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Entrepreneurship and Intrapreneurship in Social, Sustainable, and Economic Development

Edited by
Sebastian Aparicio, Andreu Turro and Maria Noguera
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Entrepreneurship and Intrapreneurship in Social, Sustainable, and Economic Development

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Editors

Sebastian Aparicio

Andreu Turro

Maria Noguera

MDPI • Basel • Beijing • Wuhan • Barcelona • Belgrade • Manchester • Tokyo • Cluj • Tianjin



Editors

Sebastian Aparicio
Durham University
UK
Fundación ECSIM
Colombia

Andreu Turro
Universitat Autònoma de Barcelona
Spain

Maria Noguera
Universitat Autònoma de Barcelona
Spain

Editorial Office

MDPI
St. Alban-Anlage 66
4052 Basel, Switzerland

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About the Editors

Sebastian Aparicio (Ph.D.) is an Assistant Professor of Entrepreneurship at Durham University. He is also a Research Fellow at the Centre for University Entrepreneurship (Universitat Autònoma de Barcelona), a Junior Research Fellow in the Institute for Development Strategies at the School of Public and Environmental Affairs (IDS-SPEA, Indiana University), and an External Researcher at Fundació ECSIM (Medellin, Colombia). He has participated in different research projects (e.g., GUESSS, World Bank, among others), and sits on the Editorial Board of the journals *Entrepreneurship Research Journal*, *Sustainability*, *Cogent Business & Management*, and *Data in Brief*. His research focuses on the effects of entrepreneurial activity and innovation on economic growth and development under institutional lenses.

Andreu Turro (Ph.D.) is a Serra-Hunter fellow in the Department of Business at the Universitat Autònoma de Barcelona (UAB) and a member of the Centre for Entrepreneurship and Social Innovation Research (CREIS). Previously, he was an Assistant Professor at Utrecht University School of Economics (the Netherlands). He has a Ph.D. in Entrepreneurship and Management from UAB. His research focuses on the conditioning factors of corporate entrepreneurship from a quantitative perspective. He has published several academic papers in this research field. He is currently participating in various Spanish and international projects on this topic.

Maria Noguera (Ph.D.) is Head and Professor at the School of Tourism and Hospitality Management at Universitat Autònoma de Barcelona (UAB). She received a Ph.D. (International Doctorate in Entrepreneurship and Management -IDEM) from UAB. Her research areas are focused on entrepreneurship, specifically on those environmental factors affecting female entrepreneurship from the institutional approach. She has various academic papers in this research field. Additionally, she has been part of the Centre for University Entrepreneurship (CIEU) at UAB, participating actively in projects about female entrepreneurship.

Editorial

Entrepreneurship and Intrapreneurship in Social, Sustainable, and Economic Development: Opportunities and Challenges for Future Research

Sebastian Aparicio ^{1,2,*}, Andreu Turro ³ and Maria Noguera ⁴

¹ Durham University Business School, Durham University, Mill Hill Lane, Durham DH1 3LB, UK

² Fundación ECSIM, Medellín, Colombia

³ Department of Business and Centre for Entrepreneurship and Social Innovation Research (CREIS), Universitat Autònoma de Barcelona, Edifici B Campus UAB, Bellaterra (Cerdanyola del Vallès), 08193 Barcelona, Spain; andreu.turro@uab.cat

⁴ School of Tourism and Hospitality Management and Centre for Entrepreneurship and Social Innovation Research (CREIS), Universitat Autònoma de Barcelona, Edifici Blanc Campus UAB, Bellaterra (Cerdanyola del Vallès), 08193 Barcelona, Spain; maria.noguera@uab.cat

* Correspondence: sebastian.aparicio@durham.ac.uk

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Abstract: Understanding entrepreneurship and intrapreneurship as engines of outcomes beyond economic terms, this paper introduces the Special Issue “Entrepreneurship and intrapreneurship in social, sustainable, and economic development”. Institutions set the basis to analyze the role societies and organizations play in supporting entrepreneurial and intrapreneurial activity. Thus, we take a broad look at formal and informal institutions as those contextual components that are encompassed in a social progress orientation. Based on this, we discuss and provide examples about how entrepreneurship and intrapreneurship lead social, sustainable, and economic outcomes. Thus, in this paper and this Issue, we argue that it is necessary to consider those (institutional) antecedents and (developmental) consequences of entrepreneurship and its diversity as a simultaneous process. In addition to summarizing the main contributions of those articles contained in this Issue, we highlight some opportunities and challenges to further explore the role of entrepreneurship and intrapreneurship not only in economic development but also in social change and sustainability.

Keywords: institutions; entrepreneurship; intrapreneurship; national growth; firm growth; economic development; social change; gender equality; sustainability

1. Introduction

Today’s crisis derived from COVID-19 has drawn the attention of many people from different areas. Scientists are looking for vaccines or medicine to diminish the negative effects of the virus; governments are reacting through different strategies (e.g., lockdown, more equipped hospitals, public aid for those unemployed, etc.) and new rules of the game (i.e., mandatory use of face masks, social distancing, etc.); banks are re-assessing loans system and interest rates; the educational sector is struggling to deliver education with quality despite the restrictions and constraints; and companies are doing their best to adapt strategies while preserving employment and surviving. One way or another, all these actors are showing an entrepreneurial capacity to creatively overcome the current situation. However, entrepreneurial activity is not only a reaction of this particular juncture. It has become a vehicle to solve problems beyond economic terms, reflecting the existence of institutions toward social progress [1,2].

As such, entrepreneurship is a research area that has been shaped thanks to insights from a variety of disciplines. Scholars have contributed to understanding the psychological, sociological, anthropological, managerial, and economic aspects of entrepreneurial activity [3]. Among these

contributions, academia has recognized the importance of institutions not only for entrepreneurship, but also for economic development [4]. Although most of the existing research focuses on traditional entrepreneurial activities [5], other types of new ventures have emerged to tackle different economic, humanitarian, and environmental problems [6]. Yet, there is still much room to keep exploring how other sorts of entrepreneurial activities can enhance economic, social, and sustainable development from an institutional perspective [7].

Although entrepreneurship is diverse in terms of its types and nature, particular gaps might exist, from sociodemographic characteristics, corporate dynamics, regional and national outputs, and environmental issues [8]. For example, finer connections between women's entrepreneurship [9], intrapreneurship [10], and sustainable entrepreneurship [11], among other (less explored) types of entrepreneurial activities and development might serve to improve our understanding of entrepreneurial behavior.

Considering that entrepreneurship does not emerge in isolation, there is also a lacuna regarding the role of the institutional context [12] in shaping individual decisions, not only for becoming entrepreneurs [13] but also for undertaking innovative projects within firms [10]. Hence, it is suggested that institutions may condition the identification of entrepreneurial opportunities that offer solutions for social and sustainable problems at the regional and country level [11].

Given these research opportunities, we openly invited scholars within all the main economics, management, and sustainability sub-disciplines, among other areas, to explore the influence of (formal and informal) institutions on gender issues, intrapreneurship (and corporate entrepreneurship), as well as on green entrepreneurial activity for social, sustainable, and economic development. Thankfully, this Special Issue collected literature reviews and empirical papers, characterized by cutting-edge discussions about entrepreneurship and intrapreneurship for a variety of outcomes related to development at the organizational, regional, and national levels.

This paper, apart from the introducing the Special Issue, revises in Section 2 the disparate literature on institutions and entrepreneurship (including intrapreneurship). Section 3 focuses on the role entrepreneurship and intrapreneurship play in social, economic, and sustainable development. Section 4 summarizes the main contributions of those papers in this Special Issue; and Section 5, in addition to concluding, discusses some future research avenues.

2. Institutional Context for Entrepreneurship and Intrapreneurship

North and Thomas [14] help us understand the development process through which institutions play a key role in influencing productive activities that are ultimately linked to economic outcomes. Despite this approach being mostly related to economic growth, the general concept of institutions as "rules of game" [12] opens the possibility to explore other social and environmental outcomes as a result of human interactions and decisions. For example, North [15] suggests that societies have different motivations toward progress. Accordingly, intentionality constitutes a key component that differentiates some countries and regions from others. According to North [15], open societies are those who create and align incentives for all members to be more productive, whereas limited societies create barriers for production, and hence, development. These incentives and barriers come mainly from what North [12] calls formal and informal institutions. The former refers to written laws and regulations, whereas the latter consists of culture and habits. Both formal and informal institutions act at different levels, implying that informal institutions are more general and less dynamic than formal ones, which are focused on particular aspects of the policy design, thus changing rapidly [16].

The complementary relationship between formal and informal institutions has called the attention of scholars in entrepreneurship research as it basically enables us comprehend that the context matters to influence decisions around entrepreneurial activity and new ventures' performance [17]. By considering entrepreneurship as a process [18,19], extant research has suggested that potential entrepreneurs may ultimately set up new ventures thanks to the social support [20]. Even in the event of an individual not being interested in creating a new business, this social support enables his or her to perform

any kind of activity in an entrepreneurial way (i.e., identifying a problem and offering a solution). In this case, societies as a whole are equipped with entrepreneurial potential [21], which is needed for potential entrepreneurship and entrepreneurial activity [22]. That is why institutions become relevant to understand the existing incentives that lead to the formation not only of traditional (or commercial) new ventures but also of other types of entrepreneurial activities with a social component [5]. In this regard, to a greater extent, institutions explain the main differences of entrepreneurship across regions and countries [23,24], as well as the emergence and need of gender [9,25], green or sustainable [11,26], immigrant [27], sport [28], and intrapreneurship [29], which are ultimately engines of development.

Particularly for intrapreneurship, there is a mixture of institutions in which the formal and informal context constitute the more external level [10]. It turns out that institutions at the organizational level [30] also condition the entrepreneurial employees' initiatives within existing companies. The societies' perception about the key role companies play in the economy as a whole, and especially in the formation of a corporate culture toward diversity, creativity, innovation, greenism, and social purposes, create an (organizational) environment that stimulates everybody within the company. Thanks to this, employees at different hierarchical levels may be motivated to move forward entrepreneurial projects that not only help the company to grow but also the economy and society as a whole.

3. Entrepreneurship and Intrapreneurship as Engines of Development

3.1. Social, Sustainable, and Economic Outcomes of Entrepreneurship

Extant research has shown that if societies are oriented toward progress, then these societies provide a suitable environment for entrepreneurs, who in exchange, create social benefits [2,31]. Indeed, econometrically speaking, the existing loop (i.e., endogeneity) between entrepreneurship and development is overcome thanks to the presence of institutions that positively affect entrepreneurial activity in one way or another. Accordingly, plenty of evidence exists around institutions, entrepreneurship, and growth (Bjørnskov and Foss [4] and Urbano et al. [32] offer thorough literature reviews). However, there are still unanswered questions regarding the role of entrepreneurship in other aspects of the development process beyond income and productivity.

Important efforts have been made regarding analyses on social outcomes such as poverty reduction [33], inequality [34], inclusive growth [2], and gender equality [35]. Although it is not as abundant as compared to the analysis of traditional economic growth, this literature confirms that entrepreneurs have a social sense, implying that their decisions transcend materialism and the money-making mindset. Williams and Shepherd [6], for instance, show appealing cases about the existence of new ventures that are created to solve problems derived from natural disasters. Similar devastation is observed when civil wars and internal conflicts destroy world heritage and create social displacement. More than jobs or other assets, people simply lose everything. To survive, they migrate to other countries where cultural aspects are sometimes totally different. From this perspective, Honig [27] and Smallbone et al. [36] reflect on how immigrant entrepreneurship turns into a solution for immigrants and even for locals, who may know about different products, services, processes, etc. This social consciousness leads individuals to turn needs and problems into opportunities through entrepreneurship. Ruiz-Rosa et al. [37] provide a perfect example, in which it is demonstrated that social entrepreneurial orientation reacts when external shocks such as the COVID-19 pandemic take place. Similar behavior is observed when environmental problems are considered more than a simple externality. Scholars agree that environmental problems become social issues in both the short- (poor healthy, misuse and exploitation of natural resources, etc.) and long-term (next generations, extinction of species, etc.) [26].

Wigger and Shepherd [38] explain that collectivism is key to entrepreneurially using natural resources while keeping environmental and social consciousness. Although much remains to be done in terms of sustainable development, the idea that social support and consciousness can properly produce what we need, helps us to comprehend that what we do may affect others not just today but

also in the near future. Collective reflection entails the acceptance of everybody, regardless of religion, origin, gender, and race. In this regard, Holliday et al. [39] invite scholars to consider the importance of gender and immigration to achieve the social development goals. Accordingly, the role of women and immigrants in multilateral organizations, policymaking, private companies, entrepreneurship, and families (as the deepest root) constitute a key component of diversity, which leads to social and environmental outcomes. Hall et al. [40] recognize that entrepreneurial mindset may enhance the decision-making processes of all stakeholders in the society aiming at sustainability. This implies, however, that much more evidence on how entrepreneurship (and its diversity) at different levels leads to better humanitarian, economic, and environmental outcomes is needed.

3.2. Intrapreneurship as a Source of Social, Sustainable, and Economic Change

Particularly for the organizational level, DiMaggio and Powell [30] analyze how societies and, especially, organizations react when social norms and shared cultural habits exist. Depending on these institutions at the country and organizational levels, firms design strategies that are linked to the entrepreneurial mindset employees might have, hence, encouraging entrepreneurial action. Nevertheless, important uncertainty can cause imitation of harmful practices [41], which may destroy all intrapreneurial initiatives toward economic development. Wrongly oriented policies or ineffective institutions may encourage behavior that is not beneficial to the economy [42,43]. As a possible solution, DiMaggio and Powell [30] suggest that cognitive scripts and schemes serve to absorb information, which is needed to define productive projects within organizations. Thus, existing rules in a society and beyond condition the best entrepreneurial practices that organizations adopt.

There exist different examples showing how rules and norms define the way entrepreneurial actions take place within organizations. In this regard, intrapreneurship is helpful for entering internationalization processes, enhancing innovativeness, and increasing performance, among other outcomes (cf. De Falco and Renzi [44] and Klofsten et al. [45]). In this sense, this sort of entrepreneurial activity within organizations has emerged as a mechanism to generate not only profitable results for firms but also valuable solutions for the society [46]. Despite the discussion around intrapreneurship, there is also extant research suggesting that certain institutions at organizational and country level influence the quantity and quality of this type of entrepreneurial activity [45,47]. For instance, Audretsch et al. [42] and Turró et al. [10] show that intrapreneurial decisions and actions are negatively affected when over-regulations for labor mobility and business procedures exist. Usually, these sorts of institutions are imposed in developing countries, where entrepreneurial and intrapreneurial action may be associated with survival reasons rather than growth and wealth creation.

However, from a theoretical perspective, Patriotta and Siegel [48] raise a debate on the role of institutions in the way individuals judge the entrepreneurial process. Honig and Samuelsson [47] explain that the intrapreneurial planning process of identification and exploitation of opportunities depends on the institutional context that is created at the aggregated level, and most importantly at the intra-firm level. Taking into account the internal and external environment, intrapreneurs create patterns that better use their resources and capabilities as mechanisms to start an adaptation process for firm and social value creation [45,49]. In light of this discussion, a better understanding on how intrapreneurs should also think strategically to overcome institutional barriers is required. Even though the exploration of human resources such as scientists, managers, workers, and intrapreneurs in general, can be derived from internal approaches, the understanding of external factors such as cultural support, social learning and adaptation, etc., that influence firms' performance might be required to understand sustainability initiatives that intrapreneurs lead in order to create firm growth and social change [49].

Figure 1 conceptually depicts the role of institutions in creating entrepreneurship and intrapreneurship for social, sustainable, and economic development.

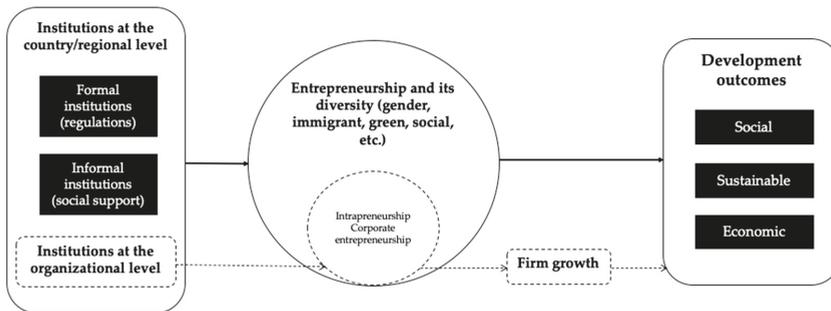


Figure 1. Integrating institutions, entrepreneurship, and intrapreneurship for development.

4. Summary of the Papers in the Special Issue

In this Special Issue about entrepreneurship and intrapreneurship in social, sustainable, and economic development, a variety of 14 articles cover all the elements raised in our main debate. For example, Martínez-González et al. [50] focus on institutions as antecedents of entrepreneurial intentions. In particular, this research shows that cultural aspects such as beliefs, social norms, and values influence motivation, self-efficacy, and intention among young students in Spain and Poland. As institutions are also observed at the university level, Jung and Lee [51] exploit a survey tool (i.e., CS-EMS) to explore differences in gender and programs (i.e., engineers vs. non-engineers). The main findings suggest that entrepreneurial mindset differs between the analyzed groups. A deeper level of institutions refers to the family support that shapes entrepreneurial intentions. In this regard, Georgescu and Herman [52] show that the entrepreneurial background of families constitutes a relevant institutional factor for students' perceiving entrepreneurship as a good career choice.

Moving from intentions to actions, in which social support is needed (particularly the family one), Escamilla-Fajardo et al. [28] reveal through an exhaustive literature review that extant research about sport entrepreneurship can be classified based on four clusters, namely (i) football, entrepreneurship, and social development; (ii) football, innovation, and management; (iii) football, efficiency, and new technology; and (iv) football, injuries, and innovation in rehabilitation. This research opens up questions on how entrepreneurial activity (and the formation of these clusters) takes place across time and space. In this regard, Litsardopoulos et al. [53] empirically demonstrate that individuals allocate time to self-employment based on gender characteristics and the place (i.e., urban and rural areas) they live. Certainly, time, dedication, and motivation matter to move forward projects regardless if these are new ventures or initiatives within existing companies.

Encouraging entrepreneurship within firms requires the understanding of the external and internal environment, which leads to the creation of different strategies to readapt the company itself when there is institutional change. In this sense, Butkouskaya et al. [54] explore the role of entrepreneurial orientation (EO) and integrated marketing communication (IMC) in SMEs' growth. Interestingly, this research finds important differences for these factors when comparing companies from Spain (as a developed country) and Belarus (as a developing one). The development stage of countries turns out to be an important characteristic of the environment. Hence, Seikkula-Leino and Salomaa [55] analyze the effect of entrepreneurial competences and organizational change in Finnish universities. Thanks to this research, intrapreneurial universities can be understood as those higher educational organizations where supervisors and employees are equipped with entrepreneurial thinking and action. Having these characteristics would lead to an increase in the efficiency of managerial as well as teaching activities. Similar results are found in Pei et al.'s [56] study, which demonstrates that learning absorption through entrepreneurial team cognition significantly influences firms' growth in China.

Learning and knowledge are, then, key aspects that entrepreneurship and intrapreneurship can use to deliver social, sustainable, and economic benefits for entrepreneurs and everybody else in the

society. Being unaware of the institutional context, particularly regulations and processes, might bring negative effects to companies as well as the society. Jaramillo-Moreno et al. [57] bring this discussion to our attention by identifying that some community-based tourism enterprises in Ecuador have neither designed nor implemented managerial, financial, operational, strategic, and marketing plans. The fact that these elements of a business plan have not been considered might reduce the social goals of these enterprises, especially in areas that are highly dependent on the tourism sector. This is something Ertac and Tanova [58] confirm in their article. They shed some light on the importance of empowering women through entrepreneurship to increase their entrepreneurial mindset, which is useful for personal development and business growth. Accordingly, the aggregated results lead to social benefits in Cyprus, even under unfavorable contexts.

Ruiz-Rosa et al. [37] suggest that when context becomes unfavorable, social entrepreneurial intention might be negatively affected. However, Ruiz-Rosa et al.'s [37] research also shows that students are explicitly expressing a desire for becoming social entrepreneurs. This is similar to what Butkouskaya et al. [59] find when analyzing tourism students in Spain. Accordingly, institutional characteristics at the macro, but most importantly, at the university level, define the intention of students to becoming entrepreneurs oriented toward sustainability. Alwakid et al. [26] also bring to our attention the power of (informal) institutions to increase the level of green entrepreneurial activity. In particular, this research builds upon the importance of sustainable entrepreneurship for the achievement of the sustainable development goals in Saudi Arabia, where knowledge expansion and growth are taking place thanks to public investment in research and development (R&D). Dobrzanski and Bobowski [60] confirm that this does not happen only in Saudi Arabia but also in ASEAN countries. By using data envelopment analysis (DEA), these authors find that public expenditure in R&D has created different effects, highlighting, for example, the case of Hong Kong, Indonesia, Singapore, and the Philippines. Certainly, the way entrepreneurs and incumbent firms identify and manage knowledge defines the development path, in which social change and sustainability transcend the traditional economic growth perception. Table 1 summarizes all these contributions.

Table 1. Summary of the studies in this Special Issue.

Category	Activity/Outcome	Authors	Contributions
Institutions and entrepreneurship/Intrapreneurship	Entrepreneurship (Entrepreneurial intentions)	Martínez-González, Kobylinska, García-Rodríguez, and Nazarko [50]	Subjective characteristics (i.e., beliefs, social norms, and values) initiate the chain of effects that influence the action variables (i.e., motivation, self-efficacy, intention). Attitude is the nexus variable between both groups of variables in Spain and Poland.
Institutions and entrepreneurship/Intrapreneurship	Entrepreneurship (Entrepreneurial intentions)	Jung and Lee [51]	The results indicate that strict invariance held for either gender or educational experiences, while scalar invariance held between the engineering and non-engineering groups. While the male, engineering, and educational experience groups generally scored higher on both the latent and observed sub-scales of the CS-EMS, the results of the conditional effects of grouping variables indicate that educational experiences mattered most.
Institutions and entrepreneurship/Intrapreneurship	Entrepreneurship (Entrepreneurial intentions)	Georgescu and Herman [52]	Results show that students with an entrepreneurial family background, effectiveness of entrepreneurship education, and entrepreneurial personality traits reported a higher entrepreneurial intention than those without such a background. However, entrepreneurial family background negatively moderated the relationship between effectiveness of entrepreneurship education and entrepreneurial intention.
Institutions and entrepreneurship/Intrapreneurship	Entrepreneurship (Sport)	Escamilla-Fajardo, Núñez-Pomar, Ratten, and Crespo [28]	Through a bibliometric analysis, four clusters about sport entrepreneurship were identified: (1) football, entrepreneurship and social development, (2) football, innovation and management, (3) football, efficiency and new technology, and (4) football, injuries and innovation in rehabilitation.
Institutions and entrepreneurship/Intrapreneurship	Entrepreneurship (Gender)	Litsardopoulos, Saridakis, and Hand [53]	This research advanced knowledge on the existence of complex dynamics between gender and age, which affect the allocation of time to self-employment between rural and urban areas.

Table 1. Cont.

Category	Activity/Outcome	Authors	Contributions
Institutions and entrepreneurship/Intrapreneurship	Intrapreneurship (Gender)	Butkouskaya, Llonch-Andreu, and Alarcón-del-Amo [54]	There is a positive relationship between entrepreneurial orientation (EO), integrated marketing communications (IMC), and performance among SMEs in Spain and Belarus. However, these connections are significantly stronger in the case of male, rather than female managers in a developed market (Spain). The EO-IMC-performance relations are more intensive when the manager is female.
Institutions and entrepreneurship/Intrapreneurship	Intrapreneurship	Seikkula-Leino and Salomaa [55]	Entrepreneurial strategies about entrepreneurial thinking and actions at individual and organizational levels have been explored. Both supervisors and employees evaluate themselves and the organization to be entrepreneurial. Results provide insights for universities aiming to implement an entrepreneurial strategy, stressing psychological factors in the development of entrepreneurial competencies.
Institutions and entrepreneurship/Intrapreneurship	Intrapreneurship	Pei, Wu, Guo, and Hu [56]	Entrepreneurial team cognition characteristics and behavior characteristics affect venture performance. Additionally, partial mediating effects of entrepreneurial team behavior characteristics on the relationship between cognition characteristics and venture performance were found.
Entrepreneurship/Intrapreneurship and development	Social change	Jaramillo-Moreno et al. [57]	Despite having a certificate from the Ministry of Tourism (MINTUR), the Community-Based Tourism Enterprises have not implemented important administrative and financial processes such as a strategic plan, operational plan, market study, cost analysis, process manual, market plan, initial situation, results status, final status, or financial indicators.
Entrepreneurship/Intrapreneurship and development	Social change (Gender)	Ertac and Tanova [58]	When psychological empowerment is high, women ecotourism entrepreneurs in Northern Cyprus with a higher level of growth mindset experience a greater level of flourishing, even in an unfavorable context.
Institutions, entrepreneurship, and development	Social entrepreneurial orientation and social change	Ruiz-Rosa, Gutiérrez-Taño, and García-Rodríguez [37]	Findings serve to validate the explanatory model of social entrepreneurial intention from the perspective of the theory of planned behavior. Results also show that social entrepreneurial intention decreases in times of deep socioeconomic crises and high uncertainty, such as that caused by COVID-19.
Institutions, entrepreneurship, and development	Sustainable entrepreneurship, gender, and sustainable development	Butkouskaya, Romagosa, and Noguera [59]	Economic factors (both societal and university related), the level of innovation in society, and the students' self-confidence are barrier for sustainable entrepreneurship amongst university students of tourism. Female students were more conscious of the possible obstacles to new business creation than male students. For example, females considered their lack of entrepreneurial education as more significant than did the males. In addition, the female students tended to need more economic and practical support than male students.
Institutions, entrepreneurship, and development	Green entrepreneurship and sustainable development	Alwakid, Aparicio, and Urbano [26]	Cultural characteristics such as environmental actions, environmental consciousness, and temporal orientation, increase the level of green entrepreneurial activity across cities in Saudi Arabia. This study contributes to existing knowledge about (informal) institutions, green entrepreneurship, and sustainable development
Entrepreneurship/Intrapreneurship and development	Economic growth	Dobrzanski and Bobowski [60]	Hong Kong and the Philippines are the most efficient regarding research and development (R&D) if efficiency is assessed through constant return to scale (CRS) approach. However, according to the variable return to scale (VRS) approach, Hong Kong, Indonesia, Singapore, and the Philippines are more efficient. The study also confirms that increased spending on innovation is resulting in non-proportional effects.

5. Conclusions and Ways Forward

This paper has brought together entrepreneurship and intrapreneurship as mechanisms that translate the influence of institutions on outcomes beyond economic terms such as social change and sustainability. By using institutional economics [12], we have analyzed the roles formal (as regulations) and informal institutions (as social support) play in the formation and development of entrepreneurship and its diversity, which includes gender, immigrant, social, green entrepreneurship, and intrapreneurship. In particular, for the latter, institutions at the organizational level [30]

have served to complement the influence of contextual factors on (intra)entrepreneurial activity. This framework analysis has helped us explore the extant literature, examples, and gaps around the usefulness of entrepreneurship and intrapreneurship for social, sustainable, and economic development. These analyses have served to open up a debate in which different scholars have participated with outstanding evidence, discussions, and contributions, in which entrepreneurship and intrapreneurship have been explored through different types such as gender, green, community-based entrepreneurship, and intrapreneurship, among others.

Some challenges still exist when considering the causal chain running from institutions, entrepreneurship, and development. Although Wigger and Shepherd [38] have drawn our attention through the proper exploitation of natural resources as a source of opportunities for entrepreneurship, some other aspects that have been always there might also drive entrepreneurial projects that individuals and companies can lead. As academics, practitioners, and policymakers, we can learn from what the Dutch non-profit company called The Ocean Cleanup is doing to preserve the environment. This firm has identified not an opportunity but a problem that is getting worse year by year: the enormous amount of plastic in oceans and rivers. The Ocean Cleanup has created a floating vacuum cleaner that, through a boat, is sucking up plastic and cleans the ocean. The way we as a society support companies like this one may create higher motivation to come up with solutions for social, sustainable, and economic problems. In this regard, alliances between universities, companies, and governments may foster a solid environment and ecosystem for entrepreneurs in pursuit of outcomes beyond money-making goals.

This undoubtedly brings theoretical challenges as well. Therefore, one might think that the complementary relationship between institutions at the macro- [12] and meso-level [30] brings solid foundations not only for firm growth but also for social, sustainable, and economic development. This theoretical viewpoint may be helpful for those policymakers oriented toward entrepreneurship, firm growth, and development, as it motivates a debate around the role of different types of institutions in entrepreneurial activity at different levels in the development process [4,7]. That is why we need a better understanding of how macro- and meso-institutions improve the decisions of policymakers, companies, and entrepreneurs before, during, and after entrepreneurial and strategic processes, which might take place in turbulent times (e.g., COVID-19, violence, natural disasters, etc.).

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Article

Antecedents of Entrepreneurial Intention among Young People: Model and Regional Evidence

José Alberto Martínez-González ¹, Urszula Kobylinska ², Francisco J. García-Rodríguez ¹ and Lukasz Nazarko ^{2,*}

¹ Department of Business Management and Economic History, Faculty of Economics, Business and Tourism, University of La Laguna, 38200 Tenerife, Spain; jmartine@ull.edu.es (J.A.M.-G.); fgarcia@ull.edu.es (F.J.G.-R.)

² Faculty of Engineering Management, Bialystok University of Technology, 15-351 Bialystok, Poland; u.kobylinska@pb.edu.pl

* Correspondence: l.nazarko@pb.edu.pl; Tel.: +48-85-7469802

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Abstract: Entrepreneurial intentions determine to a large extent the entrepreneurial behavior; therefore, the study of those intentions and the factors that influence them constitute a valid research area. The purpose of this regional comparative study was to design a new causal model of the formation of the entrepreneurial intention among young adults in Spain and Poland. Using the Structural Equation Modeling (PLS) methodology, the results show that subjective variables (beliefs, social norms, values) initiate the chain of effects that influence the action variables (motivation, self-efficacy, intention). Attitude is the nexus variable between both groups of variables. It is verified that there are no significant differences in the responses to the items or in the causal relationships of the model between both countries. This confirms the relevance of a homogenizing generational approach at a global level that allows the application of policies to promote the entrepreneurial intention for the entire segment. The proposed model takes into account and complements the previous designs, and is practical because it can be used at different levels of the education sector and by institutions promoting entrepreneurship and sustainability.

Keywords: entrepreneurial intention; attitude; social norm; subjective personal variables; motivation; beliefs; values

1. Introduction

Entrepreneurship is a phenomenon that is essential to economic growth and sustainable development of the countries, as well as to the creation of employment and prevention of economic crises [1–3]. At the individual level, the creation of companies has contributed enormously to satisfying the need for achievement of individuals who possess creative competencies and a propensity to risk [4,5]. However, on many occasions and for many reasons, the intentions of some entrepreneurs do not materialize in real projects, and the journey of entrepreneurship does not come to fruition [6,7]. For these reasons, researchers in this field make efforts to identify and strengthen the factors on which the venture depends [8,9].

Special interest exists in the literature to improve the degree of knowledge of the variables that favor entrepreneurship in a regional context [10–12]. The phenomenon of globalization and the development of ICT have accentuated it, as they make entrepreneurship an international phenomenon, questioning the influence of regional and national frameworks [13–15]. There are two main lines of research about the factors that favor entrepreneurship [14,16]. The contextual approach assumes that environmental factors (e.g., education, culture, access to financial resources) are the most influential elements in the process of creating a company [14,17]. Entrepreneurs cannot innovate in isolation,

they are influenced by, and dependent on, the institutional context in which they operate [18–20]. The institutional context consists of normative, regulative and cultural-cognitive institutions [21]. Regulative institutions are formal rules and laws. Normative institutions include social obligations and expectations, such as norms and values.

In the approach of human capital, the entrepreneur becomes the key element in the undertaking [22,23]. In the second approach, the works have focused on identifying the main attributes of the entrepreneur (e.g., values, self-efficacy, motivation), generally analyzed through their perceptions [24,25]. The focus of human capital predominates in the literature, and therefore, regional differences in entrepreneurial behavior tend to be explained to a greater extent by linking them to the personal factors of entrepreneurship [26]. In this approach, the role of contextual variables, which are more stable over time, consists in influencing the configuration of the personal factors of entrepreneurship [27]. Among the attributes of the entrepreneur, the entrepreneurial intention has acquired particular relevance in the literature. This is because it is the variable that best predicts entrepreneurial behavior [28,29].

There is also a need to study the entrepreneurial intention in a regional context in different population segments, since numerous sociological studies show the increasing homogenization of cognitive, affective-relational and behavioral patterns derived from the globalization process [30]. This is especially relevant for younger generations, such as the so-called Generation Y or Millennials (young people born approximately between 1980 and 2000). Authors such as Nabi, Holden and Walmsley [31] suggest their quantitative importance and relevance in the generational change in the current population of entrepreneurs. Particularly high is the interest in knowing the entrepreneurial intention in the case of university students because they are a good representation of that generation [32,33]. It is now generally accepted that education is vital in the creation of entrepreneurial individuals and in turn an entrepreneurial community [34,35]. Universities are the pillars of knowledge, providing students with a high level of information and skills needed to develop entrepreneurial tendencies [36]. Additionally, in the 2018 Global Student Entrepreneurship report (www.guesssurvey.org) special emphasis is placed on the crucial impact of student entrepreneurship, both economically and socially, making the study of entrepreneurial intention an even more relevant topic. At the university stage, students define their future perspectives in the short and medium terms, with entrepreneurship becoming a job option that is increasingly valued by them [37]. Likewise, it has been verified that education favors the learning of entrepreneurship and allows to distinguish the people who become entrepreneurs from those who do not. At the same time, it has been posited that inadequate education may hinder the entrepreneurial intention among students [38–40].

Descriptive studies have been developed on the personal factors on which entrepreneurship depends at a regional level, as is the case of the studies developed by the Global Entrepreneurship Monitor (GEM) (www.gemconsortium.org) [41]. GEM data provide insights into a population of individuals engaged in self-employment; however, they are limited in terms of the number of observations and variables included in the survey [42]. Likewise, causal models including personal variables and to a lesser extent, contextual variable have been developed, with the intention of identifying the dependent variable most used in these models [43]. The causal models have been fundamentally based on the proposal of Shapero and Sokol [44] of the entrepreneurial event and on the planned behavior model of Ajzen [29,45,46]. These models have received some criticism, and other authors have emphasized the importance of further clarifying the role played by certain personal variables. The need to introduce new subjective personal variables associated with action, such as beliefs and motivation, has also been highlighted [47].

The article contributes important insights to this Special Issue, taking into account that youth entrepreneurship could influence sustainable and economic development of regions. The article defines the factors that influence the entrepreneurial intention in the case of young people. Policymakers can use the findings of this research to establish policies to improve the conditions in their regional ecosystems for sustainable entrepreneurship. Hence, the findings can help them achieve their goal of transitioning to a more sustainable local economy. Specifically, the results show that there is a

potential for action in this field to improve the influence on the entrepreneurial intention in the teaching and learning process. To address the concerns and suggestions found in the literature and to enrich this special issue of *Sustainability Journal* this study aims at causal analysis in a regional comparative framework of personal variables that influence the entrepreneurial intention of the young people of Spain and Poland. Both countries are members of the EU and present sufficient similarities and differences to verify whether a homogenizing generational approach has greater weight on the entrepreneurial intention, using exclusively personal variables, than the possible differences in these variables that could derive from contextual aspects characteristic of each country. One of the articles on the expectations of Generation Y (students from Poland and Spain) regarding the labor market concluded that, despite the differences, (due to history and lifestyle) Millennials from both countries have a lot in common: They put bonds with loved ones among the priorities, their field of study is determined by their own interests and they expect a good atmosphere, decent earnings and work-life balance from their future workplace [48].

The proposed causal model, which takes into account previous reference models, is new and complete because of the type and number of personal variables and relationships it includes. Unlike the GUESS reports, this study includes variables and causal relationships that these reports do not contemplate. This model includes only subjective personal variables (e.g., beliefs, social norm) and personal action variables (e.g., motivation, self-efficacy). The inclusion of subjective variables, and social and conditioned nature, allows to determine to what extent entrepreneurship is a conscious or conditioned process.

If it is confirmed that there are no significant differences between the models of both countries, or in the responses to the items, the existence of a homogenizing generational approach could be revealed. In this way, measures to promote entrepreneurship in different regional contexts could be adopted at an educational and institutional level and for the entire segment. However, not all variables of the proposed causal model are equally manageable by educational institutions. In order to carry out the comparisons between both countries, novel statistical techniques are introduced in this study, such as the discriminant analysis and the multigroup AMS analysis in a PLS-SEM context [49], the permutation test [50], and the analysis of the invariance of measure (MICOM) [51].

The article is structured in the following way. Analysis of the entrepreneurial intention is addressed first. Next, the model and the hypotheses associated with it are presented, to subsequently present the results as well as their discussion. The paper ends with the conclusions and implications of the study, followed by the indication of the possible future research directions.

2. Theoretical Development

The intention is conceived as a conscious, deliberate and planned mental state that precedes the action and allows direct attention to certain behaviors, such as the behavior of creating a company [52,53]. The intention has also been called propensity, motivation and intentional decision [38]. In the context of entrepreneurship, the entrepreneurial intention is defined as the attempt to create new businesses, including self-employment or the expansion of an existing business by an individual, a team of individuals or an already established business [54,55].

Entrepreneurial intention (EI) is a state of mind [56] leading an individual to choose self-employment over working for another. Various studies, such as that of Turton and Herrington [57], Hornsby et al. [58] and Guerrero and Peña-Legazkue [59] discuss the positive relationship between EI and entrepreneurial activity, as well as its subsequent connection with economic development. The growing interest in the study of entrepreneurial intention is related to several factors. In the first place, the intention has a high correlation with the behavior of creating a company; this correlation being in some cases higher than 0.90 and 0.96 [6,60]. Moreover, the intention allows us to explain a high percentage of the variance of the behavior of entrepreneurship, and it is the variable that most accurately predicts entrepreneurial behavior [61]. In the educational context, some authors have also found a positive and significant causal relationship between intention and entrepreneurial behavior [60,62,63].

On the other hand, the intention is a measure of the will and effort that the entrepreneur is ready to make to establish a company [37,64,65].

Essentially, there have been three models that serve as a guide to understand the development of the entrepreneurial intention: The Bird model [66] to implement business ideas, the entrepreneurial event model (EEM) of Shapero and Sokol [44] about the business event, and Ajzen's theory of the planned behavior [45] (TPB). EEM and TPB are "the two most extensively tested competing theories that have been used to explain entrepreneurial intention" [67,68]. In the Shapero and Sokol model [44] the entrepreneurial intention is formed based on perceived desirability, perceived viability and the propensity to act [69]. Theory of planned action, in turn, maintains that the intention to establish an enterprise is dependent on the three variables: Attitude toward behavior, perceived behavioral control and subjective norm. In this model, attitude is the initial variable of the chain of direct and indirect effects that leads to intention [70,71]. The attitude in this model corresponds to the perceived desirability included in the former model, and behavioral control is a form of perceived viability, considered in the Shapero and Sokol model [44]. Ajzen adds the subjective norm in the second model, which also influences the entrepreneurial intention [72–74]. Intention-based models are implemented successfully in social psychology, marketing and management, and prior research revealed very interesting empirical conclusions. All the determinants indicated in the TPB and EEM models showed that the variables included in the two models have a positive and direct effect on entrepreneurial intentions among young people [65].

Although both models have been empirically tested and offer satisfactory predictions of the entrepreneurial intention, the use of the theory of planned behavior predominates in the literature, due to its high predictive power [69]. Due to the predictive power of intention over entrepreneurial behavior, in the majority of the designed models, the entrepreneurial intention has been used as a dependent variable [69,75].

In addition to the variables mentioned in the causal models of reference, other authors have focused on other personal variables than those mentioned above, highlighting demographic variables, life history, work experience and gender [68,76,77]. Psychological variables have also been taken into account, as is the case of motivation or personality traits (e.g., commitment, self-esteem, safety, extroversion) [62,78,79]. In any case, the most influential articles regarding entrepreneurial intention can be classified into five groups. The first category includes articles that address theoretical and methodological issues that test the central models [72]. The second category includes articles focused on variables, such as gender [80], family roles [81], social capital [82], and personality traits [83]. The third group of studies addresses the role of education in the context of entrepreneurship [84]. The documents that are classified in the fourth category, the least numerous, focus on the role of context and institutions, covering samples from several countries [85]. The last group of articles analyzes the links between intention and behavior, confirming the high predictive potential of intention on entrepreneurial behavior [86,87].

Despite the conducted studies and the obtained findings, there is a number of reasons that suggest the need to deepen the study of entrepreneurial intention, particularly in the case of young people because there is consensus in the literature regarding personal factors that influence their entrepreneurial intention, as well as divergence from other factors in different contexts (e.g., marketing) [88,89]. In the first place, some researchers consider it necessary to enrich the theoretical framework on the entrepreneurial intention [8,61]. At the empirical level, the emphasis is placed first on the enrichment of the models designed for study [90,91]. In this sense, some authors propose that new variables and relationships are introduced into the models. This is the case of commitment [92], and also of cognitive scripts, schemas and mental maps, which play a relevant role in the formation of the entrepreneurial intention through automatic processing [92].

At the contextual level, some researchers propose to deepen the understanding of the influence of institutions [93] and culture [94] on entrepreneurial intention. Likewise, it would be of great interest to investigate further the entrepreneurial intention in the wide range of business scenarios, such as

social entrepreneurship [95], family entrepreneurship [96], and entrepreneurship in the academic context [61,97]. In the latter case, it would be useful to explore the possible causal link between some educational variables (e.g., selection of participants, course contents, pedagogical methods) and certain factors that influence the intention and/or behavior (e.g., attitudes, values, abilities) [78,98]. Finally, some researchers suggest the need to carry out a greater number of comparative studies of the entrepreneurial intention at the regional level [52,94,99], and in the context of sustainable entrepreneurship [99,100].

Particularly noteworthy is the recent trend that emphasizes the role of certain subjective variables in the formation of entrepreneurial intention. This is the case of the social norm, or of the process of identity and social self-categorization of the entrepreneur [101]. Within this stream, it is considered that, although companies are created voluntarily and intentionally [28,43], it is the socialization that creates ground for unconscious internalization of attitudes and values that, ultimately, will make the entrepreneur create a company [76,77]. This raises the need to determine to what extent the entrepreneurial intention and entrepreneurship are voluntary processes and conscious or conditioned and unconscious. This study is framed in this stream of thought because it analyzes the causal influence of certain subjective variables on certain personal variables associated with the action, which in turn influence the intention and behavior of undertaking.

3. Model and Hypothesis

During their development process, students adopt a series of beliefs about various aspect of life, including entrepreneurship and the role that education plays in its promotion [102]. It can be affirmed in this sense that socio-culture influences entrepreneurship because it takes place within a social context and a network of relationships that facilitate such beliefs, as well as the infinity of aspects, such as the detection of opportunities, the acquisition of resources or the legitimacy of the company [69,103]. Beliefs are accepted and internalized by specific individuals or groups, usually unconsciously, and carry with them the obligation to perform behaviors to achieve compliance. In this way, the beliefs reflect a commitment and intentions of ideal behavior according to what a person feels should be done [25,104,105]. It can be affirmed that beliefs are a measure of expectations about behavior and the corresponding motivation to fulfill them [106–108].

In the context of the theory of planned behavior beliefs are important because they influence the social or subjective norm, which is defined as the perception of the subject about how the people close to him/her (e.g., family, friends) would accept his/her intentions, decisions and behavior [71]. Therefore, the social norm also possesses an unconscious content and is derived from beliefs and is related to them through a continuous process of causality [106,109,110]. For these reasons, some authors suggest that beliefs should be included in models that examine behavioral intentions, in which this type of prior sociocultural precursors are often ignored [111,112]. Taking the above into account, the first hypothesis states that:

Hypothesis 1 (H1). *Beliefs about the role of education in the promotion of entrepreneurship have a direct and positive influence on the social norm.*

The values are directly related to the extent to which a person has an opinion or predisposition, positive or negative, towards an object or behavior, in this case, the behavior of creating a company [70,113]. Moreover, values constitute criteria of action that are at the origin of any behavior, have high stability and are formed during the process of socialization. Therefore, just as with beliefs, values are also largely determined unconsciously and conditioned by the prevailing shared culture in society [114,115]. In any case, in most explanatory models of the formation of entrepreneurial intention values are found in the initial phases of the chain of direct and indirect effects that culminate in the intention and behavior of undertaking [116,117].

