

ANALYSIS OF AUSTRIA'S ENTREPRENEURIAL ECOSYSTEM BASED ON THE GEI APPROACH

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ABSTRACT

This paper aims to provide a comprehensive analysis of the entrepreneurial ecosystem of Austria. The study used the Global Entrepreneurship Index (GEI) method and the Penalty for Bottleneck (PFB) to achieve this objective. The findings revealed a moderated entrepreneurial ecosystem with a GEI score of 65.2%. Again, the study found a strong correlation between Austria's GDP per capita and the GEI scores and a moderate score for all the three sub-indices entrepreneurial attitudes (65.5), entrepreneurial abilities (67.6), and entrepreneurial aspirations (62.4). Using the Penalty for Bottleneck (PFB) method, the study identified high growth and human capital as the bottleneck pillars. To shun the bottlenecks related to high growth, accessibility of finance, and formulation of sophisticated strategy at the institutional level are paramount, especially during this highly competitive technological era. Also, to alleviate the human capital bottleneck, the government should draw up policies that will help boost education at the tertiary level, especially at an individual level. Further empirical research can be conducted to compare the entrepreneurial ecosystem of EU countries. This study adds to the existing literature on entrepreneurship which is scanty. Additionally, this paper highlights the bottlenecks in Austria's Entrepreneurial Ecosystem and provides possible alternative policies that can enhance the entrepreneurial ecosystem if implemented.

Keywords: Entrepreneurship, Entrepreneurial ecosystem, Entrepreneurial aspirations, Entrepreneurial attitude, Entrepreneurial abilities, GEI, Penalty for Bottleneck (PFB)

JEL Codes: J24, L26, L50, O29

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INTRODUCTION

Entrepreneurship has been argued to be a vital part of economic growth and development (Acs, 2006; Acs & Szerb, 2007; Ács, Autio & Szerb 2014; Acs, Szerb & Lloyd, 2018). Entrepreneurship awareness has created jobs leading to a more stable civil society and the growth of the economy (Acs, Szerb, Autio & Lloyd 2017). The origin of entrepreneurship can be traced to the eighteenth century when Richard Cantillon first introduced the term entrepreneur, which fascinated academic scholars and researchers (Kathleen and Yosem, 2002). This attracted the attention of Schumpeter (1930) who actively contributed through his work on the concepts of innovation and entrepreneurship in his study on "the role of innovation and entrepreneurship in economic growth" as cited by Śledzik (2013). Hence leads to the question, who is an entrepreneur? Schumpeter (1934), defined entrepreneurs as "agents of creative destruction" who disrupt the market by introducing new products. Acs, *et al.*, (2017), support this by defining an entrepreneur as an individual who visualizes an innovation and brings innovation to the market. In addition, Acs, Åstebro, Audretsch, and Robinson (2016) and Acs, Szerb, and Lloyd (2018) defined an entrepreneur as a job creator who promotes economic growth through improving the lives of the population by developing new products and processes. Consequently, this leads to the question, what is entrepreneurship? Shane and Ventakaraman (2000), define entrepreneurship as the process of unearthing and exploitation of new profitable opportunities while Klapper and Love (2010) quote the World's bank definition of entrepreneurship as the activities of individuals or groups meant to introduce the economic initiatives in the legal structure of a business. However, the success of entrepreneurship is not solely dependent on the entrepreneur but also on the conduciveness of the entrepreneurial ecosystem

(Autio & Thomad 2013). An entrepreneurial ecosystem is a complex system of interactions between individuals and institutions or groups within the informational, institutional, and socioeconomic context (Audretsch & Belitski 2016). Therefore, this paper investigates the entrepreneurial ecosystem in Austria and compares it with other European countries.

Austria is in Central Europe and neighbors' countries such as Germany, Poland, Hungary, and Switzerland. Austria's capital Vienna is also labeled as a strong economy particularly due to the high productivity and focus on the employment of a qualified labor force. The country enjoys close links and integration with competitive multinational companies owing to its proximity to Germany and other Central and Eastern European countries. Austria's exports within the EU stand at 69% with 30% of these exports to Germany and 5% to Switzerland, while the imports from the EU account for 77% where 41% are from Germany and 5% from Switzerlandⁱ. Austria's entrepreneurship ecosystem can be termed as one of the toughest and most robust environments in Europe. This can be traced back to the late 1990s when the Government put in place initiatives to increase the importance of entrepreneurship after discovering that start-ups had high survival rates (Wanzenböck, 1998 as cited by Dana, 2018). (World Bank, 2020), Austria was ranked 127 out of 190 economies in terms of ease of starting a business, 94 out of 190 economies in terms of ease of accessing credit, and 1 out of 190 economies in terms of trading across borders. Austria's population enjoys government support through funding, as well as good physical and commercial infrastructures that encourage the founding and growth of businesses (GEM Report 2017). This supports the findings of Rezaei et al., (2014) which revealed that Austria offers an entrepreneurial friendly environment with several government institutions supporting the establishment and expansion of new businesses. Moreover, Vienna had the highest number of the young population involved in entrepreneurial activities ranking it third in the European countries (GEM report, 2018). However, Apfelthaler, Schmalzer, Schneider, and Wenzel (2008), noted that the population in Austria is more sensitive toward risks hence making employment more attractive as compared to entrepreneurship. In the social aspect, the Austrian population enjoys a socially interactive life of high standards. Additionally, Austria has a strong workforce due to the inward movement of labor from neighboring countries and it has experienced an increase in the number of women in the workforce (OCED 2019). In terms of employment, Austria shows a slight decrease of 0.4% in 2019 (IMF, 2016). However, the employment rate is anticipated to remain stable despite the recent Coronavirus epidemicⁱⁱ. The main sectors in Austria include agriculture which accounts for 4.2% of total employment, industry which accounts for 25.5% of total employment, and the service sector which accounts for 70.1% of total employmentⁱⁱⁱ. Moreover, SMEs in Austria are the backbone of the economy at 99.6% of all the businesses being SMEs generating revenues of 521 billion Euros and employing over 2 million people^{iv}.

