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Evaluating the Entrepreneurial Performance in South America. Case of Chile

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Abstract. The research objective is to explore Chile's entrepreneurial landscape by assessing individual characteristics and institutional factors through a 'pillars' framework and compare it against Colombia, and Brazil; to identify socio-economic, individual, and institutional differences using the Global Entrepreneurship Index (GEI); to apply bottleneck approach to highlight areas requiring policy intervention. GEI features individual and institutional stage variables in a method where every variable collaboratively interacts, incorporating 14 foundational elements and three sub-indexes: attitudes, abilities, and aspirations. Ranking 18th on the GEI globally and the best in Latin America, Chile excels in key entrepreneurial pillars, showcasing strengths in innovation and a robust entrepreneurial culture. Brazil closely rivals Chile in competition and networking, emphasizing political and economic influence. Colombia surpasses Chile in internationalization and growth-stimulating policies but faces challenges like historical conflicts and wealth distribution. This study identified areas where immediate policy intervention may be necessary by examining Chiles's entrepreneurial ecosystem. The Penalty for Bottleneck (PFB) technique identified the weakest pillars highlighting process innovation, competition, and internationalization. The primary component identified as a bottleneck for resource allocation is Process Innovation, accounting for 73% of the allocation, followed by Competition at 23%. The findings show that allocating more resources to process innovation may improve greatly the overall GEI score.

Keywords: Entrepreneurial Ecosystem; Chile; Latin America; GEI; Process Innovation; Internationalization

Introduction

The concept of the Entrepreneurial Ecosystem (EE) encompasses all the factors that facilitate the success of entrepreneurs, including those that contribute to their failure [1]. According to Malecki's work, the use of the term "ecosystem" from a social science standpoint has been on the rise [2] and one can say that nowadays EE has been positioned as part of business strategy and regional development agenda [3].

The landscape of this field of research has evolved, evidenced by the growing emphasis on entrepreneurial ecosystems. These EEs constitute a complex interconnection of attitudes, abilities, and aspirations both individual and institutional, that help new businesses start and grow [4]. While the United States and developed nations remain a prominent nebula for entrepreneurs and start-ups worldwide, Latin America faces the challenge of enhancing its competitiveness. Chile, Colombia, Mexico, and Brazil are at the forefront of promoting an entrepreneurial culture in the region.

This paper will examine the EE of Chile through the Global Entrepreneurship Index (GEI) developed by Páger, et al. [5] considering the following variables: Risk Capital, Internationalization, High Growth, Process Innovation, Product Innovation, Competition, Human Capital, Technology Adoption,

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Opportunity Start-up, Cultural Support, Networking, Risk Tolerance, Start-up Skills, Opportunity Perception.

By exploring these variables, we are trying to answer how can insights from the GEI analysis contribute to a comprehensive understanding of the factors that define entrepreneurial success in the South American region.

Research questions of this work include:

1. How do individual characteristics and institutional factors contribute to the entrepreneurial landscape in Chile when assessed using the GEI 'pillars' framework?
2. How do the entrepreneurial ecosystems in Chile, Colombia, and Brazil differ, and what are the socio-economic, individual, and institutional factors influencing these distinctions?
3. What specific aspects of Chile's entrepreneurial ecosystem, as evaluated through the lens of the GEI and the penalty for bottleneck approach (PFB), highlight the need for policy interventions?

The article is structured in three main parts: it begins with a review of Chile's entrepreneurial performance in existing literature, followed by an evaluation of various pillars using the GEI methodology in comparison with Colombia and Brazil. Finally, the paper concludes by offering recommendations for public policies using the penalty for bottleneck methodology [5].

1. Literature Review

An entrepreneur is an individual with "*the vision to see an innovation and the ability to bring it to market*" [6]. Historically, a business was typically required to start from a new concept/invention. Consequently, only a limited number of small enterprises fell into this category [7]. Even though, entrepreneurial activities can originate from product or process innovation, the final value proposition may not necessarily entail a groundbreaking invention, but the approach taken to bring it to the market and ensure its profitability is through the innovation [6].

The literature emphasizes that evaluating entrepreneurial variables may help to understand the factors influencing the ecosystem. An EE might be defined as a set of multidimensional factors that moderate the effect of entrepreneurial activity on the economic development [1]. Measuring the performance of such ecosystems is not an easy task, due to their diversity. It is necessary to develop models that comprise the foundation pillars that support successful firms. The GEI pillars [5] approach comprehends a wide variety of individual and institutional variables that together can boost the entrepreneurial performance of new firms. These metrics are crucial for informing and improving public policies to develop this sector.

As reported by the 2022 Global Entrepreneurship Monitor (GEM), Chile exhibits a favorable disposition towards entrepreneurship. Approximately 24.2% of the adult population is involved in the initial stages of entrepreneurial endeavors, and 8% have established businesses that have been operating for 42 months or more [8]. Chile's inclination toward entrepreneurship is remarkable, as 44.7% of those who do not currently have a business express their desire to initiate one within the next three years. Although this number is still higher than in other Latin American economies, it is exhibiting a declining trend in recent years [9].