It is a proven fact that the social norm influences values [118]. It is due to the influence exercised by the social norm that individuals adopt certain values when they perceive that these values and associated behaviors are expected and approved by significant and influential agents [119,120]. Additionally, in a generational context, it is assumed that young people share values and are easily influenced by other subjects, due to the pressure of conformity [121]. Particularly in the case of young people, there is a tendency to make efforts to imitate others [122]. However, the role of the subjective norm in entrepreneurship has not been sufficiently clarified [123]. Taking the above into account, the following hypothesis dictates that:

Hypothesis 2 (H2). *The social norm has a direct and positive influence on values related to entrepreneurship.*

In the context of entrepreneurship, an attitude refers to the predisposition of a person towards the behavior of creating a company [70,113]. In explanatory models of the intention-to-undertake attitude formation, it is also found in the initial phases of the chain of direct and indirect effects that culminate in the intention and behavior of undertaking [116,124]. Regarding the antecedents of the attitude, for decades social scientists have studied the values to understand the attitudes of the subjects in different areas, as is the case of entrepreneurship [125–127], having verified that the values justify and explain the attitudes of the individuals [128,129]. This causal relationship is otherwise reasonable if one takes into account that the attitude is closer to the behavior, and that the values are part of the subject's personal philosophy, which in turn is influenced by the social norm and by the beliefs [70,113]. In this way, the attitude is also formed in the process of socialization and has an unconscious and conditioned content. Additionally, the attitude could be considered a variable that serves as a link between the values and other variables more linked to the action, such as motivation, self-efficacy and intention [126]. Taking the above into account, the following hypothesis states that:

Hypothesis 3 (H3). *Values directly and positively influence the attitude toward entrepreneurship.*

It has been found that attitude plays a fundamental activating role in the formation of the entrepreneurial intention, usually indirectly [44,45,70]. Many authors consider that efforts should be made to incorporate new personal variables into the models that serve as linkages between the attitude and the entrepreneurial intention, such as the case of motivation [101,116]. In this sense, there is a particular interest in the study of motivation to undertake, due to its high relevance in the process of creating a company [29,130,131]. The influence of attitude on motivation has already been verified by some authors in different fields, who have found that the favorable attitude towards a behavior constitutes the germ of the motivation towards such behavior [131]. Therefore, the favorable predisposition toward entrepreneurship, that is, attitude, favors the generation of motives and desires towards the creation of a company [132]. Additionally, taking into account that the motivational system of the subject is generated in a context of socialization and a specific cultural framework, it is understandable that the values, the social norm and the attitude have a causal relationship, direct or indirect, with motivation, such and as some authors suggest [133,134]. Based on the above, the following hypothesis is established as follows:

Hypothesis 4 (H4). *The attitude has a direct and positive influence on the motivation to undertake entrepreneurial activity.*

There are several reasons that motivate the entrepreneur to create a company, and all of them are classifiable in internal or external [135,136]. Among the internal factors or of necessity, the desire for achievement and the desire for independence and autonomy stand out, and among the external or opportunity motives, it is worth mentioning the desire to increase income or obtain social status [8,132,137]. Regarding the consequences of motivation, it has been found that internal and external motivation increases the alertness of entrepreneurs to new opportunities, activates creative problem solving,

improves cognitive flexibility, leads entrepreneurs to devote considerable effort and it influences the entrepreneurial intention [130,131].

The consequences of motivation seem to be mediated by self-efficacy, an essential attribute of the potential entrepreneur that refers to the extent to which a person believes that he or she can organize and execute actions effectively to produce certain achievements [138–140]. Taking into account that self-efficacy influences the amount of effort and perseverance in the face of the difficulties and challenges faced by the entrepreneur, it seems reasonable to think that the motivated person feels more self-effective than the less motivated person [48,141]. Based on the foregoing, the following hypotheses suggest that:

Hypothesis 5 (H5). *Motivation directly and positively influences the self-efficacy to undertake entrepreneurial activity.*

Self-efficacy influences the setting of goals, expectations of results [8], and the entrepreneurial intention, which is a measure of the will and effort that the entrepreneur is willing to make to create the company [142–144]. This relationship between self-efficacy and intention is particularly important because the intention is the variable that best predicts entrepreneurial behavior [61].

On the contrary with people who have a high self-efficacy, people with low self-efficacy believe that they cannot be successful, and therefore, have less intention and less likely to make an effort, being able to consider that challenging tasks are threats that should be avoided [139]. These processes seem to be due to the fact that self-efficacy is related to levels of perceived personal competence, which in turn are linked to the perception of control and the possibility of coping with processes that assume a certain risk, as is the case of entrepreneurship [120,145]. In view of the foregoing, it is stated that:

Hypothesis 6 (H6). *Self-efficacy influences positively and directly the entrepreneurial intention.*

Taking into account the hypotheses, the following a model of the relations between personal factors and entrepreneurial intention is proposed (Figure 1). It includes variables and partial relationships that have been verified in other studies. Additionally, in this and other studies, the subjective drivers influence the variables that lead to the intention and action, mediated by attitude.

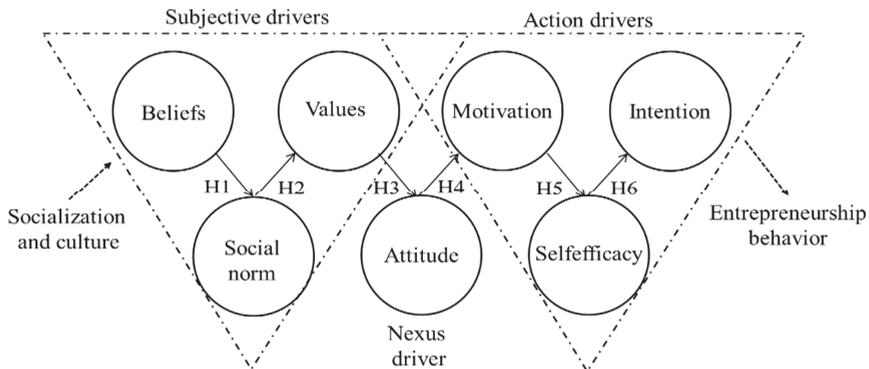


Figure 1. Proposed model of the relations between personal factors and entrepreneurial intention (Based on the review of the literature mentioned in the development of the hypotheses).

Regional differences in entrepreneurial behavior tend to be explained to a greater extent by personal factors of the entrepreneur than by contextual factors [26]. Therefore, it is personal variables that mainly lead to variations in the quantity and quality of entrepreneurship at the regional level [146]. Additionally, some researchers have confirmed the greater homogenizing weight inherent in a generational approach

to the differentiating effect of the personal variables associated with each country [30]. Therefore, taking into account the foregoing and considering that young people of generation Y share perceptions, values and attitudes at a global level [147], the following hypothesis states that:

Hypothesis 7 (H7). *There are no significant differences between Poland and Spain in the causal relationships of the proposed model.*

4. Research Method

4.1. Context

This study has been carried out in a public university in Poland and another in Spain, two countries that have in common their belonging to the EU, but that have a different socio-cultural, political and economic trajectory. From economical, institutional and cultural perspectives, having a reference point in data from another country is cognitively beneficial and allows for more adequate and in-depth judgments. Poland and Spain form a legitimate reference point in many respects [148]. Both countries belong to large European economies. They are diverse geographically and demographically. They share a similar story of the transition from closed, centralized economies to market-driven capitalist order [149]. Similarities are also noticeable in particular sectors of the economy and in the role of micro, macro and medium-sized enterprises which contribute significantly to the employment and added value in both economies. The reason for comparing Poland and Spain also derives from cultural and institutional conditions favoring entrepreneurial attitudes, development of social capital, and ultimately affecting the shape and dynamics of economic processes [148]. In addition, in the comparative research of generation Y expectations regarding the future workplace carried out on a small group of students from Poland and Spain, it turned out that the priorities in two countries are very similar: Both Polish and Spanish students expect a good atmosphere at work, high earnings and work-life balance [48]. In Spain, entrepreneurial activity has remained stable, since the economic recession, but the economic and labor impact of established companies has increased markedly (<https://www.gemconsortium.org/report>). The 2019 GEM Report of Spain highlights that the entrepreneurial activity in Spain is strongly influenced by the recovery phase of the economic cycle, and the growth of the propensity to be an entrepreneur by the Spanish population. The latest report highlights the increase in the perception of opportunities in the environment (+8%), as well as entrepreneurship by opportunity versus the need (+3% vs. −20.3%). Also highlighted in this report is an increase in the perception of entrepreneurship abilities (+8.2%), the decrease in fear of failure (−1.1%) and a decrease in the rate of entrepreneurship (ASD) among young people aged 18–24 years of 1.6% between 2017 and 2018. In Poland, the Polish government carried out several legislative actions in 2018 to promote entrepreneurship, and in that same year, the social perception regarding the creation of new companies improved. Three-fourths of adults in Poland stated that it is easy to start a business in their country. However, the percentage of new entrepreneurs has decreased, due to the excellent situation of their labor market. According to the data of the report prepared by the GEM (<https://www.gemconsortium.org/report>), in 2018 Poland was characterized by a somewhat lower (−0.35%) perception of the opportunities generated by entrepreneurship, a lower fear of failure (−3.29%), a better perception of social status (+8.6%) and opportunity of employment associated with entrepreneurship (+6.6%), as well as a lower entrepreneurial intention (−0.21%). There is an increase in entrepreneurship among young people. In both countries, less than 10% of entrepreneurs are international. Finally, Spain stood out in 2018 for a TEA slightly higher than that of Poland (6.39% vs. 5.24%, respectively) and a higher perception of entrepreneurship competencies (48.46% vs. 46.60%, respectively) (www.gemconsortium.org).

4.2. Data Analysis

The study was carried out in the months of September 2018 to May of 2019 using a quantitative method that was descriptive and causal. The partial least squares structural equation modeling approach (PLS-SEM) has been used in this study for its advantages in the study of human behavior [150,151], for its optimal predictive and exploratory potential using reflective indicators, because it does not require normal distribution of data and because it allows the use of a wide range of sample sizes [152]. As carried out by other authors, the analysis of the data was done independently for Japan and Spain [153]. It has been used the Partial Least Squares (PLS) model version 3.2.4 [154] to analyze the measurement model, the structural model and to perform the PLS-MGA multigroup analysis. To carry out the multigroup analysis, the measurement invariance was analyzed using MICOM; and a new approach developed for PLS-SEM [51,155–157].

4.3. Sample and Data Collection

The population of the study was young people from Poland and Spain. It has been taken into account that university students are a good representation of generation Y, as suggested by other authors [32,158]. Therefore, after realizing a cluster study by degrees and courses, the two final samples were made through random sampling of students representatively in Spanish and Poland universities. For a more accurate assessment, the effect size (0.15) and power (0.90) indicator were specified [159,160]. First, the characteristics of the population of both universities were identified, in relation to the number of students and gender according to the degrees and courses, as well as the sample sizes of both institutions. As proposed by Ramsey and Hewitt [161], the representativeness of the sample in terms of age, gender and academic profile were achieved by clearly specifying the level of data quality and sampling design. This has allowed consistency, diversity, and transparency. Taking all this into account, the population data distributed by degrees, gender and study programs were requested from the two universities' administration, with the corresponding percentages. These percentages were taken into account in the sampling. Data from both countries concerned the academic year of 2018/2019. In the case of Poland, 1444 students studied at the Faculty of Engineering Management, including 794 women and 650 men. Students attending the following programs were involved in the study: Management, Logistics, Service Management and Engineering, Production Management and Engineering. In Spain, 2279 students studied at the Faculty of Economy, Business and Tourism (957 men and 1322 women). In Poland, the sample was 26% of the population, in Spain approximately 15%. The days and hours were chosen at random to apply the questionnaire. The process was followed in two rounds at both universities until the samples with the appropriate characteristics and size were completed. Performed the Mann-Whitney test, it was found that only two of the fourteen variables observed had asymptotic bilateral significance greater than 0.05, which is why it is confirmed that the two samples are independent [162]. Initially, the total sample included 47 more subjects who were eliminated because they responded with the same score to all the items or because they left some item unanswered, which indicates that the answer was 93.48%. The subjects (Table 1) were aged between 18 and 24 years old (97%). The percentage of men and women in the samples is similar to that in the degrees in each of the two countries. Though in the selected Spanish university the total number of students in 2018 exceeded 20,000, and in the Polish university, more than 13,000. The samples sizes are more than the minimum requirement and in accordance with the minimum of 100 subjects when using structural equations (PLS method) [163]. Although the two samples meet the minimum sample size criteria, they are not the same size. The guideline to consider group sample size differences is when one group is more than 50% larger than the other [164]. To verify that these are two independent samples, the Mann-Whitney-U test was applied, whose result was 50,000 and a value of P (asymptotic significance, 2-sided) less than 0.05 ($P_{ab} < 0.05$) for every twelve variables observed. It can be safely concluded that the size of both samples was adequate for the purposes of this study.

Table 1. Details of the sample

Gender	Country				Total	%
	Spain (%)		Poland (%)			
	Number	%	Number	%		
Male	144	42.48%	175	45.81%	319	44.24%
Female	195	57.52%	207	54.19%	402	55.76%
Total	339	100.00%	382	100.00%	721	100.00%

4.4. Measurements

A questionnaire designed ad hoc was used as a tool for collecting data. To carry out the design of the scale, we proceed with the analysis of the variables, the relationships, and the appropriate measures for the proposed model, thus, generating content validity. Authors considered the observation from the recent literature that the variables included in this study were usually measured by means of a small number of items, thus, avoiding the methodological problems and the costs derived from the use of multiple indicators [165]. Next, the Delphi technique was used with two groups of experts to construct, through two rounds, the definitive content of items and relationships. After a pretest, the final questionnaire included 14 items (see Table 2) designed following the principles of brevity and simplicity using a Likert scale with 5 response alternatives (1: No agreement to 5: Total agreement). It also included a control item related to the country to which the subject belonged.

For the design of the two items related to beliefs, previous studies by Fang et al. [166] and Jahanshahi et al. [25] have been consulted. The reagents associated with the social norm have been developed from the contributions of Ajzen and Cote [71] and Gächter and Renner [167]. Ajzen and Fishbein studies have been considered for the design of the items related to the values [70,113]. The items associated with the attitude have been elaborated, starting from the indications of Ajzen and Fishbein [70] and Tomczyk et al. [113]. In the design of the items linked to motivation, we started with the studies of Fayolle and Liñán [8]. The two items related to self-efficacy are taken into account the contributions of Cho and Lee [120] and Kim and Jang [144]. Finally, the items related to the intention have been elaborated from the work of Liñán and Fayolle [61] and Fuller et al. [23]

Table 2. Descriptive data (in Spain N = 339, in Poland N = 382)

Items ¹	%		Median		Standard Deviation	
	ES ²	PL ³	ES	PL	ES	PL
EB1: Education must enable students to become entrepreneurs	84.96%	83.87%	4.25	4.19	0.86	0.89
EB2: Entrepreneurship must be encouraged at universities	87.43%	84.40%	4.37	4.22	0.80	0.89
SN1: Me being an entrepreneur would be perceived well by my friends	85.66%	84.08%	4.29	4.20	0.80	0.92
SN2: My family would accept that I was an entrepreneur	85.84%	87.70%	4.29	4.38	0.83	0.83
VA1: Entrepreneurship has value because it gives autonomy and freedom	76.99%	78.85%	3.85	3.94	0.97	0.89
VA2: Entrepreneurship has value because it gives you work and life in dignity	76.28%	89.37%	3.81	4.02	0.97	0.87
AT1: Entrepreneurship has more advantages than disadvantages	74.69%	81.62%	3.73	4.08	1.03	0.83
AT2: I am in favor of entrepreneurship and the creation of companies	89.91%	89.48%	4.50	4.47	0.61	0.69
MO1: I would be motivated to be an entrepreneur because I could achieve more	78.58%	86.28%	3.93	4.31	0.96	0.82
MO2: I would be motivated to be an entrepreneur because it would bring me more resources and benefits	73.63%	86.86%	3.68	4.34	1.03	0.82
SE1: I think I would be a successful entrepreneur if I created a company	71.15%	75.45%	3.56	3.77	0.92	0.89
SE2: I am confident that I would be able to create a company	67.96%	81.10%	3.40	4.06	1.22	0.92
IE1: I intend to be an entrepreneur	65.49%	71.88%	3.27	3.59	1.21	1.03
IE2: I am thinking of establishing my own company in the future	67.61%	76.13%	3.38	3.81	1.25	1.07

¹ EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention. ² ES: Spain. ³ PL: Poland.

5. Results

5.1. Descriptive Data

All the items (14) reached an overall score higher than 65% of the maximum possible value (100%) if all the subjects had valued the item with five points (see Table 2). As suggested in the GEM reports, it is confirmed that the Poles declare that they have a greater entrepreneurial intention, are more motivated, attach more importance to values and have a more favorable attitude towards entrepreneurship than Spaniards. However, the results of the discriminant analysis carried out between both samples showed that the only significant differences occurred in the items AT1 and MO2, with the Poles being the ones that tend to score both items higher. The discriminant analysis showed a high significance of the M. de Box test ($P = 0.000$), reduced levels of the eigenvalue and the canonical correlation (0.230 and 0.320, respectively), as well as a high value of the Wilks Lambda test (0.851).

5.2. Identification of Latent Variables

To identify the latent variables or constructs to which the items belong, an exploratory factor analysis with varimax rotation was first conducted for Poland and Spain, using the principal component method, the Kaiser-Meyer-Olkin test (KMO), the Bartlett test of sphericity and the Cronbach alpha reliability statistic. This process is common in studies by other authors [168,169]. After a series of analyses, a structure of seven factors or latent variables was obtained (see Table 3). The inclusion of two items in each factor has been accepted because the variables forming the factors have a high correlation between them (greater than 0.70) and a reduced correlation with other variables [170]. The latent factors or variables of the model are: EB: Education beliefs; SN: Social norm; VA: Values; AT: Attitude; MO: Motivation; SE: Self-efficacy; EI: Entrepreneurship intention.

Table 3. Measurement model: Basic data ¹ (in Spain N = 339, in Poland N = 382)

Construct	Items	Loading $\lambda > 0.70$		CR ² > 0.70		AVE ³ > 0.50	
		Spain	Poland	Spain	Poland	Spain	Poland
EB: Education beliefs	EB1	0.937	0.897	0.898	0.857	0.816	0.750
	EB2	0.868	0.834				
SN: Social norm	SN1	0.894	0.909	0.917	0.913	0.847	0.840
	SN2	0.947	0.923				
VA: Values	VA1	0.834	0.826	0.819	0.847	0.693	0.735
	VA2	0.831	0.888				
AT: Attitude	AT1	0.850	0.686	0.789	0.793	0.652	0.661
	AT2	0.762	0.924				
MO: Motivation	MO1	0.917	0.912	0.872	0.888	0.774	0.798
	MO2	0.841	0.875				
SE: Self-efficacy	SE1	0.895	0.875	0.910	0.883	0.834	0.790
	SE2	0.931	0.903				
EI: Entrepreneur. Intention	EI1	0.965	0.919	0.962	0.914	0.926	0.842
	EI2	0.960	0.916				

¹ EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention. ² CR: Composite reliability. ³ AVE: average variance extracted.

5.3. Analysis of the Model in the PLS Context of Structural Equations

First, and to test the six hypotheses of the proposed causal model, the measurement model was evaluated for Spain and Poland, which relates the observable variables to their latent variable [170].

The analysis of the measurement model involves studying the reliability (individual and composite) and the validity (convergent and discriminant) of the relationships between the observed variables (items) and the latent variables with which they are associated. The study of individual reliability showed that the observed variables reached the minimum level required ($\lambda \geq 0.70$), in the case of Spain, as well as Poland (Table 3). Therefore, it was accepted that the indicators were part of their corresponding constructs [171]. The study of composite reliability (CR), an indicator similar to Cronbach's alpha though more appropriate than Cronbach's in the framework of structural equations, showed all values were above 0.70, in the case of Poland, as well as Spain (Table 3). This shows that the measurement model was internally consistent and that all the indicators or variables observed were measuring their corresponding latent variable [157].

To evaluate the convergent validity of the model, the average variance extracted (AVE) was calculated, which provides information on the amount of variance that a construct obtains from its indicators in relation to the amount of variance, due to measurement error. In all cases, the result was greater than 0.50, so it was found that more than 50% of the variance of the construct was due to its indicators [171] (Table 3).

Regarding the discriminant validity, this implies that each construct is significantly different from the rest of constructs with which it is not related according to the theory. To calculate the discriminant validity and following Fornell and Larcker [172], it was first verified that the square root of average variance extracted (AVE) (on the diagonal of Table 4) was greater than the variance shared between the construct and the other constructs of the model (data that are not found in the diagonal of Table 4) [173].

Table 4. Discriminant validity: Criteria of Fornell Larcker (in Spain N = 339, in Poland N = 382)

	Spain							Poland						
	EB	SN	VA	AT	MO	SE	EI	EB	SN	VA	AT	MO	SE	EI
EB	0.903							0.866						
SN	0.055	0.920						0.319	0.916					
VA	0.051	0.262	0.833					0.344	0.298	0.857				
AT	0.140	0.273	0.488	0.807				0.315	0.348	0.403	0.813			
MO	0.150	0.504	0.397	0.474	0.880			0.445	0.455	0.464	0.426	0.894		
SE	0.076	0.459	0.330	0.445	0.495	0.913		0.231	0.372	0.275	0.311	0.457	0.889	
EI	0.158	0.378	0.277	0.416	0.553	0.703	0.962	0.245	0.240	0.270	0.238	0.479	0.641	0.917

EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepren. intention.

Secondly, it was used the heterotrait-monotrait (HTMT) ratio, which has been established as a superior criterion [51]. The present study uses the more conservative level of 0.85 to assess discriminant validity in all cases (Spain and Poland). Finally, the matrix of cross-factor loadings was also obtained [174]. The factor loadings, or Pearson correlations of the indicators with their own construct, should be greater than those maintained with the rest of the constructs, as was found. Therefore, the indicators were more correlated with their own construct than with others. Therefore, it can be said that the measurement model is valid and reliable.

Regarding the evaluation of the structural model, which relates some constructs with others [170], the collinearity was analyzed, both for Spain and Poland; the algebraic sign, magnitude and statistical significance of the structural path coefficients; the R2 values (variance explained); the f2 effect size; The Q2 indicator, the GoF test (Goodness-of-Fit) (predictive relevance) and the SRMR indicator of global adjustment of the model [175]. In the first place, it was verified that there was no multicollinearity between the constructs, since the variance inflation index (IVF) was, in any case, lower than 3.3 [156]. Secondly, it was verified the sign of the causal relationships between the constructs and the weight of these relations, both in the case of Poland and Spain (Table 5). Regarding the sign of the causal relationships, it was found that all had the same positive sign as their corresponding hypothesis, which is why no hypothesis had to be rejected. Regarding the weight of the causal relationships,

it was found that in Spain, except in the case of the relationship between beliefs (EB) and social norm (SN), the coefficient paths (β) (standardized regression weights) reached levels above the minimum acceptable level ($\beta \geq 0.2$) [173], or even at the optimal level ($\beta \geq 0.3$) [176]. The causal relationships with greater weight in the case of Spain were those that linked self-efficacy (SE) with the entrepreneurial intention (EI) (H6: $\beta = 0.703$) and the relationship between motivation (MO) and self-efficacy (SE) (H5: $\beta = 0.495$) (Table 5). In the case of Poland, the relationships with greater weight were also those corresponding to the relationship between self-efficacy (SE) and entrepreneurial intention (EI) (H6: $\beta = 0.641$) and the relationship between motivation (MO) and self-efficacy (SE) (H5: $\beta = 0.457$) (Table 5). It is worth highlighting the greater weight of the first two relations (H1 and H2) in the case of Poland, and the greater weight in the rest of the relations (H3 to H6) in the case of Spain. The analysis of the significance of the relationships was carried out by bootstrap with 5000 resamples and 5000 permutations [153]. All the relationships were significant except for the one corresponding to the first hypothesis (H1) in the case of Spain. Therefore, all hypotheses of the proposed model are accepted except H1 in the case of Spain.

Table 5. Relations data (in Spain N = 339, in Poland N = 382)

Hypo-Thesis	Relations	Spain					Poland				
		Paths(β)	t	P Val.	f2	Conf.	Paths(β)	t	P Val.	f2	Conf.
H1	EB→SN	0.055	0.879	0.380	0.003	No	0.319	5.809	0.000	0.113	Yes
H2	SN→VA	0.262	4.266	0.000	0.073	Yes	0.298	5.621	0.000	0.097	Yes
H3	VA→AT	0.488	12.109	0.000	0.313	Yes	0.403	7.911	0.000	0.194	Yes
H4	AT→MO	0.474	11.664	0.000	0.290	Yes	0.426	7.199	0.000	0.221	Yes
H5	MO→SE	0.495	12.524	0.000	0.324	Yes	0.457	8.548	0.000	0.263	Yes
H6	SE→EI	0.703	30.724	0.000	0.975	Yes	0.641	19.041	0.000	0.696	Yes

EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

In Figures 2 and 3 models of the relations between personal factors and entrepreneurial intention, separately for Poland and Spain (in Spain N = 339, in Poland N = 382).

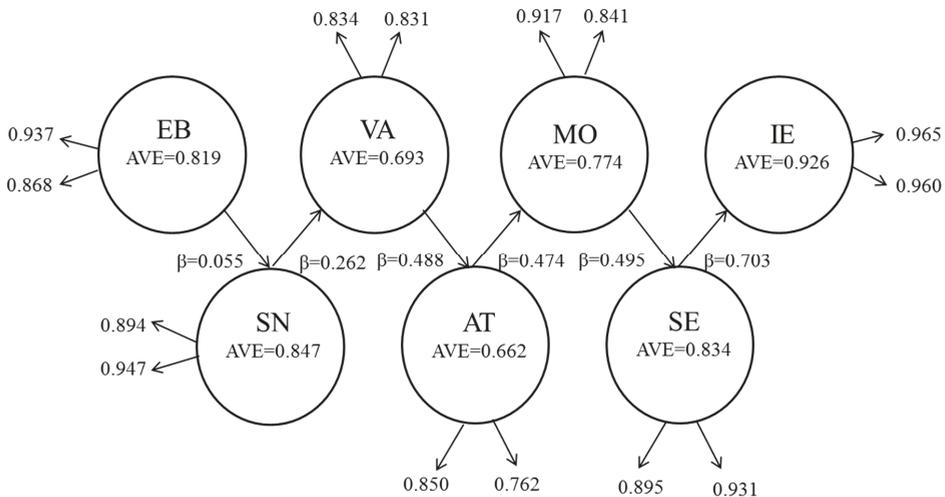


Figure 2. Spanish model of the relations between personal factors and entrepreneurial intention. EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

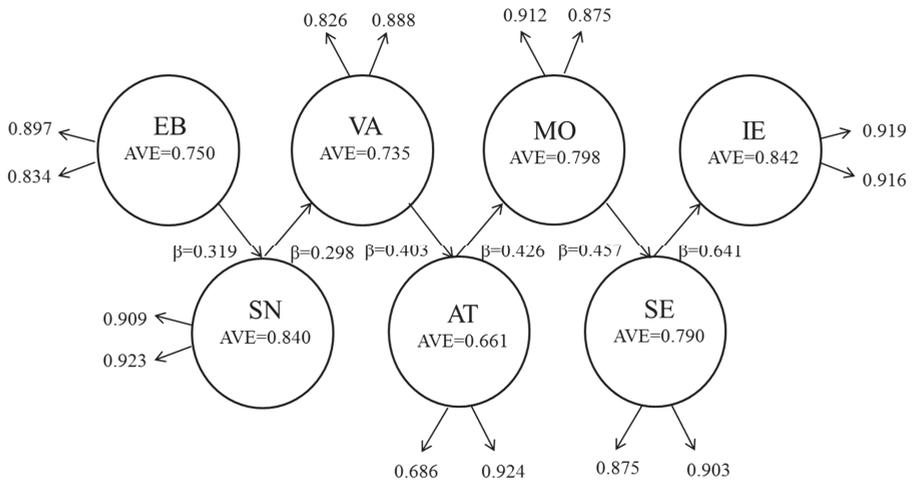


Figure 3. Polish model of the relations between personal factors and entrepreneurial intention. EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

In relation to indicator R2 (coefficient of determination) (Table 6), which reports on the amount of variance explained by the model in each dependent latent variable, R2 values above 0.2 are relatively high and acceptable by behavioral research standards [153,157] In the case of Spain, the variance of the dependent variable (EI) is better explained (R2 = 0.494) than in the case of Poland (R2 = 0.436).

Table 6. R2, Q2 and GoF indicators (in Spain N = 339, in Poland N = 382)

Key	Construct	Spain		Poland	
		R ² > 0.20	Q ² > 0	R ² > 0.20	Q ² > 0
SN	Social norm	0.003	0.002	0.102	0.077
VA	Values	0.068	0.044	0.089	0.057
AT	Attitude	0.238	0.147	0.163	0.100
MO	Motivation	0.225	0.166	0.181	0.131
SE	Self-efficacy	0.245	0.195	0.208	0.155
EI	Entrepreneurship intention	0.494	0.436	0.410	0.329
GoF		0.409		0.386	

EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

On the other hand, the f2 indicator assesses the degree to which an exogenous construct contributes to explain a specific endogenous construct in terms of R2 [159]. The values were adequate and above the minimum accepted level (0.15), except in the case of the first two hypotheses (H1 and H2), both in the case of Spain and Poland (Table 6).

Regarding the indicator Q2 (predictive relevance of the dependent constructs), it reached the values above zero in all cases (Q2 ≥ 0) [177] (Table 6).

Additionally, the GoF test, which represents the geometric mean between the average of the AVE indicator and the average of R2 in relation to the endogenous constructs [178], was calculated. The result was higher than the minimum acceptable value (GoF ≥ 0.360) (Table 6), considering the most unfavorable situation for this test, which is that of samples with high effects [178].

Finally, the SRMR composite factor model was applied to determine the extent to which the model fitted the data. In all cases, this indicator was below 0.08, thus, confirming the good of the models (SRMR Spain = 0.069, SRMR Poland = 0.071) [179]. Therefore, the predictive power of the model is accepted in the case of both countries.

The results show that the structural model is significant.

5.4. Multigroup Analysis

To test hypothesis 7 (H7), regarding the existence of significant causal differences between the Spanish and Polish models, a multigroup analysis was carried out. The MGA multigroup analysis is particularly useful for research in a global context of a comparison between countries or cultures, as well as in the analysis of segment differences carried out by age or gender [179]. This analysis was carried out using two nonparametric tests: The MGA test [49], and the permutation test [50]. These two tests are considered as the most conservative PLS-SEM techniques in the context of the structural equation model PLS-SEM [152].

Before performing the multigroup analysis, the measurement invariance was first checked in the context of PLS-SEM. The procedure called MICOM [51] (Table 7) is one of the most appropriate and is carried out in three steps. The first step is to examine the configuration invariance, which implies checking that identical indicators have been used in both groups, as well as an identical data treatment and identical configuration of the algorithm [51]. The second step is to check the invariance of the composition, which occurs when composite scores are created equally across groups [180]. Finally, the third step is to check the invariance of means and variances. When the invariance is confirmed in this third step for the case of means or in the case of variances, but not in both cases, it is concluded that partial invariance exists. It is when the partial invariance of the measurement for both groups is achieved for all the constructs of the model when the multigroup comparison can be carried out. In this study, the stability of the invariance in the first two steps has been confirmed. However, total invariance has not been achieved, according to the results of step 3 (I and II), which is why it is stated that there is partial verification of invariance, and therefore, both groups can be compared.

Table 8 shows the path differences obtained in the Spanish and Polish models, as well as the significance of said differences, both in the MGA analysis and in the permutation test. In the case of the MGA analysis, a p-value lower than 0.05 or higher than 0.95 indicates a level of significance to be taken into account between path coefficients associated with a specific hypothesis, which means that this causal relationship is significantly different between the two countries [49,155]. In the case of the permutation test, the differences are significant only when the value of p is less than 0.05. According to both criteria, the only causal relationship that is significantly different between the two countries is that which refers to the first hypothesis (H1), which has the greatest weight in the case of Poland. There are no significant differences between Spain and Poland in the case of the causal relationships associated with the other five hypotheses of the model. Therefore, it can be affirmed that there are no significant differences between the causal models of both countries, thus, confirming the seventh hypothesis (H7). However, the weight of the relations between the first two hypotheses is greater in the case of Poland, in the rest of the hypotheses the weight of the relations is greater in the case of Spain.

Table 7. Results of invariance measurement testing using permutation (in Spain N = 339, in Poland N = 382).

Dim	Step 1		Step 2		Step 3 (I)		Step 3 (II)		Full Measurement Invariance Established		
	Configural Invariance	Compositional Invariance	Partial Measurement Invariance Established	Equal Mean Assessment	Equal Variance Assessment	Confid. Interval	Equal	Confid. Interval		Equal	
EB	Yes	0.999 (0.956, 0.999)	Yes	0.148	No	(-0.139, 0.144)	No	-0.046	(-0.255, 0.245)	Yes	No
SN	Yes	0.999 (0.996, 0.999)	Yes	0.000	Yes	(-0.143, 0.149)	Yes	-0.249	(-0.238, 0.236)	No	No
VA	Yes	0.998 (0.992, 0.998)	Yes	-0.193	No	(-0.146, 0.145)	No	0.127	(-0.218, 0.221)	Yes	No
AT	Yes	0.997 (0.990, 0.997)	Yes	-0.203	No	(-0.152, 0.148)	No	0.051	(-0.231, 0.232)	Yes	No
MO	Yes	0.999 (0.999, 0.999)	Yes	-0.600	No	(-0.151, 0.148)	No	0.346	(-0.231, 0.228)	No	No
SE	Yes	1.000 (0.998, 1.000)	Yes	-0.475	No	(-0.144, 0.144)	No	0.391	(-0.199, 0.197)	No	No
EI	Yes	1.000 (1.000, 1.000)	Yes	-0.341	No	(-0.146, 0.151)	No	0.408	(-0.186, 0.187)	No	No

EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

Table 8. Multigroup analysis (in Spain N = 339, in Poland N = 382)

Hypothesis	Relationship	Path Coefficient Difference	P-Value Difference		Supported
			Henseler's MGA	Permutation Test	
H1	EB → SN	0.264	1.000	0.001	Yes/Yes
H2	SN → VA	0.036	0.679	0.650	No/No
H3	VA → AT	0.085	0.101	0.187	No/No
H4	AT → MO	0.048	0.250	0.495	No/No
H5	MO → SE	0.038	0.274	0.528	No/No
H6	SE → EI	0.062	0.089	0.102	No/No

EB: Education beliefs, SN: Social norm, VA: Values, AT: Attitude, MO: Motivation, SE: Self-efficacy, EI: Entrepreneurship intention.

6. Discussion and Theoretical Implications

Taking into account the scores of the items, it can be affirmed that the results of the descriptive analysis confirm the GEM reports and the affirmations of numerous authors about the importance that entrepreneurship has for young people, as well as the relevance that university students give to the creation of a company as a work alternative [37]. Likewise, the data from the GEM reports on the differences between Poland and Spain regarding entrepreneurship are also confirmed: Young people in Poland declare that they have a greater entrepreneurial intention, are more motivated, attach more importance to values and have a more favorable to entrepreneurship than young Spaniards. However, these differences are not very significant. Additionally, although the items related to the intention have obtained a high score, they are the variables that have been least valued by the young people of both countries. This may be due to the combined effect of several factors: Young people are still immersed in their educational process; the sample included students of the first courses who generally have a less entrepreneurial intention; and the sample included a representative percentage of women who display relatively less entrepreneurial intention too.

Following authors earlier research [181], and the suggestions of other authors, which have been included in the theoretical framework of this study, a new explanatory causal model has been generated of the entrepreneurial intention of the young people that are complete in relation to the number of variables that it incorporates. The proposed model complements previous reference models and includes other variables and different relationships, such as beliefs or motivation. By including the beliefs in the model, as a variable that initiates the chain of effects that culminate in the entrepreneurial intention, responds to the predominant thinking in this field. This current demands inclusion in the models of certain previous sociocultural precursors [111,112,165].

On the other hand, the presented model demonstrates the existence of a series of subjective variables (beliefs, social norms, values) that are found at the beginning of the model and influence other variables that are more related to the action and behavior of undertaking (motivation, self-efficacy, intention). It is noteworthy that not all variables are in the same plane of consciousness by the subject or are equally manageable by agents and institutions. Subjective variables, such as beliefs, values or the social norm, are formed to a large extent by processes associated with conditioning and modeling, and the other variables depend on them. These results lead to the question of the extent to which entrepreneurship is truly voluntary, intentional and conscious.

In relation to the hypotheses of the proposed model, it should first be noted that the confirmed influence of beliefs on the social norm (H1) gathered in previous studies [165] has been confirmed in this study for the case of Poland, but not in the case of Spain. Therefore, in the case of Spain, the subject's beliefs about the role of education in entrepreneurship have little influence on the expectations and preferences perceived by his relatives about his role as an entrepreneur. This unequal result may be related, in the case of the segment studied and particularly in Spain, with a lower perceived connection on the part of the subject and/or his close associates between the university academic world and entrepreneurship.

Secondly, the influence of the social norm on the values associated with entrepreneurship (H2) has also been confirmed, both in the case of Spain and in Poland, as suggested by other authors in this and other fields [118,120]. However, this influence is not very high, and is somewhat higher in the case of Poland. Consequently, the empirically verified compliance principle, by which people tend to adjust to what others expect of them, is somewhat greater in Poland [127]. The weight of this relationship suggests that, in addition to the social norm, there are other factors that influence the values [69].

Third, according to the results of this study, the values about entrepreneurship explain to a large extent the attitudes of young people towards the process of creating new companies (H3) [99,100], to a greater extent in the case of Spain. This result confirms the proposals and findings of other authors in other fields in which the positions of people in favor of an object or behavior are closely related to the assessment made of them [128,129]. On the other hand, once motivation has been included as an intermediate variable between attitude and entrepreneurial intention, as some authors have

suggested [101,116], the influence of attitude on motivation is confirmed (H4) [131], particularly in the case of Spain. It can be affirmed, therefore, that the favorable attitude toward entrepreneurship exerts a motivational effect in the case of young people [133,134]. This fact is particularly relevant given the high influence that motivation exerts on entrepreneurship [30,131]. Additionally, the results show that attitude is a variable that serves as a link between the values, which depend on the social norm and other subjective variables, and certain variables related to the action, such as motivation and intention. [126].

Additionally, the results also show a high causal influence between motivation and self-efficacy to undertake in the case of young people (H5), as has been observed in the literature [46,141]. This influence is also greater in the case of Spain. Therefore, it can be affirmed that the motivated young person feels self-sufficient to undertake; that is, he feels more confident and perceives that he will succeed in the creation of the company [141]. This, in turn, increases their alertness to new opportunities, activates their creative problem solving, improves their cognitive flexibility and favors the realization of the effort involved in entrepreneurship [130,131].

The high influence of self-efficacy on the entrepreneurial intention (H6) in the case of young people has been confirmed in this work, also somewhat more in the case of Spain than in Poland [61]. This difference may suggest the greater relative weight of other variables not included in the model on the entrepreneurial intention of the young Poles. However, this result must be contrasted with the data of the GEM, according to which the entrepreneurial intention declared by the Poles is greater than that of the Spanish. The causal relationship between self-efficacy and the entrepreneurial intention is very important if one takes into account that the intention is the variable that best predicts the entrepreneurial behavior and influences the establishment of goals and the effort to be made to create the company by of entrepreneur [143,144].

Finally, the results of the discriminant analysis and the multigroup analysis indicate that the differences in the responses to the items and in the causal relationships of the Polish and Spanish models are not very significant. This may be due to the homogenizing weight inherent in a generational approach according to which young people of Generation Y share global similar perceptions, attitudes and values [30,147]. This is important because there is a certain divergence in the literature on the question of the full homogeneity of Generation Y in all contexts and with respect to all variables [88,89].

7. Conclusions, Implications and Limitations

This study has sought to respond to the concerns and suggestions found in the literature regarding the need to carry out studies in greater depth and in a comparative generational and regional context of factors that influence the entrepreneurial intention of young people. This has sought to enrich theoretical and practical knowledge in this field, particularly in the case of the Generation Y of Spain and Poland.

Taking into account that the young people of Spain and Poland value very positively all the observed variables presented, given the high scores of the items, it is concluded that this segment of the population has a favorable predisposition to entrepreneurship in both countries. This predisposition favors action in the educational context and through other institutions to promote entrepreneurship, and thus, contribute to the sustainable development of regions [182–185]. As such, policymakers can use the findings of this research to establish policies to improve the conditions in the ecosystems for sustainable entrepreneurship in their regions. Findings can help them achieve their goal of transitioning to a more sustainable local economy. Specifically, the responses show that there is a potential for action in this field to improve the influence on the entrepreneurial intention in the teaching and learning process [186,187].

A new, significant and complete causal model of intention formation has been proposed that is valid for Spain and Poland, and that has taken as reference the previously existing models, including other variables and relationships proposed by other authors. The model includes exclusively personal variables, given the relevance of said variables in the enterprise. The variables of the model can be

divided into two groups, subjective variables (e.g., beliefs, social norm) and personal action variables (e.g., motivation, self-efficacy). In the model, the chain of direct and indirect effects that culminates with the entrepreneurial intention begins with the subjective variables which influence action variables.

The importance of the subjective variables, which derives from the scores obtained by the items and by initiating the chain of relationships in the proposed model, suggests that the promotion of entrepreneurship must address social and cultural aspects, in which education plays an important role (in addition to other agents and institutions). On the other hand, the role of subjective variables allows us to conclude that entrepreneurship is a less voluntary process and hints at what could be assumed at first. That is, there is an unconscious and socially determined content in the process of creating a company. Therefore, a challenge is to bring to light the aspects that empower and stop the venture, to manage them.

Despite the relevance of subjective variables, it is a practical and useful model to predict the entrepreneurial intention and influence the entrepreneurship carried out by young people. Therefore, the proposed model, through the variables and the relationships it includes, suggests the aspects on which to influence, taking into account that subjective variables are more difficult to manage. Attitude is a key variable in the model that serves as a link between the subjective variables and the variables related to the action.

The high similarity of the descriptive and causal results allows us to conclude that young people from Spain and Poland share, to a large extent, perceptions about entrepreneurship, from which behaviors will be derived. This indicates the high homogenizing weight of a generational approach, which may lead to the possibility of carrying out homogeneous measures to promote entrepreneurship for the entire segment in an educational context and in different regions. Even so, there are also some differences between both countries that could lead to different measures for both segments.

One of the limitations of this study refers to the selection of the variables under study. There are so many personal factors on which entrepreneurship depends, in addition to contextual factors, that it is very difficult to select with certainty the variables to be included in the model. However, this limitation has been addressed through the inclusion in the proposed model of the personal variables considered most important in the literature, in addition to incorporating others that have been proposed as a novel by various authors. The human capital approach predominates in the literature, according to which the personal variables, which are the object of study, directly influence the intention to undertake, while the contextual variables influence indirectly through personal variables. Subsequent studies could analyze the direct effect of contextual variables on personal variables and the indirect effect on the intention in the youth segment. A second limitation is related to the population to be studied and the selection of the samples, taking into account that a comparison has been carried out at a regional level and that differences may exist within each country. This limitation has been addressed, taking into account the homogenizing effect of generations and the representativeness in this field of university students. However, students may not turn this intention into actual behavior. Students that have shown high intention to adopt an entrepreneurial career path may choose to go in another direction. A further study could be carried out on these students to see if they have turned these intentions into behavior after graduation.

Another limitation of the research may be insufficient signalization of the relationship between entrepreneurial intentions and sustainable development. Literature has just begun researching sustainable entrepreneurship and the complicated interaction between sustainable development and innovative entrepreneurial activity [188]. To understand sustainable entrepreneurship, researchers must explore the pursuit of sustainable development opportunities embedded in ecosystems of entrepreneurship, its interaction with various entities, and its manifestations at the micro, macro and geographical levels [189–196]. New avenues of scientific reflection on sustainable entrepreneurship are revealed with the emergence of concepts, such as sustainable innovation [197] or responsible innovation [198].