Various studies have analyzed the entrepreneurial ecosystem in different countries, for instance, Russia (Szerb & Trumbull, 2018), Indonesia (Hermanto & Suryanto, 2017), and Egypt (Ali et al., 2021), however, there is scanty literature on the entrepreneurial ecosystem of Austria. This study, therefore, aimed to bridge this gap by exploring and explaining the entrepreneurial ecosystem of Austria using the GEI dataset from 2012 to 2016. The GEI analyzes the entrepreneurial ecosystem from three aspects or sub-indices: entrepreneurial attitude, entrepreneurial aspirations, and entrepreneurial abilities (Szerb & Trumbull, 2018). In the following sections, this paper presents details of GEI methodology, empirical analysis of GEI data of Austria, identifying the bottlenecks pillars and policy implications, and finally, a conclusion. The study was guided by the following hypothesis:

H₁: There is a positive relationship between GDP per capita and the GEI scores in Austria.

H₂: There is a positive relationship between GDP per capita and entrepreneurial abilities, entrepreneurial attitudes and entrepreneurial aspirations.

1 LITERATURE REVIEW

Since the introduction of entrepreneurship concepts in the early 1930s the growth and success of entrepreneurship in economic development are gradually becoming clearer (Szerb, Komlósi, & Páger 2017). This has attracted the attention of various academic researchers for instance (Zabelina *et al.*, 2019; Bosma *et al.*, 2018; Sergi *et al.*, 2019; Mwastika, 2021). According to Acs, *et al.*, (2017), entrepreneurship and innovation have been entwined with economic growth and development. Besides, entrepreneurship has been recognized as a critical driver of employment and innovation (Li *et al.*, 2020; Latif & Chae-Deug, 2021). In support, Liñán and Fernandez-Serrano (2014) posit entrepreneurship promotion increases the employment opportunities in a country translating to economic growth. This is mainly because entrepreneurship envisions new ideas with the outcome of changing and transforming the business world. Devkota *et al.*, (2022), conducted a study on the determinants of successful entrepreneurship in developing countries and found that technology is an important aspect in initiating entrepreneurship while education increases the output. Research conducted in 11 countries using GEM data shows that opportunity entrepreneurship has a positive and significant effect on economic growth and development (Acs 2006). Thus, the intrinsic relationship between entrepreneurship and economic growth and development cannot be ignored. In general, Entrepreneurs visualize ideas and can make these ideas into a reality thus bridging the gap between innovation, invention, and commercialization as they bring their products or services to the market. This has attracted the attention of more scholars who try to investigate the relationship between entrepreneurship and economic growth and development (Kritikos, 2015; Stoica, Roman, & Rusu 2020).

In addition, the entrepreneurial ecosystem has attracted the attention of academic scholars and policymakers (Alvedalen & Boschma, 2017; Abootorabi *et al.*, 2021). Academic scholars have investigated the entrepreneurship ecosystem in various sectors (Hernández-Chea *et al.*, 2021), cities (Spigel, 2017), the evolution of the entrepreneurship ecosystem (Abootorabi *et al.*, 2021), the role of intermediary organizations in the entrepreneurship ecosystem (Hernández-Chea *et al.*, 2021) and the influence of entrepreneurship ecosystems on business re-entries after failure (Guerrero & Espinoza-Benavides, 2021). The entrepreneurship ecosystem has been defined as the advanced social-economic level comprising not only the self-organization components but also the scalability and sustainability of entrepreneurship (Acs, *et al.*, 2018). Also, the entrepreneurial ecosystem has been defined as the "*dynamic institutionally embedded interaction between individuals' entrepreneurial attitudes, abilities, and aspirations and the institutions leading to the allocation of resources hence creating new ventures*" (Acs *et al.*, 2014, p. 479 as cited by Acs *et al.*, 2018). Moreover, the entrepreneurial ecosystem has been defined as "a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory (Stam & Spigel 2017 p.1 as cited by Alvedalen & Boschma, 2017). While Rao and Rajiv (2019), defined the entrepreneurship ecosystem as the "*system of all actors, institutions, government and the overall business environment that affect the growth of the new business*". Hence, exploring the interactions of the elements in the entrepreneurship ecosystem is more important than just identifying the components (Alvedalen & Boschma, 2017; Komlósi *et al.*, 2022). In support of this, (Lafuente *et al.*, 2021) argued that entrepreneurial ecosystem components don't work in isolation and the assessment of these elements individually would not give accurate results. According to Alvedalen & Boschma, (2017), the performance of an entrepreneurship ecosystem is based on the interaction between individuals, organizations, and institutions. Lafuente *et al.*, (2021), the study used the benefit of the doubt approach to evaluate the entrepreneurial ecosystems of 71 countries and found a significant and positive correlation between quality improvements in the entrepreneurial ecosystem and venture capital. González-Serrano *et al.*, (2021), study on entrepreneurial ecosystems for developing the sports industry in EU countries found that high levels of creativity, knowledge, technology, business, infrastructure, human capital, and research could explain the high levels of shared sport-related GDP (González-Serrano *et al.*, 2021). Additionally, Aminova *et al.*, (2020) conducted a study on the entrepreneurship ecosystem in the Arab world using the data from the Global Innovation Index and the Global Entrepreneurship Monitor and

concluded that digital entrepreneurship remains untapped by local entrepreneurs in comparison to foreign businesses. Singh and Ashraf (2020), conducted a study on the association between the entrepreneurship ecosystem and economic growth. The study used the entrepreneurship ecosystem index to measure the entrepreneurship ecosystem. The study found a significant relationship between the entrepreneurship ecosystem and GDP per capita, and social-economic development. These results were in line with Ashraf & Singh (2019), study on the long-term relationship of the entrepreneurship ecosystem to economic growth.