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The EE of Chile has seen significant progress in promoting the creation of start-ups in recent years. Chile managed to maintain first place in the region, just below the developed countries [8]. From the point of view of gender equality, Chile stands out as a country with great opportunities for female entrepreneurs, with six women per 10 men entrepreneurs, way higher compared to other regions [10, 11]. The financial stability and political consistency of the government have improved the EE, sustained by financial assistance programs such as "Start-up Chile", which extends support to foreign entrepreneurs, providing them with up to $40,000 USD in funding and the opportunity to attain legal residency in the country [6]. Additionally, Chile boasts low corruption levels and, as an open economy, is part of several international trade agreements with both regional and global partners [11].

Unfortunately, the economic repercussions of the COVID-19 pandemic affected the overall business dynamics in the region. Hence, it's important to differentiate the pre-pandemic (before 2020) conditions, since most GEM entrepreneurship indicators fell to up to 50% in South America [8]. Chile lost 1827 new businesses in 2020 11% more compared to the previous year [12]. The indicator that measures the perception of opportunities in the initial phases, involving the potential for growth, expansion, investment, and internationalization which was equal to 57% in 2016, was decreased by the effects of the pandemic by approximately half to 30% in 2021 [9]. This decline stresses the need for government attention to promote the generation, growth, and expansion of firms [13].

The details of development of GEI pillars are available in Annex 1. From the perspective of Chile's EE, these are the GEI pillars (with institutional and individual variables) are the following:

Opportunity Perception. Chilean EE is characterized by a robust entrepreneurial culture and a keen awareness of business prospects. This is evident in the significant presence of start-ups and small enterprises within the nation [14]. The benefits of this environment encompass a receptive market for novel offerings and individual traits like the expertise and wisdom of business leaders for exploring and exploiting opportunities.

Start-up Skills. Highly skilled entrepreneurs are emerging, with numerous entrepreneurs undergoing education and training via diverse programs and initiatives. This presents a potential boom for new enterprises, as they can tap into the expertise and experience of these people, essential for launching and managing a thriving company [15]. However, others may find themselves excluded from these resources or unable to afford them, constituting a disadvantage.

Risk Tolerance. Chile exhibits a relatively modest appetite for risk, with a considerable portion of its population inclined towards employment within established corporations rather than embarking on entrepreneurial ventures [16]. This predisposition can pose a drawback for start-ups, as they may encounter challenges in embracing the risks of initiating a business.

Networking. We find a robust community of entrepreneurs and corporate leaders, with numerous entities and programs dedicated to facilitating connections and cooperation among firms [17]. This can offer new enterprises an asset [18]. However, accessibility to these networks might be constrained for entities residing in metropolitan regions or from certain socio-economic levels.

Cultural Support. The prevailing entrepreneurial culture is encouraging, as many perceive entrepreneurship as a feasible career choice [19]. This can be advantageous for emerging enterprises, as they can tap into a readily available market of individuals willing to invest in their ventures.

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Opportunity Start-up. Chile shows increased options for start-up ventures, especially in the domains of technology and innovation [14] which offers a potential benefit for new firms, as they can tap into a diverse range of novel and cutting-edge products and services. Nevertheless, these opportunities might be clustered in specific geographic regions or industries.

Technology Adoption. The use of emerging technologies experienced a rise, surging from 12.9% to 14.6%. Chileans is a nation characterized by a robust attitude toward embracing technology, with numerous firms and institutions dedicated to the integration of these technologies [20]. This can become beneficial for growing enterprises, as they can take advantage of state-of-the-art technologies, enhancing their efficiency and competitiveness.

Human Capital. The availability of competitive human capital is a valuable resource for the nation, with young students receiving education and training in a variety of fields [21]. This can be a major benefit for emerging businesses since they can access a trained and educated workforce, enhancing their productivity and competitiveness.

Competition. The nation's start-ups and small businesses are highly competitive, competing for the same clients and resources [22], which might hinder new entrepreneurs or firms from thriving. Despite this, competition can also catalyze innovation and improvement, encouraging favorable changes within the ecosystem.

Product Innovation. Chile has gained a world reputation as a nation known for its profound innovation (10% of the adult population consider their activity somehow new). Product innovation is key and Chilean start-ups are actively working to build cutting-edge goods and services. [23]. Emerging businesses may benefit from this since they can profit from their innovation efforts.

Process Innovation. Similar events are taking place in the field of process innovation, where many start-ups are concentrating on creating fresh, efficient methods of doing business [24]. Emerging businesses may profit from this since they can acquire effective business strategies that boost their productivity and competitiveness.

High Growth. New firms try to grow their income and market share in Chile. This offers a potential benefit for new enterprises, as they can tap into the extensive experience and wisdom of established entrepreneurs, facilitating their rapid growth and success [9].