The mentioned limitations and the results of the study can give an idea of what could be some of the future lines of investigation. Among them, we can highlight the incorporation of other variables and relationships in the models, including the contextual variables, as well as the realization of longitudinal studies, the analysis of other population segments, the intergenerational comparison and the study in other geographical contexts. It could also be interesting to analyze the less conscious nature of the enterprise and the ways of managing it.

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Article

College Students' Entrepreneurial Mindset: Educational Experiences Override Gender and Major

Eunju Jung ^{1,*} and Yongjin Lee ^{2,*}

¹ Graduate School of Education, Sejong University, Seoul 05006, Korea

² Department of Liberal Arts, Hansei University, Gunpo, Gyeonggi-do 15852, Korea

* Correspondence: doduli@sejong.ac.kr (E.J.); eduist@hansei.ac.kr (Y.L.)

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Abstract: Entrepreneurship education has been popularly adopted in higher education contexts. Although evidence-based implementations of such education are widely acknowledged as beneficial, valid assessments of it are sparse. One possible outcome of entrepreneurship education is a change in students' entrepreneurial mindset, which can be measured by the recently validated College Students' Entrepreneurial Mindset Scale (CS-EMS). However, this scale awaits evidence regarding measurement invariance. This study aims to (1) examine measurement invariance of the CS-EMS; (2) compare the latent and observed means across groups based on gender, major, and educational experiences; and (3) investigate the conditional effects of the three grouping variables. Using data from 317 Korean college students' survey responses, we conducted sequential tests of factorial invariance and latent mean comparisons using multiple-group confirmatory factor analysis. Additionally, the conditional effects of the gender, major, and educational experiences were tested by structural equation modeling. The results indicate that strict invariance held for the groups compared by either gender or educational experiences, while scalar invariance held between the engineering and non-engineering groups. While the male, engineering, and educational experience groups generally scored higher on both the latent and observed sub-scales, the results of the conditional effects of grouping variables indicated that educational experiences mattered most. One practical implication for the educators is that the CS-EMS is a promising assessment tool for addressing the effectiveness of entrepreneurship education, especially when the targeted educational goals are any of its sub-constructs.

Keywords: entrepreneurial mindset; college students; gender; engineering; educational experience; measurement invariance; latent mean comparisons

1. Introduction

Since the Harvard Business School's pioneering entrepreneurship class was offered in 1947, entrepreneurial education has been expanded to diverse disciplines in higher education [1–4]. In addition, entrepreneurship education has gained global popularity among both undergraduate and graduate students [1,5]. It is also highly valued in Korea, and such courses are not uncommon in higher education curricula in diverse disciplines [6–9]. The wide dissemination of entrepreneurship education can be attributed to its expected beneficial outcomes, such as improved skills, knowledge, and attitudes related to venture creation [10], increased self-employment and ability to launch start-ups [10,11], and eventually economic growth [12]. Yet, the expected benefits are not limited to the realm of business, management, and the economy, especially in the context of higher education. The scope of entrepreneurship education has been extended to embrace broader educational goals for college students, such as improved career self-efficacy, career adaptability, project-management skills, self-regulation, and intrapreneurship in certain professional fields after graduation [13]. Due to the increasing volatility and uncertainty in job market and various career fields, college students today face

more challenges than their counterparts in the past [14]. They are more likely to encounter a shortage of stable life-long careers, more project-based short-term jobs, and jobs replaced by artificial intelligence (AI). As a result, they might need more career adaptability to allow them to pursue multiple different career paths. For them, an entrepreneurial mindset, which might enhance their career adaptability, would be a valuable asset in today's era of uncertainty and fluctuation in the workplace [14].

Participating in the broadening of entrepreneurship education, Korean universities have provided diverse educational programs ranging from short-term, intensive, experiential, and extracurricular programs [13], to formal classes lasting one semester [15]. The educational goals range from the promotion of creativity to teamwork, communication skills, product development, and opportunity identification [13]. In addition, an enhanced entrepreneurial mindset was expected in most of the programs. However, the effectiveness of entrepreneurship education has not been thoroughly studied; to date, educational effectiveness has been measured by only one or a couple of entrepreneurial intention questions in many studies (e.g., [16–19]).

This can be mainly attributed to the lack of quality-assured assessment tools to measure various aspects of educational outcomes in higher education settings. Among the available measurement instruments, the Builder Profile [20] and the Global University Entrepreneurial Spirit Students' Survey (GUESSS [21]) had little evidence of reliability and validity. Although the Individual Entrepreneurial Orientation (IEO) [22,23] and the Entrepreneurial Mindset Profile (EMP) [24] thoroughly examined reliability of and evidence for multiple validity issues (e.g., construct validity, criterion-related validity, predictive validity, etc.), their measurement invariance has never been investigated.

The College Students' Entrepreneurial Mindset Scale (CS-EMS) [25], a recently developed and validated assessment, is promising for systematic measurement of the sub-constructs of *innovativeness*, *need for achievement*, *risk-taking*, *autonomy*, and *proactiveness*, which are the mindsets that are targeted for improvement across a wide spectrum of entrepreneurship classes. Yet, the measurement invariance of the CS-EMS across gender, major, and educational experiences has never been examined, and it is unknown which grouping variable has the most influence on the sub-scales of the CS-EMS.

To fill the void in the literature on entrepreneurship in higher education, this study was designed to pursue the following three goals. First, we tested four increasingly stringent measurement invariance models (i.e., configural, metric, scalar, and strict invariance models) of the CS-EMS across gender, major, and experience groups using the multi-group confirmatory factor analysis (MG-CFA) framework. Second, we examined the latent and observed mean differences in the sub-scales of the CS-EMS across the studied groups only if scalar invariance had been established. Third, we investigated the conditional effects of the three grouping variables (i.e., *gender*, *major*, and *experience*) using the structural equation modeling framework.

We expect that the findings of the current study will be able to guide educators when they use assessment tools to compare groups. Specifically, entrepreneurship educators will learn that cross-group comparisons based on observed or latent means should be preceded by a measurement invariance test [26–29]. In addition, the findings from the cross-group mean comparisons reveal the compared groups' current status regarding the entrepreneurial mindset, and educators might be able to design their entrepreneurship education programs with more emphasis on the areas that need improvement in particular gender [30–32], major [30,31], or experience groups [33,34]. Moreover, the findings based on the conditional effects of the grouping variables imply the necessity of entrepreneurship education for college students if educational experiences with entrepreneurship are found to be the factor with the most influence on the CS-EMS sub-scales. Last, but not least, we expect that the CS-EMS will serve as an important assessment tool for reliably and validly measuring the effects of entrepreneurship education in cases where the targeted educational objectives are related to any of the sub-constructs of the CS-EMS [35,36].

In the remainder of this manuscript, we first review the previous studies that are most relevant to the current study in terms of four themes: concepts of entrepreneurship and entrepreneurial mindset, currently available assessment tools and their limitations, measurement invariance, entrepreneurship

education for college students, and issues related to gender or major differences. Next, we describe the characteristics of the participants, the CS-EMS instrument, and the analytic procedure, providing information on the materials and methods. Then, we illustrate the results of the current study for the measurement invariance test, cross-group mean comparisons, and conditional effects of the gender, major, and experience variables. Subsequently, we discuss the findings, implications, limitations, and suggestions for future studies, followed by the conclusions of the study.

2. Literature Review

2.1. Concepts of Entrepreneurship and Entrepreneurial Mindset

Researchers have defined entrepreneurship as a compound construct with various assets. Venkataraman [37,38] asserted that entrepreneurship refers to an activity that involves the discovery, evaluation, and exploitation of opportunities to introduce new goods and services, ways of organizing, processes, and raw materials [38]. Based on Miller and Friesen's work [39], the concepts of innovativeness, risk-taking, and proactiveness are commonly used to characterize and test entrepreneurship [40,41]. In addition to those three elements, Lumpkin and Dess [42] identified two more dimensions, autonomy and competitive aggressiveness, that are used to conceptualize entrepreneurial orientation. Entrepreneurial orientation has emerged as a key construct in the entrepreneurship literature. It has been viewed as a characteristic of organizations that can be measured by looking at the top management's entrepreneurial style, as evidenced by the firms' strategic decisions and operating management philosophy [43]. This concept of entrepreneurship focuses more on entrepreneurial behaviors, including seeking, identifying, grasping or creating opportunities, taking the initiative, solving problems, organizing and coordinating resources, networking effectively, combining things innovatively, taking calculated risks, and acting proactively in complex situations [44–46].

Entrepreneurship has been also defined as a mental attitude deeper than an intent to merely create a business. It requires application of energy and passion to create and implement new ideas and creative solutions [5]. Bosman and Fernhaber [47] describe the entrepreneurial mindset as an inclination toward entrepreneurial activities. A mindset is an individual's mental attitude or state that predetermines one's responses to and interpretations of a given situation [31]. An entrepreneurial mindset includes an individual's willingness to blend risk-taking, creativity, and innovation with the intention of creating value as well as an individual's ability to plan and manage projects in order to achieve objectives [47–49]. It relates to being dynamic, flexible, and self-regulating in an uncertain environment [44,45]. The entrepreneurial mindset develops over time and requires practice [47]. This supports individuals during daily life and makes employees more aware of the context of their work and better able to seize opportunities [47]. Thus, entrepreneurial-minded learning has received increased interest as a pedagogical approach within the higher education field [30,31].

When discussing entrepreneurship, the literature separates entrepreneurial mindsets from entrepreneurial behaviors [50]. Entrepreneurial mindsets refer to the abilities and general attitude of an individual, while entrepreneurial behaviors are made evident through the individual's actions. Both entrepreneurial mindsets and behaviors are valid concepts not only when dealing with business but also in all human activities [50]. Because entrepreneurship is not only about knowing facts but also a way of thinking and acting [46], recently, higher education programs have defined entrepreneurship broadly and included enterprising behaviors outside the business context [46,51–53].

2.2. Assessments for Entrepreneurial Mindsets

The literature has described several assessment instruments that are designed to measure an individual's entrepreneurial orientation and mindset. However, previous measures for entrepreneurial characteristics lack quality evidence, justifying the need for a validated measure of the entrepreneurial mindset. Some instances of instruments are reviewed as follows.

First, Badal and Struer [20] developed Builder Profile 10 to identify individual characteristics that are associated with building a successful business. The instruments include 30 items representing ten characteristics (determination, independence, confidence, delegator, risk, profitability, relationship, disruptor, knowledge, and selling). Evidence regarding its construct validity has never been examined, although its validity has been extensively investigated in relation to other variables. In addition, to our knowledge, it has never been validated for college students and has only been validated with high school and entrepreneur samples in the US.

Second, the Global University Entrepreneurial Spirit Students' Survey was developed in 2006 and designed to measure university students' perceptions of entrepreneurs (11 items) and their entrepreneurial competencies (seven items) in addition to entrepreneurial intentions. Although it has been widely used internationally until recently [21,54], its reliability and validity have never been tested.

Third, the Individual Entrepreneurial Orientation (IEO) scale, which has ten items, was developed by Bolton and his colleagues [22], and they found that the three correlated-factor structure was tenable based on validation with 1,100 university students. The three sub-factors were innovativeness, risk-taking, and proactiveness. Popov and colleagues [23] recently examined the construct validity of the IEO scale with Serbian college students and adults, and their results also supported the three correlated-factor structure of the ten items. However, neither study considered the measurement invariance of the IEO.

Fourth, the Entrepreneurial Mindset Profile (EMP) [24] was developed in 2015, and it was constituted of 14 dimensions with 72 items. Among the 14 dimensions, seven dimensions (i.e., independence, limited structure, non-conformity, risk acceptance, action orientation, passion, and need to achieve) represented traits of entrepreneurs, while the remaining seven dimensions (i.e., future focus, idea generation, execution, self-confidence, optimism, persistence, and interpersonal sensitivity) represented skills for entrepreneurs. They provided validity evidence based on the internal structure of the items and their relations to other variables. Although they compared the sub-scale scores of the EMP across gender, they did not consider measurement invariance before making a cross-group mean comparison.

2.3. Measurement Invariance

Measure invariance is an important issue, especially when a researcher wants to make cross-group comparisons using a measurement instrument consisting of multiple items that are assumed to have a smaller number of factors underlying them [27,28,55,56]. The core question in measurement invariance is whether the assessment or measurement in use operates in the same way across different groups based on either demographic characteristics (e.g., gender [57,58], nationality [57,59], language in use [55], etc.) or certain artifactual categorizations (e.g. experimental vs. treatment group [60,61]; pre- vs. post-measurement [62,63]; internet-based test vs. paper-and-pencil test [64]).

One of the most widely used methods to test measurement invariance is a multiple-group confirmatory factor analysis (MG-CFA) model which is a multi-group extension of a confirmatory factor analysis model [26–29,56,65]. Measurement invariance tested under the MG-CFA framework is also called factorial invariance, and it is well-known for its flexibility in examining every measurement parameter: factor loading (λ), intercept (τ), and unique variance (θ) [26,29,56]. The conventional way to test measurement invariance involves four sequential steps to evaluate increasingly constrained models – from configural invariance to strict invariance – across the studied groups [26–29]. Configural invariance indicates that the same factor structure holds between the groups while all measurement parameters are freely estimated for each group, which implies that the groups interpret a given set of items using equal conceptual grounding [37,55,66]. Once configural invariance is established, metric invariance is tested by imposing equality constraints on all factor loadings between the groups. Under the condition of metric invariance, the strength of the relationship between a factor and items belonging to the factor is equivalent across the groups [28,55,66]. Upon the established metric

invariance, strict invariance is tested by equally constraining all sets of intercepts between groups. Scalar invariance can be interpreted as indicating that the origin of the item score is the same across the groups [27,28,55,67]. Finally, strict invariance is tested by adding equality constraints on the pair of unique variances between the groups upon the established scalar invariance model [68]. The status of strict invariance can be interpreted as indicating that the degree of errors is equivalent across groups [29]. Among the four measurement invariance conditions, the scalar invariance condition is necessary to compare the latent and observed means across groups [26,27,29], and thus, we drew the following hypotheses:

Hypothesis 1 (H1). *The CS-EMS presents at least scalar invariance across gender, major, and experience groups.*

Hypothesis 1a (H1a). *The CS-EMS presents at least scalar invariance between the male and female groups.*

Hypothesis 1b (H1b). *The CS-EMS presents at least scalar invariance between the engineering and non-engineering groups.*

Hypothesis 1c (H1c). *The CS-EMS presents at least scalar invariance between the experience and no-experience groups.*

2.4. Entrepreneurship Education for College Students

Entrepreneurship education mainly focuses on the development of certain beliefs, values, and attitudes, with the aim of causing individuals to consider entrepreneurship as an attractive and valid alternative to paid employment or unemployment [34,69]. Since the early 2000s, entrepreneurship education programs in higher education have grown rapidly and globally [1,2,5,70] in an effort to promote entrepreneurial outcomes [36]. The global interest in entrepreneurship education is a result of the association between entrepreneurship and economic growth, which has motivated policymakers to focus on cultivating and sustaining entrepreneurship [71]. Entrepreneurship education is a major approach to developing entrepreneurial intentions, mindsets, and behaviors [72]. However, the research on the impact of entrepreneurship education on entrepreneurial mindsets or intentions has yielded mixed results [1,35]. The literature has suggested that it is important to analyze the impact of entrepreneurship in gender-specific and pedagogy-specific manners [1]. In the following subsection, the studies on gender differences, major differences, and differences based on educational experiences in entrepreneurship are introduced.

2.4.1. Comparisons Based on Gender

Past research on gender differences in entrepreneurship has typically found that females are more conservative in entrepreneurial activities than males [73,74]. The image of the entrepreneur has traditionally been masculinized and rooted in masculine discourse [75]. Moreover, research has found that for women who work in gender incongruent occupations dominated by men, the experience of discrimination has a negative association with their well-being [76].

Research on the impact of entrepreneurship education on students' intention and mindset has reported gender-specific differences [77]. With students who have less exposure to entrepreneurship, the general effect of entrepreneurship education tends to be positive because participation in the programs usually increases their entrepreneurial intentions, attitudes, and self-efficacy [78]. Nowiński et al. [79] investigated whether entrepreneurial education contributes to the entrepreneurial intentions of university students in the Czech Republic, Hungary, Poland, and Slovakia. They indicated that although women generally have lower entrepreneurial intentions and display lower levels of entrepreneurial self-efficacy, they benefit from entrepreneurship education more than men do [79]. However, emerging literature shows that the relations between gender and the entrepreneurial mindset are more complex and multi-faceted. For example, Majumdar and Varadarajan [80] investigated the

entrepreneurial mindset of women in the Arab world and suggested that the propensity for future entrepreneurship does not depend on gender; rather, it depends on factors like creativity, motivation, and awareness. An educational system that lacks a supportive environment and concrete initiatives can deeply affect female students, causing them to fear engaging in entrepreneurship [81]. Although efforts to promote an entrepreneurial mindset within society have increased, there has still been little attention on assessment and analysis of the entrepreneurial mindset amongst female students in the context of higher education. In addition, the results from the previous studies generally indicate that the females showed a lower level of entrepreneurial attitudes, intentions, and behaviors, thus we suggest the following hypotheses:

Hypothesis 2 (H2). *The male group scores higher on each of the five sub-constructs of the CS-EMS than the female group.*

Hypothesis 2a (H2a). *The male group scores higher on innovativeness than the female group.*

Hypothesis 2b (H2b). *The male group scores higher on need for achievement than the female group.*

Hypothesis 2c (H2c). *The male group scores higher on risk-taking than the female group.*

Hypothesis 2d (H2d). *The male group scores higher on autonomy than the female group.*

Hypothesis 2e (H2e). *The male group scores higher on proactiveness than the female group.*

2.4.2. Comparison Based on Major: Engineering vs. Non-Engineering

Specifically, engineering education institutes play an important role in entrepreneurial development [14]. Engineers often take positions in which entrepreneurship is highly valued because they work in areas in which technological development is moving very quickly. As entrepreneurship serves as an integral part of the economy, engineers need to develop an entrepreneurial mindset through authentic educational experiences [82]. Thus, engineering education institutes have been interested in developing an academic entrepreneurship education community through the development of engineering-specific entrepreneurship centers and programs [83].

In South Korea, there is strong pressure to develop entrepreneurship and innovation competencies in engineering education [14]. The industry has influenced the process to improve this part of engineering education, which in turn has prompted the government to consider entrepreneurship education to be crucial [14]. In the accreditation process for engineering education, universities should prove that their curricula, including capstone design courses, promote students' entrepreneurial mindset, and skills. Capstone design courses often guide students from the problem identification stage through prototyping, with a heavy focus on technological feasibility and an entrepreneurial mind. While the creation of engineering entrepreneurship programs seems to address the need for reforms in undergraduate engineering programs, such programs usually measure output metrics, such as enrollment and degrees, as opposed to evidence of the program's impact on each individual student's mindset [83]. To our knowledge, no study has directly compared the difference in entrepreneurial mindset among different majors. However, considering the efforts to promote students' entrepreneurial attitudes, intentions, and behaviors made by engineering disciplines we suggest the following hypotheses regarding major difference:

Hypothesis 3 (H3). *The engineering group scores higher on each of the five sub-constructs of the CS-EMS than the non-engineering group.*

Hypothesis 3a (H3a). *The engineering group scores higher on innovativeness than the non-engineering group.*

Hypothesis 3b (H3b). *The engineering group scores higher on need for achievement than the non-engineering group.*

Hypothesis 3c (H3c). *The engineering group scores higher on risk-taking than the non-engineering group.*

Hypothesis 3d (H3d). *The engineering group scores higher on autonomy than the non-engineering group.*

Hypothesis 3e (H3e). *The engineering group scores higher on proactiveness than the non-engineering group.*

2.4.3. Comparison Based on Educational Experiences in Entrepreneurship

Regarding the impact of entrepreneurship education, Bae and colleagues' meta-analytic review [36] found a significant correlation between entrepreneurship education and entrepreneurial intentions. They emphasized that it is important to consider the significant impact of moderators, such as the attributes of entrepreneurship education, differences between students, and cultural values, on entrepreneurial intentions. Most studies suggest a positive link between the educational program and students' entrepreneurial intentions, attitude, knowledge, and skills [84–87], but some articles report results that are not significant or negative. For example, Lanero, et al. [88] reported that there is no significant link between entrepreneurship education and entrepreneurial attitudes among Spanish students. Also, Mentoor and Friedrich [89] found a negative link between educational experiences and attitudes toward entrepreneurship among South African students. Indeed, there is still limited attention given to the impact of entrepreneurship education and the quality-assured assessment tools to measure various aspects of educational outcomes within the context of cross-cultural and academic majors [2]. Therefore, we aim to confirm the influence of educational experience in entrepreneurship with the validated assessment tool, and suggest the following hypotheses:

Hypothesis 4 (H4). *The group with educational experiences in entrepreneurship scores higher on each of the five sub-constructs of the CS-EMS than the group without such experiences.*

Hypothesis 4a (H4a). *The group with educational experiences in entrepreneurship scores higher on innovativeness than the group without such experiences.*

Hypothesis 4b (H4b). *The group with educational experiences in entrepreneurship scores higher on need for achievement than the group without such experiences.*

Hypothesis 4c (H4c). *The group with educational experiences in entrepreneurship scores higher on risk-taking than the group without such experiences.*

Hypothesis 4d (H4d). *The group with educational experiences in entrepreneurship scores higher on autonomy than the group without such experiences.*

Hypothesis 4e (H4e). *The group with educational experiences in entrepreneurship scores higher on proactiveness than the group without such experiences.*

The Hypotheses 2 through 4 deal with only marginal effects of gender, major, and educational experiences on entrepreneurship mindsets, and thus the actual effects of the variables might be confounded [90,91]. Therefore, it is imperative to investigate the conditional effects of gender, major, and educational experiences to separate out the unique contribution of each variable [90,91] on the entrepreneurship mindsets. Based on a great deal of evidences for the effect of entrepreneurship education on entrepreneurial attitude [78,92–94], intention [36,78,95–97], and behavior [98–101], we believe that the educational experiences in entrepreneurship would play the most crucial role in the college students' entrepreneurial mindset even after controlling for the effects of gender and major.

Hence, we also suggest the following hypotheses regarding the conditional effect of gender, major, and educational experiences:

Hypothesis 5 (H5). *Educational experience is the most influencing factor for the scores of the CS-EMS sub-constructs after controlling for gender and major.*

Hypothesis 5a (H5a). *Educational experience is the most influencing factor for innovativeness after controlling for gender and major.*

Hypothesis 5b (H5b). *Educational experience is the most influencing factor for need for achievement after controlling for gender and major.*

Hypothesis 5c (H5c). *Educational experience is the most influencing factor for risk-taking after controlling for gender and major.*

Hypothesis 5d (H5d). *Educational experience is the most influencing factor for autonomy after controlling for gender and major.*

Hypothesis 5e (H5e). *Educational experience is the most influencing factor for proactiveness after controlling for gender and major.*

3. Materials and Methods

3.1. Participants

We used the dataset that was collected for the initial validation of the CS-EMS [25]. At a large private university in Korea, they collected data via emails with an online survey link. A total of 317 students provided completed and valid responses. At the beginning of the online survey, the purpose of the study and the possible use of the data were presented. Only the data from participants who provided consent were analyzed in the current study. Table 1 shows the distribution of the participants' major, grade, and educational experience by gender. Of the 317 participants, 68.5% were males and 31.5% were females. The participants' majors included engineering (47.3%), economics (17.4%), liberal arts (13.9%), social sciences (13.2%), and sciences (8.2%). The majority of the participants was either juniors (28.7%) or seniors (35.7%), while 19.1% were freshmen and 16.6% were sophomores. Among the participants, 52.7% had at least one educational experience with entrepreneurship (e.g., formal classes, extracurricular activities at university, competitions out of university). It is important to be aware that the imbalanced gender representation was largely due to the large number of students from engineering majors (N = 150; 47.3%). Male students majoring in engineering (N = 123) represented 68.5% of the total number of male participants. In addition, 70 male participants majoring in engineering represented 57.4% of the male participants who had some educational experience in entrepreneurship.

3.2. Instrument

Jung and Lee [25] developed the CS-EMS with 19 items, and they investigated the evidence related to construct validity and predictive validity with regard to entrepreneurial intentions. Based on their results, the CS-EMS stipulated five sub-factors: *innovativeness*, *need for achievement*, *risk-taking*, *autonomy*, and *proactiveness*. In their study, each sub-factor was operationally defined as follows: (1) *innovativeness*: propensity to seek new opportunities and solutions; (2) *need for achievement*: propensity to achieve something quickly and well; (3) *risk-taking*: propensity to try something with either unclear expectations or the possibility of failure; (4) *autonomy*: propensity to act independently while being reluctant to rely on others; and (5) *proactiveness*: propensity to plan and act in advance. Table 2 presents the English-translated items of the Entrepreneurial Mindset Scale by sub-factor. Each of the items

was measured with a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Sub-scale scores represent the average of the items under a sub-factor. Higher scores indicate a higher level of the entrepreneurial mindset sub-factor. Table 2 presents the mean, standard deviation, skewness, and kurtosis of each item. The range of item means was 2.85 (SD = 1.13; Item 14) to 4.12 (SD = 0.85; item 4), while the skewness and kurtosis values ranged from -0.85 to 0.28 and from -0.86 to 0.97 , respectively.

Table 1. Participants' Characteristics.

Category	Male		Female		Total	
	N	%	N	%	N	%
<i>Major</i>						
Engineering	123	82.0	27	18.0	150	47.3
Science	18	69.2	8	30.8	26	8.2
Economics	32	58.2	23	41.8	55	17.4
Liberal Arts	29	51.8	27	48.2	44	13.9
Social Science	15	50.0	15	50.0	42	13.2
<i>Grade^a</i>						
Freshman	36	60.0	24	40.0	60	19.1
Sophomore	25	48.1	27	51.9	52	16.6
Junior	66	73.3	24	26.7	90	28.7
Senior	87	77.7	25	22.3	112	35.7
<i>Educational Experience in Entrepreneurship</i>						
Yes	122	73.1	55	26.9	167	52.7
No	95	63.3	44	36.7	150	47.3
Total	217	68.5	100	3.2	317	100.0

Note. ^a Three of the respondents did not provided their grade.

Table 2. English-translated College Students' Entrepreneurial Mindset Scale.

#	Item	M ^a	SD ^b	Skew. ^c	Kurt. ^d
<i>Innovativeness</i>					
Item 1	I like to take on a new challenge.	3.65	0.91	-0.42	-0.36
Item 2	I try to work in a novel way.	3.47	0.98	-0.23	-0.59
Item 3	I am likely to accept new ideas.	3.99	0.81	-0.75	0.79
Item 4	I like imaginative ideas.	4.12	0.85	-0.85	0.52
Item 5	I try to look for new opportunities earlier than others.	3.74	0.90	-0.32	-0.39
Item 6	I persistently try to come up with outstanding ideas.	3.50	0.91	0.00	-0.56
<i>Need for Achievement</i>					
Item 7	I act aggressively to achieve a goal.	4.08	0.78	-0.78	0.97
Item 8	I am more passionate than others.	3.82	0.84	-0.33	-0.29
Item 9	I have a strong will to achieve something.	4.02	0.79	-0.61	0.32
Item 10	I persist in pushing forward necessary things against all odds.	4.09	0.76	-0.63	0.50
<i>Risk-taking</i>					
Item 11	I tend to push forward something with high expected value even with high risk.	3.57	1.00	-0.28	-0.66
Item 12	I tend to take risks for new opportunities.	3.43	1.00	-0.15	-0.65
Item 13	I tend to take challenges even when there is a risk of failure.	3.47	0.99	-0.26	-0.67
<i>Autonomy</i>					
Item 14	I am reluctant to receive outside aid.	2.85	1.13	0.28	-0.86
Item 15	I prefer solving problems independently.	3.42	1.04	-0.35	-0.52
Item 16	I prefer acting based on my own decision.	3.86	0.85	-0.73	0.58
<i>Proactiveness</i>					
Item 17	I proactively plan new things.	3.83	0.76	-0.43	0.05
Item 18	I plan and act in advance rather than waiting for something to be given.	3.72	0.88	-0.42	-0.18
Item 19	I tend to actively overcome hardships rather than attributing to the environment.	3.79	0.82	-0.42	-0.03

Note. ^a Mean; ^b standard deviation; ^c skewness; and ^d kurtosis.

Jung and Lee [25] found that the Cronbach's α of the whole scale was 0.94, while the Cronbach's α s for the *innovativeness*, *need for achievement*, *risk-taking*, *autonomy*, and *proactiveness* sub-scales were 0.88, 0.83, 0.88, 0.77, and 0.80, respectively. In their study, the correlated five-factor model was confirmed based on the results from both exploratory and confirmatory factor analyses. Predictive validity was evidenced by the significant correlations (range: 0.22–0.54) between each of the three start-up intention variables (weak and vague intention, moderate intention, and strong and firm intention) and four sub-factors (*innovativeness*, *need for achievement*, *risk-taking*, and *proactiveness*), except for autonomy. The autonomy sub-scale score had a statistically significant correlation (.11) only with strong and firm intention.

3.3. Analytic Procedure

Data analyses were conducted in four phases to fulfill the purposes of the study. In the first phase, we examined the factor structure of the CS-EMS with six groups of interest (i.e., male, female, engineering, non-engineering, educational experiences, no educational experiences) separately using confirmatory factor analysis (CFA). The major reason we selected CFA is that this method is built on theories rather than guided by data [102,103]. Since a correlated five-factor model had already been established by Jung and Lee [25], CFA was considered a more appropriate starting point than exploratory factor analysis (EFA). In addition, CFA is known for providing a more trustworthy solution than EFA for models with multiple factors [102], such as the one used in our study. Most importantly, CFA is a more powerful method to test every element of factorial invariance [28], whereas EFA is capable of testing only factor loading invariance [26].

As shown in Table 2 in the previous section, neither the skewness (range: -0.85 – 0.28) nor kurtosis (range: -0.86 – 0.97) of any item appeared to seriously violate the normality assumption of the CFA based on the criteria (skewness $\leq \pm 2$; kurtosis $\leq \pm 7$) suggested by Hair et al. [104] and Byrne [105]. Therefore, we used the maximum likelihood estimation method to evaluate the model [102]. The adequacy of the tested CFA models was evaluated using conventionally reported fit indices, such as the chi-square (χ^2) fit statistic at a 0.05 significance level, the root mean square of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean squared residual (SRMR). In some conditions with large samples and/or a complex model, χ^2 is too sensitive to retain an acceptable model [102]. Thus, we carefully examined model adequacy, referring to the other fit indices while considering the models acceptable with $RMSEA \leq 0.08$, the $CFI \geq 0.90$, and the $SRMR \leq 0.08$ [102,106,107].

In the second phase, we tested H1. The four levels of factorial invariance (configural, metric, scalar, and strict invariance) were tested sequentially using a MG-CFA model. For example, the configural invariance model was compared with the metric invariance model based on the difference (Δ) in the model fit indices. The model with more invariance constraints is generally expected to have deteriorated fit statistics. A significant value of $\Delta\chi^2$ indicates that the model with more invariance constraints (e.g., the metric invariance model) is poorer than the model with fewer invariance constraints (e.g., the configural invariance model). Like χ^2 , $\Delta\chi^2$ may overly reject acceptable models. Therefore, we consulted $\Delta RMSEA$, ΔCFI , and $\Delta SRMR$ as well for the cases in which $\Delta\chi^2$ was statistically significant. We used the criteria for acceptable models in accordance with Chen's [108] recommendations. He suggested that a metric invariance model is acceptable when $\Delta RMSEA \geq 0.010$, $\Delta CFI \geq -0.005$, and $\Delta SRMR \geq 0.025$ and that either a scalar or strict invariance model is acceptable when $\Delta RMSEA \geq 0.010$, $\Delta CFI \geq -0.005$, and $\Delta SRMR \geq 0.005$, given a group size < 300 .

In the third phase, we tested H2 through H4 by investigating the observed and latent sub-factor mean differences between every pair of compared groups when at least the scalar invariance condition is satisfied [27,55]. In the final phase, we simultaneously tested the effect of the gender, major, and educational experiences on the sub-factors of the CS-EMS using the structural equation modeling framework to test H5. While the observed mean difference between the groups was examined using IBM SPSS 26, the remaining analyses (i.e., confirmatory factor analysis, multiple-group confirmatory factor analysis, latent mean comparisons, structural equation modeling) were conducted using MPLus8.

4. Results

4.1. Confirmatory Factor Analysis

Before performing a measurement invariance test, we fitted the correlated five-factor model (Figure 1) to each of the six groups (i.e., male, female, engineering, non-engineering, educational experiences, and no educational experiences) separately. In Figure 1 λ_{ij} , τ_{ij} , δ_{ij} , and θ_{ij} represent the factor loading, intercept, unique factor score, and unique variance of the i th factor's j th item, respectively.

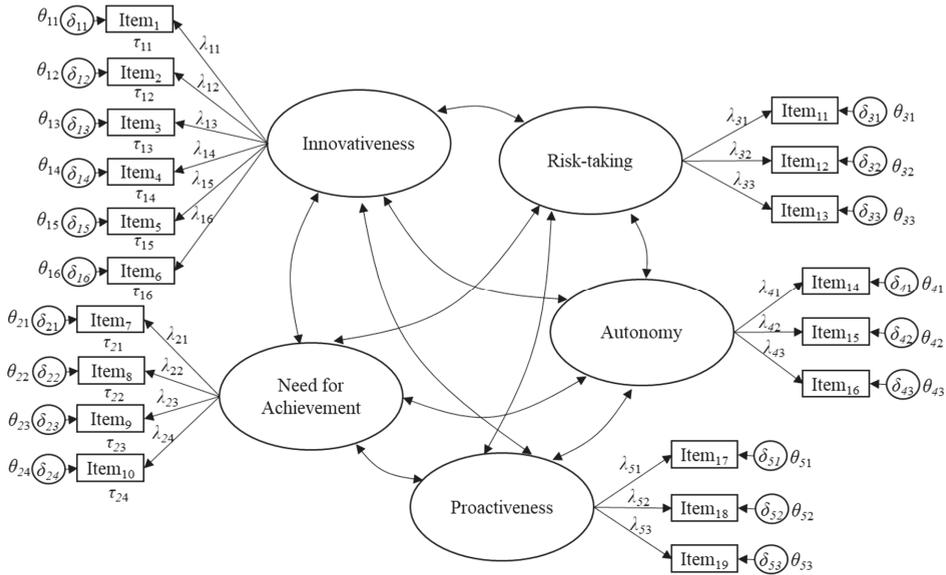


Figure 1. The correlated five-factor model of the Entrepreneurial Mindset Scale.

The results of the CFA analyses can be found in Table 3. The chi-square (χ^2) fit statistic for the CFA model was statistically significant for all groups, which means that the tested model does not fit the data. However, the limitation of the χ^2 fit statistic (i.e., it can easily reject a viable model when given a large sample [102]) allowed us to refer to alternative fit statistics, such as RMSEA, CFI, and SRMR. All the alternative fit statistics consistently indicated that the tested CFA model was tenable for all groups; for all CFI > 0.90 and RMSEA and SRMR < 0.08. Thus, the correlated five-factor model without any model modification served as the baseline model for sequential tests of factorial invariance, which were performed in the next analyses.

Table 3. Confirmatory Factor Analysis Results for Each of the Six Groups.

Sub-Groups	χ^2	df	p-Value	RMSEA	CFI	SRMR
Male	301.345	142	<0.000	0.072	0.920	0.062
Female	197.154	142	0.002	0.062	0.952	0.068
Engineering	267.909	142	<0.000	0.077	0.908	0.069
Non-Engineering	261.844	142	<0.000	0.071	0.934	0.058
Experience	280.792	142	<0.000	0.077	0.923	0.063
No experience	264.220	142	<0.000	0.076	0.913	0.065

Note. RMSEA: the root mean square of approximation; CFI: the comparative fit index; SRMR: the standardized root mean squared residual.

Table 4 presents the Cronbach's α s of the whole scale and each of the five sub-scales (*innovativeness, need for achievement, risk-taking, autonomy, and proactiveness*) for the six groups. The Cronbach's α of the whole scale ranged from 0.882 to 0.919 while those of the sub-scales ranged from 0.717 to 0.902 across the six groups. All of them appeared to be adequate [109,110].

Table 4. Cronbach's α s of the CS-EMS by Group.

Sub-Groups	Whole Scale	Innovative-Ness	Need for Achievement	Risk-Taking	Autonomy	Proactive-Ness
Male	0.891	0.863	0.813	0.883	0.717	0.803
Female	0.919	0.902	0.853	0.878	0.851	0.796
Engineering	0.886	0.864	0.799	0.866	0.743	0.821
Non-Engineering	0.914	0.886	0.850	0.896	0.793	0.789
Experience	0.916	0.881	0.860	0.897	0.729	0.796
No experience	0.882	0.874	0.789	0.858	0.809	0.793

4.2. Measurement Invariance Test

The results directly addressing Hypothesis 1 (H1: The CS-EMS presents at least scalar invariance across gender, major, and experience groups.) are presented in this section. The results of the hierarchical factorial invariance tests by gender, major, and educational experience are presented in Table 5. In addition to the overall model fit information for each invariance model, the chi-square difference test results and differences in *RMSEA*, *CFI*, and *SRMR* between a less restricted model and a more restricted model are presented. One thing we should address here is that we used the method that does not require a reference variable [26,29,56] to be appointed for identifying the metric and scalar invariance models.

Table 5. Factorial Invariance Test results across Gender, Major, and Educational Experiences.

	χ^2	<i>df</i>	<i>RMSEA</i>	<i>CFI</i>	<i>SRMR</i>	$\Delta\chi^2$	Δdf	$\Delta RMSEA$	ΔCFI	$\Delta SRMR$
Gender										
Configural	498.499 **	284	0.069	0.932	0.064					
Metric	521.084 **	298	0.069	0.929	0.073	22.585	14	0.000	−0.003	0.009
Scalar	531.878 **	312	0.067	0.930	0.073	10.794	14	−0.002 ^a	0.001	0.000
Strict	565.710 **	331	0.067	0.925	0.078	33.832 *	19	0.000	−0.005	0.005
Major										
Configural	529.752 **	284	0.074	0.923	0.063					
Metric	543.050 **	298	0.072	0.923	0.070	13.298	14	−0.002 ^a	0.000	0.007
Scalar	559.411 **	312	0.071	0.923	0.072	16.361	14	−0.001 ^a	0.000	0.002
Strict	587.722 **	331	0.070	0.920	0.081	28.311	19	−0.001 ^a	−0.003	0.009
Educational Experience										
Configural	545.012 **	284	0.070	0.918	0.064					
Metric	552.262 **	298	0.073	0.920	0.067	7.250	14	0.003	0.002	0.003
Scalar	574.837 **	312	0.073	0.918	0.069	22.575	14	0.000	−0.002	0.002
Strict	600.762 **	331	0.072	0.915	0.076	25.925	19	−0.001 ^a	−0.003	0.007

Note. * $p < 0.05$; ** $p < 0.01$; *RMSEA*: the root mean square of approximation; *CFI*: the comparative fit index; *SRMR*: the standardized root mean squared residual; Δ represents a difference test for each statistic between less restricted model (e.g., configural invariance model) and more restricted model (e.g., metric invariance model); ^a In these cases, the changes in the *RMSEA* were not expected (i.e., an increase in values).

4.2.1. Configural Invariance Model

The configural invariance model holds across gender ($\chi^2 = 529.752$, $df = 284$, $p < 0.001$; *RMSEA* = 0.074; *CFI* = 0.923; *SRMR* = 0.063), major ($\chi^2 = 498.499$, $df = 284$, $p < 0.001$; *RMSEA* = 0.069; *CFI* = 0.932; *SRMR* = 0.064), and educational experience ($\chi^2 = 545.012$, $df = 284$, $p < 0.001$; *RMSEA* = 0.070; *CFI* = 0.918; *SRMR* = 0.064) based on the same criteria for the CFA.

4.2.2. Metric Invariance Model

Metric invariance holds for every comparison based on the non-significant chi-square difference tests between the configural invariance model and metric invariance model (gender: $\Delta\chi^2 = 13.298$, $df = 14$, $p = 0.503$; major: $\Delta\chi^2 = 22.585$, $df = 14$, $p = 0.067$; educational experience: $\Delta\chi^2 = 7.250$, $df = 14$, $p = 0.925$). Based on the Chen's [108] recommendation for the metric invariance test with samples sizes less than 300 ($\Delta RMSEA \geq 0.010$, $\Delta CFI \geq -0.005$, $\Delta SRMR \geq 0.025$), the differences in *RMSEA*, *CFI*, and *SRMR* (gender: $\Delta RMSEA = 0.000$, $\Delta CFI = -0.003$, $\Delta SRMR = 0.009$; major: $\Delta RMSEA = -0.002$, $\Delta CFI = 0.000$, $\Delta SRMR = 0.007$; educational experience: $\Delta RMSEA = 0.003$, $\Delta CFI = 0.002$, $\Delta SRMR = 0.003$) also supported metric invariance across the gender, major, and educational experience groups.

4.2.3. Scalar Invariance Model

After imposing invariant intercept constraints, the chi-square difference tests between the metric invariance model and scalar invariance model were not statistically significant for all comparisons (gender: $\Delta\chi^2 = 16.361$, $df = 14$, $p = 0.292$; major: $\Delta\chi^2 = 10.794$, $df = 14$, $p = 0.702$; educational experience: $\Delta\chi^2 = 22.575$, $df = 14$, $p = 0.068$). There were no outstanding changes in *RMSEA*, *CFI*, and *SRMR* (gender: $\Delta RMSEA = -0.001$, $\Delta CFI = 0.000$, $\Delta SRMR = 0.002$; major: $\Delta RMSEA = -0.002$, $\Delta CFI = 0.001$, $\Delta SRMR = 0.000$; educational experience: $\Delta RMSEA = 0.000$, $\Delta CFI = -0.002$, $\Delta SRMR = 0.002$) based on Chen's [108] criteria for the scalar invariance test with samples of less than 300 ($\Delta RMSEA \geq 0.010$, $\Delta CFI \geq -0.005$, $\Delta SRMR \geq 0.005$). Hence, the results confirmed Hypothesis 1a (H1a: The CS-EMS presents at least scalar invariance between the male and female groups.), Hypothesis 1b (H1b: The CS-EMS presents at least scalar invariance between the engineering and non-engineering groups.), and Hypothesis 1c (H1c: The CS-EMS presents at least scalar invariance between the experience and non-experience groups.).

4.2.4. Strict Invariance Model

The chi-square difference tests between the scalar invariance model and strict invariance model were not significant across the pairs based on either major or educational experiences (major: $\Delta\chi^2 = 28.311$, $df = 19$, $p = 0.078$; educational experience: $\Delta\chi^2 = 25.925$, $df = 19$, $p = 0.132$). Based on Chen's [108] suggestions for strict invariance tests with samples of less than 300 ($\Delta RMSEA \geq 0.010$, $\Delta CFI \geq -0.005$, $\Delta SRMR \geq 0.005$), the changes in the other fit indices were negligible (major: $\Delta RMSEA = -0.001$, $\Delta CFI = -0.003$; educational experience: $\Delta RMSEA = -0.001$, $\Delta CFI = -0.003$, $\Delta SRMR = 0.007$) except for *SRMR* (major: $\Delta SRMR = 0.009$; educational experiences: $\Delta SRMR = 0.007$). For the gender comparison, the chi-square difference test results indicated that the strict invariance model was significantly worse than the scalar invariance model. In addition, changes in the two other fit indices ($\Delta CFI = -0.005$; $\Delta SRMR = 0.005$) indicated that the strict invariance model was worse than the scalar invariance model. However, we did not pursue partial strict invariance since scalar invariance is a sufficient condition for latent and observed mean comparisons [26,29]. We provide the measurement parameter estimates (λ_{ij} , τ_{ij} , and θ_{ij}) of the final confirmed factorial invariance model by gender, major, and educational experience in Appendix A (Tables A1–A3).