2 RESEARCH METHODOLOGY

This study aimed to explore and explain the entrepreneurial ecosystem of Austria using the GEI dataset from 2012 to 2016. The Global Entrepreneurship Index (GEI) was formally known as the Global Entrepreneurship and Development Index (GEDI) (Szerb, et al., 2016; Acs, et al., 2016; Ács, et al., 2014). The GEI methodology is an essential instrument that enables countries to assess and evaluate their entrepreneurship ecosystem in a bid to create more jobs (Acs, et al., 2018; Zoltán et al., 2018). GEI takes into consideration that entrepreneurship is a multifaceted sensation that requires complex measures, secondly, that an appropriate measure should consider the quality aspects of entrepreneurship and not quantity, third, that individual competencies and institutional aspects are very crucial in measuring entrepreneurship, fourth, that the 14 pillars, institutional and individual aspects of entrepreneurship are integrated, and finally that the GEI enables policy formulation from the perspective of providing a tailor-made policy rather than general global policies (Szerb, et al., 2016). In addition, the GEI methodology considers the link between the individual variables and institutional factors. GEI contains three sub-indices normally known as 3As (entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations). Entrepreneurial attitudes reflect the attitude of the population towards entrepreneurship while entrepreneurial abilities are the crucial traits possessed by an entrepreneur which determine the success of start-up businesses. Entrepreneurial aspirations refer to the distinguishing strategy-related nature of the entrepreneurial activity (Ács et al., 2018). Each of the three sub-indices comprises pillars. These pillars are 14 in number, and they contain institutional and individual variables. Additionally, the pillars endeavor to show the flexible nature of entrepreneurship. Analyzing the pillars provides a comprehensive view of the strengths and weaknesses of those listed in the index (Ács et al., 2018). While analyzing the entrepreneurial ecosystem (through the sub-indices, individual and institutional variables), the GEI applies the Penalty for Bottleneck method (PFB) to identify bottleneck pillars and recommend policy priorities. The PFB methodology was developed by Acs, et al., (2014) and views the 14 pillars in interaction with one another. This methodology helps to identify the weakest pillars or variables in the entrepreneurship ecosystem. Then, those lowest performing elements are considered as a bottleneck/s in the entrepreneurship ecosystem. This study, therefore, used the Global Entrepreneurship Index (GEI) to evaluate the entrepreneurial ecosystem of Austria using the Global Entrepreneurship Monitor (GEM) dataset for a period between 2012-2016. The study applied the Penalty for Bottleneck method to identify bottleneck pillars and recommend policy priorities in Austria.

3 DISCUSSION OF RESULTS

3.1 Entrepreneurship Performance of Austria in comparison with other countries Globally

Austria was classified by the World Bank as a high-income country. The GDP per capita of Austria in 2016 was 46,473 dollars when adjusted by the purchasing power parity (PPP). Table 1 below shows the GEI scores and GDP per capita of the top 20 countries out of the 95 countries in the dataset for a period between 2012-2016. Countries were further divided into three categories abbreviated as "DEV" in table 1 below. Category 1 consists of low-developed countries, Category 2 consists of average-developed

countries while category 3 consists of high developed countries (Szerb & Trumbull, 2018). The dataset used was calculated as the average of the 2012-2016 data. Austria was ranked as highly developed country at the 13th position with a GDP per capita of 44,210 and a GEI score of 65.2% while the USA was ranked 1st with a GDP per capita of 51,884 and GEI score of 82.5%. as shown in the table below.

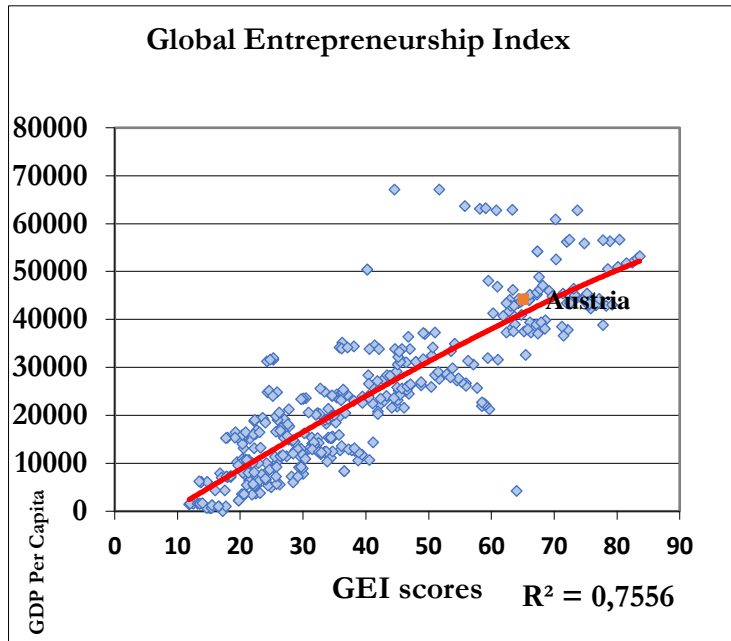
Table 1 Overall Ranking of Austria and other countries in the Global Entrepreneurship Index

Rank	Country	GDP per capita	GEI	DEV
1.	United States	51,884	82.5	3
2.	Switzerland	56,395	78.9	3
3.	Canada	42,838	78.3	3
4.	Australia	43,881	74.9	3
5.	Sweden	44,576	74.7	3
6.	Denmark	44,709	73.7	3
7.	United Kingdom	37,840	72.2	3
8.	Ireland	52,558	70.3	3
9.	Netherlands	45,951	69.2	3
10.	Finland	39,355	68.1	3
11.	Hong Kong	54,279	67.3	3
12.	France	37,575	65.2	3
13.	Austria	44,210	65.2	3
14.	Germany	43,402	64.2	3
15.	Belgium	41,216	63.3	3
16.	Taiwan	37,832	63.0	3
17.	Israel	31,676	61.1	3
18.	Chile	22,160	59.0	2
19.	Luxembourg	94,277	58.5	3
20.	Norway	63,173	58.2	3