Internationalization. International Entrepreneurship, which reflects the number of foreign clients from the total sales went up (pre-pandemic) from 27.7% in 2015 to 34.3% in 2018 [13] and dropped 7 places from 40th to 47th on the latest entrepreneurial assessment [8]. This presents an opportunity for new enterprises, as they can tap into a broader market and customer base, augmenting their efficiency and competitiveness [25].

Risk Capital. Even though many venture capital firms and other investors offer funding opportunities to start-ups and small enterprises, they can secure financial support to initiate and expand their ventures [26]. Some entrepreneurs may encounter limitations in accessing funding due to a lack of Networking or support from the government.

A systematic study of the results emerged from the Global Entrepreneurship Index (GEI) from 2016-2019 will try to discern the following hypothesis:

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1. Individual characteristics and institutional factors influence Chile's entrepreneurial landscape as measured by the novel 'pillars' framework [2].

2. The entrepreneurial ecosystem (EE) in Chile, Colombia, and Brazil differs significantly, influenced by a combination of socio-economic, individual, and institutional factors.

3. The assessment of Chile's EE using a penalty for the bottleneck (PFB) approach will reveal specific pillars that should shape the policy interventions to foster and enhance the entrepreneurial environment.

2. Research Methodology

This paper gathers data from the GEI results designed to evaluate the entrepreneurial performance of Chile as part of a comprehensive ecosystem.

Acs, et al. [27] debated that defining entrepreneurship on a national scale is a challenging endeavor. They acknowledged the need for a more precise definition that outlines individual-level behavior involving the redirection of resources and interactions with the business environment when presented with an opportunity to establish a new company. The concept behind the National System of Entrepreneurship's definition stems from a systemic perspective and is articulated as follows: "The dynamic, institutionally embedded interaction between entrepreneurial attitudes, ability, and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures" [27].

Various approaches are employed to estimate the extent of entrepreneurship, including output-based measurements like the GEM. Another methodology assesses entrepreneurial attitudes, while framework measures offer indicators for making valuable comparisons regarding an economy's institutional and regulatory environment. Collectively, these components constitute the GEI. This index encompasses both individual and institutional-level variables within a comprehensive system where these variables interact. It includes 14 pillars and is further subdivided into three sub-indexes: attitudes, abilities, and aspirations [5].

The GEI (Table 1) uses Individual-level variables and comes from the GEM “Adult Population Survey”. Institutional and environmental variables are drawn from a wide array of sources, including but not limited to GEM and UNESCO, among others [27]. It's important to note that the GEI differentiates itself from the National Systems of Entrepreneurship (formerly GEDI). The GEI only captures a subset of the variables found in GEDI, with one of its most significant outcomes being the formulation of policy recommendations or the identification of bottlenecks [5].

Following the creation of the pillars, the values undergo a normalization process, transforming them into a scale ranging from 0 to 1. This approach facilitates a comparison between a given country and the highest-performing state. To enhance the accuracy of this comparison, a capping technique is employed, which involves selecting only 95% of the values while disregarding the top 5%. The purpose behind this is to eliminate outliers, generate a more reasonable benchmark, and enable a comprehensive comparison of the pillars for the construction of public policies. GEI standardizes the minimal outcomes

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of the components concerning the average pillar values across nations. Annex 1 describes the variables that comprise each pillar.

The GEI scores are also contrasted against other two regional competitors: Colombia, and Brazil. A former EE study in Chile recommended the use of a wider array of parameters to enhance the findings on regional entrepreneurship in the South America [28]. As well Amoros et al. suggested that this replication should be extended to other significant emerging economies such as the BRICS (Brazil, India, Russia, China, and South Africa) or other emergent economies within the OECD, broadening the scope to include additional countries, whether in Latin America or elsewhere globally [29]. Comparing Chile against these countries provides a regional context. Each country has unique socio-economic, cultural, and institutional backgrounds that influence its EE. Understanding these differences within a regional context can provide a broader perspective on factors contributing to entrepreneurial success.

Finally, a penalty for the bottleneck (PFB) methodology is developed, the central concept of PFB is that the lack of performance of a specific variable, [referred to as a bottleneck] adversely impacts other variables on the index, consequently affecting the entire system. Enhancing the weakest aspect amplifies the impact on the index; hence, offering customized policy recommendations is especially valuable [30]. The sub-indexes: entrepreneurial attitudes, abilities, and aspirations are the average of the corrected PFB values of individual pillars on a scale of 0 to 100. A detailed construct design of the bottleneck method is found in Annex 2.