4.3. Comparison of Latent and Observed Means

In this section, we present the results that are directly related to Hypothesis 2 (H2: The male group scores higher on each of the five sub-constructs of the CS-EMS than the female group.), Hypothesis 3 (H3: The engineering group scores higher on each of the five sub-constructs of the CS-EMS than the non-engineering group.), and Hypothesis 4 (H4: The group with educational experiences in entrepreneurship scores higher on each of the five sub-constructs of the CS-EMS than the group without such experiences.). The latent means were tested between every set of the compared groups under the finally confirmed factorial invariance model using a MG-CFA. For the groups based on major (engineering vs. non-engineering) and educational experience (with educational experiences in

entrepreneurship vs. without educational experiences in entrepreneurship), the latent means were compared using the strict invariance model. To compare the latent means between males and females, the scalar invariance model was used. For each comparison, non-engineering students, females, and the students without educational experiences in entrepreneurship served reference groups with a fixed latent mean score of zero. Table 6 shows the estimated sub-scale latent and observed means of the groups by gender, major, and educational experience.

Table 6. Factorial Invariance Test results across Gender, Major, and Educational Experience Groups.

		Gender		Major		Educational Experience	
		Male M (SE)	Female M (SD)	Eng. M (SE)	Non-Eng. M (SD)	Yes M (SE)	No M (SD)
Innovativeness	ξ_i	0.44 (0.15) **	0.00 (0.00)	0.37 (0.11) **	0.00 (0.00)	0.42 (0.13) **	0.00 (0.00)
	O_i	3.83(0.66) **	3.57 (0.77)	3.89 (0.63) **	3.62 (0.75)	3.86 (0.71) **	3.61 (0.68)
Need for Achievement	ξ_i	0.22 (0.15) *	0.00 (0.00)	0.17 (0.11) **	0.00 (0.00)	0.21 (0.13) **	0.00 (0.00)
	O_i	4.04 (0.60) *	3.92 (0.73)	4.06 (0.60) *	3.95 (0.68)	4.06 (0.68) **	3.94 (0.61)
Risk-taking	ξ_i	0.33 (0.13) **	0.00 (0.00)	0.28 (0.12) **	0.00 (0.00)	0.44 (0.13) **	0.00 (0.00)
	O_i	3.58 (0.90) **	3.29 (0.87)	3.63 (0.87) **	3.36 (0.91)	3.66 (0.90) **	3.30 (0.85)
Autonomy	ξ_i	0.05 (0.15) *	0.00 (0.00)	-0.09 (0.12) *	0.00 (0.00)	-0.13 (0.11) **	0.00 (0.00)
	O_i	3.37 (0.79) *	3.39 (0.96)	3.37 (0.82) *	3.37 (0.87)	3.33 (0.81) **	3.44 (0.89)
Proactiveness	ξ_i	0.40 (0.16) *	0.00 (0.00)	0.14 (0.12) *	0.00 (0.00)	0.52 (0.13) **	0.00 (0.00)
	O_i	3.85 (0.64) **	3.62 (0.78)	3.82 (0.67) *	3.85 (0.71)	3.93 (0.67) **	3.61 (0.68)

Note. ξ_i : Estimated latent mean; O_i : observed mean; M: mean; SE: standard error of the estimated mean; SD: standard deviation; * $p < 0.05$; ** $p < 0.01$.

4.3.1. Comparison Based on Gender

Among the five sub-scales, the male group had significantly higher latent means on the *innovativeness* ($M = 0.44$, $SE = 0.15$), *risk-taking* ($M = 0.33$, $SE = 0.13$), and *proactiveness* ($M = 0.40$, $SE = 0.16$) sub-scales than the female group, which confirmed Hypothesis 2a (H2a: The male group scores higher on innovativeness than the female group.), Hypothesis 2c (H2c: The male group scores higher on risk-taking than the female group.), and Hypothesis 2e (H2e: The male group scores higher on proactiveness than the female group.). The latent means of two sub-scales (*need for achievement* and *autonomy*) did not differ across the groups, and thus Hypothesis 2b (H2b: The male group scores higher on need for achievement than the female group.) and Hypothesis 2d (H2d: The male group scores higher on autonomy than the female group.) were rejected. Regarding the sub-scales' observed means, the male group scored higher on the *innovativeness* ($M = 3.83$, $SD = 0.66$), *risk-taking* ($M = 3.58$, $SD = 0.90$), and *proactiveness* ($M = 3.85$, $SD = 0.64$) sub-scales than the female group. The effect sizes (Cohen's d , 1988) for the observed mean scores of *innovativeness*, *risk-taking*, and *proactiveness* were 0.38, 0.33, and 0.34, respectively, which indicate small to medium effects (Cohen, 1988).

4.3.2. Comparison Based on Major

The engineering major group had significantly higher latent means for the *innovativeness* ($M = 0.37$, $SE = 0.11$) and *risk-taking* ($M = 0.28$, $SE = 0.12$) sub-scale compared to the non-engineering major group, which supported Hypothesis 3a (H3a: The engineering group scores higher on innovativeness than the non-engineering group.) and Hypothesis 3e (H3e: The engineering group scores higher on proactiveness than the non-engineering group.). Yet, the two groups did not differ in the latent means of the *need for achievement*, *autonomy*, and *proactiveness* sub-scales, and thus we rejected Hypothesis 3b (H3b: The engineering group scores higher on need for achievement than the non-engineering group.), Hypothesis 3c (H3c: The engineering group scores higher on risk-taking than the non-engineering group.), and Hypothesis 3d (H3d: The engineering group scores higher on autonomy than the non-engineering group.). The same pattern of significant differences could be found in the observed sub-scale mean comparisons. The engineering major group had higher observed sub-scale mean scores for both *innovativeness* ($M = 3.89$, $SD = 0.63$) and *risk-taking* ($M = 3.62$, $SD = 0.75$) compared to the

non-engineering major group. The Cohen’s *d* effect sizes for the *innovativeness* and *risk-taking* sub-scales were 0.39 and 0.29, respectively, which indicate small (0.02) to medium effects (0.05) according to Cohen (1988).

4.3.3. Comparison Based on Educational Experiences in Entrepreneurship

The group with educational experiences in entrepreneurship scored substantially higher on the *innovativeness* ($M = 0.42, SE = 0.13$), *risk-taking* ($M = 0.44, SE = 0.13$), and *proactiveness* ($M = 0.52, SE = 0.13$) sub-scales than the group without such experiences, which confirmed Hypothesis 4a (H4a: The group with educational experiences in entrepreneurship scores higher on each of the five sub-constructs of the CS-EMS than the group without such experiences.), Hypothesis 4c (H4c: The group with educational experiences in entrepreneurship scores higher on risk-taking than the group without such experiences.), and Hypothesis 4e (H4e: The group with educational experiences in entrepreneurship scores higher on proactiveness than the group without such experiences.). The remaining sub-scales, *need for achievement* and *autonomy*, did not differ across the groups, and thus we rejected Hypothesis 4b (H4b: The group with educational experiences in entrepreneurship scores higher on need for achievement than the group without such experiences.) and Hypothesis 4d (H4d: The group with educational experiences in entrepreneurship scores higher on autonomy than the group without such experiences.). For the observed sub-scale scores, the group with educational experiences in entrepreneurship scored higher on the *innovativeness* ($M = 3.86, SD = 0.71$), *risk-taking* ($M = 3.66, SD = 0.90$), and *proactiveness* ($M = 3.93, SD = 0.67$) sub-scales than the group without educational experiences. The effect sizes for the observed mean scores of the *innovativeness*, *risk-taking*, and *proactiveness* sub-scales were 0.37, 0.41, and 0.48, respectively, which indicate small to medium effects (Cohen, 1988).

4.4. Structural Equation Modeling: Tests of Conditional Group Effects on Each Sub-Scale

This section addresses Hypothesis 5 (H5: Educational experience is the most influencing factor for the scores of the CS-EMS sub-constructs after controlling for gender and major.) directly. In the previous phase, we tested the sub-scales’ latent means across each pair of groups without considering the effect of the other groups. Thus, we investigated the conditional effect of the group on the latent scores of the CS-EMS sub-scales by including all three grouping variables as independent variables in the model under the structural equation modeling framework (Figure 2). By doing so, the effect of the overrepresentation of male participants majoring in engineering can be controlled, and we can single out the effects of each of the three variables.

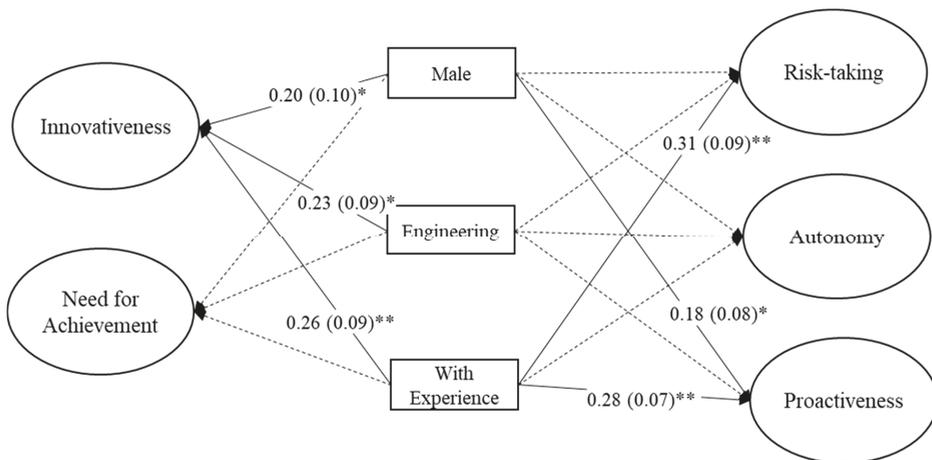


Figure 2. Tests of the Grouping Variable Effects on the Entrepreneurial Mindset Sub-scales.

4.4.1. Innovativeness

In the simple latent and observed mean comparisons, the *innovativeness* sub-scale scores significantly differed across all comparison pairs. Even after controlling for the remaining variables, each of the three grouping variables (gender, major, and experience) had a significant effect on the *innovativeness* sub-scale score. To interpret the estimated effect, the male group's *innovativeness* score was 0.20 higher than the female group when the effect of the major and experience variables was considered. The engineering major group's *innovativeness* score was 0.23 higher than the non-engineering major group when controlling for the effect of major and gender. The group with educational experiences in entrepreneurship scored 0.26 higher on the *innovativeness* sub-scale than the group without educational experiences when the effects of major and gender were accounted for. To sum up the results, we considered Hypothesis 5a (H5a: Educational experience is the most influencing factor for *innovativeness* after controlling for gender and major.) to be supported.

4.4.2. Need for Achievement

Similarly, in the results for the simple latent and observed mean comparisons, none of the three grouping variables (*gender, major, and experience*) had a significant effect on the score of the *need for achievement* sub-scale. Thus, we rejected Hypothesis 5b (H5b: Educational experience is the most influencing factor for *need for achievement* after controlling for gender and major.).

4.4.3. Risk-Taking

Whereas the *risk-taking* sub-scale scores significantly differed across all pairs of comparison in the simple latent and observed mean difference tests, only experience had a significant effect on the *risk-taking* sub-scale. That is, the score for the *risk-taking* sub-scale was 0.31 higher for the group with educational experiences in entrepreneurship than the group without such experiences after controlling for the effects of gender and major. Interestingly, the effects of *gender* and *major* disappeared when the other grouping variables were considered. Hence, the result confirmed Hypothesis 5c (H5c: Educational experience is the most influencing factor for *risk-taking* after controlling for gender and major.).

4.4.4. Autonomy

None of the three grouping variables (*gender, major, and experience*) had a significant effect on the *need for achievement* sub-scale score, which was consistent with the results of the simple latent and observed mean comparisons. Therefore, we rejected Hypothesis 5d (H5d: Educational experience is the most influencing factor for *autonomy* after controlling for gender and major.).

4.4.5. Proactiveness

In the simple latent and observed mean comparisons, the *proactiveness* sub-scale scores significantly differed across groups based on either gender or educational experiences. A similar pattern was found through a structural equation modeling analysis. The same two grouping variables (gender and experience) had a significant effect on the *proactiveness* sub-scale scores. Specifically, the male group's *proactiveness* score was 0.18 higher than that of the female group after controlling for the effect of major and experience, while the group with educational experiences in entrepreneurship scored 0.28 higher on the *proactiveness* sub-scale than the group without such experiences when the effects of major and gender was considered. Hence, Hypothesis 5e (H5e: Educational experience is the most influencing factor for *proactiveness* after controlling for gender and major.) was confirmed by the result.

To briefly summarize the results of the current study by the hypotheses, we present Table 7. Table 7 provides the information on whether each of the hypotheses was confirmed or not.

Table 7. Summary of the Study Results based on the Research Hypotheses.

Hypothesis	Result
H1: The CS-EMS presents at least scalar invariance across gender, major, and experience groups.	Confirmed
H1a: The CS-EMS presents at least scalar invariance between the male and female groups.	Confirmed
H1b: The CS-EMS presents at least scalar invariance between the engineering and non-engineering groups.	Confirmed
H1c: The CS-EMS presents at least scalar invariance between the experience and no-experience groups.	Confirmed
H2: The male group scores higher on each of the five sub-constructs of the CS-EMS than the female group.	Confirmed
H2a: The male group scores higher on innovativeness than the female group.	Rejected
H2b: The male group scores higher on need for achievement than the female group.	Confirmed
H2c: The male group scores higher on risk-taking than the female group.	Rejected
H2d: The male group scores higher on autonomy than the female group.	Confirmed
H2e: The male group scores higher on proactiveness than the female group.	Confirmed
H3: The engineering group scores higher on each of the five sub-constructs of the CS-EMS than the non-engineering group.	Confirmed
H3a: The engineering group scores higher on innovativeness than the non-engineering group.	Rejected
H3b: The engineering group scores higher on need for achievement than the non-engineering group.	Rejected
H3c: The engineering group scores higher on risk-taking than the non-engineering group.	Rejected
H3d: The engineering group scores higher on autonomy than the non-engineering group.	Confirmed
H3e: The engineering group scores higher on proactiveness than the non-engineering group.	Confirmed
H4: The group with educational experiences in entrepreneurship scores higher on each of the five sub-constructs of the CS-EMS than the group without such experiences.	Confirmed
H4a: The group with educational experiences in entrepreneurship scores higher on innovativeness than the group without such experiences.	Rejected
H4b: The group with educational experiences in entrepreneurship scores higher on need for achievement than the group without such experiences.	Confirmed
H4c: The group with educational experiences in entrepreneurship scores higher on risk-taking than the group without such experiences.	Rejected
H4d: The group with educational experiences in entrepreneurship scores higher on autonomy than the group without such experiences.	Confirmed
H4e: The group with educational experiences in entrepreneurship scores higher on proactiveness than the group without such experiences.	Confirmed
H5: Educational experience is the most influencing factor for the scores of the CS-EMS sub-constructs after controlling for gender and major.	Confirmed
H5a: Educational experience is the most influencing factor for innovativeness after controlling for gender and major.	Rejected
H5b: Educational experience is the most influencing factor for need for achievement after controlling for gender and major.	Confirmed
H5c: Educational experience is the most influencing factor for risk-taking after controlling for gender and major.	Rejected
H5d: Educational experience is the most influencing factor for autonomy after controlling for gender and major.	Confirmed
H5e: Educational experience is the most influencing factor for proactiveness after controlling for gender and major.	Confirmed

5. Discussion

5.1. Findings and Implications

We began this study with the motivation to contribute to the literature on entrepreneurship in higher education by investigating the untouched topic of measurement invariance of the CS-EMS, which is required for cross-group mean comparisons [26–29,55]. To do so, we focused on comparing the groups of participants by gender, major (engineering vs. non-engineering), or educational experiences in entrepreneurship. In this section, we summarized the findings based on the outline of the analytic procedures and results: (1) confirmatory factor analysis, (2) measurement invariance tests, (3) cross-group latent and observed mean comparisons, and (4) examination of the conditional effects of the grouping variables, while discussing the implications of each finding.

First, we found that the correlated five factor model [25] was viable for all six groups (male, female, engineering, non-engineering, educational experience, and no educational experience). This finding was not consistent with previous studies [22,23,111], in which only three sub-factors (*innovativeness*, *risk-taking*, and *proactiveness*) were included. Instead, our findings are more closely aligned with the study of Lumpkin and Dess [42], in which they introduced five traits (*innovativeness*, *risk-taking*, *proactiveness*, *autonomy*, and *competitive aggressiveness*) related to entrepreneurial orientation at the organizational level. Given the inconsistency in the structure of individual-level entrepreneurial propensity/ orientation/ mindset, our findings might encourage future research to validate the factor structure of the CS-EMS in different countries or different educational contexts. We provided the English-translated items of the CS-EMS in the hope of observing further investigations related to the structural validity of the CS-EMS.

Secondly, we found that the strict invariance model was tenable across both pairs of groups for major and educational experience. To put it another way, all levels (factor loadings, intercepts, and unique variances) of the measurement property operated in the same way between the male and female groups as well as between the group with educational experiences in entrepreneurship and the group without such experiences. Yet, only scalar invariance was retained between the male and female groups, which means that the extent of the unique variance – the approximation of measurement errors – was not equivalent between the groups. Because the required condition (i.e., at least scalar invariance) for comparing latent and observed group means was met, we did not pursue partial strict invariance [26,29,55]. In some studies, measurement invariance of entrepreneurial attitude and intention was tested across only gender. For example, measurement invariance of entrepreneurial intention held between males and females [74,112]. In addition, measurement invariance of entrepreneurial attitude was also established between males and females. To our knowledge, this study is the first to investigate measurement invariance of the entrepreneurial mindset not only between the gender groups but also between groups based on major and educational experience. As a result, we contribute to entrepreneurship literature by reporting evidence of measurement invariance across plausible groups of interest in the context of higher education.

Third, we tested the latent means for each comparison based upon the established measurement invariance model. We also examined the observed mean differences between each set of the compared groups. The pattern of significant difference was consistent between the latent and observed mean comparisons. Male students had generally higher scores on the CS-EMS sub-scales except for *need for achievement* and *autonomy*, compared to the female students. This finding is consistent with formal studies in which male participants scored higher on other entrepreneurship-related variables, such as entrepreneurial orientation [113,114], intention [79,112], and attitude [112]. However, some inconsistent results on the gender difference also exist [115,116]. The gender difference found in the current study raises the old but persistent question, “Is it innate or socially constructed?” Since our study used the term “gender” as analogous to biological sex, future research should thoroughly investigate whether the gender difference in the CS-EMS is given or constructed, following the example of Goktan and Gupta’s [113] study by including the concepts of both biological sex and gender (masculinity

vs. femininity). In the comparison by major, the engineering-major group scored higher on the *innovativeness* and *risk-taking* sub-scales. Unfortunately, we could not find any study that directly compares the entrepreneurial orientation or mindset between engineering majors and non-engineering majors. Therefore, it is not possible to discuss the finding in relation to the results of other studies. Instead, one plausible explanation might be that engineering is a field in which males are dominant in most countries [117,118] and, due to the effects of gendered stereotypes, the male participants might have higher self-efficacy and more positive self-reflection than the female participants in our study. Regarding educational experiences in entrepreneurship, the students with experiences showed higher scores on the *innovativeness*, *risk-taking*, and *proactiveness* sub-scales than the students without such experiences. This finding implies that two sub-scales (*need for achievement* and *autonomy*) might not be the outcomes of entrepreneurship education, while the other three sub-scales (*innovativeness*, *risk-taking*, and *proactiveness*) might be. Even though the five correlated-factor model was sustained for the CS-EMS, the *need for achievement* and *autonomy* sub-scales might not measure educational impact effectively. In addition, those sub-scales were found to not be closely related to the entrepreneurial intention variables described by Jung and Lee [25]. Yet, those sub-factors might positively predict other career-related variables (e.g., career adaptability). Further research is needed to investigate this matter. Thus, we are very reluctant to claim that these two sub-scales are not useful.

Finally, as far as the conditional effects of the grouping variables are concerned, only three sub-scales (*innovativeness*, *risk-taking*, and *proactiveness*) of the CS-EMS were influenced by at least one of the grouping variables, whereas the *need for achievement* and *autonomy* sub-scales were not influenced by any of those variables. Among the three grouping variables, the educational experience variable appeared to have the most influence on the *innovativeness*, *risk-taking*, and *proactiveness* sub-scales, as the largest difference between the two groups was observed for these three sub-scales. This finding suggests that the factor with the most influence on the entrepreneurial mindset is educational experiences in entrepreneurship, and the effect of gender and major might be confounded after students have educational experiences. However, our speculation might not be appropriate for making causal inferences within this study. We will revisit this issue when discussing the limitations of the study.

5.2. Limitations and Suggestions for Future Studies

Despite its values and contributions, the current study is not free from limitations. The first limitation is related to generalizability. Since we collected data at only one university, which is one of the top colleges in Korea, the results of the current study might not be applicable to other contexts, such as colleges located in other places domestically or globally. To address this limitation, more replication studies should comprehensively discuss the generalizability issue regarding the structural validity and measurement invariance of the CS-EMS. In particular, cross-cultural measurement invariance tests between different countries could be added to the future research agenda. The second limitation is related to the nature of the self-reported assessment tool. Because the CS-EMS measures the extent of the entrepreneurial mindset based on self-reports, some sort of bias (e.g., distribution leaning toward socially desirable values or insincere responses [1]) might have confounded the actual status of the participants' entrepreneurial mindset. Hence, educators or researchers should carefully interpret the scores from the CS-EMS while collecting more evidence regarding educational impact using multiple assessments (e.g., peer evaluation, portfolios, project products). The third limitation is that we cannot make any inferences regarding the causal relationship between the participants' educational experiences and the level of their entrepreneurial mindset. Our data were cross-sectionally collected survey data, and the *experience* variable was made based on heterogeneous past educational experiences, including semester-length formal entrepreneurship classes, extracurricular activities with varying hours, out-of-college competitions to conceive plausible business ideas, and so on. Thus, future research should incorporate an experimental design that can validly measure the actual impact of entrepreneurship education using the CS-EMS. If the design includes pre-and post-measurement, longitudinal measurement invariance should be tested [28,119] before proceeding to latent or observed

mean comparisons between the pre- and post-scores. However, future researchers should be aware that measurement invariance needs a sufficient amount of data [120–122].

6. Conclusions

Given the limited evidence regarding the quality of the currently available assessment tools, the CS-EMS would be more useful than the other tools [20–24] for the educators who want to validly measure the educational outcomes or design their own entrepreneurship guided by the current status of the college students' entrepreneurial mindset. In an earlier study, the validity of CS-EMS had been supported by the evidence grounded on structural validity (the five correlated-factor structure) and predictive validity with entrepreneurial intention [25]. The current study provided evidence of measurement invariance, which indicates validity based on the use of assessment results [123], and it legitimately uses CS-EMS scores to compare different groups. Based on the satisfied conditions (scalar or strict invariance) for the cross-group mean comparison, the simple between-group comparisons revealed that the male engineering majors with educational experience generally scored higher on the CS-EMS subscales than their counterparts. As far as the major variable is concerned, the engineering students scored higher on innovativeness compared to the non-engineering students, which might be due to the majors' technology orientation. Regarding the difference based on gender, educators should be aware that female students showed a lower level of innovativeness and proactiveness than the male students. To cultivate the development of sustainable entrepreneurship among female students, universities may invigorate female support programs in entrepreneurial education [124].

Furthermore, we found that educational experience in entrepreneurship is the factor with the most influence on the three sub-scales (*innovativeness*, *risk-taking*, and *proactiveness*) which have been acknowledged to be the core characteristics of entrepreneurial individuals [22,23]. That finding also implies that the CS-EMS has potential as an assessment to efficiently measure the effectiveness of the entrepreneurial education targeting the sub-construct of the CS-EMS. Our finding supports former studies stating that entrepreneurship education is an important factor for building an entrepreneurial mindset [125]. Entrepreneurially-oriented educational programs might enable students to obtain the attitudes needed to gain practical experience and have a positive impact on students' entrepreneurial intentions [32,124]. However, to confirm the causal relationship between educational experiences and the entrepreneurial mindset, further studies with an experimental design are required to gain causal evidence. As a final remark, we would like to gladly introduce the CM-EMS items for future researchers in other countries, and we hope for future studies that perform cross-cultural comparisons using the CS-EMS.

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Appendix A

Table A1. Parameter Estimates of the Scalar Invariance Model: Groups based on Gender.

Item	Factor Loading (λ_{ij})		Intercept (τ_{ij})		Residual Variances (θ_{ij}^G)			
	Estimate	S.E.	Estimate	S.E.	Male		Female	
					Estimate	S.E.	Estimate	S.E.
Innovativeness								
Item 1	0.69	(0.05)	3.75	(0.06)	0.28	(0.03)	0.26	(0.05)
Item 2	0.75	(0.05)	3.57	(0.06)	0.31	(0.04)	0.25	(0.05)
Item 3	0.54	(0.04)	4.07	(0.05)	0.29	(0.03)	0.33	(0.05)
Item 4	0.49	(0.04)	4.19	(0.05)	0.43	(0.04)	0.48	(0.07)
Item 5	0.61	(0.05)	3.82	(0.05)	0.36	(0.04)	0.40	(0.06)
Item 6	0.60	(0.05)	3.59	(0.06)	0.42	(0.05)	0.35	(0.06)
Need for Achievement								
Item 7	0.54	(0.04)	4.12	(0.05)	0.27	(0.03)	0.26	(0.05)
Item 8	0.58	(0.05)	3.86	(0.05)	0.28	(0.04)	0.41	(0.07)
Item 9	0.58	(0.04)	4.06	(0.05)	0.23	(0.03)	0.22	(0.05)
Item 10	0.48	(0.04)	4.12	(0.05)	0.29	(0.03)	0.33	(0.06)
Risk-taking								
Item 11	0.82	(0.05)	3.66	(0.07)	0.36	(0.04)	0.27	(0.05)
Item 12	0.92	(0.05)	3.53	(0.07)	0.15	(0.03)	0.16	(0.07)
Item 13	0.81	(0.05)	3.55	(0.06)	0.30	(0.04)	0.38	(0.07)
Autonomy								
Item 14	0.73	(0.06)	2.87	(0.07)	0.66	(0.08)	0.60	(0.11)
Item 15	0.87	(0.06)	3.43	(0.07)	0.23	(0.07)	0.08	(0.09)
Item 16	0.49	(0.05)	3.87	(0.05)	0.47	(0.05)	0.41	(0.07)
Proactiveness								
Item 17	0.55	(0.04)	3.89	(0.05)	0.19	(0.03)	0.33	(0.06)
Item 18	0.63	(0.05)	3.80	(0.06)	0.31	(0.04)	0.29	(0.06)
Item 19	0.55	(0.04)	3.87	(0.05)	0.23	(0.03)	0.47	(0.08)

Note. Each item and its number correspond to those in Table 2.

Table A2. Parameter Estimates of the Scalar Invariance Model: Groups based on Major

Item	Factor Loading (λ_{ij})		Intercept (τ_{ij})		Residual Variances (θ_{ij})	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Innovativeness						
Item1	0.79	(0.06)	3.52	(0.07)	0.28	(0.03)
Item 2	0.87	(0.06)	3.32	(0.08)	0.29	(0.03)
Item 3	0.63	(0.05)	3.88	(0.06)	0.30	(0.03)
Item 4	0.57	(0.05)	4.02	(0.06)	0.45	(0.04)
Item 5	0.70	(0.06)	3.61	(0.07)	0.37	(0.03)
Item 6	0.71	(0.06)	3.38	(0.07)	0.39	(0.04)
Need for Achievement						
Item 7	0.62	(0.05)	4.03	(0.06)	0.27	(0.03)
Item 8	0.67	(0.05)	3.77	(0.06)	0.31	(0.03)
Item 9	0.67	(0.05)	3.97	(0.06)	0.24	(0.03)
Item 10	0.55	(0.05)	4.05	(0.05)	0.31	(0.03)
Risk-taking						
Item 11	0.81	(0.06)	3.47	(0.07)	0.33	(0.03)
Item 12	0.92	(0.06)	3.31	(0.08)	0.15	(0.03)
Item 13	0.81	(0.06)	3.36	(0.07)	0.33	(0.03)

Table A2. Cont.

Item	Factor Loading (λ_{ij})		Intercept (τ_{ij})		Residual Variances (θ_{ij})	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Autonomy						
Item 14	0.81	(0.07)	2.89	(0.08)	0.64	(0.07)
Item 15	0.98	(0.07)	3.46	(0.08)	0.17	(0.07)
Item 16	0.53	(0.06)	3.89	(0.06)	0.46	(0.04)
Proactiveness						
Item 17	0.61	(0.05)	3.79	(0.06)	0.23	(0.03)
Item 18	0.70	(0.06)	3.67	(0.07)	0.31	(0.03)
Item 19	0.61	(0.05)	3.76	(0.06)	0.31	(0.03)

Note. Each item and its number correspond to those in Table 2.

Table A3. Parameter Estimates of the Scalar Invariance Model: Groups based on Educational Experiences.

Item	Factor Loading (λ_{ij})		Intercept (τ_{ij})		Residual Variances (θ_{ij})	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Innovativeness						
Item 1	0.70	(0.05)	3.50	(0.07)	0.27	(0.03)
Item 2	0.77	(0.06)	3.30	(0.07)	0.29	(0.03)
Item 3	0.56	(0.05)	3.87	(0.06)	0.30	(0.03)
Item 4	0.50	(0.05)	4.01	(0.06)	0.45	(0.04)
Item 5	0.62	(0.05)	3.60	(0.06)	0.38	(0.03)
Item 6	0.62	(0.05)	3.37	(0.06)	0.39	(0.04)
Need for Achievement						
Item 7	0.55	(0.05)	4.02	(0.06)	0.27	(0.03)
Item 8	0.58	(0.05)	3.76	(0.06)	0.31	(0.03)
Item 9	0.58	(0.05)	3.96	(0.06)	0.23	(0.03)
Item 10	0.48	(0.05)	4.04	(0.05)	0.31	(0.03)
Risk-taking						
Item 11	0.77	(0.06)	3.40	(0.07)	0.33	(0.03)
Item 12	0.87	(0.06)	3.23	(0.08)	0.16	(0.03)
Item 13	0.77	(0.06)	3.29	(0.07)	0.33	(0.03)
Autonomy						
Item 14	0.84	(0.08)	2.91	(0.08)	0.63	(0.06)
Item 15	0.99	(0.07)	3.49	(0.09)	0.19	(0.06)
Item 16	0.54	(0.06)	3.90	(0.06)	0.45	(0.04)
Proactiveness						
Item 17	0.57	(0.05)	3.67	(0.06)	0.24	(0.03)
Item 18	0.66	(0.06)	3.54	(0.07)	0.30	(0.03)
Item 19	0.58	(0.05)	3.64	(0.06)	0.31	(0.03)

Note. Each item and its number correspond to those in Table 2.

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Article

The Impact of the Family Background on Students' Entrepreneurial Intentions: An Empirical Analysis

Maria-Ana Georgescu ¹ and Emilia Herman ^{2,*}

¹ Faculty of Sciences and Letters, "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology of Tirgu-Mures, 540139 Tirgu Mures, Romania; maria.georgescu@umfst.ro

² Faculty of Economics and Law, "George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology of Tirgu-Mures, 540139 Tirgu Mures, Romania

* Correspondence: emilia.herman@umfst.ro; Tel.: +40-745-258-520

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Abstract: In the current economic and social environment, a real challenge for youth is the acquisition and development of the relevant skills in entrepreneurship in order to consider entrepreneurship as a desirable employment choice. Given this aspect, the purpose of this paper is to investigate the main factors influencing students' entrepreneurial intentions, paying particular attention to their entrepreneurial family background. Additionally, the paper aims to explore the effect of entrepreneurial family background on the relationship between effectiveness of entrepreneurship education and entrepreneurial intention. We conducted a study where results were based on the outcomes of a survey among Romanian high school and university students in the final year (N = 617). Our four main hypotheses were tested through independent samples t-tests, correlation analysis, and hierarchical multiple regression analysis. The findings highlighted that the students with an entrepreneurial family background reported a higher entrepreneurial intention than those without such a background. The variables that positively influenced the entrepreneurial intentions of the students were entrepreneurial family background, effectiveness of entrepreneurship education, and entrepreneurial personality traits. Furthermore, this entrepreneurial family background negatively moderated the relationship between effectiveness of entrepreneurship education and entrepreneurial intention. For this reason, emphasis should be placed on both formal and informal entrepreneurial education, which will increase the propensity of young people to choose an entrepreneurial career.

Keywords: entrepreneurial intentions; self-employment; entrepreneurship education; entrepreneurial family background; entrepreneurial personality traits; students; hierarchical multiple regression analysis

1. Introduction

Unemployment is one of the biggest challenges for young people, taking into account that at EU level and elsewhere unemployment among young individuals (aged 18 to 24) is two to three times higher than the overall unemployment rate [1]. Choosing an entrepreneurial career is recognized as a plausible option for successfully integrating young people into the labour market and reducing the risk of social exclusion among youth [2–4]. Thus, an increase in employment through entrepreneurial activity among young people from different countries could achieve at least one of the 17 Sustainable Development Goals included in the 2030 Agenda for Sustainable Development [5]: Goal 8—“Promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”.

Although there is plenty of evidence available that a fairly large segment of young people intends to develop an entrepreneurial career, statistical data [1,6] prove that there is a low level of entrepreneurial activity among young people, measured both by the young self-employed and total

early stage entrepreneurship activity (TEA) for those aged between 18 and 24. Therefore, the central question of entrepreneurship research is why individuals, especially young ones, choose or do not choose an entrepreneurial career, self-employment, or starting their own business.

Theoretical and empirical studies point out that intentionality is a central concept in understanding the reasons for individuals' careers [7]. In particular, entrepreneurial intention is considered a key aspect that explains the determination to start a business or to become self-employed. Entrepreneurial intentions (EIs), defined as "desires to own or start a business" [8], represent the antecedent of entrepreneurial behaviour in most career choice models [9], being a prerequisite for entrepreneurial behaviour [10].

Prior studies [4,7,11] have found that EIs of individuals can be determined by different factors (environmental or contextual factors and personal background factors), which can have a positive or negative influence, a direct or indirect influence, respectively. Also, a specific combination and interaction of the determinants of EI can drive entrepreneurial career choice [12–14]. Moreover, according to Dyer's model [15] of entrepreneurial careers, there are three important factors that can influence the entrepreneurial career choice. These are social factors, including educational experiences (formal and informal); individual factors such as entrepreneurial attitudes and traits; and economic factors, like the availability of network resources and economic resources. As regards the social factors, based on the social learning theory [16], researchers found that social influence via parents is an essential determinant of entrepreneurial career decisions. Thus, parental roles within the family business, observed from an early age, influence "the children's attitude towards becoming self-employed themselves" [13] (p. 122).

Based on these premises, the aim of this paper is to highlight the impact of Romanian students' exposure to prior family business as informal education, both directly, on students' entrepreneurial career intentions, and indirectly, on the entrepreneurship education–entrepreneurial intention relationship. The objectives of the research focus on analysing student entrepreneurial intentions and identifying differences between EI students in terms of entrepreneurial family background (EFB); identifying the direct effect of an EFB, effectiveness of entrepreneurship education (EEE), and entrepreneurial personality traits on students' entrepreneurial intentions; and emphasizing the moderating effects of an EFB on the EEE–EI relationship.

The topic is of real interest because the totalitarian regime in Romania, which lasted over 40 years, led to the drastic limitation of private initiative and the cessation of family business, in favour of large state-owned enterprises, based on common property. Moreover, a sustainable market economy is based on entrepreneurship, and Romania took this direction after the change of political regime in December 1989. Therefore, we are interested in the extent to which the family inheritance of entrepreneurial initiatives in the last three decades influenced the career intentions of the youth, and, at the same time, what types of young people show entrepreneurial intentions and to what extent entrepreneurial intentions are influenced by entrepreneurial education.

As for novelty, this paper fills the gap in the available research because it focuses on the moderating effect of entrepreneurial family background on the relationship between entrepreneurship education and the entrepreneurial intention of students. Also, the novelty of the paper lies in the socioeconomic context of the research, taking into account that in Romania, a former communist country, there is no other study that explores this moderating effect. Other Romanian studies [17,18] in the field highlighted the extent to which entrepreneurial intentions are influenced by certain psycho-behavioural traits of individuals and evaluated the influence of different types of education on these intentions or on the important determinants of venture creation among young students, such as locus of control, that are needed for achievement and entrepreneurial education.

2. Theoretical Background and Research Hypotheses

Scholars have recognized a broad influence of entrepreneurial family background (EFB) on the entrepreneurial intentions of offspring: modeling career options [12,19], acquiring human

capital—especially entrepreneurial knowledge and skills [20]—providing better access to knowledge about entrepreneurial opportunities [21], and transferring financial and social capital to their children [21–23].

Empirical research [20,24–27] highlighted that the children from families with entrepreneurial backgrounds are more likely to start their own businesses or to join the family business. Sørensen [21] found that children with self-employed parents are twice as likely to become self-employed, but there is little evidence (from Danish data) to show that these young people become independent because they have privileged access to the financial or social capital of their parents, or because they have superior entrepreneurial abilities [21]. The most recent international report of the GUESS Project–Global Student Entrepreneurship 2018 [26], based on 208,000 completed responses from 54 countries and 3000 universities, highlighted that the higher intention to become an entrepreneur among students with entrepreneurial parents, as opposed to students without entrepreneurial parents, depends on the parents’ entrepreneurial performance.

According to social learning theory [16], which emphasizes that new patterns of behaviour can be acquired either through direct experience or by observing the behaviour of others, individuals learn (the informal learning) by observing the actions of their parents. In the context of role identification and social learning theories, Bosma et al. [28] state that four functions of entrepreneurial role models can be formulated that are interrelated: inspiration and motivation, increasing self-efficacy, learning by example, and learning by support.

The mechanisms of social influence via parents may include the transmission of skills gained through experience, tacit knowledge, and modeling of career options [20]. Walter and Dohse [29] argue that social networks play an important role in transferring tacit knowledge regarding how to seize entrepreneurial opportunities, with parental role models serving as a substitute for tacit knowledge obtained through entrepreneurial experience [28]. As Faas et al. [30] point out, parents with jobs requiring managerial skills, training and communication skills are able to transfer these skills to their children through a number of direct resources and indirect behaviours [30].

There have been studies [21,31] that explained the intergenerational transmission of self-employment, suggesting different mechanisms such as the influence of parental characteristics on children’s aspirations and values and on the development of human capital (entrepreneurial skills). In addition, other potential sources of closure fostering the inheritance of self-employment are the financial and social capital of self-employed parents.

In order to highlight how the family business can impact, encourage, or constrain the EI of children, it is also important to take into consideration the main characteristics of the family business. Researchers [32] pointed out a high heterogeneity among family firms caused by a series of factors such as type of goal (economic vs. non-economic, and family-centred vs. business-centred) [33,34], resources, the involvement in and influence of the family upon the business [35–37]. As regards the entrepreneurial behaviours of family firms, entrepreneurship research identified significant differences among these firms that are determined by multiple factors. Thus, the feeling of family unity around their own firm [38], as well as the financial and social capital of the family [21] can explain why some family firms are more entrepreneurial than others. The organizational culture of family firms that fosters decentralization, a long-term orientation, as well as the ability to perceive technological opportunities and the desire for change [39,40] is also an important determinant of entrepreneurship in family firms. There are studies that claim entrepreneurship in family firms may be influenced by genetic factors [41] and by “role modeling by entrepreneurial parents” [27], suggesting that transgenerational inheritance is another driver factor of entrepreneurship in family firms. According to Jaskiewicz et al. [42], entrepreneurial heritage as a rhetorical reconstruction by the family of past entrepreneurial achievements or resilience helps to explain transgenerational entrepreneurship [42]. In addition, the same authors stated that children are taking over the inherited entrepreneurial legacies through active involvement in the family business and through storytelling in large and cohesive families. Exceeding common succession, entrepreneurial heritage motivates owners of the current

and next generation to engage in three strategic activities feeding the transgenerational entrepreneurship, namely—strategic education, entrepreneurial bridging, and strategic succession [42].

Regarding students from this particular family background who inherit the atmosphere of a business environment that could influence their future career intentions, this aspect seems to induce optimism about their resources and abilities to follow an entrepreneurial career. Thus, an entrepreneurial career path can be feasible, but not necessarily desirable [22]. Also, the same authors pointed out that education received from parents who are firm owners might have a negative impact on their offspring's entrepreneurial career through their understanding of locus of control.

Entrepreneurial values and know-how can be taken up by children from parental role models, both during primary socialization and in later stages of life [29]. Based on the effect of parental role models, the decision to become an entrepreneur is positively correlated, according to some studies [13,24,27,43], with having parents who are or have been entrepreneurs or self-employed. According to Chlosta et al. [13], the EI analysis done on students from eight German universities showed that there is a positive relationship between the presence of parental role models of self-employment and the self-employment of the offspring, this relationship being moderated by aspects of their personality, such as the openness of the individual. According to Athayde [44], both EE and EFB positively influence high school students' intentions to become self-employed in the UK.

Entrepreneurial intentions can be indirectly influenced by the family business background [45,46], which has implications for antecedents of EI (perceptions of venture feasibility and desirability, attitude, and subjective norms). Peterman and Kennedy's research [46], based on a sample of Australian high school students, found a significant positive relationship between prior exposure to family business and entrepreneurship education, and the antecedents of entrepreneurial intention. Carr and Sequeira [12] found a significant, direct as well as indirect, influence of previous exposure to the existence of family businesses on entrepreneurial intention, by means of variables such as attitude towards starting a business, perception of family support, and entrepreneurial self-efficacy.

Empirical evidence regarding the EFB–EI relationship remains mixed, and there are also studies that highlight the existence of negative parental role models [9] or insignificant ones [47] for EI. Turkur and Selcuk [48], analysing the EI of students from universities in Turkey as a function of entrepreneurial educational, relational, and structural support, showed that only educational support (entrepreneurship education) and structural support influence the entrepreneurial intentions of students, whereas relational support (family background) does not affect entrepreneurial career choice. Mungai and Velamuri [31] emphasized that parental influence may not exist in case of parents' economic failure in self-employment, and the choice of an entrepreneurial career depends on the performance of self-employed parents. Criaco et al. [19] found, based on a large sample of 21,895 people from 33 countries, that the perceived performance of parents in entrepreneurship acts as a "double-edged sword". Thus, this perception, on the one hand, enriches the entrepreneurial desire and the feasibility of the descendants through mechanisms of exposure, but, on the other hand, inhibits the transposition of both the desires and the perceptions of feasibility regarding the entrepreneurial career intentions because of the ascending mechanisms of social comparison. Moreover, Murphy and Lambrechts [49] suggested that the family business involvement of the next generation, through the activity of helping, not only influences, but in some cases alters the career decisions of the next generation family members. Also, the same authors underlined the fact that these members strive to make "pure" career choices, because they are divided between helping and doing what is best for the family business, and following their own careers.

Educational experiences (formal and informal) as social factors can influence the decision to pursue a career [15], including an entrepreneurial career. The fact that entrepreneurial skills associated with entrepreneurial behaviour can be taught and learned is proven by the research of several authors [50]. Therefore, the main role of EE is to increase student awareness and to emphasize that entrepreneurship is a viable career choice [51]. Entrepreneurship education represents an important driver of the development of entrepreneurial attitudes of both potential and nascent

entrepreneurs [51,52]. Different empirical researches [4,9,11,23,53,54] focused on the EE–EI relationship among university students from different countries (e.g., China, USA, Spain, Ukraine, UK, France, Poland, Romania) and found that EE’s effect on students’ EI is positive, but that its intensity varies among different countries. This positive impact was also confirmed by a university student sample from Hungary and Estonia [55]. Similar results were obtained by other studies [8,56], based on comprehensive qualitative and quantitative reviews, including meta-analyses of the EE–EI relationship.

Other researches [57–59] showed that the relationship between EE and EI is negative, a fact that can be explained by students’ awareness of the risks associated with entrepreneurship because of higher education. This relationship is significantly influenced by the effectiveness of different types of entrepreneurship programmes and the field of study [4,26,60]. In a recent study, Herman and Stefanescu [4] stressed that the impact of EE in university on EI is higher in the case of Romanian business students than in engineering students. Solesvik [61] obtained similar results in the case of Ukraine university students, concluding that entrepreneurship education enhances entrepreneurial skills and competencies, as well as entrepreneurial intentions. Some researchers underlined the fact that providing only an adequate education may foster the entrepreneurial intention of individuals [48,62].