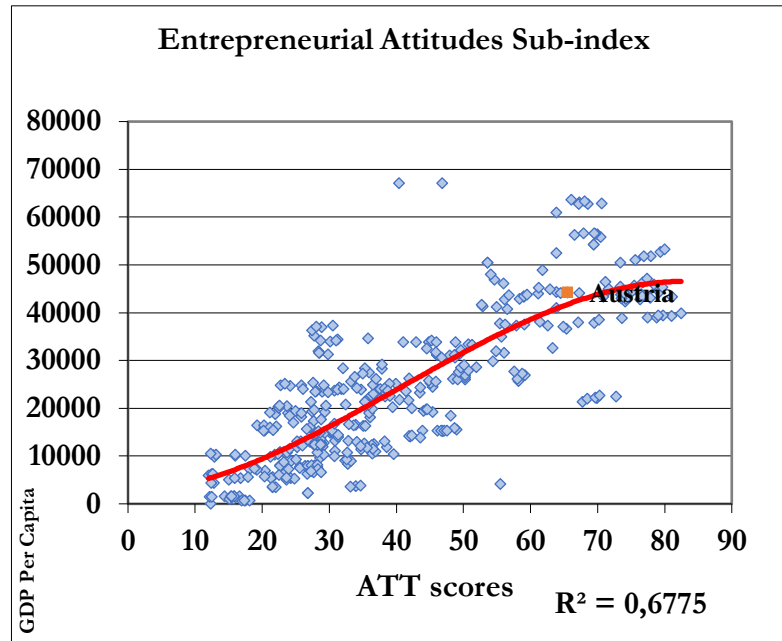
(Source: Own calculation, 2022 using the GEI method)

Figure 1 below presents the correlation between the GDP per capita, GEI scores, and the sub-indices. Figure 1(a) shows the relationship between GDP and the GEI scores, Figure 1(b) shows the relationship between entrepreneurial attitude and GDP, Figure 1(c) shows the relationship between entrepreneurial abilities and GDP while Figure 1(d) shows the relationship between entrepreneurial aspirations and GDP. There is a positive and strong correlation between Austria's GDP per capita and the GEI scores. This can be confirmed by the R^2 of 0.7556 meaning that 75.56% of the variance in the GDP per capita can be explained by the GEI scores. Additionally, the entrepreneurial sub-indices positively correlate with Austria's GDP per capita. This can be confirmed by the entrepreneurial attitudes R^2 of 0.6775 (67.75%), entrepreneurial abilities R^2 0.7595 (75.95%) and entrepreneurial aspirations R^2 of 0.6432 (64.32%).

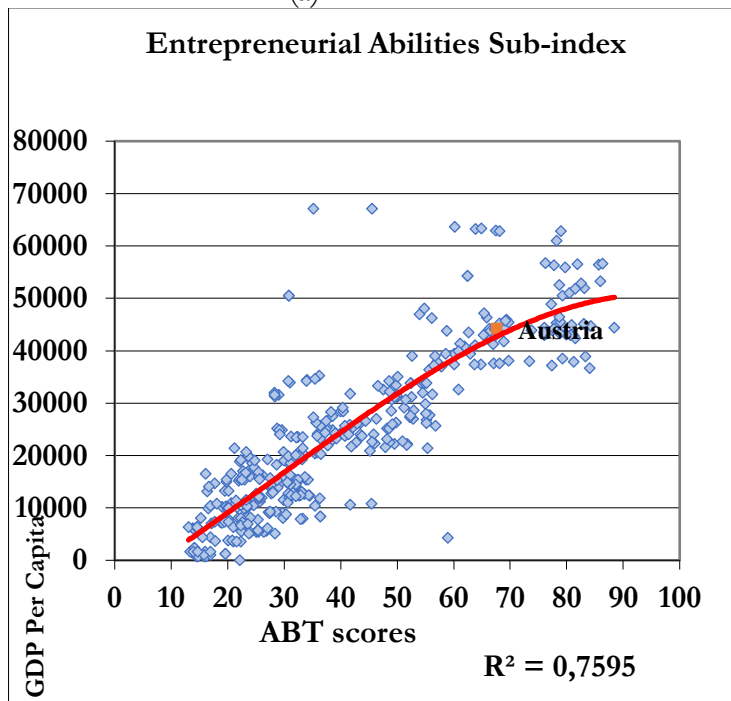
Figure 1 Correlation between GEI Scores, GDP per capita, and Entrepreneurial sub-indices



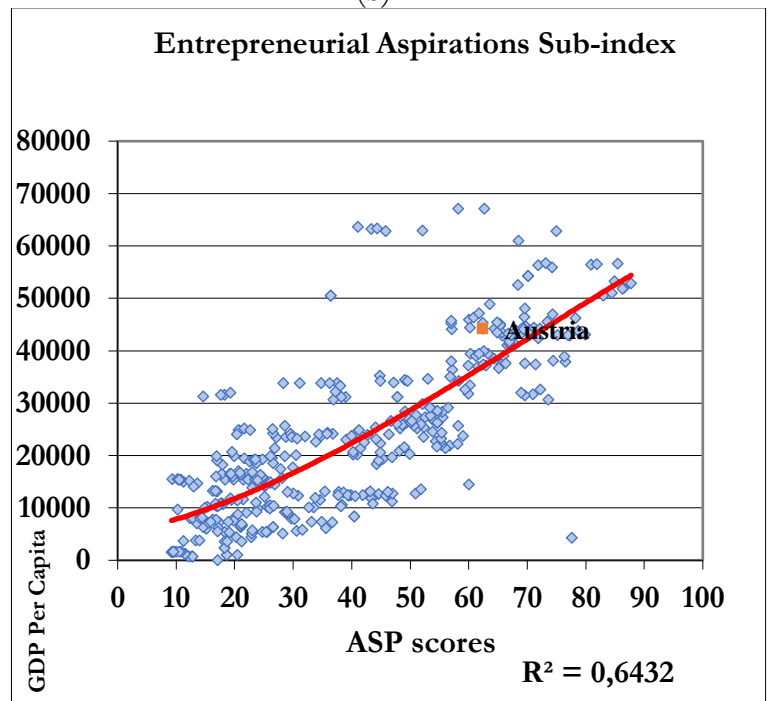
(a)