Pillar	Definition
Opportunity Perception	It assesses the entrepreneurial opportunity perception of the population and balances it with the country's level of freedom and the protection of property rights.
Start-up Skills	The perception of entrepreneurial skills within the population considers the quality of education as a contributing factor.
Acceptance Risk	The impact of the population's fear of failure on entrepreneurial activities, in conjunction with an assessment of the country's overall risk level.
Networking	Integrate two components of Networking: a) an indicator representing the capacity of potential and active entrepreneurs to connect with and utilize opportunities and resources, and b) the convenience of reaching out to one another.
Cultural Support	Addresses the perception of entrepreneurs in a specific country, examining the degree to which its residents view entrepreneurship as an esteemed status and career choice, and explores the influence of corruption levels on this perception.
Opportunity Start-up	The prevalence of individuals engaging in opportunity-driven startups, which typically offer higher quality prospects compared to necessity-driven start-ups, is evaluated in conjunction with the combined impact of taxation and the quality of government services.
Technology Absorption	The level of technological involvement in a country's startup endeavors, along with the country's ability to effectively assimilate technology at the firm level.
Human Capital	The assessment of entrepreneur quality involves a combination of quantitative and qualitative factors. It considers the proportion of start-ups initiated by individuals possessing education beyond the secondary level, along with a qualitative evaluation of a country's firms' inclination to provide training to their employees, all in conjunction with the level of labor market freedom.
The Competition	The degree of novelty in a start-up's product or market, when considered alongside the market dominance of established enterprises and corporate conglomerates, is also influenced by the effectiveness of regulatory measures promoting competition.
Product Innovation	The inclination of entrepreneurial enterprises to innovate and introduce novel products is balanced against a country's capability for technology transfer.

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Process Innovation	The integration of cutting-edge technologies by start-ups, along with a nation's Gross Domestic Expenditure on Research and Development (GERD) and its capacity for applied research, plays a significant role in this context.
High Growth	A composite metric includes a) the proportion of high-growth businesses with intentions to hire a minimum of ten employees and aspire to achieve over a 50 percent growth within five years, b) the accessibility of venture capital, and c) the sophistication of business strategy.
Internationalization	The extent to which a country's entrepreneurs engage in international activities is assessed by factoring in the export potential of businesses and the economic complexity level of the nation.
Risk Capital	Two financial indicators: informal funding provided to start-ups and an assessment of the capital market's depth.

Table 1. The Pillars of GEI [5]

3. Results and Discussion

The initial examination of the comprehensive GEI variables involves calculating the average index spanning from 2016 to 2019. This index provides an overview of a country's entrepreneurial performance over a four-year cycle. Chile, with a GEI of 58.3 and a GDP (PPP) of 24,912, emerges as the best-ranked country in Latin America and the Caribbean. Notably, despite having the lowest GDP purchasing power among the best 30 classified, Chile exhibits a distinct entrepreneurial competency when compared to the most developed nations [4].

Colombia achieves the 52nd position and it is the third highest-ranked country in the region with a GEI of 34.1. Conversely, Brazil, despite being one of the largest economies in South America, is positioned poorly at 118th place [4]. There's a substantial need for enhancements in Brazil's entrepreneurial ecosystem. Table 2 provides a comparison of the averages of GEI from 2016-2019 positioning Chile, Colombia, and Brazil.

GEI Rank	Country	GDP per capita (PPP)	GEI	GEI Rank	Country	GDP per capita (PPP)	GEI
1	United States	$65,112	86.8	**60**	Uruguay	$21,463	30.1
2	Switzerland	$83,832	82.2	**65**	Costa Rica	$16,515	28.8
3	Canada	$48,149	80.4	**67**	Peru	$12,979	28.4
4	Denmark	$63,027	79.3	**70**	Mexico	$19,373	27.1
5	United Kingdom	$42,788	77.5	**72**	Belize	$8,684	26.2
6	Australia	$56,436	73.1	**74**	Argentina	$18,347	26.0
7	Iceland	$73,827	73.0	**76**	Panama	$29,252	25.5
8	Netherlands	$53,579	72.3	**79**	Jamaica	$9,991	24.8
9	Ireland	$79,806	71.3	**84**	Dominican Rep.	$19,964	23.6
10	Sweden	$53,096	70.2	**89**	Bolivia	$7,013	22.1
19	**Chile [1]**	$24,912	58.3	**104**	Guatemala	$8,362	18.7
30	Puerto Rico	$38,004	48.7	**105**	Ecuador	$11,380	18.5
31	Spain	$42,781	46.9	**106**	Suriname	$17,615	18.4
52	**Colombia**	$15,488	34.1	**118**	**Brazil**	$16,291	16.1

Table 2. South America and the world's best overall scores of GEI and GDP [4]

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Figure 1 presents the results of the 14 GEI pillars, offering a benchmarking between Chile, Colombia, and Brazil. The positioning of the 14 pillars of Chilean Entrepreneurship indicates high scores for many variables. For example, Risk Acceptance (GEI 100/100) implies that a significant portion of the population holds a resilient attitude toward entrepreneurship. This pillar explains the percentage of individuals who don't perceive fear of failure as a deterrent to initiating a business. This suggests a favorable environment where aspiring entrepreneurs are less discouraged by the possibility of failure, fostering a culture of innovation and risk-taking.