Therefore, taking into account that a large part of the empirical results highlights that an EFB provided as informal education and EE provided as formal education positively affect the EI, the following hypotheses can be formulated:

Hypotheses H1a. *Students who have previous entrepreneurial exposure within the family will demonstrate greater entrepreneurial intention.*

Hypotheses H1b. *Students’ prior family entrepreneurial exposure positively influences the EI of students.*

Hypotheses H2. *Effectiveness of EE positively influences the EI of students.*

Prior researches [11,63–65] considered certain personality traits as important factors that influence students’ EI. According to Rauch and Frese [64], personality traits are “dispositions to exhibit a certain kind of response across various situations” [64] (p. 355). The impact of the individual personality dimensions (conscientiousness, openness to experience, emotional stability, extraversion, and agreeableness) of the Big Five model (developed by Goldberg [66]) on entrepreneurial intention was largely analysed by several studies [65,67]. Şahin et al. [67] highlighted that “the multiple configurations of the big five personality traits and entrepreneurial self-efficacy” [67] (p. 1188) can generate a high level of entrepreneurial intention among Turkish students. Rauch and Frese [64], based on a meta-analysis of the relationship between business owners’ personality traits and business creation, found that innovativeness, generalized self-efficacy, and proactive personality are significantly correlated with entrepreneurial behaviour. The risk-taking propensity and the locus of control have a strong impact on the attitude towards self-employment [63,65]. Ahmed et al. [68] found significant but small indirect effects of innovativeness and risk propensity on entrepreneurial intentions in the case of a sample of final year MBA students. According to Giacomini et al. [47], students who are more optimistic are more likely to intend to pursue an entrepreneurial career.

Zellweger and Sieger [69] emphasized that autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness reflect only a partial picture of entrepreneurial orientation. Thus, the authors highlighted a real need to extend the entrepreneurial orientation scale in order to provide entrepreneurial behaviours in long-lived family businesses [69]. The research results of other authors [17], using four personality traits (innovativeness, propensity for taking risks, the need for achievement, and the locus of control), pointed out that risk-taking propensity and the need for achievement positively influence the entrepreneurial intention among Romanian university students. Although many personality traits were identified as having a significant effect on entrepreneurial intention, based on the EU report [70] we focused on the five student entrepreneurial personality traits, namely, innovativeness, risk-taking propensity, sense of self-confidence, optimism, and competitiveness. Therefore, we hypothesize:

Hypotheses H3. *Students' entrepreneurial personality traits positively influence their entrepreneurial intention.*

Entrepreneurial intentions represent the result of interrelated contextual factors [7,9,43], such as EE and EFB. Fayolle and Gailly [51] highlighted that students with prior exposure to entrepreneurship will benefit disproportionately from attending an EE programme. Thus, highly exposed students will be marginally or even negatively influenced by EE, whereas less exposed students could be impacted in a positive way. For the French students, their research results showed that the impact of EE on entrepreneurial intention is strongly affected by students' prior exposure to entrepreneurship, illustrating that this impact "on the variables of planned behaviour tend to supersede the impact of the training itself" [51] (p. 87). Bae et al. [8] reviewed 73 studies, analysing their results with a total sample size of 37,285 people, and identifying a significantly positive but weak correlation between EE and EI, which may explain EFB as a moderator of the EE–EI relationship.

Taking into account that students from entrepreneurial families are more likely than those without a similar background to have access to the human, financial, and social capital [22,24,27,43], and to learn techniques taught at universities, such as business planning or market analysis [29], their requirements for additional inputs from entrepreneurship education are reduced [8]. In the same line of ideas, Eesley and Wang [20] highlighted that, because the students who come from entrepreneurial families are already exposed to start-up norms, formal education such as EE in school has a marginal impact on EI. Additionally, exposed students can interpret the materials offered by EE more critically than others. Thus, EE may be less effective toward entrepreneurial intentions for students with an entrepreneurial family background than for those from non-entrepreneurial families [8]. Walter and Dohse [29] examined how the effect of entrepreneurial education on the entrepreneurial career intentions of German students is complemented by role models. Their study showed that parent role models motivate and qualify students for independent activity, significantly increasing entrepreneurial intentions. At the same time, role models surpass the effect of entrepreneurial education by simultaneously raising attitudes towards behaviour, subjective norms, and perceived behavioural control. Therefore, we hypothesize:

Hypotheses H4. *The intensity of the impact of EE on EI depends on the student's entrepreneurial family background.*

Figure 1 provides an illustration of our proposed conceptual model.

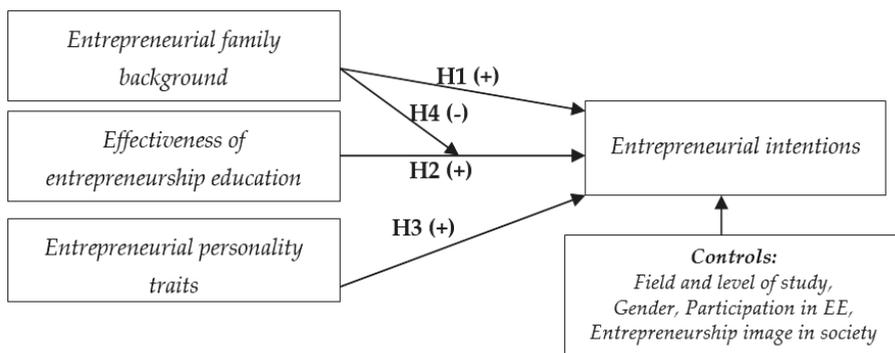


Figure 1. Conceptual model.

In summary, this study mainly hypothesizes that the EFB of students has both a direct effect and a moderating effect on the entrepreneurial intentions of students.

3. Methodology and Research Design

3.1. Studied Population and Sample

An empirical explorative research was conducted based on a questionnaire that was applied to final year undergraduate students, high school and university students. Two high schools (economics and non-economics) and two faculties were selected (the Faculty of Economics and the Faculty of Engineering of “G.E. Palade” University of Medicine, Pharmacy, Sciences and Technology of Tirgu-Mures (former “Petru Maior” University of Tirgu-Mures)), Romania. Our selection was limited to final year students, considering that these could be characterized as ready to launch into their professional careers and express their own choices, “as at this stage of life entrepreneurial conscience and attitude towards entrepreneurial career are formed” [14] (p. 387). Data for this study were collected using a non-random sampling technique, on quotas, according to the fields of study.

According to the records of the Faculties of Engineering and Economic Sciences of the university and the two targeted high schools, there were 880 students enrolled in the final years. Of these, we obtained valid questionnaires from 617 subjects, the sample (N) representing over 70% of the total number of young people in the last year of study, of the mentioned faculties (bachelor level) and of the two high schools. This fact indicates the representativeness of the sample.

From the total of 617 respondents, 57.9% were university students, 58.3% were female, and 17.8% had one or both parents self-employed or entrepreneurs. A total of 46.5% of students studied economics, and 74.7% of students considered that EE was included in their programmes of study (Table 1).

Table 1. Sample description (N = 617).

Respondents' Characteristics	Absolute Frequencies (N)	Absolute Frequencies (%)
Gender:		
Male	257	41.7
Female	360	58.3
Field of study:		
Economics students	287	46.5
Non-economics students	330	53.5
Level of study:		
High school	260	42.1
University	357	57.9
Students whose parents are self-employed or entrepreneurs (EFB)	110	17.8
Students' participation in entrepreneurship education (PEE)	461	74.7

3.2. Measures

3.2.1. Dependent Variables

To identify students' entrepreneurial intentions (EIs)—a dependent variable—we adapted two items from Sieger et al. [26] and EC [70]. Thus, respondents were asked the two following questions linked to: self-employment choice (If you could choose between different kinds of jobs after graduation, which would you prefer? employee = 0; self-employed = 1) and intention to become an entrepreneur (Do you want to become an entrepreneur or to start a business after graduation? yes = 1; no = 0). EI was assessed by averaging the individual mean of each question.

3.2.2. Independent Variables

In order to measure the students' EFB—Entrepreneurial family background—based on prior studies [13,26], we took into consideration the occupational status of the respondents' parents (employees or other category = 0; self-employed or entrepreneur = 1).

We assessed effectiveness of EE (EEE) using a four-item score (according to [70]) based on the self-assessment of the following statements by students (Education: has helped me to develop my sense of initiative; has helped me to better understand the role of entrepreneurs in society; has given me the skills and know-how to enable me to run a business; has made me interested in becoming an entrepreneur). In this study, EE was defined according to the EU report [71] as an education that equips individuals with key entrepreneurial competences, including entrepreneurial attitude, entrepreneurial skills, and entrepreneurship knowledge. Each response was given on a Likert scale from 1 (totally disagree) to 4 (totally agree). We calculated the total EEE score by taking the average of the four items.

The entrepreneurial personality traits (EPTs) of students were measured subjectively (from a student perspective) using five statements (according to [70]) concerning assertions linked to: innovativeness (I am an inventive person who has ideas), the risk-taking propensity (In general, I am willing to take risks), sense of self-confidence (Generally, when facing difficult tasks, I am certain that I will accomplish them), willingness to compete with others (I like situations in which I compete with others), and optimism (I am optimistic about my future). For the answers, a 4-point Likert scale was provided, where 1 = “completely disagree” and 4 = “completely agree”. The final EPT score was calculated by averaging the scores of the five statements. Cronbach’s alpha for EEE (of 0.68) and EPT (of 0.72) were above the acceptable threshold by 0.6, according to Aiken and West [72], a fact that proved the internal reliability of EEE and EPT.

3.2.3. Control Variables

We used a total of five control variables (Table 1) that potentially influenced the results of this research: participation in EE, field of study (non-economics = 0 and economics = 1), level of study (high school = 0 and university = 1), the student perception of the entrepreneurship’s image in society and gender (male = 0 and female = 1). We assessed the students’ participation in EE (PEE) based on the responses to the question: “Are there courses in the curricula which might be considered a form of entrepreneurship education?” (yes = 1; no = 0). The student perception of the image of entrepreneurs in society (positive entrepreneurship image–PEI) was assessed based on the self-assessment of two positive statements: “Entrepreneurs are job creators”; “Entrepreneurs create new products and services and benefit us all” (according to [70]) on a Likert scale that ranged from 1 = totally disagree to 4 = totally agree.

In terms of gender differences, there are studies [23,26] which showed that men have a stronger preference for self-employment than women. Moreover, statistical data report that women are less likely to be involved in entrepreneurial activity than men [1,6]. Block et al. [73] showed that the higher the level of education, the more likely the possibility of starting a business. There are significant differences in EI according to field of study [4,26,53], EI being higher among business students than among other students (engineering sciences and social sciences students). On the contrary, other empirical research [9] proved that science students have higher EI than students from other majors based on a higher risk-taking propensity, which was explained by the advantage created by their technical skills generating a higher sense of self-efficacy. As regards students’ participation in EE, the EU report [71], based on a large sample of 2582 students from different European higher education institutions, found that entrepreneurship alumni had a higher preference for being self-employed than those who did not participate in EE. Moreover, we used the image of entrepreneurs in society as a control variable, taking into account that the favourable cultural attitudes of society towards entrepreneurship may also influence entrepreneurial intentions [6,25].

3.3. Methods for Data Analysis

From a methodological point of view, we used descriptive statistics, correlations, and a hierarchical analysis of multiple regression.

To find out if there were or were not significant differences between students in relation to the EI, t-test statistics (independent samples t-test for equality of means) were used. The intensity of the relationship between variables was analysed based on Pearson correlation coefficient (r).

To identify the functional relationship between the independent variable (EI) and the dependent and control variables, we used hierarchical multiple linear regression analysis ($Y = \alpha + \beta_1 \times X_1 + \beta_2 \times X_2 + \dots + \beta_n \times X_n + \varepsilon$; Y —dependent variable, X —explanatory variables, α and β —regression coefficients, and ε —residual error). The regression coefficients were estimated based on the least-squares method [74]. We chose to use the hierarchical multiple linear regression analysis in this research, taking into account that, in recent years, this statistical analysis method was widely applied to empirical research [12,14,23,48] in order to analyse the influence of various factors (such as perceived family support, perceived educational support, entrepreneurial self-efficacy, EE, risk propensity, etc.) on entrepreneurial intentions. The hierarchical multiple regression analysis was conducted in three steps. Firstly, the control variables were regressed on student entrepreneurial intention (Model 1). Secondly, the direct effects of EFB, EEE, and EPT were added to regression (Models 2–5). Finally, we added the interaction effect between EFB and EEE to investigate the moderator effect of EFB on the EEE–EI link (Models 6–7). Significant interaction was probed with the simple effects approach [75], and was plotted by using a moderator variable (EFB) and one standard deviation above and one below the mean of the predictor (EEE). Fisher Snedecor (F) statistics was used to assess the validity of the models. For checking if the results were affected by multicollinearity, the variance inflation factors (VIFs) were tested. To avoid multicollinearity, according to Aiken and West [72], all independent variables were centred (the mean subtracted). We also examined multicollinearity by calculating the variance inflation factor (VIF) for the explanatory variables in multiple regressions. According to Hair et al. [76], there is a high multicollinearity if the VIF has a value which is higher than 10. The data were analysed with SPSS 18.0.

4. Results and Discussions

Our results showed a high level of student EI (60.5% of students intended to become entrepreneurs or self-employed). For Romania, this finding was in line with [6], according to which, on average, two-thirds of the adult population in the efficiency-driven economies (including Romania) consider starting a business a good career choice. This unexpected high level of student EI showed the desire for self-employment more than the feasibility of self-employment. Thus, according to the most recent EC Report [77], there is significant difference between the desire for and the feasibility of self-employment among Romanian young respondents (58% against 31%, respectively). Also, statistical data [1] show that in Romania in 2018, young self-employment accounted for only 11.4% of the employed persons aged between 20 and 24, and 10.08% of the employed persons aged between 25 and 29. There were large gaps in self-employment in the 25–29 age group among EU countries. Thus, developed countries like Germany (3.42%), Ireland (3.92%), Sweden (3.96%), and Ireland (3.96%) had the lowest values, while some CEE countries (Slovakia—11%; Czechia—10.9%; Poland—10.8%), as well as Italy (14.6%) and Greece (14.06%), showed the highest percentages of young self-employed among employed persons. These data should be viewed in a national context, taking into account the socioeconomic situation of each country, the size of the public and private sectors, the type of self-employment, etc. For example, in the case of Romania, the higher value of young self-employed (10.08%) can be partially explained by a high propensity for necessity-driven entrepreneurship [78], as young people choose self-employment out of necessity in the absence of other employment opportunities. In addition, Romania still has a high share of the self-employed population in agriculture, and this economic aspect is not at all in favour of a predominantly productive entrepreneurship [78].

For the analysed variables, the Pearson (r) correlations shown in Table 2 reflected low values, even if they were significant. The correlation results indicated that EI is positively low correlated with the field of study ($r = 0.096$), EFB ($r = 0.145$), EEE ($r = 0.142$), and EPT ($r = 0.201$), and is negatively correlated with the level of study. EFB is negatively correlated with PEE ($r = -0.099$) and EEE ($r = -0.115$).

Table 2. Correlations¹ matrix of dependent variables and independent variables (n = 617).

Variables	1	2	3	4	5	6	7	8	9
1. EI	1.00	0.016	0.096 *	−0.091 *	0.029	−0.017	0.145 **	0.142 **	0.201 **
2. PEE		1.00	0.288 **	−0.089 *	0.083 *	0.076	−0.099 *	0.311 **	0.079
3. Field of study			1.00	−0.106 **	0.094 *	0.056	−0.069	0.443 **	−0.009
4. Level of study				1.00	−0.003	−0.109 **	−0.048	0.072	0.016
5. PEI					1.00	0.023	0.007	0.145 **	0.064
6. Gender						1.00	−0.019	0.035	−0.099 *
7. EFB							1.00	−0.115 **	0.041
8. EEE								1.00	0.230 **
9. EPT									1.00

Note: ¹ Pearson correlations (r); * $p < 0.05$ (2-tailed); ** $p < 0.01$ (2-tailed); EI = Entrepreneurial intention; PEE = Participation in EE; PEI = Positive entrepreneurship image; EEE = Effectiveness of EE; EFB = Entrepreneurial family background; EPT = Entrepreneurial personality trait.

A positive correlation ($r = 0.311$, $p < 0.01$) was identified between effectiveness of EE (with an average score of 2.725) and participation in EE, which emphasizes that the students who participate in EE access a higher level of the effectiveness of EE and vice versa. Also, EEE was positively associated with the field of study (economics vs. non-economics students) and students' positive perceptions of the image of entrepreneurs in society (the average score of PEI is 3.2), which suggests that students who have a high positive entrepreneurship image and are economics students report a high effectiveness of EE.

Our results showed that 74.7% of students appreciated that there were courses in the curricula that might be considered forms of entrepreneurship education. This very high percentage was surprising, taking into account that only 46.5% of respondents were economics students whose curricula contained entrepreneurship courses or entrepreneurship-related courses. However, this can be explained by the existence of economics or management courses in the curriculum of non-economics university students that might develop some entrepreneurship skills. Although, entrepreneurship education should not be confused with general business and economic studies [79]. We have to mention that in Romania, "Entrepreneurship education" is included in the high school curricula as elective courses in the second or third year of study, no matter the high school profile, and the subjects probably considered those hours as an equivalent of entrepreneurship education.

All significant correlations between the independent variables were modest and ranged from 0.115 to 0.443, showing a low probability that multicollinearity would affect the regression analysis.

Table 3 summarizes the results of the independent t-tests of the samples, from which it appeared that there was a positive difference in EI between students with an EFB and students without an EFB ($t(615) = -3.864$; $p = 0.000$). This implies that the inclination to choose an entrepreneurial career by students whose parents are self-employed is greater than among students whose parents are employees or other categories (73.6% against 57.6%). These results confirm hypothesis H1a.

Table 3. Results of independent samples t-test: EFB group vs. non-EFB group.

Variables	Mean		Levene's Test ¹		t-Test ²	
	Non-EFB (N = 507)	EFB (N = 110)	F	Sig.	t	Sig. ³
EI	0.576	0.736	4.716	0.030	−3.864	0.000
EEE	2.763	2.550	0.176	0.675	2.859	0.004
EPT	3.317	3.367	0.003	0.958	−1.012	0.312

Note: ¹ Levene's test for equality of variances delivered a significance value higher than 0.05 for all the variables except EI, for which the "equal variances not assumed" option was used; $df = 615$; ² t-test for equality of means; ³ 2-tailed; EI—entrepreneurial intention; EEE—effectiveness of EE; EPT—entrepreneurial personality trait.

Additionally, results pointed out that EEE differed significantly according to EFB ($t(615) = 2.859$; $p = 0.004$), which means that students with an EFB have a lower EEE score than students who do not

have prior entrepreneurial family exposure (2.55 against 2.76). Thus, students who have entrepreneurial experience in the family context (EFB) consider that they already have entrepreneurial competences acquired from home and, therefore, EE in university and in high school is less effective. It means that the education offered by the education system helps them less to develop their sense of initiative, better understand the role of entrepreneurs in society, gain the necessary skills and knowledge to run a business, or arouse their interest in becoming an entrepreneur.

Regarding EPTs of students (with an average score of 3.326), no significant differences were identified between the two groups of subjects ($t(615) = -1.012; p = 0.312$).

Results obtained from the hierarchical regression analysis are presented in Table 4. In the first step, the control variables PEE, field of study, level of study, students' positive perception of the image of entrepreneurs in society (PEI), and gender were entered into the prediction model and two of them emerged as significant predictors. This baseline control variable model (Model 1) was significant at the 0.1 level ($F(5, 611) = 2.18, p < 0.1$). The level of study (high school vs. university) and field of study (economics vs. non-economics) significantly influenced students' EI. Therefore, those students from the field of economics ($\beta = 0.091, p < 0.05$) and at high school level ($\beta = -0.087, p < 0.05$) reported a higher EI. Our results do not support research findings [73], which indicated a positive link between level of education and the possibility of starting a business. However, there is an inconsistency regarding this link. For instance, another research finding [80] showed, for a Romanian sample, that the level of education does not influence significantly the perceived desirability of self-employment.

Table 4. Results of hierarchical multiple regression analysis for students' entrepreneurial intentions.

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 ¹	Model 7 ¹
	Controls	Direct Effects			Interaction Effects		
PEE ^a	-0.018	-0.004	-0.036	-0.023	-0.043	-0.037	
Field of study ^a	0.091 *	0.099 *	0.036	0.105 *	0.061	0.035	
Level of study ^a	-0.087 *	-0.077 +	-0.098 *	-0.080 *	-0.094 *	-0.098 *	
PEI ^a	0.022	0.019	0.004	0.007	-0.002	0.007	
Gender ^a	-0.030	-0.028	-0.029	-0.007	-0.011	-0.029	
EFB ^a		0.147 **	0.157 **	0.138 **	0.146 **	0.151 **	0.158 **
EEE ^a			0.163 **		0.113 *	0.164 **	0.162 **
EPT ^a				0.198 **	0.173 **		
EEE*EFB ^a						-0.031	-0.041 +
Intercept	0.587	0.546	0.375	-0.010	-0.059	0.663	0.603
R ²	0.018	0.039	0.058	0.077	0.086	0.059	0.047
Adjusted R ²	0.009	0.029	0.047	0.066	0.074	0.047	0.043
R ² Change	0.018	0.021	0.020	0.038	0.027	0.001	
Sig. F Change	0.055 +	0.000	0.000	0.000	0.000	0.438	
F value	2.180	4.096	5.381	7.248	7.120	4.781	10.144

Note: Dependent Variable: EI; ^a Standardized β -regression coefficients; + $p < 0.10$; * $p < 0.05$; ** $p < 0.001$;
¹ Moderator: EFB.

We found that gender and the students' positive perception of image entrepreneurship in society had no significant effect on EI. Thus, our sample could not confirm the widespread belief that men have a higher propensity for an entrepreneurial career than women, but it confirmed the results of other studies [7].

Based on this model (Model 1), we added step by step independent variables for testing hypotheses H1b–H3: EFB (Model 2), EEE (Model 3), EPT (Model 4) and all three together (Model 5). As compared with the base model, R² improved to 3.9% (Model 2), 5.8% (Model 3), 7.7% (Model 4), and 8.6% (Model 5). These models were significant at the 0.01 level. Also, VIF scores (values ranged between 1.03 and 1.45) suggested that these models were not distorted by multicollinearity. As for the control variables, the level of study exhibited a negative relation to EI in the case of Models 2–5, while the field of study revealed a positive effect on EI, but only in the case of Model 2 and Model 4. For the other control variables, an insignificant effect was found in all models.

Table 4 shows that Model 2 was statistically significant ($F(6, 610) = 4.096, p < 0.01$), representing 3.9% of the EI variation ($R^2 = 0.039$, adjusted $R^2 = 0.029$), the change of R^2 was 0.021. By analysing beta (β) weights, it was found that EFB had a positive influence on EI ($\beta = 0.147, p < 0.001$). Therefore, H1b is supported. These aspects noted by us are consistent with the results of other studies [12,21,24], which revealed a positive direct influence of the entrepreneurial parental role model on the EI of the students. For instance, according to Carr and Sequeira [11], from an intergenerational point of view, children's experiences within business families have a great influence on entrepreneurial intention. This experience is an essential element in meeting informational and behavioural requirements as skills necessary for independent activities, regardless of whether this exposure happens within the family's existing business or not.

The results of Model 3 indicated that a higher level of EEE is predicted to be positively associated with a higher likelihood that the young people will choose an entrepreneurial career ($\beta = 0.163, p < 0.001$). Thus, hypothesis H2 is supported, confirmed by [11,23,53,81], which highlights the positive and direct effect of effectiveness of EE, as formal education, on students' entrepreneurial intentions.

In Model 4, EPT was identified as a significant determinant of EI ($\beta = 0.163, p < 0.001$). In the case of Model 5, all three independent variables, which were added at the same time, were statistically significant ($p < 0.01$), having a positive influence on EI. EPT received the strongest weight in the model ($\beta = 0.173, p < 0.01$), followed by EFB ($\beta = 0.146, p < 0.01$), and EEE ($\beta = 0.113, p < 0.05$), implying that EPT has a greater impact on EI. Thus, hypothesis H3 is confirmed and supported by the findings of other authors [47,64,65,80], hence entrepreneurial personality traits such as innovativeness, risk-taking propensity, sense of self-confidence, optimism, and competitiveness positively influence entrepreneurial career intentions.

We continued adding the interaction effect between EFB and EEE to verify hypothesis H4. (Model 6). This model did not improve significantly in comparison with the direct effect model (Model 3) according to its R^2 of 5.9% (Model 6: R^2 change = 0.001, $p = 0.438$), indicating that the interaction variable explained only a very small percentage of EI variation. The moderator variables EFB ($\beta = 0.151, p < 0.01$) and EEE ($\beta = 0.164, p < 0.01$) were significantly positively associated with the EI, as can be seen in Table 4 (Model 6). Also, we found an insignificant negative interaction effect between EFB and EEE ($\beta = -0.031, p = 0.438$, Model 6). Taking these results into account, in order to better identify the interaction effect between EFB and EEE on EI, the impact of the EFB moderator on the EEE–EI relationship was retested by adding the interaction term between EEE and EFB in the model without the control variables (Model 7). Model 7 was statistically significant ($F(3613) = 10.144, p < 0.001$) and accounted for over 4% of the variance of EI ($R^2 = 0.047$, Adjusted $R^2 = 0.043$). EEE received the strongest weight in the model ($\beta = 0.162, p < 0.01$), followed by EFB ($\beta = 0.158, p < 0.01$), which suggests that EEE influences EI positively and its influence is stronger than the EFB of students. In this model, the interaction effect between EFB and EEE was significantly negative, but marginal ($\beta = -0.041, p < 0.10$, Model 7). Moreover, based on the unstandardized coefficients of the regression model (Model 7), according to Preacher et al. [75], the moderating effect of EFB on the EEE–EI relationship is plotted in Figure 2. EI is on the y-axis of the dependent variable and EEE is plotted on the x-axis of the independent variable, representing low EEE (one standard deviation below mean) vs. high EEE (one standard deviation above mean).

In Figure 2, we can see that the link between EEE and EI was more pronounced for students who had no previous family entrepreneurial exposure than for students who had prior family entrepreneurial exposure, supporting hypothesis H4. Thus, the intensity of the impact of EEE on EI depends on the students' EFB being stronger for students without prior entrepreneurial family exposure. These results are in line with previous studies [24,51] that suggested that individuals coming from entrepreneurial families are already exposed to informal entrepreneurship learning (learning by doing and learning by example or modeling), providing an important opportunity for the acquisition of human capital related to running a successful business. As Carr and Sequeira [11] (p. 67) pointed out, family business can be seen as a "business incubator for future business".

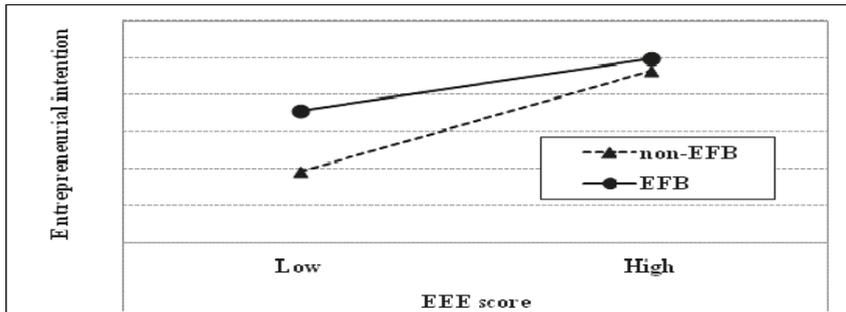


Figure 2. Interaction between EFB and EEE (Model 7).

Our study revealed other challenges faced by Romanian young people who aim to become entrepreneurs. Some of the most important are the lack of financial resources and the unfavourable business conditions in Romania. Thus, our results pointed out that the first reason why Romanian students do not want to become entrepreneurs is the lack of financial resources, whereas the second reason is the unfavourable business conditions in Romania. These results are in line with data provided by World Bank's Doing Business 2020 report [82], which showed that according to the Ease of doing business ranking, Romania ranked 55th out of 190 countries, after other CEE countries such as Poland (40th), Czechia (41st), Slovakia (45th), and Hungary (52nd). The place occupied by Romania is an argument that, in this country, the institutional environment represents a significant barrier to entrepreneurship.

Although students gave EEE a high score (2.73 out of 4), the lack of entrepreneurship knowledge was reported as the third reason why they do not want to become entrepreneurs. These results highlighted, once again, the need to increase the impact of primary, secondary, and tertiary education on entrepreneurship. Consequently, a strategic approach is highly needed, at both national and European levels. We emphasize that Romania is included among those EU countries that do not have a specific EE national strategy, although it has a broader strategy related to EE, especially economic development strategy [83].

5. Conclusions and Main Implications

In the current economic and social environment, the acquisition and development of the relevant skills in entrepreneurship is a real challenge for youth. These skills can offer them the path to an entrepreneurial career as a viable and sustainable alternative for them to successfully integrate into the labour market. In this context, the paper highlights the influence of the main social factors on entrepreneurial career intention by focusing on the impact of the EFB of students, aiming to improve their entrepreneurial intentions and to consider entrepreneurship as a desirable employment choice.

Following the completion of an exploratory research, which used a sample of 617 final year undergraduate Romanian students, the results highlight, on the one hand, a high level of Romanian students' entrepreneurial intentions, and, on the other hand, significant differences between the desire for and feasibility of self-employment, accompanied by a low number of young people actually being self-employed. Consequently, more attention needs to be paid in order to "improve the entrepreneurship key competence so that the desire for an entrepreneurial career turns into a real career choice" [4] (p. 320). Moreover, the research findings support the hypothesis that the students who have an entrepreneurial family background benefit from this informal education and exhibit a higher entrepreneurial intention than students without such a background.

Surprisingly, the effect of the level of study (high school vs. university) on EI is negative, university students having lower EI than high school students. These results can be explained, according to Oosterbeek et al. [57], by the fact that university education provides students with a more realistic

perspective on the feasibility of entrepreneurship, creating an awareness of the risks associated with an entrepreneurial career path. Moreover, the research results prove that economics students have a higher propensity for an entrepreneurial career than non-economics students. This fact shows that entrepreneurship education, especially in the non-economic field, is necessary and must be ensured in order to meet the specific needs of students and thus improve the integration of young people into the labour market.

The hierarchical multiple regression analysis results show that students' entrepreneurial intentions are directly and positively influenced by EFB and EEE. These findings point out that the informal and formal education received by the students from their entrepreneur parents and from school improved their entrepreneurship key competence and enhanced entrepreneurial career intentions. The research results also prove that entrepreneurial personality traits positively influence the entrepreneurial intentions of students, highlighting the fact that high levels of innovativeness, risk-taking propensity, sense of self-confidence, optimism, and competitiveness increase the likelihood that young people will choose an entrepreneurial career.

By corroborating informal and formal education, our results, based on the moderator effect, show that the influence of EEE on students' entrepreneurial intentions is marginally negatively affected by the EFB. Thus, for our sample the greater the prior entrepreneurial family exposure, the lower the impact of the EEE on students' EI. Therefore, in order to foster and nurture entrepreneurial intentions among students with an EFB for a higher level of effectiveness of EE, education institutions, especially those with a large proportion of students with an entrepreneurial family background, should include special courses promoting the interests of students in their family business and not only in the curricula.

We consider that both formal and informal entrepreneurship education must act together, complementing each other, in order to increase the propensity of young people for choosing an entrepreneurial career, taking into account that "Europe needs more entrepreneurs" [3], including Romania, which, as an EU member state, must generate inclusive economic growth and more and better jobs.

The students pointed out some unfavourable barriers to starting a business in Romania, such as the lack of financial resources and the rather difficult access to them, an institutional framework that requires a lot of bureaucracy, and even insufficient knowledge in the entrepreneurial field. These barriers have negative consequences for young people's desires to start a business.

Therefore, in order to turn entrepreneurial intentions into a real motivation to start a business and become an entrepreneur, there are at least three issues that policy makers need to address for their practical implications. First, an improvement in the "Ease of Doing Business" context regarding the resources (such as easier access to credit, lower minimum capital to start a business) is needed. Second, at the level of bureaucracy, a shorter time for registering a firm, simpler procedures, and an online system for filing and paying taxes are necessary [82]. Finally, at the educational level, a specific EE national strategy must be developed.

The findings from our research have implications for those who pursue actual or potential entrepreneurship, the teaching staff who teach entrepreneurship, and the decision makers responsible for improving and sustaining entrepreneurship.

We recognize as a limitation of this study the fact that it focuses on intentionality, expressing an intention to pursue an entrepreneurial career, and not on the actual behaviour of entrepreneurs. Taking into account that intentions may not turn into actual behaviour in the future, even if some respondents expressed a high entrepreneurial intention in the survey, their career paths in the future can be completely different. Therefore, future longitudinal studies would be appropriate to find out to what extent the intentions of students with prior exposure to formal and informal education actually evolve into action. Another limitation is the fact that our findings represent only a partial picture of the issues related to the influence of an EFB on students' entrepreneurial intentions. In this context, further research should focus on a deeper analysis of the impact of an EFB on EI in order to find out

if the EI is due to the transfer of human capital (entrepreneurial skills) and/or financial and/or social capital from self-employed parents to their children. Moreover, an interesting aspect to be further explored is to what extent parental economic success can influence the choice of an entrepreneurial career by young people.

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Article

Entrepreneurship and Innovation in Soccer: Web of Science Bibliometric Analysis

Paloma Escamilla-Fajardo ¹, Juan Manuel Núñez-Pomar ^{1,*}, Vanessa Ratten ² and Josep Crespo ¹

¹ Department of Physical Education and Sport, Faculty of Physical Activity and Sport Sciences, University of Valencia, Gascó Oliag 3, 46010 Valencia, Spain; paloma.escamilla@uv.es (P.E.-F.); josep.crespo@uv.es (J.C.)

² La Trobe Business, La Trobe University, Plenty Rd & Kingsbury Dr, Bundoora VIC, Melbourne 3086, Australia; V.Ratten@latrobe.edu.au

* Correspondence: juan.m.nunez@uv.es

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Abstract: According to the existing literature, there is growing interest in the sports industry by individuals involved in entrepreneurship and innovation. However, no bibliometric analyses on the importance of and interest that these individuals have in the football industry have been conducted. A total of 220 articles and reviews retrieved from Thomson Reuters Web of Science (Core Collection™) between 1997 and 2019 were analysed. These articles were published in 169 different journals by 609 authors from 340 different institutions in 46 countries. The following basic bibliometric analyses and co-occurrence networks were carried out: co-authorship and co-words. As a result, four clusters that summarise the following four different thematic areas were found: (1) football, entrepreneurship and social development, (2) football, innovation and management, (3) football, efficiency and new technology, and (4) football, injuries and innovation in rehabilitation. A thematic analysis of the four clusters found was carried out. Finally, practical implications and future lines of research were presented.

Keywords: soccer; football; innovation; entrepreneurship; bibliometric analysis; performance

1. Introduction

Globalisation, increasing competitiveness and the emergence of new sports disciplines have forced sports organisations to develop innovative ideas [1]. “Innovation represents new ideas and changes to sport organisations, coaching, sports events, performance and new competitive advantages” [1] (p. 292). The sports sector is considered a competitive market [2], so it is necessary to reinvent itself to differentiate itself from other sports providers [3] and achieve social and economic sustainability. The common objective of any type of sports organisation is to attain a market positioning and achieve the sustainability of its organisation. Nowadays, due to the dynamic and competitive market, innovative and proactive strategies are necessary. In this context, innovation is related to the management, production and marketing of products or services [4] and can provide vital solutions on the way to improve performance and sustainability [5]. A sports organisation, by its nature, in addition to being characterised by the pursuit of economic and social performance, needs to achieve sporting performance [6]. By idiosyncrasy, professional and non-professional sports clubs try to carry out strategies that improve their sports performance. In this context, innovation and the implementation of new technologies play an important role in football.

Similarly, in this dynamic environment, entrepreneurship is a vehicle to develop economic efficiency [7] and achieve the necessary economic sustainability [8]. According to Ratten [4] (p. 58), “Entrepreneurship is an integral part of sports management and creates a competitive advantage for people and organisations involved in sport”. Sports entrepreneurship has attracted the attention of

academics and professionals in recent years due to its importance in a strong competition context, however, “is still in its infancy” [9]. Entrepreneurship and innovation play significant roles in sports development [10]. Although innovation is a factor in entrepreneurship, it has been widely considered on an individual level in the field of sport [11–13].

Mediatization and big data have helped to position football as the king of sports. Today, football moves large masses of fans and money, so it is necessary to take an active position from the entrepreneurial perspective in order to not lose the attention of the fans [13]. During the 1980s, business-oriented entrepreneurs appeared in football clubs [14]. It was from there that football went from being a sport discipline to professionalizing organisations through specialised training and skills, complexity and exclusivity [15]. In this context, entrepreneurship and innovation are perfect allies to improve the identity of the sports organisation and the players, in order to maximise the overall performance.

The role of sports has been widely considered from an entrepreneurial perspective [16] due to its growing importance in different spheres of today’s society. However, although soccer is considered one of the most practised and followed sports worldwide [17], it is still in the early stages of its study from an entrepreneurial perspective. Currently, football is the sport with the largest amount of participation, repercussions and income generated worldwide, with influence not only in the sports aspect but also in the social, economic and even cultural aspects. According to Louzada, Moiorano and Ara [18], approximately 270 million people (including officials and referees) are actively involved in football, leading to a stratospheric economic and social impact. However, this popular game seems to have no limit in terms of influence, as one of the main objectives reported by FIFA [19] is that by 2026, more than 60% of the world’s population will participate in the game to some extent.

Due to this degree of importance, football, referred to in this study as either football or soccer, encompasses several independent factors that act in a coordinated manner toward the same outcome. Soccer involves a large number of people and organisations and is considered a highly competitive sector. Hence, innovative strategies and an entrepreneurial attitude are vital to attain a competitive advantage and achieve the sustainability that organisations desire after a crisis like the one that occurred years ago. Nevertheless, football can be approached from two different perspectives: professional football and non-professional football. It is undeniable that sports, in general, have special characteristics. These characteristics, together with new technologies and globalisation, have helped make football a well-known sport worldwide. Because of this popularity, football has traditionally been widely used for different educational and social purposes. These social objectives include the formalisation and development of important social difficulties, such as fights against racism [20] and anti-Semitism [21], facilitation of the process of inclusion of refugees in another country [22] and vulnerable groups of expatriates [23], or the empowerment of the female collective [24]. These objectives are only examples of the social power of this sport worldwide.

On the other hand, professional football involves important leagues, tournaments and events that attract masses of individuals worldwide [25]. A clear example of this type of event is the 2018 FIFA World Cup in Russia, in which more than 3,030,000 tickets were sold and on average, 98% of the seats in the 12 Russian stadiums were filled [26]. It is also important to note the large number of fans who follow football, which is currently a mass phenomenon, even in countries where soccer is not the most popular sport [27]. In addition, the number of fans is continuously increasing, as reflected in the data on the latest football world championships; the number of fans increased from 5.2 million for the 2014 FIFA World Cup in Brazil to a total of 7.7 million for the 2018 FIFA World Cup in Russia [26]. As expected, “professional sport is indeed a hyper-competitive environment, which produces constant pressures on organisations to discover and exploit new opportunities to survive, grow, and win competitions” [28] (p. 70). This competitiveness may be one of the reasons why football must involve constant change and innovation. One of the most recent important technological innovations implemented is the *video assistant referee* (VAR), which uses real-time tracking data to make instant decisions at a later time. This technology was created and implemented to increase

competitiveness in professional competitions. Similarly, electronic performance and tracking systems (EPTS) have been introduced recently.

However, despite the importance of football currently and the important technological innovations and entrepreneurial aspects that must be developed to maintain the current levels of competitiveness and sustainability and interest of the society, there are no studies that have investigated the origin and evolution of innovation and entrepreneurship in football from an academic perspective. Thus, this study has two main objectives: (i) to identify and analyse the evolution of articles related to entrepreneurship and innovation in football and (ii) to study the thematic areas related to the search carried out. To that end, a bibliometric analysis will be conducted. Bibliometrics, as it is now known, originated in the early 20th century. However, although bibliometric studies have evolved, they essentially involve analysing existing bibliographic material [29] and representing it in an explanatory and graphical way. Bibliometric analysis has two important uses: performance analysis of study area and science mapping [30]. In this way, the visions of the most important authors, journals, institutions, countries and publications are represented, taking into account the frequency of appearance and the number of citations received. This method is considered an instrument for priority analysis in different fields of science [31]. However, in order to provide a complementary qualitative perspective, this study will be complemented by a thematic analysis of the four clusters found.

Finally, the structure of the present study after the introduction section is as follows: the data collection and methods (Section 2), results and discussion (Section 3), conclusions, limitations and future lines of research (Section 4), acknowledgements and bibliographical references.

2. Materials and Methods

All data analysed in this article were retrieved on 31 December 2019 from the Thomson Reuters Web of Science database (WoS), specifically from the Web of Science Core Collection™, the main component covering a wide range of high-impact journals and high-quality articles that were previously reviewed by experts in the fields of study [32]. For the search, the terms football*, soccer*, innovate* and entrepreneur* were used in the topic search field, without limitations on the publication year or language of the documents. The previous terms have been used since innovation is the most recognised dimension of entrepreneurship [4], thus thinking that we would include the largest number of interesting documents in the search collection. Terms entered in the topic field are searched in the titles, abstracts, keywords (provided by the authors) and KeyWords Plus® (index terms automatically generated from the titles of articles cited by the Web of Science). Moreover, Boolean operators (AND-OR) were used to optimise the search for related documents.

Therefore, in the search field topic, the following terms were entered [(football* OR soccer*) and (innovate* OR entrepreneur*)]. In the first stage, 435 results met the predetermined search criteria. However, a criterion for the type of document was established. Only articles and reviews were considered in this study; therefore, five book chapters, three early access articles, 90 proceeding papers, six editorial materials, three meeting abstracts and a book review were excluded. Therefore, the total number of articles and reviews included in this study was 345, 323 articles and 22 reviews, which were published between 1993 and 2019.

However, because the word “football” can refer to different sports, the abstracts of the 345 documents were analysed. Afterward, 47 articles and three reviews were excluded because they referred to American football, the National Football League (NFL) and the National Collegiate Athletic Association (NCAA); 20 articles were excluded because they referred to Australian football; two articles were excluded because they referred to Gaelic football, and; 41 articles and 12 reviews that were not related to football (soccer) or innovation and entrepreneurship were excluded. They had only been added by KeyWords Plus, but the terms used for our search did not appear throughout the text or they included the search terms in the abstract, but were not related to the area of study. In the end, a total of 220 related articles and reviews were analysed. For analysis, the data were downloaded in plain text with the complete record and references cited.

To perform a bibliometric analysis, there must be a set of selected nodes and connections [33]. In this case, the nodes were the published articles, authors, citations and keywords, and the relationships between the nodes were the connections. Connections can also occur between words or authors; hence, co-word and co-authorship analyses were performed. The 220 records were downloaded as plain text files for use in HisCite (Software LLC, New York, NY, USA, version 10.12). However, the data were previously reviewed to eliminate duplicate data, review incomplete data, and aggregate the articles with authors, countries, journals, and institutions that referred to the same content but had been reported differently. First, basic bibliometric analyses were carried out to identify the authors, countries, journals and institutions with the largest number of articles and citations. In this study, qualitative indexes were considered: global citation score (GCS) and local citation score (LCS) [34]. GCS includes the number of citations the document has received in the Web of Science Core Collection, and, LCS is related to the number of citations that a document (always included in our search) has been cited by other different documents within the same collection [35].

Second, the co-occurrence networks between the authors and keywords were analysed by a similarity visualisation perspective (VOS) and the algorithm provided by VOSviewer [36]. This software was used to analyse and represent the existing relationships and networks between the authors and keywords.

Figure 1 shows the methodology followed, which involved 5 steps: (step 1) the keywords related to football/soccer, entrepreneurship and innovation were identified. Afterward, the search was defined, (step 2) 435 results were found, and after the analysis, 220 articles were finally included. (step 3) The articles were categorised by year, author, number of citations, journal, country and institution. (step 4) The co-authorship, co-citation and co-word maps were created. (step 5) The content on the networks was analysed, and the results were obtained.

