence the EE as they are a source of human and social capital for younger generations of entrepreneurs and that collaboration among different generations can be a source for identifying entrepreneurial opportunities. This is a very important topic that needs further research.

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Appendix

Table A1. Descriptive statistics for senior entrepreneurs' dataset

Variable	*N*	Mean	Std. dev.	Min	Max
ATT	15,019	47.33	20.02	21.18	72.80
ABT	15,019	34.05	13.25	16.10	50.91
ASP	15,019	37.06	18.37	10.75	58.12
Income level	15,019	1.93	0.841	1	3
Education level	15,019	0.82	0.890	0	3
Occupation	15,019	0.36	0.481	0	1
Gender	15,019	0.51	0.500	0	1
Perceive_skills	15,019	0.59	0.492	0	1
EDU2	15,019	2.927	0.309	2.33	3.53
TEA_OPP	15,019	0.11	0.309	0	1
Country	15,019				
AR	1,045	0.07			
BR	3,212	0.21			
CL	6,019	0.40			
CO	2,417	0.16			
MX	2,326	0.16			

Source: Own elaboration

Table A2. Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1 ATT	1									
2 ABT	0.960**	1								
3 ASP	0.850**	0.944**	1							
4 Income level	0.071**	0.061**	0.044**	1						
5 Education level	0.311**	0.360**	0.367**	0.414**	1					
6 Occupation	0.118**	0.128**	0.107**	0.148**	0.167**	1				
7 Gender	−0.030**	−0.031**	−0.026**	−0.150**	−0.094**	−0.177**	1			
8 Perceive skills	0.135**	0.156**	0.171**	0.127**	0.190**	−0.010	−0.131**	1		
9 EDU2	−0.071**	0.089**	0.231**	−0.006	0.028**	0.089**	−0.004	0.020*	1	
10 TEA_OPP	0.085**	0.090**	0.095**	0.120**	0.133**	−0.021**	−0.073**	0.206**	0.029**	1

Notes: **The correlation is significant at the 0.01 level (two-sided); *the correlation is significant at the 0.05 level (two-sided)

Source: Own elaboration

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