Product Innovation pillar (GEI 100/100) indicates a country's capacity for innovation and adaptability. GEI index shows that Chilean entrepreneurs' potential to create novel products and embrace or replicate existing ones is at maximum possible level. The inclusion of an institutional variable related to technology and innovation transfer underscores a favorable business environment that facilitates the application of innovations for the development of new products. This suggests a conducive atmosphere for fostering creativity, technological advancement, and the introduction of innovative products to the market in the country.

Start-up skills (GEI 92/100) index results highlight the emphasis on advanced education. In developing countries like Chile, individuals often believe they possess the requisite skills for entrepreneurship, with a majority gaining these skills through hands-on experience in uncomplicated business activities.

Opportunity Perception (GEI 82/100) pillar positively evaluates a Chilean population's "opportunity perception" by assessing property rights and regulatory conditions. This helps identify and address potential barriers to successfully realizing entrepreneurial opportunities, fostering an environment conducive to economic growth and innovation.

Among the weakest pillars is Process Innovation (GEI 32/100), recognizing that relying solely on R&D does not ensure successful growth. The absence of systematic research activity obstructs the development and implementation of new technologies, thereby impeding future growth. The Science institutional variable attempts to integrate R&D potential with physical scientific infrastructure and science-oriented human capital, suggesting a potential limitation in the absence of a comprehensive and organized research approach.

Competition (GEI 37/100) pillar is the percentage of Total Early stages Entrepreneurial Activity (TEA) businesses with only a few competitors for the same product or service. This variable may overlook the impact of powerful business groups dominating the market. The presence of dominant players can complicate market entry for new businesses, challenging the effectiveness of the competition.

Internationalization (GEI 37/100), assessing the extent of Chile's entrepreneurial global engagement, may overlook important factors by just considering exporting potential and controlling to produce complex products. This narrow focus might limit a comprehensive understanding of broader economic and external factors influencing internationalization.

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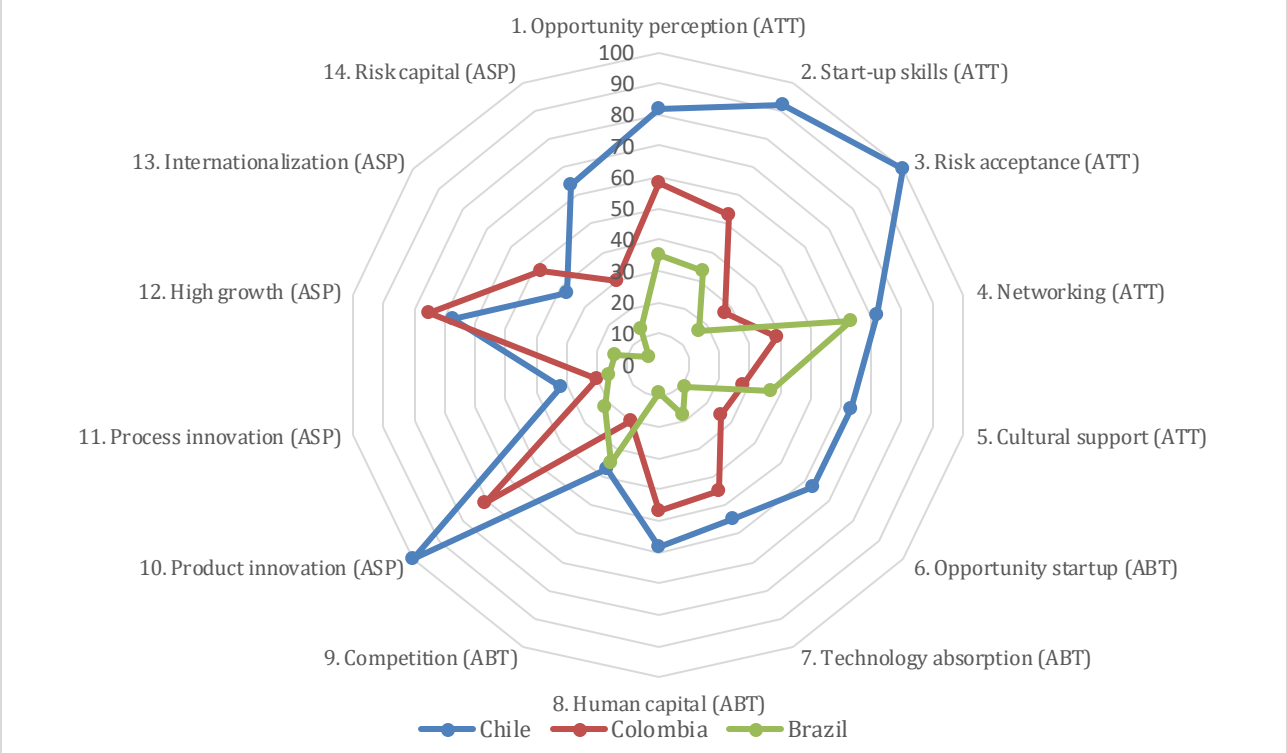

Figure 1. Entrepreneurship Pillars Comparison. Chile/Colombia/Brazil. Source: Own elaboration based on GEI 2019 data [4]

When the pillars of regional economies are contrasted, Brazil, one of the biggest economies in the world, does not dominate over Chili in any of the pillars. As expected for a globally highly ranked nation in the GEI, Chile excels in most of the pillars (1-11) showing a great performance in product innovation, Risk acceptance, and Start-up skills, which shows a truly entrepreneurial culture in this country.