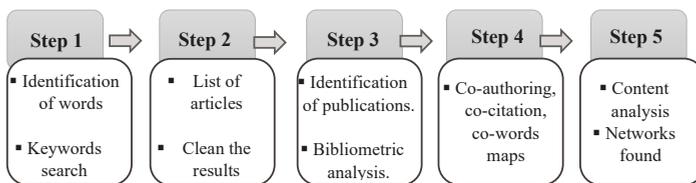


Figure 1. The bibliometric analysis process.

3. Results and Discussion

In the present study, after the data retrieved were organised, a total of 220 articles published in 169 different journals between 1997 and 2019 were analysed. Considering the results and as shown in Figure 2, an increasing trend can be observed from 2015 to the present; 65.45% ($n = 144$) of the total articles were published in the last five years (2015–2019). In fact, from 1997 to 2010, only 35 articles (15.90%) had been published, but since then, an increasing trend in the number of publications has been observed (Figure 2). However, the number of articles is extremely low (average of 10 articles published per year since 1997), so it can be considered a “niche” study area [37]. The change in the number of articles took place in 2011, with an increase from four articles in 2010 to 13 articles in 2011. This increase may be due to the impact of the global economic crisis that forced academics and professionals to analyse innovative strategies and develop entrepreneurial attitudes to maintain the sustainability of their organisations.

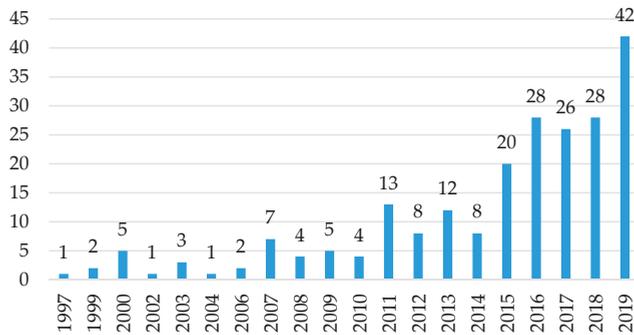


Figure 2. Number of articles published per year (1997–2019).

The results suggest that football is a subject that has aroused the interest of academics and professionals in recent years, although it is not possible to state unequivocally whether this trend will continue in the coming years. However, according to Price’s law [38], the process of research involves four phases: (i) pioneers begin to publish on a field of research, (ii) there is exponential growth since many academics are attracted to the subject of study, (iii) there is a consolidation of knowledge and research related to the subject, and (iv) there is a decrease in the number of publications. Considering the above process, it can be considered that football is currently at a point of interest for academics and professionals, so the number of related publications is constantly growing compared to previous years. The data obtained confirm that the growing interest over recent years towards entrepreneurship and innovation in the sports industry [16] is also reflected in one of the most important sports in the world, football/soccer [17,28].

3.1. Analysis of the Authors by the Number of Publications and Number of Citations

Considering the 220 articles analysed in this study, there were a total of 609 authors from 46 countries who belonged to 340 different institutions. Table 1 shows the authors with the highest number of published articles on entrepreneurship and innovation in football/soccer. The order followed in Table 1 was (i) the highest number of publications to identify the productivity of the author in the analysed field of study and (ii) the highest number of citations, which is frequently used to analyse the impact of the papers [39] and the researchers.

Table 1. Authors with the highest number of publications in the search (≥2).

Author	Affiliation	No.	LCS	GCS	GCS/No.
Esson, J	Loughborough University (UK)	3	6	54	18
Lemmink, K	University of Groningen (Netherlands)	2	1	160	80
Jones, GA	Digital Imaging Research Centre (UK)	2	1	55	27.50
Orwell, J	Digital Imaging Research Centre (UK)	2	1	55	27.50
Ren, J	Northwestern Polytechnic University (China)	2	1	55	27.50
Xu, M	Xi’an Jiaotong Liverpool University (China)	2	1	55	27.50

No.: number of articles; LCS: local citations score; GCS: global citations score.

Therefore, the most important author was identified to be James Esson, who has three articles and a total of 54 citations in WoS (GCS). This author has published only these three articles, which are related to a common theme: the influence of football on the development and migration of the Ghanaian population. Second, Koen Lemmink has published two articles with a total of 160 citations in WoS. This author analysed the tactical performance of football teams using positioning data. Finally, Graeme A. Jones has published two articles in the same field of study as the last author. However,

despite the fact that some authors are more productive than others, there is no clear “reference author(s)”, so it can be considered a fragmented area of study.

However, the most important authors considering the number of citations are shown in Table 2 and partially coincide with the authors with the highest number of publications related to entrepreneurship and innovation in football. The most cited authors are Benoît Demil and Xavier Lecocq [40], for their article “*Business Model Evolution: In Search of Dynamic Consistency*”, which presents an innovative business model and its evolution based on the Arsenal FC. The authors shown in Table 2 were determined to be the most relevant authors in the search carried out because they have a large number of citations [40]; however, Peters, Kraker, Lex, Gumpenberger and Gorraiz [41] stated that much of the information collected in the existing literature is not cited in a rigorous manner.

Table 2. Authors with the highest number of citations (≥ 156).

Author	Affiliation	No.	LCS	GCS	GCS/No.
Lecocq, X	University of Lille (France)	1	0	430	430
Demil, B	University of Lille (France)	1	0	430	430
Lemmink, K	University of Groningen (Netherlands)	2	2	160	80
Pongsakornrungrungsilp, S	Walailak University	1	0	120	120
Schroeder, J.E.	Rochester Institute of Technology (USA)	1	0	120	120

No.: number of articles; LCS: local citations score; GCS: global citations score.

Taking into account the countries of authors, the UK is the country with the highest number of articles published ($n = 50$), with 521 GCS, followed by the USA (39) with 486 GCS, and Germany (23) with 226 citations. A total of 50.90% ($n = 112$) of the articles analysed in this paper were published in the UK, USA and Germany (Table 3). This result is understandable because the most important football leagues are located in the most productive countries in terms of the number of publications: UK (English Premier League), USA (Major League Soccer), Germany (Bundesliga), Italy (Serie A) and Spain (LaLiga).

Table 3. Primary countries in which the authors conducted research (≥ 8).

Country	No. Art	LCS	GCS	GCS/No.	%
UK	50	11	521	10.42	22.62
USA	39	2	486	12.46	17.65
Germany	23	0	226	9.83	10.41
Italy	20	0	98	4.90	9.05
Australia	15	3	110	7.33	6.79
Spain	13	1	17	1.31	5.88
China Republic	12	1	88	7.33	5.43
Switzerland	10	0	57	5.70	4.52
Portugal	10	1	93	9.30	4.52
France	10	1	481	48.10	4.52

No.: number of articles; LCS: local citations score; GCS: global citations score.

Of the 220 articles, 87.27% (192) were written in English, eight were in Spanish (3.64%), and five were in Russian (2.27%). This result is consistent with the results obtained in previous studies, as English is known to be the most frequently used language in WoS academic publications.

3.2. Analysis of the Main Journals and Publications

The journals that have published the most articles on entrepreneurship and innovation in football/soccer include “*Sport, Business and Management: An International Journal (SBM)*”, with six articles, “*European Sport Management Quarterly*”, with five articles, and “*International Journal of the History of Sport*”, with five articles. However, when we took into account the total number of citations received,

the most important journal was found to be “*British Journal of Sports Medicine*”, with 111 citations in WoS and four articles published (Table 4).

Table 4. Main journals (≥ 3 articles).

Journal	No.	LCS	GCS	SJR	HI
<i>Sport, Business and Management: an International Journal (SBM)</i>	6	1	17	0.28	12
<i>European Sport Management Quarterly</i>	5	0	45	1.28	24
<i>International Journal of the History of Sport</i>	5	1	3	0.35	17
<i>British Journal of Sports Medicine</i>	4	0	111	4.14	141
<i>International Journal of Sport Policy and Politics</i>	3	1	8	0.76	22
<i>Journal of Organizational Change Management</i>	3	1	38	0.60	62
<i>Managing Sport and Leisure</i>	3	0	8	0.29	29
<i>Sustainability</i>	3	0	5	0.55	53
<i>PLoS ONE</i>	3	0	7	1.1	268

No.: number of articles; LCS: local citations score; GCS: global citations score; SJR: Scimago Journal Rank; HI: h-index.

However, when we considered the number of citations received in the publications analysed in this study, we found that “*Long Range Planning*” had 430 citations in WoS (GCS) for a published article, “*Organisation Studies*” had 156 citations GCS for a published article, and “*Marketing Theory*” had 120 citations for a published article (Table 5).

Table 5. Most cited journals (≥ 107 citations).

Journal	No.	LCS	GCS	IF *	HI *
<i>Long Range Planning</i>	1	0	430	2.04	89
<i>Organization Studies</i>	1	0	156	2.36	130
<i>Marketing Theory</i>	1	0	120	1.52	55
<i>British Journal of Sports Medicine</i>	4	0	111	4.14	141
<i>European Journal of Sport Science</i>	1	1	107	1.17	41

¹ No.: number of articles; LCS: local citations score; GCS: global citations score; IF: impact factor; HI: h-index;

* = extracted from Scimago Journal Rank (SJR).

Table 6 shows the papers in our search collection that receive the most citations in WoS (GCS). The most cited article to date was that published by Demil and Lecocq [40], which analysed a business model that valued sustainability and interactions between the activity components of an English football club (Arsenal FC); it had received a total of 430 citations in WoS by the day the search was performed. The second highest-ranked article in terms of the number of citations was published by Pongsakornrungrasit and Schroeder [42], which received 120 citations; in that study, the authors studied the role of online football fans and related communities in co-creating value. Finally, the third highest-ranked article is published by Frencken et al. [43] which analysed the position of the players on the field and predicted their performance.

On the other hand, the number of articles that have been cited within the documents included in the search carried out is 9091, that is, an average of 41.32 references were included in each article analysed in the present study. The most-referenced article in our search collection was the book published by Yin [44], with a frequency of 8, the second most-referenced was the article published by Harvey [45], with a frequency of 7, and the third most-referenced was the one published by Ratten [4], which provides novel information on the theory of sports entrepreneurship in sport management (Table 7).

Table 6. Most cited articles by external papers (≥ 35 citations).

Article	Year	Authors	Journal	LCS	GCS
Business Model Evolution: In Search of Dynamic Consistency	2010	Demil, B. Lecocq, X.	<i>Long Range Planning</i>	0	430
Understanding value co-creation in a co-consuming brand community	2011	Pongsakornrungsilp, S. Schroeder, J.E.	<i>Marketing Theory</i>	0	120
Oscillations of centroid position and surface area of soccer teams in small-sided games	2011	Frencken, W. Lemmink, K. Delleman, N. Visscher, C.	<i>European Journal of Sport Science</i>	1	107
Current Approaches to Tactical Performance Analyses in Soccer Using Position Data	2017	Memmert, D. Lemmink, K. Sampaio, J.	<i>Sports Medicine</i>	1	53
A body and a dream at a vital juncture: Ghanaian youth, uncertainty and the allure of football	2011	Esson, J.	<i>Geoforum</i>	3	35

LCS: local citations score; GCS: global citations score.

Table 7. Most referenced articles in our search collection (≥ 5).

Article	Year	Authors	Journal	f	ΣC
Case study research: Design and methods	2003	Yin, R.	Book	8	568
The roots of geographical change: 1973 to the present	1989	Harvey, D.	<i>Geografiska Annaler: Series B, Human Geography</i>	7	7
Sport-based entrepreneurship: towards a new theory of entrepreneurship and sport management	2011	Ratten, V.	<i>International Entrepreneurship and Management Journal</i>	6	205
Supporters, followers, fans, and flaneurs: A taxonomy of spectator identities in football	2002	Giulianotti, R.	<i>Journal of Sport & Social Issues</i>	6	825
Building theories from case study research	1989	Eisenhardt, K.M.	<i>Academy of Management Review</i>	5	55.121
Football Academies and the Migration of African Football Labor to Europe	2007	Darby, P. Akindes, G. Kirwin, M.	<i>Journal of Sport and Social Issues</i>	5	219
The English football industry: profit, performance and industrial structure	1997	Szymanski, S. Smith, R.	<i>International Review of Applied Economics</i>	5	350

f: frequency, ΣC : citations in Google Scholar.

3.3. Co-Occurrence Analysis

Co-occurrence analyses provide information about the relationship or interaction between two nodes. Each node can be a publication, an author or a keyword. In this study, co-authorship and co-words were analysed.

3.3.1. Co-Authorship Analysis

A large number of co-authored publications indicate a close relationship between authors within the same field of study, which may encourage collaboration in future research [46]. However, in the present study, the average number of authors for each publication analysed was 2.77 (609/220). It can be concluded that there is collaborative research in entrepreneurship and innovation in football, but the level of collaboration is not extensive, as shown in Figure 3.

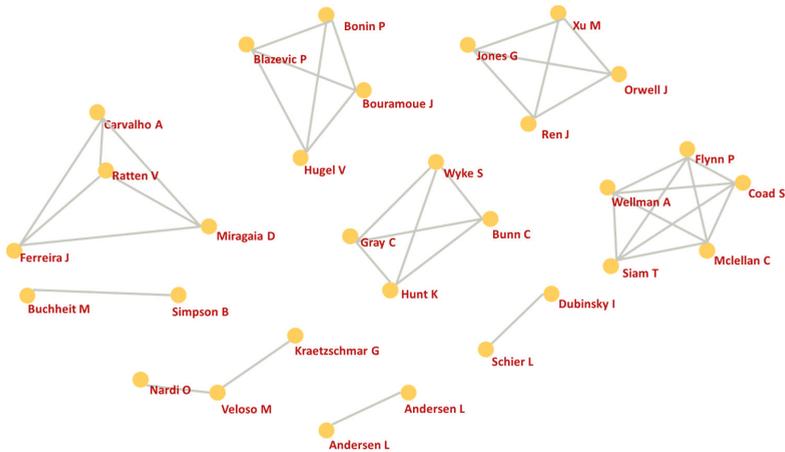


Figure 3. Co-authorship networks (≥ 2).

The minimum criterion established for representation is two co-authors. The five largest networks of co-authors included (i) Jones, G., Ren, J., Xu, M. and Orwell, J., who published articles related to the thematic area “performance and efficiency”, and (ii) Bouramoue, J., Bonnin, P., Hugel, V. and Blazevic, P., who also published articles in the thematic area “performance and efficiency”. The following network of co-authors, including (iii) Carvalho, A., Ratten, V., Miragaia, D. and Ferreira, J., published in the thematic area “innovation and management”. (iv) Flynn, P., Wellman, A., Slam, T. and Mclellan, C. published articles in the thematic area “performance and efficiency”, (v) another network of co-authorship with Wyke, S., Gray, C., Hunt, K. and Bunn, C. of whom published in the area of “performance and efficiency”, (vi) there was a network between Dubinsky, I. and Schler, L., who published in the thematic area “entrepreneurship and migration policy”, (vii) another network between Simpson, B. and Buchheit, M. published articles in the thematic area “performance and efficiency”, (viii) Veloso, M., who has a network of co-authorship with Nardi, D. and (v) another network of co-authorship with Kraetzschmar, G., both of whom published in the area of “performance and efficiency”, (ix) Dubinsky, I. and Schier, L. published in the thematic area “entrepreneurship and migration policy”, and finally, (x) Andersen L. and Andersen, L. published articles related to “injuries and rehabilitation”

3.3.2. Co-Word Analysis

Keywords have a fundamental role in the field of research since they can be a tool by which the evolution of a specific area of knowledge can be identified [47]. In the present study, a total of 1.092 keywords (keywords set by the authors and the keywords set by ISI WoS) were identified, of which 73.08% (798) were repeated only once, while only 292 (26.92%) co-occurred, i.e., they appeared more than once. Co-word analysis is “a content analysis technique that uses the words in documents to establish relationships and build a conceptual structure of the domain” [33] and it means that the concepts are closely related. Figure 4 reflects the main co-occurrence relationships present in the analysed articles.

In Table 8, the most cited keywords are listed; the most cited keyword was football/soccer (GCS = 756), followed by business (GCS = 461), evolution (GCS = 440) and consistency (GCS = 430) (Table 8). The criteria to select the keywords in Table 8 was, a frequency of appearance in the search collection equal or superior to 10 times for the most frequent keywords, and global citations in WoS (GCS) equal or superior to 140 citations for most cited keywords. The words football/soccer were considered as one word since they referred to the same sport discipline (F = 102; LCS = 12; GCS = 756). In the same way, in sport* all the variants were included, such as sporting, sports or sport (F = 51; LCS = 4; GCS =

327) and in innovate* were included innovative or innovation (F = 19; LCS = 1; GCS = 140). However, the keywords that receive more citations vary slightly from the most frequently used keywords.

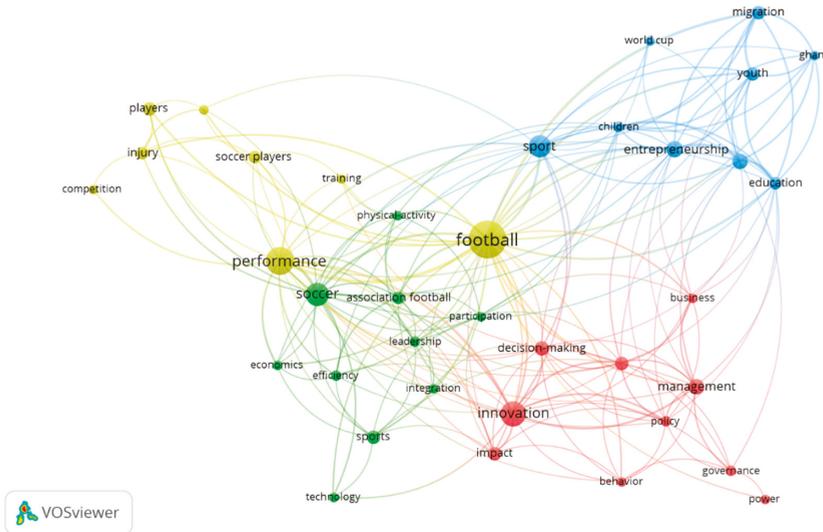


Figure 4. Co-word network.

Table 8. Most frequent keywords.

Most Frequent Keywords (≥10)				Most Cited Keywords (≥140)			
Keyword	f	LCS	GCS	Keyword	f	LCS	GCS
Football/Soccer	102	12	756	Football/Soccer	102	12	756
Sport*	51	4	327	Business	10	1	461
Innovat*	19	1	140	Evolution	4	0	440
Entrepreneur*	14	5	226	Consistency	1	0	430
Professional	13	0	50	Dynamic	1	0	430
Elite	13	1	73	Sport*	51	4	327
Development	12	4	83	Entrepreneur*	14	5	226
Business	10	1	461	Institutional	2	0	165
Performance	10	1	77	Innovat*	19	1	140

sport + sports; f: frequency; LCS: local citation score; GCS: global citations score.

Currently, with advanced analysis software such as VOSviewer, keywords can be identified, studied and represented in a systematic way. To show a co-word network, a map was created based on bibliographic data. To standardize the association values of the keywords, the “association strength” was applied [48], while the “Visualization of Similarities” (VOS) technique was used to position each term on the map in a graphic way [36]. Finally, to detect the different clusters, the VOSviewer algorithm gives the option to include different resolution parameters. In our case, we determined finally 37 keywords that were selected and the total strength of the co-occurrence links with other keywords was calculated.

After this analysis, four different clusters were differentiated by colours (blue, yellow, green and red). Figure 4 shows the graphical representation of the co-occurrence of keywords or co-words. This describes in a generalised way the structure of the knowledge or concepts that exist in the previous literature [49]. The analysis of the terms is represented by circles of different sizes and colours. The size of the circles represents the frequency of appearance of a specific term; that is, the larger the circle

is, the larger the number of occurrences in the titles and abstracts of the analysed publications [50]. The colours of the circles correspond to the different clusters found in the search. The distance between the circles (keywords) provides relevant information about their relationship; the shorter the distance between the circles is, the stronger the relationship. This relationship is determined by the number of occurrences in which the terms appear together in the titles and abstracts [51].

Thematic analysis was conducted considering the terms that appear in the total of keywords, i.e., the keywords set by the authors and the keywords set by ISI WoS. The criterion of inclusion was an occurrence frequency of ≥ 4 times. Finally, a total of 37 terms were used in this study. The software VosViewer found four different clusters according to the thematic area and differentiated by four different colours:

- Blue cluster—“Football, entrepreneurship and social development”; the following keywords stand out: Sport, entrepreneurship, migration, education and politics. This cluster is composed of nine terms and related to the importance of football in the politics of less developed countries (e.g., Ghana) and its relationship with migration, policy and education, which was analysed from an entrepreneurial perspective.
- Red cluster—“Football, innovation and management”: Composed of 10 terms; the following keywords stand out: innovation, management, organisations and football. This cluster relates to innovation policies and the impact on the management of soccer-related sports organisations.
- Green cluster—“Football, Performance and efficiency”: Formed by 10 terms, which relate to the introduction of new technologies and innovations to improve the performance and efficiency of athletes and organisations.
- Yellow cluster—“Football, Innovation in injury treatment and rehabilitation”: Composed of eight terms, which refer to the study and implementation of innovations and new technologies to treat injuries of professional and non-professional football players in order to improve their overall performance.

Cluster 1—Blue: Football, Entrepreneurship and Social Development

In general, this cluster aggregates papers related to the social function of sport, with football as a central element of contributions to social development. Even so, we can observe two approaches: on the one hand, we find studies that analyse football as a means of educating and developing people [52–55] through entrepreneurs who developed educational initiatives in the form of schools or academies [56,57]. Innovative football-based programmes can promote ethical and civic values while improving the health and well-being of participants [54,58–60]. On the other hand, we find papers related to social development through football in less-developed countries and its innovations in those communities, such as Ghana [61–64] or South Africa [65]. Similarly, there can be connection and learning between countries through football [66,67], encouraging entrepreneurship among the population and a possible path to success.

Sport is an important agent of social change and development because of its democratic, educational and inclusive nature [68]. This is why it is considered a vital element in modern and developed societies [69], however, due to globalisation and the mediatisation of information in today’s society, the influence of sport, and in particular football, has reached every corner of the planet. Football has worldwide media coverage and generates a huge amount of money, and this can be exposed in the less developed countries as a future opportunity that would ensure personal economic sustainability [70]. One of the most cited articles in this cluster is the paper published by [61], which relates the possible causes of the increase of professional football players in West Africa. Football is used as a lens to expand opportunities and general development for young people. Consolidating a career in football is seen as a source of income, but also to demonstrate masculinity. The article discusses that professional football players are “entrepreneurs of self”. Moreover, the aspirations and “self-starter” aspects that lead people with fewer resources and chances of success to a career in football were also identified.

The football industry in Ghana is notable for exporting young Ghanaian footballers to foreign leagues, and the author with the largest number of publications in our research collection, James Esson, conducts a case study to understand the causes and consequences of this entrepreneurial business [63]. According to Poli, Ravenel and Besson [71], 46.7% of professional football players in the top five football leagues are expatriates. This percentage is very high and strengthens the importance of this cluster in the search carried out. This area of knowledge involves the ability of football to motivate and inspire people from different regions of the world [61]. In addition, it is closely related to the institutional logic that surrounds different multi-sport sports organisations, among which football stands out as a key sport [72].

“Football has become a bridge between communities, and a vehicle for mobilising national and transnational solidarities that cut across deep-seated ethnic divides” [56]. In the existing literature in our search collection, a collaboration between countries with football as both a means and an end has been a topic of interest for academics and professionals in recent years [67]. One country can learn from another in different facets in which it excels, with football in Ghana, for example, is an outstanding activity to show the world [67]. In the same way, British entrepreneurs (players and coaches) were of significant importance in spreading the word about football around the world, as studied by Smith [73] in his study. Football has important entrepreneurial activities associated with it, such as major events, associations, sports clubs, etc. The big football events could help the development of slums that need more innovative strategies to improve economic activity and sustainability [65,74]. Similarly, thanks to the help of entrepreneurs, very important teams and events have been created at a national level [75].

On the other hand, in the context of the development of underdeveloped societies, is the creation of academies and organisations such as the Mandela Soccer Academy, aspiring the imaginations and hopes of entrepreneurs and promoting the development of young people in the country [57]. The above authors, included in our search collection, analyse the social and developmental role of innovative football academies in underdeveloped countries such as Ghana. Through football, young people and adults can find a path to success and sustainability, both in their home countries and in countries to which they migrate [64]. However, it is not only important to develop people in their own countries but to achieve equal treatment and inclusion with immigrants when they migrate to other countries. Football, supported by the changing behavior of whites towards blacks, has facilitated the desegregation process of professional football teams [53]. This paper reviews the role of African Americans in professional football and suggests avenues for future research.

This area of knowledge is attracting the attention of academics, governments and professionals, as entrepreneurship in sports is a vital aspect of success [4]. Sport plays a major role in government policies, and social enterprises related to football can be included in social innovation policies. Reid [76], an article within our search collection, analyses the efforts and innovative strategies made by football social enterprises and their social impact on a deprived community. In the same way, the impact of football is so significant that it has been used as the main activity in innovative social programmes developed by organisations and governments to improve the health of African citizens [58], raise concerns about gender equality [54] or approach ethnic issues [21,55]. Moreover, football has been used as a vehicle for mental health interventions [77] or develop sexual health education [52] from an entrepreneurial approach. For example, innovative activities to achieve social goals, such as midnight football in disadvantaged slums, are carried out within these government sports initiatives to promote social change [78], or innovative football-related programmes have been developed at universities, having a significant social impact on students [79]. Similarly, Gray et al. [80] developed a programme called Football Fans in Training (FFIT) to achieve a reduction in obesity through an innovative sports programme using club facilities. In this way, the participants, generally sedentary, felt an added motivation by having a close relationship with their favourite football club. This innovative program achieved good results so it was implemented and studied in South Africa [58]. However, this area of study must continue to develop entrepreneurial initiatives to combat existing discrimination in football [59,60].

Cluster 2—Red: Football, Innovation and Management

In cluster 2, represented by the colour red, there are also 10 keywords. This cluster includes papers related to innovation and entrepreneurship in the management of sports organisations (usually football clubs) and major football events. The studies that conform to our cluster can be divided into two different areas: (i) innovation in sports organisation management, and (ii) entrepreneurship in sports events.

The development of pay-TV and the increase in the cost of the domain to offer football matches in free access could have been a determining factor in the dizzying increase of professionalisation in the football sector and its growing commercialisation [81] until sport became a business. Similarly, changes related to the signing of image rights and television contracts, the participation of capitalist entrepreneurs in football projects and the construction of football stadiums, have transformed the management of football into a business today. In our search, the most cited article analyses the concept of “business model evolution” taking as a case study a professional football team of the English Premier League. This concept can be used as a tool to develop changes and innovations in the organisation towards a business model [40]. The initiatives and strategies adopted by football clubs have been analysed due to the great importance that football has at an economic, sportive and social level in our society [72], and in the way that their football players have been defined as superstars and are at the top end of the market value distribution. In our search, authors like Hoerber and Hoerber [82] stand out, they analyse the innovations developed by community sports organisations (CSOs) (among them soccer clubs) and classify them according to their form, type and magnitude. This study improves knowledge about entrepreneurship and innovation in small nonprofit sports clubs.

In the same vein, Schuhmacher and Kuester [83] collected ideas from users who participated in an “idea contest” to improve new online services for football clubs. “An idea contest is an invitation by a firm to the general public or a targeted group to submit contributions to a specific topic within a given timeline” [83] (p. 428). The authors show that lead user analysis increases the potential for creating useful and attractive innovations for the organisation. Just as the opinion of users/members is important, so also the opinion of football fans is vital. Pereira et al. [84] proposed a theoretical model in which fans of football clubs throughout Brazil would express their perception of innovation and their intention to renew the annuity. This study provides information to club managers about the variables that influence the perception and behaviour of their fans.

Various authors have studied the role of fans of specific football teams on important marketing and management variables of the organisation. Pongsakornrungrasit and Schroeder [42] analyse the role of fans of specific football teams on the creation of value through their consumption practices, while Sotelo Gonzalez [85] analyses the Spanish professional football league from the innovative perspective of social media. In the same vein, Vimieiro [86] examines and discusses the importance of communication material and production projects run by football fans in Brazil. Fans create stories and news through various formats that manage to promote an innovative and close approach that brings added social value to the football industry.

However, due to the growing economic, sporting and social impact of professional football leagues, several authors have analysed the changes and innovations that have taken place in English football in recent years [87], leading to the creation of the English Premier League (EPL), “the most lucrative worldwide” [88] (p. 136). The process followed by sponsors to improve the new service development (NSD) of two EPL teams has also been studied. EPL has been studied from different perspectives, Olson et al. [89] analyse the structure, strategy and culture of football clubs competing in EPL. The authors analyse the innovation orientation within the organisational behaviour of sports clubs, providing information relevant to the entrepreneurial and sports environment. On the other hand, Buraimo, Forrest, and Simmons [90] present an innovative model that estimates attendance at EFL matches through quantitative variables.

Sport entrepreneurship is an important factor for sports organisations. Along these lines, Radaelli et al. [28] carry out a longitudinal analysis with sports directors of Italian Serie A football

clubs to find out the impact of adopting an entrepreneurial attitude as opposed to not adopting it. Along the same lines, Cohen and Peachey [91] examine the impact of a sport-for-development initiative and motivations towards becoming a social entrepreneur in Street Soccer USA. However, the overall performance of sports clubs and their sustainability is a common concern and goal for all of them. In this line, Miragaia et al. [92] analysed the influence of different variables on sports performance in European professional football clubs from a sustainable entrepreneurial approach, in the same way that Garcia et al. [93] evaluated the impact that marketing innovations could have on the income of football clubs, providing valuable information regarding economic performance. Finally, important aspects for football clubs have also been addressed, such as the analysis of an innovative and specific construction system for the pitch [94]. However, innovation and entrepreneurship in football is still in its infancy and several authors are analysing future changes and trends in professional football [95].

Another broad area of study within this cluster is that of large football events and stadiums, as these are generally related to important socio-cultural and economic opportunities for the host cities or countries [96]. This author analyses the “urban entrepreneurship” and security aspects of the European Football Championships 2008 in the eight host cities of Austria and Switzerland (Euro 2008), as well as a way of sustaining the urban entrepreneurial strategy realised in UEFA European Championship (Euro 2012). However, for an event to take place, the host city or cities must first be selected. In this context, Müller [97] analyses the important process known as “event seizure” of the 2018 World Cup in Russia. At a time when the hosts have been questioned, Ludvigsen [98] analyses the “multiple host format” by providing an innovative strategy to address the organisational and security implications.

In relation to major events, a large area of study emerges: football stadiums. In recent years, considerable efforts have been made to learn about innovative techniques and enterprising management models to achieve maximum profitability and make the most of their resources. Various authors have analysed innovative techniques in relation to structural aspects of football stadiums such as the roof [99,100] and even to transform the football stadium into a pro-environmental stadium design through innovations and initiatives developed by entrepreneurs, owners and investors [101]. However, this type of event and the construction or remodeling of stadiums involves the movement of large amounts of money, hence Eick [102] studied the shadows that exist after the celebration of the FIFA World Cup in Germany 2006, providing first a description of the “neo-communitarian entrepreneur” of the 20th century.

Cluster 3—Green: Football, Efficiency and New Technology.

In cluster 3, represented by the colour green, there are 10 keywords, such as soccer, football, technology, efficiency and sports. However, it should be noted that it is very close to the term performance because of its close relationship in terms of content. This cluster includes papers related to the analysis of technique and tactics during training and competitions through innovations or new technologies to achieve maximum efficiency.

Football sports clubs are characterised by their sporting objective, which is considered an idiosyncratic feature of competitive sports clubs, compared to other organisations in other sectors of activity. Hence, exploring new processes or materials to achieve greater efficiency has been the subject of study for many academics and professionals. However, this interest has increased in recent decades due to the extensive professionalisation of football sports clubs and their growing economic, sporting and social impact. In this context, player tracking has become one of the most developed aspects in the control of the load in football, so that seeking innovations and implementing them can have considerable improvements in the final efficiency of the player, the team, and, consequently, the football club [103]. In their study, the previous authors discuss the limitations of some traditional methods and present powerful innovative variables that can always be used from a cost/benefit approach. In the same line, other studies study the position of the player or the ball itself through innovative and proactive materials and processes. The most cited article in this cluster, investigates the positions of players on the field to know the flow of attack and defense in professional football for men. To do

so, they used an innovative player tracking system that provides important information, mainly about goal plays, and that can be implemented by other football clubs to improve their performance and sustainability [43]. Memmert, Lemmink, and Sampaio [104] offer in their paper an overview of position data in soccer, based on two professional soccer clubs, in addition to providing new ways to develop this important technique. One of the studies that has provided an entrepreneurial vision in training is that of Yang [105], in which he explores the innovative applications of the computer virtual reality technology in football, explaining practical cases and providing new information for the field of education.

However, to achieve high performance and improve the competitiveness of the team, planned, controlled and proactive training is necessary. Training can be very varied in physical demands, technique, tactics, etc, and these, in turn, are different from competitive matches. Therefore, Abbott, Brickley, and Smeeton [106] analyse the position of the players through a novel global positioning system (GPS) during training sessions of different physical demands and their comparison with the real competition. Similarly, Szwarc et al. [107] analyse goalkeeper information by proposing two innovative instruments in the sector: the goalkeeper's activity index (GAI) and an analysis of 5-min periods performed with a video tracking system, while Murgia et al. [108] analyse the effectiveness of perceptive training on goalkeeper skills by innovatively including a training protocol in which goalkeepers schedule training sessions on their own. Van Maarseveen, Oudejans, and Savelsbergh [109] explore the skills of talented female soccer players through two innovative methods of analysis and behavioural gaze data.

In addition to developing the skills of players individually and also as a team, another important aspect in the world of professional football is to detect talent. In this sense, Maanijou and Mirroshandel [17] introduce an innovative system of talent detection in football players. This entrepreneurial approach processes information available on the Internet through classification algorithms. This could help coaches, physical trainers and managers to categorise football players according to their ranking. This experimental research was carried out with the Persian first division league and obtained good results, which can be cautiously extrapolated to other international football leagues in the future. Similarly, Diquigiovanni and Scarpa [110] developed an innovative hierarchical grouping method to divide participants according to their playing style and predict team performance. This study was conducted with the Italian Serie A teams.

However, in addition to the players, the ball is one of the characteristics of football compared to other sports. In this context, several authors have analysed the trajectory and behaviour of the ball through innovative techniques and state-of-the-art cameras [111–114]. The valuable information provided by the above authors improves the knowledge of football, but can also be used from an entrepreneurial lens in the sports ball market.

However, it is not only footballers, coaches, managers and trainers who are important: referees also play a key role. In this context, Kolbinger and Link [115] presents the initiative developed in recent years for referees to use spray to improve compliance with the rules. However, in order to enforce the rules, decision making is fundamental in this collective, hence Samuel et al. [116] analyse a new and successful decision-making simulator for soccer referees that could become a potential training method for referees. Finally, in this cluster appear the soccer robot systems. Yoshida [117] introduced an innovative design approach of autonomous soccer robots designed to play in the RoboCup League. In the article he discusses different types of robots as a new system used in system life concept.

Cluster 4—Yellow: Football, Injuries and Innovation in Rehabilitation

In this cluster, represented by the colour yellow, there are eight keywords; the following keywords are considered the most important: soccer player, injury, performance and competition. This area of study is most related to injuries and recovery in soccer players, specifically those involved in professional soccer. It should be noted that the word soccer is closely related to word performance.

“The marketing of elite sport consequently produces extreme performance pressures on clubs, teams, managers, coaches, trainers, sports associations and athletes, especially those at the highest levels in their sports. One of the consequences is a conspicuous high rate of injury” [88] (p. 136). In this context, prevention is the best way to reduce the number of injuries, and therefore implementing new techniques and innovations can help improve both prevention and treatment, and has attracted the attention of academics and practitioners in recent years. There is currently a great deal of pressure on professionals and researchers to innovate and achieve the fastest and most effective treatments to treat professional football players’ injuries, and thereby return them to peak performance. In this line, Faulkner et al. [88] analyse conventional therapies and access to innovative techniques in professional football and cycling.

The application of artificial intelligence (AI) has opened up an innovative and useful perspective in the prediction and treatment of injuries. Pares et al. [118] examine the effectiveness of Physium, an innovative device that could be used to prevent the risk of injury in football players at risk of injury according to the Saló Darder (SD) test. This research was totally innovative in the field of player injury prevention and recovery. For their part, Claudino et al. [119] conducted a systematic review of studies encompassing 11 techniques or methods that included the use of AI in the risk of injury in team sports, including football, providing practical implications for sports entrepreneurs. Sousa, Cabri, and Donaghy [120] conducted a detailed review to provide novel information on sports physiotherapy, with football as one of the most common sports to be studied. Twenty-seven percent of the documents analysed included innovative approaches that can improve understanding of the area of study, giving rise to novel practical implications.

But what factors can influence injuries? In this context, Contrò et al. [121] analysed the phenotype of professional football players to determine whether it influenced injuries and performance in a novel way. This cluster also included articles that analysed forms of injury prevention such as masks [122] or innovative operating and treatment techniques for more frequent injuries in football, such as pubalgia [123] or vestibular dysfunction after impact on the head [124].

Finally, several authors analysed new techniques and surgical procedures for football injuries, such as Contreras-Muñoz et al. [125] or Mithoefer et al. [126]. The latter authors investigated the evolution and results derived from new changes and innovations related to autologous chondrocyte implantation (ACI), a technique used in football and analysed in this article in football players.

4. Conclusions, Limitations and Future Lines of Research

The results of this study partly help us understand the current state and evolution of entrepreneurship and innovation in football. This information is important because it provides an overview of the publications, authors, countries, institutions and journals with the highest number of publications and the highest number of citations according to an analysis of a total of 220 articles. In addition, perhaps one of the greatest contributions is the identification of the thematic areas in which research related to innovation and entrepreneurship in football is developed. This allows, on the one hand, to identify the topics and areas of interest for researchers and academics, and on the other hand, to point out future lines of research in the perspective of the development and state of each of the clusters mentioned. The thematic areas addressed by each of them converge on a common theme, which is none other than the entrepreneurial ecosystem known as football, but they differ profoundly in the subject matter from which they are approached: from an approach to social development in which football can even function as a social elevator, to a technical-health or sports performance perspective, as well as a cluster related to innovation in sports management.

This variety shows how around a successful activity with a high social and economic impact, a high academic interest is developed from multiple fields. This high interest also has another, less friendly side: there are important gaps in the existing bibliography, most of the articles found are of a transversal nature and do not follow up the sample to analyse the evolution of performance measures, and the collaboration networks found among the authors are few and far between, which makes it

difficult to establish a coherent connection. Despite this, entrepreneurship and innovation in football continue to develop, showing an upward trend in growth, as evidenced by the evolution of the number of publications.

The study may have limitations that should be discussed. The search was carried out in Web of Science, as this database is widely used for academic searches and has been used in previous studies [32,50], but valuable information may have been missed in our study. Nevertheless, we ensured that the quality and impact of the publications are high. In the same way, a qualitative analysis was performed to determine whether to include or exclude articles in the study; this process may have involved biases, but it increased the credibility of the study results by excluding articles referring to American football, Australian football and Gaelic football and including only those referring to football/soccer.

In a bibliometric analysis, the information is analysed quantitatively; therefore, important qualitative information is not interpreted [49]. In future research, it is proposed that a qualitative study of the search results is conducted so that valuable information for academics and professionals can be obtained. This type of study may provide detailed information on the gaps in the existing literature. The area of sports, specifically football, from an entrepreneurial and innovative perspective, is still in its infancy, so it is important to focus attention on its theoretical and empirical development.

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Article

The Effects of Rural and Urban Areas on Time Allocated to Self-Employment: Differences between Men and Women

Nicholas Litsardopoulos ^{1,*}, George Saridakis ² and Chris Hand ¹

¹ Kingston Business School, Kingston University London, Kingston Hill KT2 7LB, UK; c.hand@kingston.ac.uk

² Kent Business School, University of Kent, Canterbury CT2 7FS, UK; g.saridakis@kent.ac.uk

* Correspondence: n.litsardopoulos@kingston.ac.uk

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Abstract: This study investigates the association of the rural–urban divide and the time individuals allocate to self-employment. The empirical analysis uses fixed effects modelling on data from the UK Household Longitudinal Survey over the period 2009–2019. The study identifies significant differences in the time men and women allocate to self-employment between rural and urban areas according to their career age group. While men and women tend to allocate more time to self-employment in their senior career age when residents of urban areas, the time they allocate to self-employment between rural and urban areas in early- and mid-career age differs markedly. More importantly, we find that significant differences exist not only between residents of rural and urban areas, but also between residents of these areas and in-migrants to these areas. We find a significant positive effect on the time senior career age women who migrate to rural areas allocate to self-employment. In contrast, we find that early career men who move from rural to urban areas allocate significantly more time to self-employment. The results reveal the existence of complex dynamics between gender and age, which affect the allocation of time to self-employment between rural and urban areas.

Keywords: time in self-employment; gender; regional development; rural and urban areas; age; UK

1. Introduction

The development of the modern city as a centre for work has transformed the landscape of business opportunities for both the wage- and the self-employed [1–3]. The process of urbanism is strongly associated with economic growth that often dictates *what* the economy will produce, *how* will it produce, *where* will it produce, and for *whom* [4,5]. The study of urbanism and how *the city* has become a focus for socioeconomic pursuit dates to Wirth’s 1938 publication of “Urbanism as a way of life” [6]. The city has become an engine of economic growth, and the location where venture capitalists and firms cluster [4]. A 2011 McKinsey report indicates that the top 600 urban centres (ranked by GDP) generate half the world’s GDP [2]. Evidence from the United States suggests that venture capital-backed start-ups in digital industries are highly concentrated in dense urban areas (e.g., Lower Manhattan and downtown San Francisco) [3]. However, urbanisation and the idea of *the city* as an economic growth centre has also received criticism over the years [7–10]. A recent study by the Massachusetts Institute of Technology (MIT) Task Force on the Work of the Future explores the occupational changes in urban employment and incomes for the period 1980–2020, indicating that middle income jobs are fast disappearing from thriving cities such as New York and San Francisco [10]. The study shows that whereas the socioeconomic status of highly educated workers has improved during the past decade, that of non-highly educated workers has deteriorated.

The fast growth of urban economies has resulted in a continuous movement of young and well-educated people from rural areas to large cities [10–12]. In the UK, the Greater London area

accounts for almost a third of the economy in England and Wales [13]. Such vibrant local economies are attractive for start-ups and offer greater opportunities for entrepreneurs. Moreover, major urban areas, such as London, account for the largest share of start-ups and creation of jobs, as well as a large share of the national economy [2,13,14]. However, with start-up costs being much higher in major cities (i.e., office, storage, personnel, etc.), it will be harder to break even in an urban area than a rural area, and failure will be considerably more costly. Most start-ups will not survive beyond their fifth year in business, while many do not survive even their first year [15–17]. Moreover, the hazard rate is likely higher in urban than rural areas [18]. Wirth argues that “On the whole, the city discourages an economic life in which the individual in time of crisis has a basis of subsistence to fall back upon, and it discourages self-employment” [6] (pp. 21–22). He explains that this is because while income is on average higher in the city than in the countryside, homeownership is rare and housing accommodation expenses are higher in the cities, absorbing as a result a large share of the earned income. Moreover, the rising cost of urban living (e.g., housing) has eroded the real earnings of city workers, pushing many workers away from major cities [10].

Urban areas offer a larger variety of jobs and possibilities for higher gross earnings compared to rural areas [14], which attracts large numbers of individuals from rural areas to major cities in pursuit of better employment opportunities and higher incomes. However, an increasing number of people also move out of major cities and into rural areas [14,19]. Urban areas offer several advantages in terms of access to goods and services compared to rural areas, but the greater noise and air pollution of urban areas, as well as the higher cost of living, can have a negative effect on individual life satisfaction and overall quality of life [5,20,21]. During the years leading to the 2008 financial crisis, there was an increase in the movement of people from urban to rural areas in the UK, which also continued during the recovery years [22,23]. While it is not uncommon for people to move out of major cities when jobs become scarce during financial downturns, data analysed by Champion [24] for the UK Government’s Foresight Future of Cities Project indicate that the 2008 financial crisis had a profound impact on within-UK migration patterns, with no recovery of urban migration rates having been observed by 2011.