(b)



(c)



(d)

(Source: GEI Data Set 2012-2016)

3.2 Austria's Entrepreneurial Profile: Strengths and Weaknesses

Table 2 below, gives a more detailed analysis of the three sub-indices by ranking them in the highest or lowest percentile to obtain the categorization scores of each pillar. Therefore, if the index scores below the 33 percentiles, then it means that the pillars fall in the category of the worst-performing pillars and if the index scores above the 67 percentiles, it means that the pillars are high performing category. From

Table 2 below all the pillars scored over the 33-percentile meaning that they did not fall in the category of the worst-performing pillars.

Table 2 Categorization of Pillars

Components of Entrepreneurial Attitudes Sub-index (normalized scores)					
	Opportunity perception	Start-up skills	Risk acceptance	Networking	Cultural support
Austria	0.77	0.89	0.68	0.60	0.64
33% percentile	0.32	0.31	0.26	0.36	0.29
67% percentile	0.54	0.58	0.63	0.53	0.57
Components of Entrepreneurial Abilities Sub-index (normalized scores)					
	Opportunity startup	Technology absorption	Human capital	Competition	
Austria	0.81	0.97	0.47	0.78	
33% percentile	0.30	0.29	0.33	0.31	
67% percentile	0.60	0.60	0.54	0.54	
Components of Entrepreneurial Aspirations Sub-index (normalized scores)					
	Product innovation	Process innovation	High growth	Internationalization	Risk capital
Austria	0.75	0.76	0.36	0.88	0.67
33% percentile	0.31	0.30	0.28	0.32	0.28
67% percentile	0.54	0.61	0.62	0.57	0.60

(Source: GEI Data Set 2012-2016)

GEI is analyzed based on three sub-indices namely the attitude (ATT), ability (ABT), and aspirations (ASP). According to Acs, et al., (2014) and Szerb, et al., (2016), entrepreneurial attitude mirrors how people feel about entrepreneurship and the type of business that the entrepreneurs would like to venture into. Austria as a country performs better on institutional variables rather than individual variables (see table 3 below) moreover, in terms of the three sub-indices shows that Austria performs well in terms of entrepreneurial ability where high scores in technological absorption of 0.97 and technology level of 0.97 are recorded. This is a clear indication of how the country is technologically inclined and its willingness to incorporate technology in its entrepreneurial activities. Yet, weak scores were recorded on the human capital of 0.47. This can be explained by the weak scores in the educational level of 0.44. Additionally, the performance of entrepreneurial attitude is dragged by the individual's perception of risk, skills, and career status. However, Austria's entrepreneurial ecosystem experiences bottlenecks in high growth (0.36) and human capital (0.54) which is due to the low performance of new technology (0.45), gazelle (0.43), and education (0.44) at an individual level as shown in table 3 below.

Table 3 Austria's Entrepreneurial Profile: The Fourteen Average Equalized Pillar Values

	PILLARS		INSTITUTIONAL VARIABLES		INDIVIDUAL VARIABLES	
Entrepreneurial Attitudes	Opportunity Perception	0.77	Freedom	0.85	Opportunity Recognition	0.67
	Start-up skills	0.89	Education	0.89	Skill Perception	0.58
	Risk Acceptance	0.68	Country Risk	1.00	Risk Perception	0.44
	Networking	0.60	Connectivity	0.73	Know Entrepreneurs	0.57
	Cultural Support	0.64	Corruption	0.81	Career Status	0.45
	Entrepreneurial Attitudes	65.5				
Entrepreneurial Abilities	Opportunity Startup Technology Absorption	0.81	Governance Technology Absorption	0.86	Opportunity Motivation Technology Level	0.82
	Human Capital	0.47	Labor Market	0.84	Educational Level	0.44
	Competition	0.78	Competitiveness and Regulation	0.84	Competitors	0.74
	Entrepreneurial Abilities	67.6				
Entrepreneurial Aspirations	Product Innovation	0.75	Technology Transfer	0.81	New Product New Technology Gazelle	0.69
	Process Innovation High Growth	0.76	Science Finance and strategy	0.91		0.45
	Internationalization	0.36	Economic complexity	0.69		0.43
	Risk Capital	0.88	Depth of Capital Market	0.91	Export Informal Investment	0.86
		0.67		0.72		0.76
	Entrepreneurial Aspirations	62.4				
GEI	65.2	Institutional	0.83	Individual	0.63	

(Source: GEI Data Set 2007-2016)

It is important to note that due to the location of Austria in Central Europe, its neighboring countries such as Switzerland and Germany, and its long history as trading partners with Germany has made the entrepreneurial ecosystem in the country highly internationalized performing at (0.88). This indicates that Austria's economic and entrepreneurial ecosystems can accommodate international entrepreneurs. This leads to the exportation of competencies and skills at the individual level. Germany has become a top investor in Austria with approximately 88 Germany-based companies investing in Austria^v. The government performs better in all institutional variables as compared to individual-level variables. Especially, *new technology*, *career status*, and *risk perception* are individual-level variables that are worst performing and need utmost attention in enhancing a conducive entrepreneurial ecosystem.