Colombia beats Chile on Internationalization and High Growth stimulated by public policies. However, Colombia has struggled with internal conflicts and political instability in the past three decades and a weak distribution of wealth, which is a social scheme that divides the population into six socio-economic strata [10]. Brazil, which has dealt with corruption scandals and high levels of poverty only gets close to Chile on the Competition and Networking pillars, showing its strength in political agreements and economic influence on the region.

Collaboration among governments, the private sector, and universities is crucial to support start-up creation and development. However, financial assistance falls short of the required levels. In 2016, the proportion of national GDP invested in R&D for Latin American start-ups was merely 0.74%, significantly lower than the OECD's average of 2.3% [11]. Furthermore, local government subsidies allocated to the entrepreneurial sector remain insufficient and ineffective, often misdirecting resources [6]. These populist policies result in an unproductive entrepreneurship [31].

Figure 2 represents the analysis of individual and institutional components, namely Entrepreneurial Attitudes (ATT), Entrepreneurial Abilities (ABT), and Entrepreneurial Aspirations (ASP) derived from the 14 normalized pillars. The Figure illustrates the evolution of these variables over the decade spanning from 2009 to 2019. Notably, Chile's Entrepreneurial Attitude has consistently placed it among the top 10 countries globally. However, Entrepreneurial Abilities experienced a significant decline in the

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pre-pandemic years, while Entrepreneurial Aspirations exhibited steady growth from 2007 to 2016, followed by a subsequent decrease of nearly 5 points later.