People who move to rural areas will often commute to cities in close proximity for work [25], which suggests the reason for moving to a rural area was not primarily for employment reasons. Nevertheless, people who move to rural areas might also seek to become self-employed [26]. A study on college graduates in the United States found that graduates who were residents of rural areas were more likely to be self-employed rather than wage-employees compared to the graduates residents of urban areas [27]. Several differences between urban and rural areas, such as differences in life satisfaction and the likelihood of self-employment, have already been investigated. In this paper, we argue that self-employment can offer a sustainable source of income to individuals in rural areas and the means to promoting sustainable regional economic development. However, it is unclear if individuals switch their employment when they move from a rural to an urban area (and vice versa) or if they continue their previous wage- or self-employment at the new location. Additionally, while there is research on the different drivers of self-employment for men and women [28–30], less is known about whether the effect of location on self-employment is the same for men and women, or if there are differences.

To answer these questions, our research uses data from the UK Household Longitudinal Survey (UKHLS) over the period 2009–2019. We employ fixed effect modelling to control for unobserved heterogeneity and examine subsamples of men and women. Since time-invariant variables are automatically omitted in the fixed effects model, any changes in the response variable must be due to variation in other than the fixed characteristics [31–33]. The rich data of UKHLS allow us to capture the effect of the rural–urban divide, while controlling for individual characteristics, such as educational achievement and socioeconomic class.

The paper follows the following structure. Section 2 reviews the literature and derives the hypotheses to be tested. Section 3 describes the data used in this paper and the empirical model.

Section 4 presents the empirical results and discussion. Section 5 offers a discussion of the results and directions for future research. Lastly, Section 6 concludes the paper.

2. Literature Review

Urban districts account for 86 percent of the business economy in England and Wales, and for 78 percent in Scotland [13]. The world's top 10 leading areas of venture capital investment are major cities that in 2010, accounted for 52 percent of the world venture capital investment, but just 1.4 percent of world's population [3]. Major cities such as San Francisco, New York, and London act as clusters of entrepreneurship, which attract a large share of venture capital investment. London also accounted for approximately 20 percent of UK's highest growth firms over the period 2005–2008 [34], which, not surprisingly, was the largest share of high-growth companies among UK regions. However, Wales and Northern Ireland also had an above average share of high growth firms, even though they are much smaller and peripheral regional economies compared to London [34]. Additionally, accessible rural areas have a high gross value added per worker, which is second only to that of major urban areas [13]. This suggests that rural areas in the periphery can sustain healthy local economies. Furthermore, the growing interest in rural areas is revealed in the statistics of newly constructed building prices. That is, villages, hamlets, and small towns that are identified as rural areas have seen a greater overall price growth of new dwellings compared to major cities [35]. While the overall rural population of England decreased by 0.2 percent over the period of 2011 to 2018, the population of Lower Super Output Areas (LSOAs) increased by 4.4 percent (LSOAs have an average population of 1500 people or 650 households. The 'Rural population and migration: Mid-year population 2018' report, notes that analyses using LSOAs may slightly underestimate the rural population).

The de-urbanisation that took place during the 2008 financial crisis may have originally pushed people away from cities since they could not support the cost of living associated with major cities (e.g., cost of housing). However, Champion [24] suggests that those who moved out of major cities, such as London, did not return later when the economy picked up. Rural in-migrants may have found that self-employment in rural areas offered a sustainable solution to income and standards of living. Williams and Shepherd [36] find that in the aftermath of an extreme event in rural Australia, individuals created business ventures as a means to overcome adversity, which not only created value for the entrepreneurs themselves, but also for their local communities. Mayer, Habersetzer, and Meili [37] argue that rural entrepreneurs who maintain links with urban centres can use the advantages of both areas (e.g., local knowledge) to their benefit and contribute to local sustainable development. Nevertheless, it has been observed that people often turn to self-employment out of necessity during economic crises when there are no wage-based sources of income, but when the economy recovers, those necessity-entrepreneurs tend to return to wage-employment once more [15,38,39]. However, self-employment has been continuously rising in the UK, even after the economy recovered from the 2008 economic crisis [22,23].

With the advancement of intercity connectivity (i.e., high-speed rail, highways, etc.) and the increasingly reduced costs associated with the transportation of goods, logistics, and accounting, it would be plausible to assume that individuals who wish to pursue their entrepreneurial aspirations could do so without the need to live in a major city [26,37,40]. Evidence from the United States suggests that growth in rural self-employment is fostered by the relative proximity of rural areas to smaller metropolitan areas, but generally hampered by their proximity to larger metropolitan areas [41]. Rural areas in the UK have seen, in recent years, the restructuring of traditional rural industries and the development of local community enterprises, as well as rural small and medium enterprises (SMEs) [40,42]. Audretsch and Feldman [4] suggest that when start-ups are supported by networks, they enjoy a high degree of stability and also that cooperation of firms within a network can reduce the size-inherent disadvantages of small firms and so improve their viability. With the emergence of a myriad online platforms that connect businesses with other businesses and customers,

the contemporary entrepreneur may have a new network available to them, which enables them to operate their business without being physically present in the city.

In a study of long distance commuting in rural England, Champion, Coombes, and Brown [25] find that almost 35 percent of rural residents travel to work at distances of less than 5 km, another 17 percent travel to work at distances of at least 20 km, while approximately 11 percent of rural residents work from home. They also find that approximately 20 percent of recent movers to rural areas commute at least 20 km for their work, compared with only 12 percent of longer-term rural residents. The study notes some differences between residents and recent movers, but it also reveals that a large share of rural area residents works locally. Champion, Coombes, and Brown [25] note that the rationale for local work using the limit of 5 km, is because no settlement in rural England has a diameter larger than 5 km. Moreover, the study indicates that the reason for moving into a rural area is not primarily to move closer to the workplace. This may have to do with decisions related to quality of life away from problems of atmospheric pollution, noise, and traffic congestion that are often associated with cities [5,21,43]. It may also relate to the inflated home prices in major cities that force people to move to rural areas where they may find more affordable accommodation [20,44]. Ryan-Collins' [20,44] research on homeownership, housing rents, and the increased cost of living in a big city, argues that local authorities have gradually withdrawn from offering affordable housing in the UK that has resulted in inflated house prices, which in major cities (e.g., London, Manchester) can be over 7 times the median income. Stockdale's [43] findings support the argument of rural in-migration due to rising urban costs and pollution, indicating that 62 percent of in-migrants in rural England continue to commute to their workplace at distances greater than 20 km away (likely an urban centre) from their rural residence. These workers earn more than 25,000 GBP per annum, when 49 percent of those who work locally earn that income. The DEFRA [14] report also notes that people living in rural areas, but commute to work in urban areas, have seen a greater increase in median incomes compared to those who live and work in urban areas (i.e., 2.3 percent versus 1.4 percent, based on 2016–2017 median earnings). Nevertheless, it is still possible that at a later period, the rural area in-migrants may find wage-employment closer to home or start their own business locally [25].

The attractiveness of rural areas can also be seen in the higher reported life satisfaction of rural areas compared to urban areas [21]. Rural areas appear to attract professionals and individuals from managerial classes who seek to combine employment with higher quality-of-life and more affordable housing [43]. However, managerial experience has also been associated with the launch of new businesses [45], and evidence suggests that such individuals indeed start up new businesses in the rural areas they migrate to. For example, Findlay, Short, and Stockdale [46] find that only 7 percent of the people who had recently moved to a rural area of Scotland worked in the primary sector, with the majority of recent in-migrants being employed in the service sector. They also observe that many in-migrants, who are highly skilled professionals, either operate their own business or work as managers in other businesses. The presence of skilled professionals and other individuals from managerial classes in rural areas can act as a vehicle for knowledge transmission and spillovers from urban to rural areas [47], and also encourage the overall entrepreneurial activity of rural areas [4]. Rural in-migrants strengthen rural–urban links, which can contribute to the long-run sustainable economic development of rural areas [37].

Furthermore, a study of Scotland shows that 45 percent of in-migrants who establish a business within the rural area were employing others and had created on average 1.6 extra jobs [46]. Stockdale [43] also finds that self-employed in-migrants to rural areas bring their businesses with them, creating opportunities for local employment expansion. A common theme about the in-migrants that move to rural areas is that it was “part of their life goals in shifting to becoming self-employed” [43] (p. 125). In-migrants appear to bring with them elements from their urban life experience that not only diversify the rural economies but also affect conditions associated with the generation of employment [43,46]. The above findings suggest that the migration process actually creates jobs in rural areas and is a more complex phenomenon than a simple residential relocation of urban households [46]. Therefore,

self-employment and rural economic development appear intertwined with the quality of life possible in rural areas [48].

It is reasonable to assume that not all self-employed in rural areas become self-employed due to pull factors such as opportunities for higher income [27], but many turn to self-employment due to push factors, including the lack of better alternatives in wage-employment [49,50]. However, it has also been suggested that rural areas attract individuals who were already self-employed [43]. Nevertheless, important differences may exist between residents of rural areas and in-migrants with regards to their allocation of time to self-employment. The number of registered businesses in rural areas is greater than in urban areas when accounting for their population [14], which suggests that rural-based businesses are smaller than urban-based ones. The DEFRA [14] report finds that the rural areas in England had 585 registered businesses per 10,000 population, when urban areas had 406. Nevertheless, businesses in urban areas of England employed approximately 28.9 million employees, compared to just above 3.5 million employees for the rural areas. Evidently, a large percentage of businesses in rural areas are businesses with only a few employees, or even self-employed professionals with no employees. There is also some evidence of a growing number of individuals living in rural areas who work from home [26]. Therefore, either due to pull or push factors, it is possible that individuals will tend to spend more time as self-employed rather than wage-employees in rural areas compared to urban areas.

Nevertheless, in-migrants of rural and urban areas might allocate differently their time to self-employment compared to those who reside in rural or urban areas [51]. The demographics of rural/urban areas suggest that individuals tend to live in major cities when younger and in rural areas when older. DEFRA [14] reports that approximately 55 percent of the individuals living in rural areas are aged above 45 years old compared to approximately 40 percent in urban areas. The self-employed tend to be in general older than wage-employees [52,53]. This is often associated with accumulation of experience and expertise that lead to specialisation and the ability to recognise entrepreneurial opportunities [52,54,55]. Hence, greater self-employment might be expected in rural areas based on the rural age profile. However, urban areas may offer better overall opportunities for either wage- or self-employment, depending on the career stage, age, and employment experience/expertise of individuals, due to greater business activity taking place in urban areas compared to rural areas [13,14,56].

There is also some evidence of differences between men and women in terms of rural self-employment. Champion, Coombes, and Brown [25] find that men who migrate to rural areas are more likely to commute more than 20 km for work than women, suggesting that that men who migrate to rural areas tend to maintain their previous jobs in the city whilst women will tend to find employment closer to home. The authors suggest that women tend to work locally because of gender roles associated with caring for family and home. It could be argued though, that more experienced women who migrate to rural areas will be more likely to become self-employed than others. Based on their experience, they are better able to spot opportunities and respond to them.

The above literature leads us to form three hypotheses: H1, H2 α , and H2 β . We express these hypotheses as:

H1: *Individuals who live in rural areas will have spent more time in self-employment than individuals who live in urban areas.*

H2 α : *Older men who migrate from urban areas to rural areas are less likely to have spent more time in self-employment.*

H2 β : *Older women who migrate from urban areas to rural areas are more likely to have spent more time in self-employment.*

3. Materials and Methods

3.1. Data

We used data from the UK Household Longitudinal Study (UKHLS), also known as the Understanding Society survey (for further information, see Knies, [57]). The Understanding Society survey is a well-established and widely used longitudinal dataset, based at the University of Essex and funded by the Economic and Social Research Council (ESRC). The Understanding Society survey collects data from every household member, aged 16 and above. The same household is surveyed in the same quarter each year, mainly from face-to-face interviews, with a small supplement of telephone interviews. Understanding Society covers approximately 40 thousand households (at wave 1). At the time of this study, there were data for nine waves publicly available. The analysis retained only the observation for participants who were either wage-employed or self-employed in waves 1–9, surveyed over the period 2009–2019. This way, we limited the effects from becoming self-employed out of necessity due to unemployment [58–60]. Any participants with missing values among the variables examined in the models were removed. The final sample contained 43,614 observations, of which 46.99 percent were men and 53.01 percent were women.

3.2. Model Specification

The data analysis used fixed effects (FE) modelling to examine the data, though a random effects (RE) model is also reported for comparative reasons. The FE estimator (also known as the within estimator) provides effect estimates of the time-varying factors. As such, the time-constant unobserved heterogeneity no longer presents a problem [31–33]. Formally, the FE model is expressed as:

$$y_{it} - \bar{y}_i = \beta(x_{it} - \bar{x}) + e_{it} - \bar{e}_i \quad (1)$$

The dependent variable for time in self-employment (tSEMP) is constructed as the share of time spent in self-employment to total time in employment (either wage-employment or self-employment). Following the empirical entrepreneurship literature, self-employment can be used as a proxy for entrepreneurship, since entrepreneurs are typically individuals who have started and developed their own business enterprises [39,55,61,62]. Nevertheless, we are aware of the issues arising from this approach and we discuss them in Section 5.2 Limitations and further research. tSEMP is a continuous variable that denotes the ratio of time in self-employment to total employment time. tSEMP ranges from 0 to 1, where 0 indicates that no time at all was dedicated in self-employment and 1 indicates that all employment time was dedicated in self-employment. Using this approach to measure the employment experience of individuals offers a way to measure self-employment experience which captures the actual share of self-employment experience at each wave. This way, the risk of recall bias occurring from asking respondents to recall information in retrospect is being limited [63–66]. The independent variable for Urban/Rural is derived from the Office for National Statistics Rural and Urban Classification of Output Areas 2001. The indicator assumes a value of (1) if the address falls within urban settlements with a population of 10,000 or more, or (0) otherwise. However, we expected the effect of residential location to differ for residents and for in-migrants. Following the definition of long-term migrant used by the UK Department for Environment, Food and Rural Affairs and the Office for National Statistics, this study uses the term ‘resident’ for those who usually live in an area and have resided there for at least a year. To examine if and how residents and in-migrants differ, we first created two variables which captured, for those who moved, the time the respondents moved into a rural area or the time they moved into an urban area. We also created a variable which took the value of 1 if the respondent lived in an urban area throughout the period covered by our data. For movers, this was the period lived in an urban area after the urban migration took place. In our model, our reference category was rural area residence. This allowed us to capture the specific effect of rural and urban in-migration on the time spent in self-employment separately from the effect of

rural and urban residence. We also created an age variable with three age groups, for early career age (up to 25 years of age), middle career age (over 25 and up to 45 years of age), and senior career age (over 45 years of age), using the age information from Department for Education [67] and DEFRA [14], which we used as a proxy for experience.

Other control variables included health status, part-time employment, education, marital status, the presence of children in the household and their age, and homeownership. Controls were also included for the five socioeconomic status categories (NS-SEC5), the industrial sector they were employed in, and the geographical region of the household. Following previous studies [68], homeownership was used as a proxy of individuals' financial standing as well as the combined gross personal monthly income from job/business, savings, and investments. 'Gross personal income' is by default calculated per month in the UKHLS, and therefore, it was transformed to per annum before it was combined with 'income from savings and investments' which is, by default, calculated per annum in the UKHLS. Table A1 in the Appendix A presents a descriptive summary of the variables used in the analysis.

4. Results

4.1. Descriptive Statistics

The majority of men and women are employed in salaried jobs, that is 82.22 percent of men and 91.05 percent of women, with a small share of them working as self-employed (i.e., 17.78 percent of men and 8.95 percent of women). In total, 76.79 percent of men and 74.79 percent of women are living in urban areas, whereas 23.21 percent of men and 25.21 percent of women are living in rural areas. The mean age of individuals living in rural areas is 47.1 years of age and 44.5 for those in urban areas (see the descriptive statistics in Table A1 in the Appendix A). In line with the literature, the age distribution indicates the expected negative skew for rural areas (see Table A2 in the Appendix A). Approximately 54.2 percent of the sample population living in rural areas are aged above 45 years, whereas the share of the sample population above the age of 45 is approximately 53.4 percent.

4.2. Empirical Analysis

The analysis offers some important insight in the effects of gender and age towards the time individuals spend in self-employment in urban and rural areas. Overall, the results indicate that age plays a dominant role in men's and women's allocation of time to self-employment. Table 1 presents the analysis results for the overall model and the separate model specifications for men and women.

Table 1. Rural–Urban areas and Time in Self-employment: Random and Fixed effects models.

	RE Mix-Gender	FE Mix-Gender	FE Men	FE Women
	I	II	III	IV
Urban Area Residence	−0.003	0.006 **	0.005	0.006 **
Urban migration	−0.013 ***	−0.007	−0.009	−0.005
Rural migration	−0.001	0.003	0.000	0.005
(Baseline: Rural Area Residence)				
Gender: woman	−0.061 ***	(omitted)	(omitted)	(omitted)
Career Age group				
Middle	0.007 ***	0.007 ***	0.005	0.010 ***
Senior	0.012 ***	0.010 ***	0.006	0.013 ***
(Baseline: Early career)				
Health status	0.000	0.000	−0.001	0.000
Part-time work	0.006 ***	0.004 ***	0.016 ***	0.001
Educational achievement				
High School	−0.014 *	0.005	0.005	0.005
+16 Education	−0.005	0.004	0.011	0.000
University	−0.011	−0.003	−0.012	0.002
Vocational Qualification	−0.012	−0.001	0.007	−0.005
(Baseline: Elementary school)				

Table 1. Cont.

	RE Mix-Gender	FE Mix-Gender	FE Men	FE Women
<i>Marital status</i>				
Married/Civil Partner	0.005 ***	0.005 ***	0.007 **	0.003
Divorced/Separated	0.007 ***	0.006 **	0.008 **	0.003
Widowed	0.002	−0.001	−0.024 **	0.005
(Baseline: Single/never married)				
<i>Number of Children in HH</i>				
Aged 0–4	−0.003 ***	−0.003 ***	−0.002	−0.003 ***
Aged 5–11	0.000	0.001	−0.002	0.004 ***
Aged 12–15	0.000	0.000	−0.001	0.001
(Baseline: No children)				
<i>Socioeconomic class</i>				
Management and professional	0.013 ***	0.012 ***	0.018 ***	0.008 ***
Intermediate	0.003	0.003 *	0.003	0.003
Small employer and own account	0.349 ***	0.318 ***	0.328 ***	0.300 ***
Lower supervisory and technical	−0.001	−0.001	−0.003	0.003
(Baseline: Routine and Semi-routine)				
Income from job/business and investments	0.000 ***	0.000 ***	0.000 ***	0.000
Homeownership	0.001	−0.001	−0.006 *	0.003 *
<i>Industrial Sector</i>				
Agriculture, forestry, and fishing	0.066 ***	0.026 **	0.054 ***	−0.002
Mining and quarrying	−0.001	0.000	0.001	(omitted)
Manufacturing	0.008 **	0.003	0.011	0.007
Electricity, gas, steam, and air conditioning	0.009	0.009	0.015	0.004
Water supply; sewerage, waste management, and remediation activities	−0.005	−0.009	0.011	−0.067 **
Construction	0.053 ***	0.035 ***	0.058 ***	0.006
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.011 ***	0.004	0.022 ***	−0.007 *
Transportation and storage	0.023 ***	0.019 ***	0.034 ***	0.012 *
Accommodation and food service activities	0.022 ***	0.014 ***	0.033 ***	0.002
Information and communication	0.021 ***	0.010 *	0.020 **	0.009
Financial and insurance activities	0.008	0.000	0.019 *	−0.011 *
Real estate activities	0.041 ***	0.037 ***	0.041 ***	0.053 ***
Professional, scientific, and technical activities	0.041 ***	0.029 ***	0.041 ***	0.023 ***
Administrative and support service activities	0.026 ***	0.018 ***	0.040 ***	0.004
Education	0.017 ***	0.011 ***	0.048 ***	−0.005
Human health and social work activities	0.006 *	0.001	−0.031 ***	0.006 *
Arts, entertainment, and recreation	0.020 ***	0.001	0.017	−0.003
Other service activities	0.019 ***	0.005	0.002	0.006
Activities of households as employers	0.040 ***	0.044 ***	0.061 **	0.040 ***
Activities of extraterritorial organisations	0.006	0.002		−0.006
(Baseline: Public services)				
<i>Region</i>				
North East	−0.012	0.022 *	0.037 **	−0.002
North West	−0.031 ***	−0.030 ***	−0.034 **	−0.018
Yorkshire And The Humber	−0.016 **	0.012	0.040 ***	−0.013
East Midlands	0.011	0.049 ***	0.062 ***	0.037 ***
West Midlands	−0.019 **	0.009	0.004	0.009
East Of England	−0.028 ***	−0.025 ***	−0.016	−0.030 ***
South East	−0.014 **	−0.022 ***	−0.038 **	0.000
South West	−0.002	0.004	−0.005	0.016
Wales	−0.025 **	−0.014	−0.002	−0.032 *
Scotland	−0.044 ***	−0.048 ***	−0.035 *	−0.049 ***
Northern Ireland	−0.029 *	0.217 ***	(omitted)	0.238 ***
(Baseline: London)				
Constant	0.114 ***	0.059 ***	0.092 ***	0.031 **
<i>Statistics</i>				
χ^2	22,982.890			
F		365.760	176.490	210.150
R-sq: within	0.365	0.367	0.372	0.375
R-sq: between	0.623	0.498	0.585	0.418
R-sq: overall	0.588	0.476	0.553	0.405
Corr(u_i, Xb)	0 (assumed)	0.452	0.534	0.367
N	38385	38385	17460	20925

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; we also tested the models restricting the sample to the labour force using the latest information from Gov.uk on Working, jobs, and pensions. The results of the restricted models are consistent with the original results and the conclusions remain unchanged.

The results in Table 1 for the RE model (Column I) show that urban area residence is not a significant explanatory variable of the time individuals allocate to self-employment. Urban migration, however, is a significant explanatory variable ($p < 0.01$). Urban migration has a significantly negative effect on the time individuals allocate to self-employment. This shows that compared to rural areas, individuals who migrate to urban areas spend, on average, less time in self-employment. The random effects model results include effects from time-invariant variables (e.g., gender) and any interaction effects correlated with it, which makes it difficult to gain further insights. Nevertheless, the negative effect is not unexpected considering that self-employment is a source of employment when the supply of salaried jobs is limited [69–71], and urban areas offer many more wage-employment opportunities compared to rural areas [2,14]. The FE model (Column II) suggests that urban area residence has a positive effect on the time individuals allocate to self-employment compared to rural area residence. However, the time-invariant control for gender is omitted, forcing other variables to absorb the gender effect, which likely is quite significant. A Hausman specification test (HT) comparing the RE and FE models (Columns I and II) indicates that the RE specification does not adequately model individual effects ($\chi^2 = 3843.32$; $p < 0.001$). Hence, the mixed results offer only limited support for Hypothesis 1, that “Individuals who live in rural areas will spend more time in self-employment than individuals who live in urban areas”.

To examine the effects further, we estimate the FE model separately for men and women and present them in Columns III and IV of Table 1. We find that the urban residence effect is positively associated with time in self-employment for women, whereas for men, the effect is non-significant (perhaps suggesting that the greater opportunities for self-employment are counterbalanced by the availability of paid employment opportunities). Additionally, neither urban migration, nor rural migration appear to affect the time men and women allocate to self-employment. Furthermore, as might be expected, both middle and senior career age groups have a positive effect on time in self-employment for women ($p < 0.01$) [55,72,73]. However, age does not appear to have significant explanatory power for men.

To examine the effects further, we analyse the FE models of men and women and decompose the models by career age groups. The results overall indicate that there exist differences between in-migrants and residents of urban and rural areas. Table 2 presents the analysis results for the model specification separated by age group for men and women.

Table 2. Urban–Rural areas and Time in Self-Employment: Men and Women by Career Age group.

	Early Career Men (FE)	Middle Career Men (FE)	Senior Career Men (FE)	Early Career Women (FE)	Middle Career Women (FE)	Senior Career Women (FE)
	I	II	III	IV	V	VI
Urban Area Residence	0.058 ***	−0.004	0.041 ***	−0.0023	0.013 ***	0.018 ***
Urban migration	0.037 *	0.004	−0.028 **	−0.002	−0.006	0.003
Rural migration (Baseline: Rural Area Residence)	0.024	0.005	0.016	−0.005	0.008	0.018 **
Age	−0.000	0.000	0.001 ***	0.001 **	0.001 ***	0.000
Health status	0.003	−0.002	0.002 *	−0.001	0.000	0.000
Part-time work	−0.002	0.019 ***	0.001	−0.003	0.003 *	0.000
Homeownership	0.015	−0.009 **	0.011	−0.009 ***	0.004 *	0.011 ***
Constant	−0.054	0.072 **	0.065 *	−0.002	0.001	0.027
Statistics						
F	22.710	87.030	82.630	65.880	105.300	84.040
R-sq: within	0.748	0.381	0.358	0.878	0.395	0.313
R-sq: between	0.298	0.654	0.471	0.756	0.277	0.488
R-sq: overall	0.252	0.598	0.464	0.715	0.292	0.484
Corr(u _i , X _b)	0.127	0.591	0.418	0.172	0.182	0.491
N	438	8345	8677	565	9747	10613

Note: Other controls as in Table 1; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; We also test the models excluding the Age variable, and the results are similar.

The results indicate an overall greater allocation of time to self-employment for men and women who live in urban areas, particularly at older ages. This can be explained from the perspective of the greater business opportunity availability in urban areas, where individuals can utilise their accumulated employment experience, expertise, and wealth to start up their own business [54,55,73–75]. Nevertheless, there are several differences in the effect of urban and rural areas between men and women and across age groups.

The path men follow with regards to self-employment appears consistent with the self-employment and entrepreneurship literature. That is, urban area residence has a positive effect on the time younger and senior career age men allocate to self-employment. This is not surprising since cities offer young professionals entrepreneurship opportunities that may be limited in rural areas [2,14], allowing younger individuals to make career choices that often involve self-employment [55,76]. Additionally, older individuals also tend to turn to self-employment and start their own businesses after accumulating sufficient professional experience to make the transition [39,52,53,55]. Urban in-migrants also appear to allocate more time to self-employment rather than seek wage-employment when younger. Contrarily, urban in-migrant men in senior career ages allocate significantly less time to self-employment ($p < 0.05$).

Additionally, the linear age control for senior career men is also positively associated with time in self-employment ($p < 0.01$), offering further support that as men get older, they tend to allocate more time to self-employment. However, the results also show a difference between residents of urban areas and urban in-migrants. Specifically, senior age men who are in-migrants to urban areas spend significantly less time in self-employment, perhaps suggesting that much of the migration to urban areas is linked to wage-employment opportunities. Moreover, rural versus urban location does not appear to have a significant effect on the allocation of time to self-employment for middle career age men, which might indicate contrasting themes arising within this particular age group of men. The non-significant effects might be an indication that middle career age men have contrasting behaviours that cancel out each other. It is worth observing that the constant is also significant at $p < 0.05$ in this specification. Overall, the results do not indicate that men alter their allocation of time between wage- and self-employment due to migration in a rural or an urban area. Hence, we do not find support for Hypothesis 2 α that “Older men who migrate from urban areas to rural areas are less likely to spend more time in self-employment”.

Women who are urban area residents allocate more time to self-employment compared to women in rural areas when in middle or senior career ages. When younger, the urban versus rural location does not significantly affect the time women allocate to self-employment. However, the linear age variable in this group has a significant positive effect on the time spent in self-employment; something we did not observe for men. Women, similarly to men, tend to allocate more time to self-employment as they get older, but at the same time, the impact of age has a stronger effect at a comparatively earlier stage in life for women than men. Often, women use self-employment to balance work and family [73,77,78], which, combined with the business opportunities available in urban areas, might explain the positive effect of urban residence for mid-career ages. Furthermore, rural migration has a significant positive effect on time in self-employment for senior career age women. This is also something we did not observe for men. This is supportive of the literature that suggests women who move to rural areas tend to find employment closer to home [25], which suggests they are more likely to turn to self-employment. The results offer support for Hypothesis 2 β that “Older women who migrate from urban areas to rural are more likely to spend more time in self-employment”.

Moreover, some of the control variables also offer interesting insights considering the effects of the rural–urban divide and the effect of age we have analysed so far. Specifically, part-time employment has a significant and positive association with time in self-employment for both men and women in the middle career age groups ($p < 0.01$ and $p < 0.05$, respectively). Since this age group is typically when families are likely to be formed, the dual demands for work and family balance might influence the decision to turn to part-time employment [76,79–81]. The significant influence of part-time employment in this group might also be linked to the general rise in part-time self-employment in the aftermath of

the 2008 economic crisis [22,82]. Health is also interesting, since it has a significant and positive effect only for men in the senior career age. Not surprisingly, this offers support for previous findings that older men choose self-employment for retirement reasons [72,76].

5. Discussion

5.1. Summary

This study examined the effects that living in a rural or urban area have on the time people allocate to self-employment. The empirical analysis used fixed effects modelling on rich panel data from the UKHLS over the period 2009–2019. The fixed effects model allowed us to control for unobserved heterogeneity, while the rich survey data enabled us to control for several individual characteristics, such as educational achievement, socioeconomic class, industrial sector of employment, marital status, and number of children, among others. Departing from previous analyses that use the typical binary wage- or self-employment variables and examine the transition to self-employment as an end in itself, our approach perceives the transition, to and from self-employment, as part of a continuous employment experience. Using this novel approach to measuring the time people spend in wage- and self-employment, the analysis shows that there exist important differences not only between rural and urban areas, but also differences between men and women. The gender differences between the time spent in self-employment in rural and urban areas become more pronounced when examined using separate age groups. Generally, the effects of rural and urban migration, as well as rural and urban residence, appear gendered and age group-specific. Our findings contribute towards the theoretical and methodological approach of examining self-employment and the rural–urban divide, as well as policy implications for rural development.

In line with the self-employment and entrepreneurship literature [2,39,52,53,76], we find that older individuals tend to veer towards self-employment as they get older. Urban areas are, in general, positively associated with time in self-employment across most age groups. This effect is likely associated with the greater business opportunities available in larger markets of cities, compared to the smaller markets of rural towns and villages [2,14]. Therefore, major cities in the UK evidently remain centres of entrepreneurial activity [1–3]. Urban residence is positively associated with the time young men and senior men allocate to self-employment. Migration to urban areas is also positively associated with time in self-employment for men. However, our results show that younger men differ from senior men in their motivation to enter self-employment. Younger men, who tend to be less risk averse than older men, are willing to try out several career options in their efforts to find a job that satisfies their needs, including self-employment [72,76]. It might also be the case that young career age men are not concerned with future family and parenting responsibilities, and therefore, are more prone to take risks [83]. Older men might turn to self-employment after having increased their financial and human capital from a career in wage-employment [54,55,73,84]. Nevertheless, our findings cast doubt that senior career age men who move to rural areas from urban areas turn to self-employment and set up local businesses, as conjectured by Champion, Coombes, and Brown [25]. If we extrapolate a bit further, the finding that senior career age men who move from rural to urban areas allocate significantly less time to self-employment (see Table 2, Column III), may suggest that these men had been pushed to self-employment when previously residing in rural areas.

Interestingly, young women living in urban areas do not appear to be as attracted into self-employment as young men do. While young women's age still has a positive effect on time in self-employment, neither their urban residence nor urban migration alter their allocation of time between wage- and self-employment. This could be associated with family and parenting obligations, which for women, typically comes at an earlier life-stage [56]. In relatively more gender-egalitarian societies, such as the UK, wage-employment may offer a level of security for working class young mothers, which may not be accessible in self-employment [56]. Instead, women allocate more time to self-employment at middle career ages and senior career ages. This difference in the self-employment

attitudes of men and women at their early career age might be related to self-efficacy [85–87]. In this sense, younger women who live in urban areas might feel more uncertain than young men in choosing the riskier career path of self-employment. This changes quickly after they accumulate some employment experience [85,87], which might explain the significant and positive effect of urban area residence for women in their middle career age group. Nevertheless, this age group includes the age period when people tend to have children and from families (e.g., late 20s to early 40s). Since women typically bear the greatest burden of family responsibilities, they will be more likely to turn to self-employment and part-time work to balance work and family [56,88,89]. The results show that for this group of women, urban residence and part-time employment are positively associated with time in self-employment. Therefore, the positive association may be associated more with work and family factors, rather than attitudinal choices to specific employment type [89–92]. However, urban migration is not, which indicates that women in mid-career ages who migrate to urban areas do not significantly change their allocation of time to self-employment.

When looking at the senior career women, the results show that both urban residence and rural migration positively affect the allocation of time to self-employment. Women in this age group who live in urban areas might turn to self-employment due to age effects associated with human and financial capital, similarly to women in the mid-career age group [55,73,84]. The age effect though might not be the only reason that rural in-migrant women turn to self-employment. It may be the case that they bring new ideas from their experience in the city and start up their business there. Considering that rural in-migrant women do not travel far from home to work [25], this suggests they work locally in the rural area they live. Given the limited wage-employment opportunities of rural areas [14], there might not find suitable jobs for these in-migrant women, hence, they choose to become self-employed. However, their past experience from working in urban areas might still facilitate their entrepreneurial aspiration, regardless of initial motives [36,37,83].

5.2. Limitations and Further Research

Like any other study, our study has some limitations. In this analysis, we use self-employment as a proxy for entrepreneurship. While there are distinctions between the two concepts, there are also major overlapping themes between the two. For example, both entrepreneurs and self-employed are individuals who typically do not work for someone else's business but have started and developed their own business enterprises. In empirical studies that examine individual-level data and not firm-level data, and given the practical difficulties in identifying the entrepreneur, self-employment has been traditionally used as a proxy [93]. Another limitation is that our analysis does not directly control for opportunity or necessity entrepreneurship. Therefore, we cannot know with certainty if men and women were pulled or pushed into self-employment. However, as our sample was restricted to those continuously in wage- or self-employment, the results are more likely to capture the effects of *pull* rather than *push* factors. Investigating whether the urban or rural location impacts the emergence of necessity or opportunity entrepreneurial activity in each area would be a fruitful avenue for future research. Additionally, the UK is a developed country with mature welfare institutions, which further decreases the probability of entrepreneurial activity out of necessity [94]. Nevertheless, more research is needed to fully understand the push or pull factors of self-employment motivations of rural/urban residents and in-migrants. It must also be noted that regional heterogeneity can affect the differences between rural and urban areas, as it is evident from the results of the region control variable. These remain potentially important issues to address in future research on sustainable regional development.

6. Conclusions

The results show that there exist complex dynamics of gender and age, which affect the allocation of time to self-employment between rural and urban areas. Residents and in-migrants of rural/urban areas also exhibit differences in the time they allocate to self-employment based on their gender and career age group. The rural versus urban location appears to exert contrasting effects on men and

women that need to be considered in entrepreneurship policy, as well as rural/urban development planning. Nevertheless, our findings show that overall, urban areas are positively associated with the time individuals allocate to self-employment and remain a magnet for young men with entrepreneurial intentions. These findings support those by Champion and Shepherd, [11] Dobbs et al., [2], ONS [13], and DEFRA [14]. Rural areas, on the contrary, are positively associated with the time senior career women allocate to self-employment, which may reveal links with age and social entrepreneurship [83]. However, limited internet connection and speed is still a factor that hinders rural entrepreneurship [95]. Improvements in communication and transportation infrastructure can minimise the distance between rural and urban areas, which allows entrepreneurs to conduct their business from rural areas without the need to live in a major city [40,41]. Self-employment might be driven by different reasons for young or senior men and women who live in rural or urban areas, but nevertheless, self-employment offers an opportunity to create jobs for the self-employed and others in the area they live [14,96].

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Appendix A

Table A1. Descriptive statistics.

	Summary Statistics			
	Males		Females	
	Mean	Std. Dev.	Mean	Std. Dev.
Self-Emp. dummy	0.178	-	0.089	-
Wage-Emp. dummy	0.822	-	0.911	-
Part-Time Employment	0.074	-	0.352	-
Age	45.152	10.581	45.120	10.234
Self-Employees Age	49.846	10.679	48.771	10.800
Wage-Employees Age	44.137	10.282	44.761	10.106
Homeownership	0.838	-	0.823	-
Urban Area Residence	0.768	-	0.748	-
Health status	3.671	0.920	3.660	0.938
Income from job/business and investments	37,296.640	26,102.990	25,636.310	18,212.790
<i>Marital status</i>				
Single/Never Married	0.216	-	0.215	-
Married/Civil Partner	0.682	-	0.611	-
Divorced/Separated	0.095	-	0.155	-
Widowed	0.006	-	0.019	-
<i>Number of Children in HH</i>				
Aged 0–4	0.201	-	0.157	-
Aged 5–11	0.335	-	0.307	-
Aged 12–15	0.175	-	0.195	-
<i>Educational achievement</i>				
Elementary Education	0.094	-	0.081	-
High School	0.315	-	0.295	-
+16 Education	0.115	-	0.097	-
University	0.384	-	0.377	-
Vocational Qualification	0.091	-	0.150	-
<i>Socioeconomic class</i>				
Management and professional	0.512	-	0.500	-
Intermediate	0.100	-	0.176	-
Small employer and own account	0.127	-	0.063	-
Lower supervisory and technical	0.089	-	0.044	-
Routine and Semi-routine	0.172	-	0.217	-

Table A1. Cont.

Summary Statistics				
		Males		Females
<i>Industrial Sector</i>				
Agriculture, forestry, and fishing	0.010	-	0.005	-
Mining and quarrying	0.003	-	0.001	-
Manufacturing	0.156	-	0.049	-
Electricity, gas, steam, and air conditioning	0.008	-	0.004	-
Water supply; sewerage, waste management, and remediation activities	0.007	-	0.003	-
Construction	0.095	-	0.012	-
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.106	-	0.128	-
Transportation and storage	0.073	-	0.020	-
Accommodation and food service activities	0.017	-	0.025	-
Information and communication	0.073	-	0.016	-
Financial and insurance activities	0.041	-	0.033	-
Real estate activities	0.012	-	0.009	-
Professional, scientific, and technical activities	0.075	-	0.062	-
Administrative and support service activities	0.046	-	0.033	-
Public administration and defence; compulsory social security	0.087	-	0.086	-
Education	0.087	-	0.187	-
Human health and social work activities	0.069	-	0.271	-
Arts, entertainment, and recreation	0.015	-	0.020	-
Other service activities	0.017	-	0.034	-
Activities of households as employers	0.001	-	0.002	-
Activities of extraterritorial organisations	0.000	-	0.000	-
<i>Region</i>				
North East	0.043	-	0.047	-
North West	0.110	-	0.108	-
Yorkshire And The Humber	0.076	-	0.077	-
East Midlands	0.082	-	0.089	-
West Midlands	0.088	-	0.091	-
East Of England	0.102	-	0.100	-
London	0.101	-	0.082	-
South East	0.145	-	0.133	-
South West	0.109	-	0.111	-
Wales	0.038	-	0.043	-
Scotland	0.071	-	0.083	-
Northern Ireland	0.034	-	0.038	-
Total Observation	17,460		20,925	

Table A2. Age in Rural/Urban Areas: Skewness and Kurtosis.

Age	Rural Area	Urban Areas
Mean	47.082	44.509
Skewness	-0.092	-0.027
Kurtosis	2.708	2.538
Skewness/Kurtosis tests for Normality (95 CI)		
Pr(Skewness)	0.000	0.060
Pr(Kurtosis)	0.000	0.000
Adj chi2(2)	51.980	-
Prob > chi2	0.000	0.000
Observations	9328	29,057

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Article

Entrepreneurial Orientation (EO), Integrated Marketing Communications (IMC), and Performance in Small and Medium-Sized Enterprises (SMEs): Gender Gap and Inter-Country Context

Vera Butkouskaya ^{1,*}, Joan Llonch-Andreu ¹ and María-del-Carmen Alarcón-del-Amo ²

¹ Business Department, Autonomous University of Barcelona, 08193 Bellaterra, Catalonia, Spain; joan.llonch@uab.cat

² Marketing Department, University of Murcia, 30100 Murcia, Spain; mcarmenalarcon@um.es

* Correspondence: vera.butkouskaya@uab.cat

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Abstract: Expanding and maintaining the number of Small and Medium-sized Enterprises (SMEs) is directly related to sustainable economic, social, and individual development. However, SMEs are vulnerable to competition. Thus, this study focusses on the analysis of entrepreneurial orientation (EO) as an antecedent of integrated marketing communications' (IMC) successful implementation directed at improving SMEs' performance, with additional focus on the institutional inter-country context. Considering the role of owner-managers in SMEs, analysis of the gender gap is also applied. The data from 315 managers' surveys (in Spain and Belarus) is analyzed using Structural Equation Modelling (SEM). The results show a positive relationship between EO, IMC, and performance among SMEs in both markets. However, these connections are significantly stronger in the case of male, rather than female managers in a developed market (Spain). There is no gender gap in an emerging market (Belarus). Moreover, and conversely, in a developing market, the EO-IMC-performance relations are more intensive when the manager is female. Further implementations are provided for practitioners and government organizations with a focus on the gender gap and inter-country differences.

Keywords: SMEs; entrepreneurial orientation; IMC capability; organizational performance; competitive advantage; gender; inter-country analysis

1. Introduction

Sustainability research is a widely discussed topic, with the focus on *what* should be sustained (environmental issues), *which* areas should be developed (the economy and society), and *how* it can be maintained (sustainable strategies) [1–4]. Thus, the concept of sustainability is about conserving, development (economic and non-economic), and maintaining the environment, economy, society, and individuals. The particular role of entrepreneurship in the context of the sustainability concept has been specified [2,5–7]. However, there is still room to keep exploring how the growth of small and medium enterprises (SMEs) can enhance economic, social, and sustainable development from an institutional perspective [8]. Moreover, there is an important current question to be addressed regarding, not only the growth, but also the sustaining of the number of SMEs [3].

Dynamic changes in the market situation and innovation development complicate the rivalry among different type of firms [9]. Competition in the dynamic market is specifically harmful to SMEs because they are limited in their tangible resources [10]. Depending on their resources and competencies, firms develop the strength to gain competitive advantage and enhance their performance,

but their lack of resources questions the sustainability of SMEs. Thus, to survive in the market against larger rivals, SMEs should focus more on intangible resources, competences, and dynamic capabilities [11]. Dynamic capabilities, in comparison with the ordinary ones, underline the need for information acquisition, utilization, and constant transformation to address the environmental threats of an uncertain market [9]. In this situation, less formalized SMEs are capable of responding to environmental changes in a more agile way [12].

The implementation of integrated marketing communications (IMC) within an organization can be considered a dynamic capability [13,14]. However, the majority of recent studies focus on an analysis of IMC implementation for larger companies, which limits the decision-making process for SMEs [12]. Recent empirical studies from both a company and customer point of view confirm the positive effect of IMC on organizational performance [13,14]. As one of the IMC components, cross-functional coordination facilitates the response to market changes, and message integration positively impacts on customer performance [14]. Under this condition, less formalized SMEs are capable of responding to environmental changes faster than larger competitors and gain by this extra advantage [12,15]. However, the cost of transforming the capabilities may be non-beneficial for young SMEs that need to focus on the short-term to address the liabilities of newness and smallness [16].

Additionally, as successful IMC implementation requires up-to-date information, a company's strategic orientation can enhance integration effectiveness [13,14]. The lack of analysis on entrepreneurial orientation's (EO) influence on IMC in SMEs is another limitation that requires further research. But EO effectiveness varies in large companies and SMEs due to organizational and structural issues [17]. The dynamic capabilities theory underlines the strong relation between managerial behavior and strategic changes in the organization [18]. The use of EO for successful decision-making in SMEs is related to intrapreneurship ('in-company entrepreneurship') [19]. As a valuable strategic asset of SMEs, EO represents the identification and exploitation of the market [11,20,21]. Previous studies have demonstrated that, in SMEs, EO has a positive impact on the acquisition and utilization of market information and marketing capability, further enhancing organizational performance [22,23]. To gain market advantage, SMEs rely on social capital and networking, as well as the endorsement of talent enrichment and individual development [11,21]. However, research advises that smaller SMEs, especially in the initial period of their existence, may be less likely to have the experienced managerial talent to build and deploy dynamic capabilities [16].