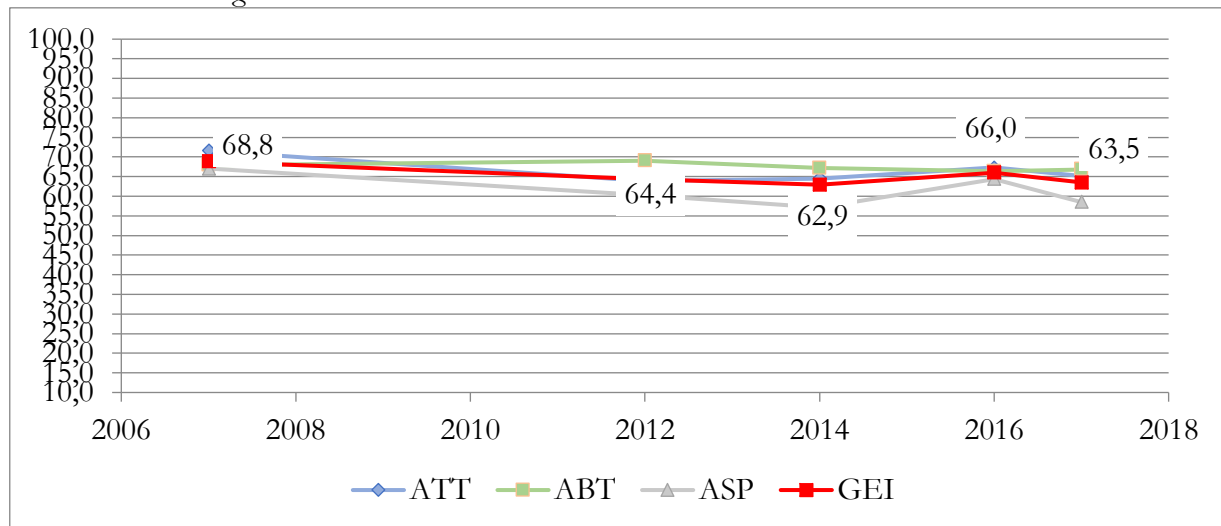
Further, at the institutional level, education (0.89) is ranked among the best performing variables. This has led to enhanced technological transfer (0.81) which also ranked among the best performing

institutional variables. According to Satalkina and Steiner (2020) digitalization leads to the transformation of business and entrepreneurial models in the market as they endeavor to meet the changing and dynamic needs of society. This has led to Austria as a country witnessing a significant increase in the companies involved in research and technology. The Government is also supporting the entrepreneurship ecosystem in Austria especially at the institutional level (0.86) by putting in place good physical and legal infrastructure.

However, among all pillars, the least performing pillar is found in entrepreneurial aspiration, which is a 'high growth' orientation (0.36); whereas under entrepreneurial ability, human capital (0.47) is the least performing pillar, though not among the worst one as compared to other countries. In Austria, the lower performance of the human capital pillar can be explained by education (0.44) at the individual level. This is mainly attributed to the fact that in Austria, the key emphasis is placed on the elementary, primary, and secondary school levels which are compulsory. This type of education only impacts individuals with basic knowledge and not skills necessary to start up and run a successful business hence also explaining the weak performance of skills perception (0.58) at an individual level. According to Acs *et al.*, (2018), the dominance of quality human capital is extremely essential for businesses that require a highly innovative, experienced, and educated labor force to prosper. Hence, it is paramount for Austria's entrepreneurial ecosystem to have a more experienced, healthy, and educated workforce. In terms of high growth, the poor performance can be explained by the low performance of the gazelle at the individual level. This is probably because the expected growth rate differs from the actual growth rate. Indicating that the individual start-ups in Austria lack proper objectives (such as projected growth in 5 years) and business strategies to strategically place themselves in the market.

Figure 2, below, gives an analysis of the GEI scores based on the three sub-indices. From the figure, an overall 2.8% decline in GEI scores between 2007 to 2016 can be noted. This can be explained by the overall decline of the three sub-indices where entrepreneurial attitude declined by 4.3%, entrepreneurial abilities declined by 1.5% and entrepreneurial aspirations declined by 2.6%. Between 2007 and 2008, the world faced the global financial crisis whose effect was not only felt by the US economy but also in other developing and developed economies. Austria's economy was not spared either. According to Peer, Sedlacek, and Goldstein (2018), before the financial crisis, entrepreneurs in Austria approached traditional banks for funding through loans. However, this changed after the financial crisis when banks implemented stricter regulations such as the BASEL III. Further, the decline in the GEI scores can be explained by a decline in entrepreneurial abilities (1.5%). This decline may be attributed to weak scores in human capital. However, the government through the Vienna Business Agency and the federal government started providing public funds to promote entrepreneurship in the country (Peer et al., 2018). This can explain the slight increase witnessed in the GEI scores of 3.1% between 2016 and 2014. Also, entrepreneurial attitude and entrepreneurial aspiration increased by 4.3% and 7.3% respectively while entrepreneurial ability decreased by 0.7%.

Figure 2 Performance of Austria in sub-indices from 2007-2017



(Source: GEI Dataset, 2007-2017)

3.3 Bottlenecks and Entrepreneurship Policy suggestions

Entrepreneurship policies have continuously advanced over time-based on the country's deliberation and understanding of entrepreneurship and the probable effects of designing and implementing the policies in support of entrepreneurship (Szerb *et al.*, 2017). What entrepreneurs need are entrepreneurial policies that make it easier to start and run a business in any economy (Acs, *et al.*, 2016). Ács, *et al.*, (2014) posit that the failure of entrepreneurial policies can be attributed to a lack of coordination and identification of bottlenecks. Szerb *et al.*, (2015), defined bottlenecks as the weak performing entrepreneurial pillar as compared with other pillars in the system. The GEI methodology not only highlights the bottlenecks affecting entrepreneurial performance but also shows how much the economy should invest to optimize resources (Szerb *et al.*, 2016).

Table 4, below shows the required increase in the pillars highlighting human capital and growth as the bottlenecks of the entrepreneurial ecosystem of Austria. The zero figure in the pillars column means that there are no additional resources needed in that pillar. If Austria would like to increase its GEI score by 10%, it's the government has to invest about 69% of its extra efforts in high growth'-oriented businesses or gazelles by increasing their venture capital financing accessibility and providing strategy support. While the remaining 31% of extra resources have to be directed towards enhancing human capital. Besides, stimulating the labor market, the government needs to focus on upgrading education level-which refers to increasing the percentage of the Total early-stage Entrepreneurial Activities (TEA) by business owners/managers who have participated in secondary education (GEI, 2018).