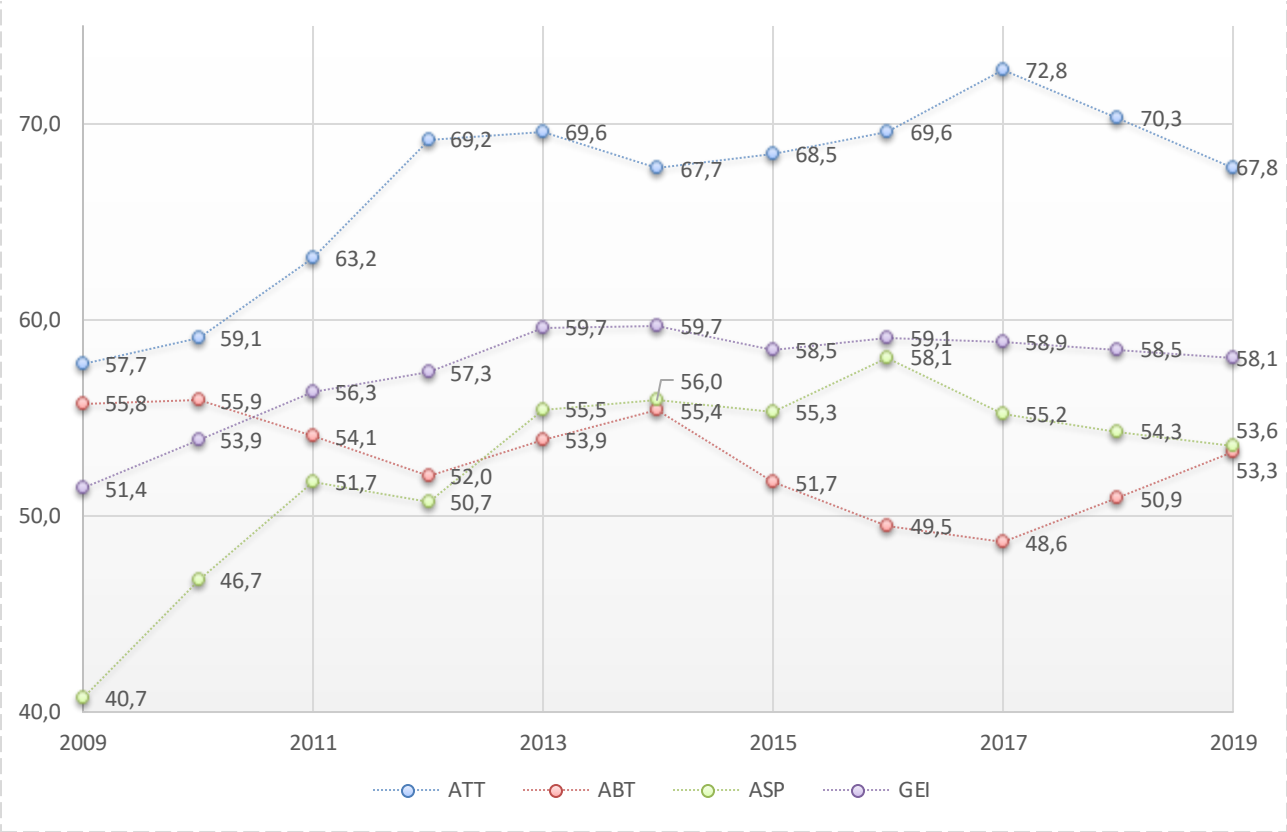

Figure 2. Performance of Chile in Entrepreneurial Attitudes (ATT), Entrepreneurial Abilities (ABT), and Entrepreneurial Aspirations (ASP) sub-indexes. Source: own elaboration based on GEI 2019 data [4]

Table 3 displays the outcomes categorized by sub-indexes, individual and institutional variables. The weakest among the institutional factors in Chile is Science (45), hence, despite recent increases in the R&D component, there is still a need for optimizing the allocation of resources for research development. It appears that the distribution of funds may not have been well-balanced [13].

The Competitiveness and Regulation variable (44) are also underperformed. Therefore, the drive for competition among entrepreneurs has been reduced, despite recent improvement in terms of gender equality. This can be further strengthened through continuous improvement within well-established innovative companies.

Furthermore, the nation's economic complexity, which is a component of the Internationalization pillar remains suboptimal. This complexity is associated with the wealth of valuable knowledge that can be generated from the products the country can produce [5]. On the positive side, Freedom (80) and Governance (79) received the best institutional scores.

On the individual classification, the lowest scores belong to Career status (57), Technology level (66), and Informal investment (68). On the other hand, the attitude of Opportunity recognition (90), the ability to manage competitors (99), and the aspiration of developing New products (100) show a real strength of Chilean entrepreneurs.

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		PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	**70.3**	Opportunity Perception	82	Freedom	80	Opportunity Recognition	90
		Start-up skills	92	Education	77	Skill Perception	77
		Risk Acceptance	100	Country Risk	76	Risk Perception	73
		Networking	72	Connectivity	79	Know Entrepreneurs	66
		Cultural Support	63	Corruption	79	Career Status	57
Entrepreneurial Abilities	53.3	Opportunity Startup	63	Governance	79	Opportunity Motivation	70
		Technology Absorption	55	Technology Absorption	62	Technology Level	66
		Human Capital	58	Labor Market	66	Educational Level	71
		Competition	37	Competitiveness and Regulation	44	Competitors	99
Entrepreneurial Aspirations	52.1	Product Innovation	100[1]	Technology Transfer	58	New Product	100
		Process Innovation	32[2]	Science	45	New Technology	73
		High Growth	67	Finance and Strategy	59	Gazelle	88
		Internationalization	37	Economic complexity	43	Export	75
		Risk Capital	64	Depth of Capital Market	82	Informal Investment	68
		GEI	**59%**	**INSTITUTIONAL**	**69%**	**INDIVIDUAL**	**76%**

Table 3. Individual and Institutional variables. Source: GEI 2019 [4]

As mentioned, the essence of the penalty for the bottleneck (PFB) approach lies in recognizing that the underperformance of a designated bottleneck variable has a ripple effect on other index variables and the overall system. Addressing the weakest link yields a magnified impact on the index, emphasizing the significance of tailoring policy recommendations for optimal outcomes.

Table 4 shows how Process Innovation is the bottleneck known as the key factor regarding resource allocation (73%), while the second most influencing is Competition (23%). Process Innovation is linked to the utilization of new technologies by entrepreneurs, along with the level of GDP investment in Research and Development and Chile's capacity for generating scientific research [5]. The fundamental concept behind this approach is to pinpoint and allocate resources where they can lead to a substantial enhancement in the country's overall GEI [30]. Chile should refocus its resources on the enhancement

[1] Darker tones show the best performer variables, note how Product Innovation and New Product got a perfect score.
[2] Process Innovation and Competition are the factors showing work to do.

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of R&D, fostering collaboration between public and private research centers, promoting partnerships between universities and industry, and strengthening the protection of inventions through legal mechanisms such as patents [32, 33].

The second element to consider is Competition (23%), and existing literature highlights the insufficient competitiveness in various regions of Chile. A significant portion of entrepreneurial activities is concentrated in Santiago (capital), partly due to the country's challenging geographical and topographical features. To address this, efforts should be made to diversify development and distribute economic prosperity to more underserved regions [10, 11, 34]. Finally, Internationalization (4%) might be improved by market diversification and the promotion of born global firms [25].

Focusing policies toward these pivotal areas can trigger an integral response in other components of the system. However, it is advisable to exercise caution and not directly target those bottlenecks, such as funding, for instance, which involves other variables [27].

Pillar	Impact on GEI	% Resource allocation
Process Innovation	**0,19**[3]	**73%**
Competition	0,06	23%
Internationalization	0,01	4%

Table 4. Public Policies Development (PFB). Source: GEI 2019 [4]

Conclusions

This paper aimed to Explore Chile's entrepreneurial landscape by assessing individual characteristics and institutional factors through a 'pillars' framework and compare it against Colombia and Brazil to identify socioeconomic, individual, and institutional differences using the GEI and bottleneck approach to highlight areas requiring policy intervention.

In conclusion, the positive implications of the evaluated pillars showcase a promising entrepreneurial landscape. The High Risk Acceptance score indicates a resilient attitude among a significant portion of the population, fostering a culture of innovation and risk-taking. The Product Innovation metric reflects a country's capacity for creativity and adaptability, with an institutional focus on technology and innovation transfer enhancing the business environment. Additionally, the emphasis on advanced education in the Start-up Skills pillar highlights the belief in possessing entrepreneurial skills, often acquired through practical experience, particularly in developing countries. Collectively, these factors contribute to a conducive atmosphere for fostering entrepreneurship, technological advancement, and the introduction of innovative products to the market.

However, the weaknesses identified in Process Innovation highlight the limitations of relying solely on R&D for growth, emphasizing the need for a more comprehensive research approach. The Competition pillar may overlook the influence of dominant market players, potentially complicating market entry for new businesses. Similarly, the Internationalization pillar's focus on exporting potential may limit its ability to capture broader economic factors influencing global entrepreneurial engagement. These insights underscore the importance of addressing these limitations for a more nuanced understanding

[3] Resource allocation in Process innovation may be the best ROI strategy for the Government.

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of the entrepreneurial landscape. While Chile's GDP may be modest in comparison to highly developed nations, the country has cultivated a vibrant "Andes Silicon Valley" in its capital, Santiago partially thanks to its geographical advantages. Nevertheless, there is substantial work to be done out of the metro area, as the entrepreneurial network is not evenly distributed across other regions of the country.

On the regional side, Chile excels in key entrepreneurial pillars, showcasing strengths in innovation and a robust entrepreneurial culture. Brazil closely rivals Chile in competition and networking, emphasizing political and economic influence. Colombia surpasses Chile in internationalization and growth-stimulating policies but faces challenges like historical conflicts and wealth distribution. Each country's unique profile underscores the complex nature of economic dynamics in the region.

Chile has a strong and growing entrepreneurship ecosystem, supported by several individual and institutional variables that promote the success of regional start-ups and small firms. On the organizational side, Chile's firms face challenges in the Science and Competitiveness and regulation of institutional factors, indicating a need for optimized resource allocation and a renewed focus on fostering entrepreneurial competition. Additionally, cultivating economic complexity, a component of the Internationalization pillar, can enhance the generation of valuable knowledge from the country's products. On a positive note, Chile excels in Freedom and Governance, showcasing strengths in institutional aspects that contribute to a favorable entrepreneurial environment. Individually, Entrepreneurs worry about their Career Status, Technology Level, and Informal Investment scores. However, notable strengths shine through in Opportunity Recognition, Competitor Management, and Aspiration for Developing New Products, showcasing their robust entrepreneurial culture and skilled capabilities.

The Penalty for Bottleneck, (PFB) technique identified the weakest pillars in a country's ecosystem, which are Process Innovation, Competition, and Internationalization. Chile ranks 18th on the GEI globally and the best in Latin America. Prioritizing process innovation in public policies is justified by the identified weakness. Process innovation offers a comprehensive growth strategy, fostering operational efficiency, job creation, resilience, resource optimization, and inclusive economic development. By encouraging businesses to optimize internal processes, public policies can contribute to a more sustainable, adaptable, and equitable economic landscape. New and robust entrepreneurial environments have flourished, Chile holds the 15th position among the 47 OECD countries in terms of physical infrastructure and the 4th position out of 19 in the category of public policies that stimulate entrepreneurship, as indicated in the 2018 GEM report [13]. Yet, the country has not been able to translate those improvements into established business owners.

Future studies might consider the standardization and refinement of entrepreneurship measurements, leveraging the strengths of tools like the Global Entrepreneurship Index (GEI). Emphasis should be placed on adaptability to dynamic landscapes, collaboration for international standards, and exploration of innovative metrics that consider social and environmental impacts.

Utilizing the GEI for informed public policies and resource allocation, emphasizing strategic investment in innovation. Chile serves as a model for effective entrepreneurship but should worry about R&D spending. Encouraging competition among entrepreneurs and facilitating information transfer are key priorities for sustained growth.

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Further Latin American studies on the development of process innovation, competition, and internationalization enablers are needed in future analyses, for example, foreign direct investment, market diversification, and R&D procurement practices (patents).

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