To shun the bottlenecks related to high growth and enable gazelle firms to take the stage, both accessibility of finance and formulation of sophisticated strategy at the institutional level is paramount, especially during this highly competitive technological era. Also, to alleviate the human capital bottleneck, the government should draw up policies that will help in boosting education at the tertiary level, especially at an individual level. For instance, the government can offer partial or full scholarships to individuals who attend tertiary education. The government should also develop a curriculum geared toward impacting individuals with entrepreneurship skills and knowledge at the lower levels of education (primary and secondary levels) and also involve and encourage successful entrepreneurs' presentations as part of the learning process. Successful entrepreneurs will act as role models to the students and hence

giving the students a chance to acquaint themselves with practice experiences. According to Acs *et al.*, (2016) the level of education influences the quality of the entrepreneurs.

Table 4 Bottleneck pillars

Pillar	Required Increase in Pillar	Percentage of total new effort
<i>Opportunity Perception</i>	0.00	0%
<i>Start-up Skills</i>	0.00	0%
<i>Risk Acceptance</i>	0.00	0%
<i>Networking</i>	0.00	0%
<i>Cultural Support</i>	0.00	0%
<i>Opportunity Startup</i>	0.00	0%
<i>Technology Absorption</i>	0.00	0%
<i>Human Capital</i>	0.09	31%
<i>Competition</i>	0.00	0%
<i>Product Innovation</i>	0.00	0%
<i>Process Innovation</i>	0.00	0%
<i>High Growth</i>	0.20	69%
<i>Internationalization</i>	0.00	0%
<i>Risk Capital</i>	0.00	0%

(Source: GEI Dataset, 2012-2016)

CONCLUSION AND RECOMMENDATION

The study used Global Entrepreneurship Index (GEI) to evaluate the entrepreneurial ecosystem of Austria using the Global Entrepreneurship Monitor (GEM) dataset for a period between 2012-2016. The study applied the Penalty for Bottleneck method to identify bottleneck pillars and recommend policy priorities in Austria.

Austria is ranked among the top ten countries in Europe concerning entrepreneurship and entrepreneurship activities. The study found a strong correlation between Austria's GDP per capita and the GEI scores. More analysis revealed that the country shows the lowest performance in entrepreneurial aspiration among the three sub-indices. The 'high-growth' pillar, which belongs to aspiration, is the most poorly performed of all pillars in the index. New technology, risk perception, and career status are the worst of all the individual variables. The country performs better in all institutional variables and no worst-performing variables as all pillars scored over the 33-percentile, meaning that they did not fall in the category of the worst-performing pillars.

Austria performed well in the technological absorption and networking pillars. This indicates that the entrepreneurs in Austria can have the capability to identify possible opportunities and use technology both at the individual and institutional level, which exposes the entrepreneurs to wider and greater opportunities. However, Austria performed poorly in risk capital, high growth, and human capital. The economy lags in entrepreneurship education as secondary education is termed the highest level of completed education. The OECD (2017) report indicated that only 39.7% of Austria's population aged 25-34 years possess a tertiary education. In case if Austria would like to increase its GEI score by 10%, the government has to invest about 69% of its extra efforts in high growth-oriented businesses or gazelles by increasing their venture capital financing accessibility and providing strategic support. At the same time, the remaining 31% of extra resources have to be directed towards enhancing human capital. This

study may be beneficial to the Government (policymakers) and researchers as it provides deep insight into entrepreneurship and the entrepreneurial ecosystem in a country.

LIMITATIONS AND FUTURE RESEARCH

The study had some limitations which can be used as a basis for future research. The study used GEI data from 2012 to 2016 to evaluate the entrepreneurial ecosystem of Austria. Therefore, a deeper analysis using the most recent data is recommended. Again, future researchers may use different sources of data, for instance, primary data through surveys. The study also concentrated on evaluating the entrepreneurial ecosystem of only one country (Austria). Therefore, a comparative analysis of the entrepreneurial ecosystem of other Europe countries is recommended. Finally, the study used only the GEI methodology to assess and evaluate the entrepreneurship ecosystem. In the future, a mixture of different methodologies may provide a more comprehensive assessment of the entrepreneurial ecosystem.

REFERENCES

- Abootorabi, H., Wiklund, J., Johnson, A. R., & Miller, C. D. (2021). A holistic approach to the evolution of an entrepreneurial ecosystem: An exploratory study of academic spin-offs. *Journal of Business Venturing*, 36(5). <https://doi.org/10.1016/j.jbusvent.2021.106143>
- Ács, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43(3), 476-494. <https://doi.org/10.1016/j.respol.2013.08.016>
- Acs, Z., Åstebro, T., Audretsch, D., & Robinson, D. T. (2016). Public policy to promote entrepreneurship: a call to arms. *Small Business Economics*, 47(1), 35-51.
- Acs, Z.J. L. Szerb and Lloyd, A (2018) Global Entrepreneurship Index 2018. The Global Entrepreneurship and Development. *Institute, Washington, D.C., USA* <https://doi.org/10.1007/978-3-030-03279>
- Acs Z, Szerb L, Autio E. 2013. The Global Entrepreneurship and Development Index 2013. *Edward Elgar: Cheltenham* <https://doi.org/10.4337/9781782540427>
- Ali, M. A., Kabil, M., Alayan, R., Magda, R., & Dávid, L. D. (2021). Entrepreneurship ecosystem performance in egypt: An empirical study based on the global entrepreneurship index (gei). *Sustainability* (Switzerland), 13(13). <https://doi.org/10.3390/su13137171>
- Alvedalen, J., & Boschma, R. (2017). A critical review of entrepreneurial ecosystems research: towards a future research agenda. *European Planning Studies*, 25(6), 887–903. <https://doi.org/10.1080/09654313.2017.1299694>
- Aminova, M., Mareef, S., & Machado, C. (2020). Entrepreneurship Ecosystem in Arab World: the status quo, impediments and the ways forward. *International Journal of Business Ethics and Governance*, 1–13. <https://doi.org/10.51325/ijbeg.v3i3.37>
- Ashraf, S. N., & Singh, A. K. (2019). Does entrepreneurship ecosystem have a long-term relationship with economic Growth in selected economies? *A statistical investigation*. 176–187. <http://library.ediindia.ac.in:8181/xmlui/handle/123456789/7903>.
- Autio, E., Cleevely, M., Hart, M., Levie, J., Acs, Z., & Szerb, L. 2012. Entrepreneurial Profile of the UK in the Light of the Global Entrepreneurship and Development Index, Innovation and Entrepreneurship Group Working Papers: 35. *London: Imperial College Business School*.
- Bosma, N., Content, J., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51(2), 483–499. <https://doi.org/10.1007/s11187-018-0012-x>
- Devkota, N., Shreebastab, D. K., Korpysa, J., Bhattarai, K., & Paudel, U. R. (2022). Determinants of successful entrepreneurship in a developing nation: Empirical evaluation using an ordered logit

- model. *Journal of International Studies*, 15(1), 181–196. <https://doi.org/10.14254/2071-8330.2022/15-1/12>
- González-Serrano, M. H., Crespo-Hervás, J., Pérez-Campos, C., & Calabuig, F. (2021). Entrepreneurial ecosystems for developing the sports industry in European Union countries. *Journal of Business Research*, 136(July), 667–677. <https://doi.org/10.1016/j.jbusres.2021.07.060>
- Guerrero, M., & Espinoza-Benavides, J. (2021). Does entrepreneurship ecosystem influence business re-entries after failure? *International Entrepreneurship and Management Journal*, 17(1), 211–227. <https://doi.org/10.1007/s11365-020-00694-7>
- Hermanto, B., & Suryanto, S. E. (2017). Entrepreneurship Ecosystem Policy in Indonesia. *Mediterranean Journal of Social Sciences*, 8(1), 110–115. <https://doi.org/10.5901/mjss.2017.v8n1p110>
- Hernández-Chea, R., Mahdad, M., Minh, T. T., & Hjortsø, C. N. (2021). Moving beyond intermediation: How intermediary organizations shape collaboration dynamics in entrepreneurial ecosystems. *Technovation*, 108(May). <https://doi.org/10.1016/j.technovation.2021.102332>
- Lafuente, E., Ács, Z. J., & Szerb, L. (2021). A composite indicator analysis for optimizing entrepreneurial ecosystems. *Research Policy*. <https://doi.org/10.1016/j.respol.2021.104379>
- Li, C., Murad, M., Ashraf, S. F., Syed, N., & Riaz, M. (2020). Entrepreneurial nascent behaviour: The role of causation process in opportunity discovery and creation. *Entrepreneurial Business and Economics Review*, 8(4), 183–200. <https://doi.org/10.15678/EBER.2020.080410>
- Liñán, F., & Fernandez-Serrano, J. (2014). National culture, entrepreneurship and economic development: different patterns across the European Union. *Small Business Economics*, 42(4), 685–701. <https://doi.org/10.1007/s11187-013-9520>
- Rao, P. U. T., & Rajiv, J. (2019). Entrepreneurial Ecosystem and Entrepreneurial Finance: A Study of Financing and Funding of Early Stage Ventures. *International Journal of Applied Finance and Accounting*, 3(1), 61–68.
- Singh, A. K., & Ashraf, S. N. (2020). Association Of Entrepreneurship Ecosystem With Economic Growth In Selected Countries : An Empirical Exploration Introduction Existing studies have highlighted that entrepreneurship ecosystem is helpful to create a vital mechanism to increase economic. *Journal of Entrepreneurship, Business and Economics*, 8(2), 36–92.
- Spigel, B. 2017. The Rational Organization of Entrepreneurial Ecosystems. *Entrepreneur Theory Practice* 41(1), 49-72
- Szerb, L., Ács, Z.J., Komlósi, E., & Argilés, R.O. (2015). Measuring Entrepreneurial Ecosystems: The Regional Entrepreneurship and Development Index (REDI). *Discussion Paper Number: CFE-2015-02*
- Szerb, L., & Trumbull, W. N. (2016). The Development of Entrepreneurship in the European Transition Countries: Is Transition Complete?. *Strategic Change*, 25(2), 109-129.
- Szerb, L. A., É. Komlósi, P. Páger (2016) Measuring Entrepreneurship and Optimizing Entrepreneurship Policy Efforts in the European Union, *CEsifo DICE Report 3/2016* (September)
- Szerb, L., & Trumbull, W. N. (2018). Entrepreneurship development in Russia: is Russia a normal country? An empirical analysis. *Journal of Small Business and Enterprise Development*, 25(6), 902–929. <https://doi.org/10.1108/JSBED-01-2018-0033>
- Zabelina, E., Deyneka, O., & Tsiring, D. (2019). Entrepreneurial attitudes in the structure of students' economic minds. *International Journal of Entrepreneurial Behavior & Research*
- Zoltán, J.Á.; László, S.; Lloyd, A. (2018). The Global Entrepreneurship Index 2018; The Global Entrepreneurship and Development Institute: *Washington, DC, USA, 2018*.
- World Bank. (2020). Economic Profile: Austria. Doing Business, comparing business regulation in 190 economies. *World Bank Group*.

ENDNOTES

¹ https://european-union.europa.eu/principles-countries-history/country-profiles/austria_en

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- ii <https://www.nordeatrade.com/fi/explore-new-market/austria/economical-context>.
iii <https://www.nordeatrade.com/fi/explore-new-market/austria/economical-context>.
iv <https://www.kmuforschung.ac.at/facts-and-figures/kmu-daten/?lang=en>
v <https://www.thelocal.at/20150407/germany-top-investor-in-austria-as-business-location>.

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