The gender issue is a critical concept in sustainability and entrepreneurship research [24,25]. Not taking into consideration a possible gender moderating effect may be a significant limitation, given that the owner-manager traits are strongly related to the behavioral characteristics of the SMEs [25,26]. Various proposals exist on the gender gaps in entrepreneurship/intrapreneurship in the working environment [25,27–29]. For example, affected by social-cultural obstacles, women entrepreneurs/intrapreneurs may avoid taking risky decisions and evaluate their 'perceived capabilities' lower than males [24,29]. Another study suggests that female managers evaluate higher firm-level EO but lower performance outcomes [28]. But, according to the research on individual EO, males are more proactive, risk-taking, and autonomic than females [25].

Also, the variations in the results of gender effect analysis in the inter-country context underline the need for further examination [25,30]. For example, the comparison between the USA and Korea demonstrates that the context affects more the individual EO level in the case of women (no differences in the case of male respondents) [25]. From the other side, [30] suggest that females may be more proactive in marketing related management in developed markets compared to developing ones. Institutional theory supports the idea that a company's behavior may change depending on the context [31–33]. The sociological/organizational branch of the theory indicates that the institutional context shapes individual entrepreneurial behaviors [33] and the undertaking of decisions within the firm [32,34]. The economic/political branch of institutional theory emphasizes the role of external formal institutions in management processes [31,34]. The institutional networks and institution-based resources, such as access to information, play a vital role for SMEs' decision-making processes [35].

Following the above mentioned, this study covers such research gaps as the lack of analysis on IMC implementation in SMEs, the importance of the gender issue in the entrepreneurship research, and the need to clarify the existing variations in the gender gap in the inter-country contest. Thus, the main objective of this article is to study the role of EO as an antecedent of IMC implementation in SMEs with the focus on gender and inter-country multi-group analysis. The following research issues are underlined: (1) the impact of EO on IMC implementation in SMEs, (2) the influence of IMC on performance in SMEs, (3) the gender moderating effect in the theoretical model, and (4) the country moderating effect in the theoretical model.

Based on the research gaps, the data from 315 SME managers' surveys (in Spain and Belarus) was analyzed using Structural Equation Modelling (SEM). Multi-group analysis technique was applied for testing gender and country moderating effects. Some similarities and valuable differences underline the choice of the countries selected for analysis. Following World Bank data and the Entrepreneurship Monitor 2019/2020 Global (GEM) Report, Spain represents a developed market with good data availability, developed financial markets, technology, and research and development (R&D) investment compared to Belarus, which is an emerging economy [7,36,37]. Both countries demonstrate recent economic growth [36]. They are in the same region/group in the GEM report and share some similar characteristics in entrepreneurship activities (such as physical infrastructure and entrepreneurial education at the school stage) [7]. However, the weighted average state of the set of national entrepreneurship framework conditions in Belarus (4.24) is lower than in Spain (5.24), with the notable differences in entrepreneurial finance, government policies, R&D transfer, and commercial and legal infrastructure [7]. Furthermore, spending on marketing (including spending on IMC tools) as a share of GDP is much higher in Spain (0.49%) than in Belarus (0.17%). However, the internal market dynamic and average increase in annual marketing expenditure is higher in Belarus (15%) than in Spain (5.8%) [38,39], confirming the developmental dynamics of the Belarusian market.

This study contributes to sustainability, entrepreneurship, and marketing research by connecting the company's strategic orientation with marketing communications in SMEs. The focus of the analysis on the SME sample closes the gap on the lack of IMC implementation analysis among SMEs. Moreover, it focusses on the importance of gender issues in sustainability and entrepreneurship research. Finally, the institutional context and inter-country analysis aim to generalize the research results in an international setting.

From a managerial perspective, the research sheds light on the issues related to practices of the EO role in dynamic capabilities implementation and their contribution to the sustainable competitive advantage of SMEs. This is a valuable issue considering the vital role of SMEs in the sustainable development of the economy and society. Gender issue investigation adds to understanding the role of the manager in SMEs and the effect of intrapreneurs' behavior on a company's performance. The inter-country analysis clarifies the environmental and institutional context in different regions, economies, and markets, along with its effect on managerial behaviors and organizational outcomes.

Section 2 starts with a literature review and outlines the hypotheses to be tested. Then, Section 3 explains the context, data collection, and analysis. Next, Section 4, based on an analysis of the data, presents the research reports, and Section 5 discusses the results. Section 6 comments on the theoretical contributions and practical implementations. Finally, Section 7 lists some limitations and provides suggestions for future research.

2. Literature Review

The topic of sustainability is widely discussed in the literature [2,3]. Recent research defines sustainability in the following ways: *what* should be sustained (emphasizing the environmental issues, natural resources, and community); *which* areas should be developed (with the focus on the economy, individuals, and society); and *how* it can be maintained (with the emphasis on sustainable strategies) [1,2,4]. In summary, the concept of sustainability can be defined as the protection,

development (economic and non-economic), and maintenance of nature, the economy, society, and individuals.

In the current state of the theoretical and practical context, the growth and sustaining of SMEs is considered to be directly related to sustainable development [3,8]. Scientific research states that SMEs play an essential role in new job creation, the counteracting of inflation, increased productivity, innovation, networking, and communities [2,5]. SMEs also provide individuals and society with non-economic gains [6,7]. Previous studies from entrepreneurship literature and official publications (such as the GEM) affirm the particular importance of small businesses in sustainable development [7].

However, as SMEs are limited in their number of tangible resources, intense competition threatens their survival in the market against larger rivals [10,15,16,40]. Changes in the dynamic market and innovation development create uncertainty and complicate the rivalry among different types of firms [41]. It motivates companies to be more proactive in searching for a competitive advantage [9,18]. More usually, to advance in the market, firms rely, not just on resources that are important for performance outcomes, but also on searching for customer-linking capabilities [18,41,42]. Reasonably, instead of focusing on tangible resources, SMEs could concentrate more on intangible resources and dynamic capabilities [11,16].

2.1. IMC as SMEs Capability

The dynamic capabilities theory proposes the strategic actions that the company should undertake if aiming to gain and sustain competitive advantage [18,41]. The theory claims that, complementary to the need for information acquisition and utilization as a part of ordinary capabilities, the constant capabilities transformation to address the environmental threats of an uncertain market is needed [9,16]. Previous research confirmed the significant role of marketing capabilities, including marketing communications, in empowering a company's competitive strategies [42–44]. Specifically, the power of IMC as a market capability drives the achievement of a superior performance [13,14,42]. In particular, a company accumulates market intelligence (including competitor actions and changes in customer preferences) and senses environmental changes (such as the appearance of new technologies). Using the data collected, managers take decisions about capturing internal resources and competences and transforming them into integrated communicational actions that address the changing, uncertain environment [13,18,41]. The possibility of using IMC as one of a company's dynamic capabilities additionally supports the suggestion of its favorable implementation in SMEs [11,16,17].

However, smaller SMEs, especially in the initial period of their existence, may be less likely to have the experience managerial talent to build and deploy dynamic capabilities. Furthermore, the cost of transforming the capabilities does not benefit young SMEs that need to focus on the short-term in order to address the liabilities of newness and smallness [16]. This may inhibit the effectiveness of IMC implementation as a dynamic capability in SMEs. From the other side, it is suggested in the literature that, for the successful implementation of IMC, the company must apply cross-functional coordination and have a certain level of flexibility [13,42,45]. Various studies underline that SMEs being more flexible and simpler in their organizational structure are better at cross-functional coordination and sharing the information within the organization [17,19,46]. Simpler coordination together with a less formalized organizational structure may facilitate SMEs' faster response to the changes in dynamic market environments [14,15,17]. Moreover, studies suggest that SMEs may also be successful in integration due to the simplicity of their communication activities [46]. Specifically, SMEs are more likely to practice IMC because they target fewer market segments and use fewer communication messages. Furthermore, other studies advise that better informed managers and fewer numbers of communications facilitate better message and channel integration, which positively impacts on a company's performance [14,19]. Thus, SMEs could gain an edge over their larger rivals in IMC effectiveness [11,17]. Following on this, we suggest that:

Hypothesis 1 (H1). *IMC has a positive impact on organizational performance in SMEs.*

2.2. Entrepreneurial Orientation as an Antecedent of Successful IMC Implementation in SMEs

Entrepreneurial literature defines EO as a company's strategic asset representing the intensity with which firms establish the identification and exploitation of untapped opportunities as a management principle of the firm [15,20,47]. Studies focusing on the analysis of SMEs additionally specify that, due to organizational and structural differences compared to larger companies, there is a deeper connection between EO due to the existence of intrapreneurship [15,19]. The concept of intrapreneurship (which derives from the phrase 'in-company entrepreneurship') describes with which internal and external characteristics a firm's 'entrepreneurial' orientation is associated, and under what conditions this orientation results in a superior performance [19,27].

Specifically, the scientific literature mentions that the development of intrapreneurs in SMEs is important, as the decisions on product innovation, risk-taking, and proactive behavior are always taken by managers [18,28,48]. Additionally, the dynamic capabilities theory underlines the strong relation between managerial behavior and strategic changes in the organization [18], and research demonstrates that employees with a higher level of individual EO tend to be more proactive, explore new opportunities, and implement them [49]. Therefore, in order to gain market advantage, SMEs, develop social capital, endorse talent enrichment and individual development, and advance networking [11,15,21,42].

Previous studies focused on SMEs demonstrated that EO has a positive impact on the acquisition and utilization of market information, on marketing capability [22], and the further enhancing of organizational performance [23]. Firms pursuing innovation, proactiveness, and risk-taking are more likely to make strategic decisions and upgrade core capabilities in a dynamic environment [22]. Thus, the company's strategic orientation could enhance integration effectiveness as a successful IMC implementation [50]. Therefore, we state that:

Hypothesis 2 (H2). *EO has a positive impact on IMC in SMEs.*

2.3. Gender Issues in Managerial Decision-Making

Entrepreneurship research emphasizes the gender impacts on decision-making [25,26]. The literature demonstrates various proposals regarding the gender gap in entrepreneurship/intrapreneurship in the working environment [25,28,29].

Specifically, compared to men, research has demonstrated that female entrepreneurs/intrapreneurs have higher pressures from social-cultural obstacles such as 'the fear of failure' and 'perceived capabilities' [24]. Among others, several informal factors (the recognition of an entrepreneurial career and female networks) and formal factors (education, family context, and differential of income level) may affect the decisions of female owner-managers [51]. In this case, even knowing that IMC may have a positive effect on the company's performance, female managers may avoid implementation of risky changes related to process innovation [29]. Furthermore, immaterial of their true skills, women may undervalue their ability to implement the strategy successfully or estimate in a less positive way the possible results/outcomes of IMC implementation [24]. The empirical analysis of individual EO suggested that, in comparison with men, women have lower rates of both entrepreneurial and intrapreneurial activities [25,28]. The decisions of females may involve lower degrees of risk-taking, innovativeness, aggressiveness, and autonomy [25,29,30]. It may neglect the positive effect of EO on IMC.

However, the research suggests that female managers may evaluate higher the firm-level of EO but lower the level of performance outcomes [28]. There is also a suggestion that, under specific environmental conditions of developing markets, female managers may be more effective in the implementation of marketing-related strategies [30,52]. Nevertheless, even presenting inconsistent results, all the previous researchers underline the influence of the manager's gender and the possibility for SMEs to sustain themselves in the market [25,29,30,51,52]. Consequently, we hypothesize:

Hypothesis 3 (H3). *Gender moderates the EO-IMC relationship in SMEs.*

Hypothesis 4 (H4). *Gender moderates the relationship between IMC and organizational performance.*

2.4. Inter-Country Comparison

Institutional theory states that a company's behavior varies depending on the context [31,32]. The economic/political branch of institutional theory emphasizes the role of external formal institutions and institution-based resources [31,34]. There is a lower level of market activity and rivalry in emerging markets compared to developed ones [13]. Therefore, there is less information available, lower competition, and less networking opportunities in emerging markets. The deficit of institution-based resources—such as access to information—may impact negatively on managers' decision-making [13,35]. Additionally, the lack of institutional networks may have a negative influence on business practices in SMEs [29].

Also, the sociological/organizational branch of institutional theory implies that the context shapes individual entrepreneurial and intrapreneurial behavior, and the undertaking of decisions within the firm [32–34]. Specifically, significant differences have been demonstrated in IMC implementation effectiveness between developed and emerging markets [13]. The higher level of environmental turbulence in developed markets enhances motivation to improve the relationship between a strategic orientation and performance in SMEs [40]. Furthermore, the pressure of risk-avoidance is more significant in emerging markets, where managers prefer to avoid decisions that may have uncertain outcomes. Even being aware of the advantage of process innovation (the implementation of IMC practices), decision-makers prefer to invest in production and product innovation [31,53].

Additionally, variations in the environmental context may affect personal values and lead to inconsistencies in the strategies adopted by women and men [25,30]. In contrast to developed markets, in emerging economies, women owner-managers are more proactive in marketing related management and less successful in strategic, financial, and HRM (Human Resources Management) planning [30]. Thus, in an emerging market, IMC performance outcomes may be higher in the case of a female rather than a male manager [25,30]. Moreover, previous studies suggest that in various markets there may exist differences in the outcomes for females, but not for males. For example, one study [25] illustrates notable differences in intrapreneurial activity in the comparison of US and Korean students. Male respondents are more risk-taking and competitively aggressive. They engage more often in innovativeness and rely on a higher level of autonomy, depending less on spouses, family, and friends for help [29]. However, these differences are not significant when comparing only male respondents (when the female group is excluded from the analyses). Thus, we suggest that:

Hypothesis 5 (H5). *Economy type moderates the EO-IMC relationship in SMEs.*

Hypothesis 6 (H6). *Economy type moderates the relationship between IMC and organizational performance.*

3. Materials and Methods

3.1. Context

This research makes an inter-country analysis of the data from 2 different markets (Spain and Belarus). These two countries are suitable subjects for comparison due to some similarities and some relevant differences. Following World Bank data and Entrepreneurship Monitor 2019/2020 Global Report (GEM), Spain represents a developed market with good data availability, developed financial markets, technology, and R&D investment compared to Belarus, which is an emerging economy [7,36]. Both countries demonstrated economic growth during the years of data collection [36]. But, in Belarus, as in most developing economies, the levels of competitive intensity and market activity remain lower than in developed economies such as Spain [37]. In the years of data collection, the spending on marketing (including IMC tools) as a share of GDP was much higher in Spain (0.49%) than in Belarus (0.17%). This is caused by the fact that there is less market information available and fewer

opportunities for networking. However, the average increase in annual marketing expenditure is much higher in Belarus (15%) than in Spain (5.8%) [38,39], confirming the developmental dynamics of the Belarusian market.

Additionally, based on the data on the GEM National Entrepreneurship Context Index (NECI), the weighted average state of the set of national Entrepreneurship Framework Conditions in Belarus (4.24) is lower than in Spain (5.24) (from 0 = very inadequate insufficient status to 10 = very adequate sufficient status) [7]. This index includes factors related to entrepreneurship such as government policies, entrepreneurship resources availability, education, market dynamics, and infrastructure, among others. Both countries are presented in the same region/group 'Europe and North America' in the Global Entrepreneurship Monitor 2019/2020 Global Report [7]. Spain and Belarus share some similar characteristics in entrepreneurship activities (rank out of 54 recorded countries in the region) such as physical infrastructure (Spain: 6.95, 27/54; Belarus: 7.40, 15/54) and entrepreneurial education at school level (Spain: 2.65, 39/54; Belarus: 2.63, 41/54). The notable differences that favor the Spanish market lay in such factors as entrepreneurial finance (Spain: 4.87, 23/54; Belarus: 3.24, 49/54), government policies: support and relevance (Spain: 5.33, 12/54; Belarus: 3.28, 44/54), government policies: taxes and bureaucracy (Spain: 5.17, 6/54; Belarus: 4.35, 22/54), R&D transfer (Spain: 5.26, 8/54; Belarus: 3.38; 36/54), and commercial and legal infrastructure (Spain: 6.04, 6/54; Belarus: 5.26, 19/54) [7]. However, the internal market dynamic is better in Belarus (Spain: 5.31, 23/54; Belarus: 5.56, 18/54), additionally confirming the development processes in the Belarusian market [7].

3.2. Data Collection and Analysis

Primary data was collected by a survey of SME managers in Spain and Belarus between January and March 2018. The questionnaire was created in English. It was then translated into the native language of the respondents, Spanish (for the survey in Spain) and Russian (for the survey in Belarus), and back-translated, with no wording issues identified. Before sending out the questionnaire, it was pre-tested among both marketing managers and academic researchers. The final respondent profiles consisted of managers of different genders, ages, and education from SMEs. Industry and company type parameters were also fixed in the company's profile (Table 1).

Five-point Likert-type scales previously used by other researches in the literature were applied to measure the following constructs in the theoretical model: entrepreneurial orientation [20,48], integrated marketing communications [13], and customer and market performance [44]. Appendix A presents the summary of the Scale Items and Measures with the descriptive statistics.

Partial least squares structural equation modelling (SEM-PLS) with SmartPLS 3.0 was used for testing the hypotheses and multi-group analysis (MGA) for the evaluation of the moderating effects. This method is suitable as it accepts multivariate statistical technique to estimate relationships between constructs in international marketing research and across groups of respondents from different countries [54]. Additionally, the PLS algorithm was imposed for fewer restrictions on the sample size.

Table 1. Respondent's and company's profile.

	Number of Respondents		Number of Respondents	
	Belarus	Spain	Belarus	Spain
Company profile				
	Industry		Company type (B2B or B2C)	
Agriculture	13	8	B2B	108
Construction	11	19	B2C	60
Manufacturing	71	59	Total	168
Retail	15	25		89
Service	57	35		58
Total	168	147		147
Respondent's profile				
Gender			Education	
Male	90	60	No higher education	8
Female	78	87	Higher education	135
Total	168	147	Master and higher	25
Age			Marketing education	
≤25	19	15	Yes	122
26–45	128	108	No	46
≥46	21	23	Total	168
Total	168	147		147

The two-step PLS model analysis approach by [55] was applied: first the assessment of the measurement model and then the assessment of the structural model. The measurement model assessment was performed for the criteria of internal reliability and convergent and discriminant validity analysis. All the items in the measurement model fulfilled the critical criteria, and the adequacy of the instrument was supported [56]. The fit of the structural model was confirmed by the number of parameters [57]. The results met the critical criteria and supported the predictive ability of the structural model. The relationships in the structural model were tested via a bootstrap resampling procedure (5000 sub-samples).

To test the gender and economy type moderating effects, we ran a multi-group analysis (MGA) with SmartPLS 3.0. Moreover, as an essential procedure before the multi-group analysis (MGA), the three-step examination of the measurement invariance of composite models (MICOM) was run [54]. MICOM analysis confirmed the possibility of running MGA analysis.

4. Results

The results of testing the theoretical model (Table 2) demonstrate that EO has a significant positive impact on IMC (H1: 0.539, $p < 0.01$). Furthermore, IMC has a significant positive impact on performance: customer (H2: 0.592, $p < 0.01$) and market performance (H3: 0.491, $p < 0.01$).

Table 2. Testing the theoretical model (global model).

		Path Coefficients	t-Values	p-Values
H2	EO → IMC	0.539	12.011	0.000 ***
H1a	IMC → CUP	0.592	12.992	0.000 ***
H1b	IMC → MP	0.491	10.465	0.000 ***

Note: EO—Entrepreneurial orientation, IMC—Integrated marketing communications, CUP—Customer performance, MP—Market performance. *** $p < 0.01$.

The results of gender moderating effect analysis in Table 3 suggest that, in SMEs where managers are male, compared to ones where they are female, EO has a significantly stronger effect on IMC ($H4_{\text{female}}$: 0.486 vs. $H4_{\text{male}}$: 0.658; $p < 0.01$), and IMC has a significantly stronger effect on

customer performance (H4b_{female}: 0.558 vs. H4b_{male}: 0.767; $p < 0.01$) and market performance (H4c_{female}: 0.489 vs. H4c_{male}: 0.811; $p < 0.01$).

Table 3. Testing the theoretical model (gender moderating effect, global model).

		Female		Male		Multi-Group Analysis	
		Path Coefficients	t-Values	Path Coefficients	t-Values	Path Coefficients—Diff	p-Value
H3	EO → IMC	0.486	7.186 ***	0.658	18.487 ***	0.172	0.002 *** S
H4a	IMC → CUP	0.558	8.244 ***	0.767	27.644 ***	0.208	0.000 *** S
H4b	IMC → MP	0.489	7.983 ***	0.811	42.680 ***	0.322	0.000 *** S

Note: EO—Entrepreneurial orientation, IMC—Integrated marketing communications, CUP—Customer performance, MP—Market performance. *** $p < 0.01$. S = Hypothesis supported.

Following the results of country moderating effect in Table 4, the relationships between EO and IMC in SMEs are significantly stronger in the developed economy when compared with the emerging economy (H5a_{Belarus}: 0.506 vs. H5a_{Spain}: 0.647; $p < 0.05$); the same is true for the relationships between IMC and customer performance (H5b_{Belarus}: 0.576 vs. H5b_{Spain}: 0.740; $p < 0.01$) and IMC and market performance (H5c_{Belarus}: 0.515 vs. H5c_{Spain}: 0.733; $p < 0.01$).

Table 4. Testing the theoretical model (country moderating effect, global model).

		Belarus		Spain		Multi-Group Analysis	
		Path Coefficients	t-Values	Path Coefficients	t-Values	Path Coefficients—Diff	p-Value
H5	EO → IMC	0.506	11.807 ***	0.647	14.463 ***	0.141	0.014 ** S
H6a	IMC → CUP	0.576	11.844 ***	0.740	21.597 ***	0.164	0.002 *** S
H5b	IMC → MP	0.515	12.292 ***	0.733	21.427 ***	0.218	0.000 *** S

Note: EO—Entrepreneurial orientation, IMC—Integrated marketing communications, CUP—Customer performance, MP—Market performance. *** $p < 0.01$; ** $p < 0.05$. S = Hypothesis supported.

Figure 1 presents the results of the global model analysis and testing gender and country moderating effects.

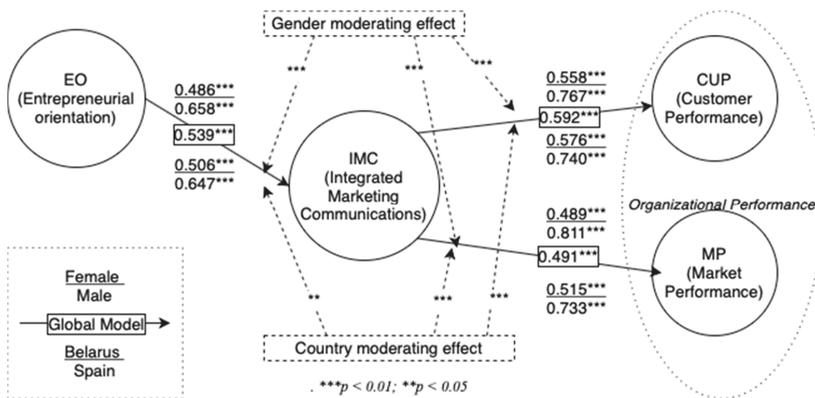


Figure 1. Hypothesis testing (global model, gender and country moderating effects).

Deeper results on the gender gap analysis in the inter-country context are presented in Table 5. The data from the global sample is analyzed separately for Spain and Belarus. The analysis suggests that, in a developed market, similar to the data from the global sample, the EO-IMC-performance relationship is significantly stronger for male respondents than it is for female ones. However, in the case of Belarus (an emerging market) there are no significant differences.

Table 5. Testing the theoretical model (gender moderating effect, Belarus and Spain).

	Female		Male		Multi-Group Analysis		
	Path Coefficients	t-Values	Path Coefficients	t-Values	Path Coefficients—Diff	p-Value	
Belarus							
EO → IMC	0.632	7.897 ***	0.562	11.321 ***	0.070	0.358 ^{ns}	R
IMC → CUP	0.569	10.576 ***	0.599	9.992 ***	0.031	0.460 ^{ns}	R
IMC → MP	0.605	7.643 ***	0.518	9.859 ***	0.087	0.315 ^{ns}	R
Spain							
EO → IMC	0.395	6.355 ***	0.832	35.963 ***	0.437	0.004 ***	S
IMC → CUP	0.468	3.370 ***	0.860	41.244 ***	0.392	0.002 ***	S
IMC → MP	0.430	5.001 ***	0.883	47.330 ***	0.452	0.000 ***	S

Note: EO—Entrepreneurial orientation, IMC—Integrated marketing communications, CUP—Customer performance, MP—Market performance. *** $p < 0.01$; ns = not significant. S = Hypothesis supported, R = Hypothesis rejected.

Furthermore, the multi-group analysis for the country moderating effect was done separately for male and female respondents. The results in Table 6 suggest that, like the global model, the EO-IMC-performance relationship in the case of a male manager is significantly stronger in a developed market (Spain) ($p < 0.01$). Conversely, in the case of female managers, the EO-IMC-performance relationship is significantly stronger in the case of developing market ($p < 0.01$).

Table 6. Testing of the theoretical model (country moderating effect, male and female).

	Belarus		Spain		Multi-Group Analysis		
	Path Coefficients	t-Values	Path Coefficients	t-Values	Path Coefficients—Diff	p-Value	
Male							
EO → IMC	0.562	11.321 ***	0.832	35.963 ***	0.270	0.000	S
MC → CUP	0.599	9.992 ***	0.860	41.244 ***	0.260	0.000	S
MC → MP	0.518	9.859 ***	0.883	47.330 ***	0.365	0.000	S
Female							
EO → IMC	0.632	7.897 ***	0.395	6.355 ***	0.237	0.002	S
MC → CUP	0.569	10.576 ***	0.468	3.370 ***	0.100	0.004	S
MC → MP	0.605	7.643 ***	0.430	5.001 ***	0.175	0.000	S

Note: EO—Entrepreneurial orientation, IMC—Integrated marketing communications, CUP—Customer performance, MP—Market performance. *** $p < 0.01$. S = Hypothesis supported.

5. Discussion

As has been suggested, the results confirm that EO has a positive effect on IMC implementation in SMEs, and IMC has a further positive impact on organizational performance (customer and market). Thus, hypotheses H1 and H2 are supported. In addition to the previous findings on the positive effect of EO on market capabilities and organizational performance in SMEs [22,23], this suggests that IMC can be a source of competitive advantage for SMEs.

However, the research indicates a significant moderating effect of gender on the EO-IMC-performance relationship. Thus, hypotheses H3 and H4 are supported. This result is congruent with previous research that demonstrates the existence of a gender gap in the working environment [24,44]. Specifically, the impact of EO on IMC in SMEs is significantly more intense when the manager is a male. These results may additionally support the suggestion about a deeper connection between EO and intrapreneurship in SMEs [15,19]. The explanation could be the fact that, in comparison with men, women have lower rates of individual EO and intrapreneurial activities [25,28]. The IMC impact on organizational performance (customer and market) is also considerably higher in the case of male managers. These results could be related to the social-cultural pressure and possible underestimating of their capability level perception [22]. Additionally, the reason could be due to the lower degree of risk-taking, innovativeness, aggressiveness, and autonomy of females [24,25,29,30]. Furthermore, the conditions of SMEs, where the decision-making and sharing of managerial responsibilities are limited, could be an additional obstacle for female managers [46].

The economy type moderating effect analysis also confirms the inter-country differences in the EO-IMC-performance relationship in SMEs. Thus, hypotheses H5 and H6 are supported. The effect of EO on IMC is significantly higher in a developed economy compared to an emerging one, and the same is true for the IMC outcomes for organizational performance. This supports previous research demonstrating the lower effectiveness of a strategic orientation on IMC in emerging economies [13]. This confirms that market turbulence in developed markets motivates SMEs to apply EO practices more [40]. Moreover, the lack of networking, less available market information, and the rejection of risk-related decisions in an emerging market all reduce IMC implementation effectiveness in SMEs [13,29].

Further multi-group analysis of the gender moderating effect separately in each country presents additional insights. Meanwhile, the relationships in the model are stronger for male than for female managers in the developed market; however, there is no significant gender moderating effect in the emerging market. This means that there is a gender gap among managers of SMEs in Spain, but no gender gap in Belarus. A possible reason for the lack of gender differences in the emerging market could be that both male and female behavior tends towards risk-avoidance [12]. Perhaps due to the limit of resources or market information, even being aware of the implementation of IMC practices, managers in developing markets prefer to invest in production and product innovation [31,53].

There is also a contrast in country moderating effect when testing male and female groups of respondents separately. In the case of male managers, as in the global sample results, the relationships in the model are significantly stronger in the developed market compared to the emerging one. Interestingly, the results are the opposite for the analysis of data from the female respondents. When the manager is a female, contrary to the mixed sample, the EO-IMC-performance relationship is considerably more intense in the emerging market. This supports the suggestion that the institutional conditions may affect females and males differently [25,54]. It also means that female managers in emerging markets may be more efficient in functional strategies in the area of marketing [30]. As is similar to the previous studies, these results can probably be explained by the variation in the perception of the values [45]. The socio-cultural obstacle of the 'fear of failure' for females in emerging markets may be lower. This could be explained by the lower level of competition in the labor market and, as a consequence, a diminished fear of losing a job and career opportunities; or it could be due to the longer period of maturity stays and the fact that there is more focus on family rather than on career in emerging countries.

6. Conclusions

This research has valuable theoretical and practical contributions to make to the study of marketing, entrepreneurship, and sustainability topics with a specific focus on SMEs, gender issues, and inter-country context. Specifically, the empirical analysis covers the gap in explaining the possible use of EO as an antecedent of IMC as a source of competitive advantage in SMEs. Additionally, the research focuses on the analysis of the important sustainability and entrepreneurship research gender issues. The results underline the significant differences among male and female managers, which may affect the effectiveness of IMC implementation in SMEs. Additionally, this study helps to generalize the results in the inter-country context. The outcomes of the analysis highlight the significant differences in EO-IMC-performance relationships in developed and developing markets. Finally, this article further covers the effect of the institutional environment on the variations in the gender gap between markets.

These are relevant enrichments as SMEs play a significant role in the sustainable development of economies and societies. They provide, not only economic gains, but also resource social capital, endorse talent advancement, and stimulate individual development [2,5–7,11]. The sustainability literature underlines the importance of both the growth and sustaining of SMEs [3,8]. Additionally, gender is considered to be an important issue in sustainability and entrepreneurship research [24,25]. The managers' profile was considered to play a significant role in SMEs [25,26]. Finally, the effectiveness of managerial practices varies in the international context [13,14].

6.1. Theoretical Contribution

Specifically, the study covers the gap in understanding IMC effectiveness for SMEs and the role of entrepreneurial orientation in enhancing IMC effectiveness, which contributes to better organizational performance. Our results confirm that IMC can be considered a dynamic capability for SMEs. The study of the gender gap in this research contributes more to understanding the role of intrapreneurs in firms. The results suggest that IMC effectiveness is higher in the case of male managers.

The inter-country perspective and application of institutional theory in this research is an additional contribution towards generalizing the results in the international context. The study states that, in the emerging economy compared to the developed one, the EO impact on IMC implementation is lower. Furthermore, the IMC outcomes for the organizational performance (customer and market) are weaker. The lack of a developed institutional formal context, fewer networking opportunities, and scarcity of institutional resources, such as market information, probably hurts SMEs' opportunities in gaining a sustainable competitive advantage.

Additional analysis of gender moderating effects separately in Belarus and Spain contribute to a deeper understanding of the gender gap in SMEs in the inter-country context. In the case of the developed market, the gender impact on the EO-IMC-performance relations is significantly weaker when the manager is female. In the emerging market, there is no significant gender gap. Probably in the situation of lack of resources and no available market information neither female nor male managers are able to implement risky decisions related with IMC implementation processes effectively.

The country moderating effects analysis independently in the case of male and female managers and contributes deeper to understanding the institutional context effect on manager behavior. In the case of male managers, EO-IMC-performance relationships are more intense in a developed market. In the case of the female manager, conversely, these relationships are more intense in emerging markets. Thus, female managers are probably more affected by social-cultural obstacles and avoid making risky decisions due to 'fear of failure' in developed markets. In emerging markets, women tend to be more efficient than men in applying marketing related strategies. Additionally, the variations in results additionally confirm the importance of multi-group analysis of moderating effects in marketing research.

6.2. Practical Implementation

From the practical perspective, the orientation towards new opportunities in the market, together with the flexibility and formalization of SMEs, facilitates the integration processes. Proactiveness, risk-taking, and innovativeness have a positive effect on the message/channel integration and cross-functional coordination in SMEs. This results in higher customer satisfaction, an increase in repurchase intention, a higher market share, and more opportunities for new customer acquisition. Thus, IMC can be considered to be a source of sustainable competitive advantage for SMEs. The loss of IMC effectiveness may reduce the positive effect on organizational performance and the possibility of SME survival in the market.

The results additionally confirm the importance of the owner-manager profile for the success of SMEs [42]. Thus, the practices supporting the entrepreneurs/intrapreneurs may help individual development and the survival of SMEs in the market. The extra support, networking possibilities, and sharing of responsibilities, together with specific educational programs on risk-management, can be helpful. They may facilitate accepting more risky choices and, as a result, increase the number of innovative decisions among managers in SMEs.

The inter-country analysis shows extra complications for SMEs looking to gain a competitive advantage in the emerging markets. As a solution, specific plans can be applied to provide small and medium companies with extra information resources and to facilitate networking opportunities.

The lack of a gender gap may mean that the manager's profile is less important in emerging markets compared to developed ones. In the situation of scarce resources and limited information, both male and female managers need extra support. Additionally, the institutional context of an emerging

environment negatively impacts the male managers' decision-making effectiveness. Thus, similar to the previous suggestion, resource and information support may be helpful for the survival of SMEs in the case of male managers. Conversely, it is interesting that the emerging market environment has a favorable impact on female managers. In developing markets, contradicting the results in developed ones, female respondents show more effectiveness in the implementation of marketing strategies than male managers. Socio-cultural and institutional factors such as the lower dedication of females to a career, more days of the maturity stage, or less competition in the labor market, among others, should also be mentioned.

7. Limitations and Future Research Lines

As in any novel research, there are some limitations to this study that provide lines for future research. First, due to some difficulties in obtaining responses from SME managers, the sample is of a limited size. Further research could extend the analysis with a larger number of respondents. Second, the theoretical model includes a limited number of measurement variables. This research focuses only on EO as a leading strategic asset of SMEs and just two criteria of organizational performance (market and customer performance). Future research could consider measuring other instruments of IMC capability enhancement in SMEs (such as market, customer, learning, technology, or brand orientation) and the IMC effect on more performance variables (such as financial or brand performance or innovation success). Moreover, a more sustainable vision of the variables, for example, the use of sustainable entrepreneurial orientation (SEO) instead of EO, could enrich future studies [58]. Third, the study analyses only two moderator variables (gender and country). The research can additionally consider some extra moderators in the theoretical models, such as age or size of the SMEs, including the application of longitudinal studies [16]. Furthermore, the data from solely two markets limits the generalization of inter-country analysis. Further investigations could focus on a greater number of distinct countries.

Despite the limitations mentioned, descriptive statistics provide ideas for future investigation. Similar to the previous research, women evaluate the firm-level EO higher than men [28]. However, differently from the earlier findings, IMC and performance level evaluation of females is also higher than that of male respondents. Moreover, surprisingly, many mean scores are higher in the respondents of Belarusian managers than in Spanish ones. Thus, it will be interesting to check if these differences are significant and further discuss the nature of the results.

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Appendix A

Table A1. Scale Items, Measures and descriptive statistics.

	Female	Male	Belarus	Spain
	μ	μ	μ	μ
<i>IMC = Integrated marketing communications</i> [13]. Five-point scale with 1 = strongly disagree and 5 = strongly agree Our company ...				
IMC1. ... carefully examines whether our intended message is consistently delivered through all communications tools and channels (e.g., advertising, packaging, and website).	3.264	2.934	3.060	3.122

Table A1. Cont.

	Female	Male	Belarus	Spain
	μ	μ	μ	μ
IMC2. . . . maintains consistency in all visual components of communication (e.g., trademarks, logos, and color).	3.784	3.563	3.560	3.789
IMC3. . . . maintains consistency in all linguistic components of communication (e.g., slogans and mottos).	3.736	3.467	3.458	3.748
IMC4. . . . ensuring a consistent brand image as one of the most important goals of our marketing communications program.	3.541	3.180	3.262	3.449
IMC5. . . . does not alter the brand image, even as its context changes, but maintains its consistency from the long-term.	3.953	3.467	3.655	3.741
IMC6. Our marketing communications strategy differentiates the buyer and the user if the two are not the same.	2.905	3.192	2.964	3.163
IMC7. . . . carefully deliberates whether a creating more than two target customer group is desirable.	3.135	3.114	3.071	3.184
IMC8. In our company the issue of whether to maintain a single brand image or to create multiple brand images of the product is thoroughly discussed.	2.703	3.006	2.786	2.952
IMC9. Our marketing communications strategy is based on a close scrutiny of the stages of the customers' buying process such as brand awareness, information search, showroom/website visit, and purchase.	3.338	3.192	3.244	3.279
IMC10. . . . employs the marketing communications tools that are most appropriate for each stage of the consumers' buying process.	3.236	3.120	3.179	3.170
IMC11. Our marketing communications activities are designed to induce customers' actions (e.g., telephone order, showroom/website visit, etc.).	3.865	3.317	3.655	3.483
IMC12. . . . follows up on consumer responses to our marketing communications activities (e.g., mailing promos to those who participated before in the company-sponsored events).	3.412	3.036	3.327	3.082
IMC13. . . . sees to it that the consumer information that is generated in the course of marketing communications activities is compiled.	3.709	3.287	3.577	3.381
IMC14. . . . integrates customer information collected or generated from different divisions into a unified database.	3.608	3.323	3.518	3.388
IMC15. . . . actively carries out marketing communications activities, which strengthen the relationship with existing customers (e.g., sending birthday cards).	3.730	2.922	3.476	3.102
IMC16. . . . emphasizes that maintaining and strengthening relationships with existing customers is as important as expanding the market share by recruiting new customers.	3.777	3.503	3.726	3.524
IMC17. Our marketing communications strategy places heavy emphasis on generating continuous business from our existing customers by enhancing their satisfaction level.	3.655	3.425	3.661	3.388

Table A1. Cont.

	Female	Male	Belarus	Spain
	μ	μ	μ	μ
IMC18. . . . makes efforts to generate a continuous flow of profits from individual customers in the long run by solidifying relationships with them.	3.791	3.186	3.673	3.238
IMC19. In our company managers from different departments communicate with each other.	3.696	3.317	3.631	3.340
IMC20. In our company we create long-term communications with both internal and external stakeholders (consumers, partners, employees, and others).	3.635	3.389	3.631	3.361
IMC21. In our company different marketing communications tools for one product are planned by the same manager.	3.622	3.305	3.393	3.524
IMC22. . . . creates corporate brand equity, company identity, and reputation of the organization.	4.115	3.659	3.869	3.878
<i>EO = Entrepreneurial Orientation [20,48]. Five-point scale, endpoint descriptions in italics.</i>				
EO1. In general, our top managers favor a strong emphasis on . . . <i>marketing of tried and true products or services . . . research and development, technological leadership and innovation.</i>	2.595	2.784	2.512	2.905
EO2. In general, our top managers have a strong proclivity for low risk projects . . . <i>with normal and certain rates of return . . . with chances of very high return.</i>	2.818	1.988	2.774	1.925
EO3. In general, our top managers believe in . . . <i>gradual and cautious incremental behavior . . . bold, wide ranging acts.</i>	2.473	2.036	2.470	1.980
EO4. When confronted with decision-making involving uncertainty, we typically adopts . . . <i>a cautious, "wait and see" posture to minimize the probability of making costly . . . a bold, aggressive posture to maximize the potential of exploiting potential.</i>	2.764	2.257	2.476	2.517
EO5. How would you characterize changes in your product or service lines in the past five years?—Changes have been . . . <i>minor . . . dramatic.</i>	2.642	2.162	2.631	2.109
EO6. In dealing with competitors we typically . . . <i>respond to actions that competitors initiate . . . initiate actions to which competitors then respond.</i>	2.811	2.575	2.446	2.959
EO7. In dealing with competitors, we are the first to introduce new products, services, administrative techniques, operating technologies, etc. . . . <i>very seldom . . . very often.</i>	2.669	2.305	2.440	2.517
EO8. In dealing with competitors, we typically . . . <i>seek to avoid competitive clashes, preferring a "live and let live" posture . . . adopt a very competitive "undo the competitors" posture.</i>	2.986	2.419	2.815	2.537
<i>CUP = Customer performance [51]. Five-point scale with 1 = much worse than competitors and 5 = much better</i>				
CUP1. Customer satisfaction.	3.466	3.120	3.387	3.163
CUP2. Delivering value to your customers.	3.392	3.042	3.238	3.170

Table A1. Cont.

	Female	Male	Belarus	Spain
	μ	μ	μ	μ
CUP3. Delivering what your customers want.	3.453	3.084	3.315	3.190
CUP4. Retaining valued customers.	3.486	3.114	3.387	3.177
<i>MP = Market performance [51]. Five-point scale with 1 = much worse than competitors and 5 = much better</i>				
MP1. Market share growth.	3.209	2.886	3.018	3.061
MP2. Growth in sales revenue.	3.399	2.737	3.190	2.884
MP3. Acquiring new customers.	3.574	3.108	3.304	3.354
MP4. Increasing sales to existing customers.	3.304	3.000	3.250	3.020

Note. μ —population mean.

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Article

Entrepreneurial Competencies and Organisational Change—Assessing Entrepreneurial Staff Competencies within Higher Education Institutions

Jaana Seikkula-Leino ^{1,*} and Maria Salomaa ^{1,2}

¹ RDI and Business Operations, Tampere University of Applied Sciences, Kuntokatu, 33520 Tampere, Finland

² Lincoln International Business School, University of Lincoln, Brayford Pool, Lincoln LN6 7DQ, UK; maria.salomaa@tuni.fi

* Correspondence: jaana.seikkula-leino@tuni.fi

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Abstract: Universities have become more entrepreneurial organisations in the past decades. However, the entrepreneurial competences needed for driving societal change have not been largely discussed in research literature. This paper sought to examine entrepreneurial staff competencies in the context of universities of applied sciences. A single case study from Finland, Tampere University of Applied Science, was selected. As the case institution has systematically developed an entrepreneurial strategy, the aim was to examine how entrepreneurial thinking and actions at individual and organisational levels were realised. The quantitative study involved 17 supervisors and 39 employees, and the survey took place in the Spring of 2020. The results indicate that the entrepreneurial strategy has been successfully implemented. Although both supervisors and employees evaluate themselves and the organisation to be entrepreneurial, internal communication should be further developed. Especially the provision of constructive feedback to support self-efficacy and self-esteem should be highlighted. As previous studies have stressed the challenges of integrating entrepreneurial behaviour in a ‘traditional’ academic context, these results provide insights for universities aiming to implement an entrepreneurial strategy, stressing psychological factors in the development of entrepreneurial competencies. Furthermore, we introduce a new theoretical approach to the discussion on the entrepreneurial university based on entrepreneurial competences.

Keywords: entrepreneurial competencies; sustainability; higher education; entrepreneurial university; organisational change

1. Introduction: Towards Entrepreneurial Organisation

Over the past decade, there has been a clear shift towards strengthening organisational culture through entrepreneurial competencies. The overarching aim to reinforce these competencies reflects the many recent socio-economic and politic changes in the society: In all sectors, new solutions for promoting innovation and creativity, aligned with social and economic well-being, are constantly being sought out [1,2]. However, investments in new knowledge do not automatically lead into increased competitiveness and growth, but the focus should be on commercialization and encouraging entrepreneurship [3], especially by strengthening the transition from ‘latent’ to ‘emergent’ entrepreneurship. In the latter, the entrepreneur has the needed strategic and managerial capacity to pursue change by turning knowledge spillovers into economic growth [4]. According to Chandler and Jansen [5] these entrepreneurial competencies are indeed fundamental for different kinds of organisations, so that they can perform and succeed well. In the context of corporate entrepreneurship, the development of an entrepreneurial organisation has been defined as a process whereby an individual or a group of individuals, in association with an existing organisation, together create

a new organisation or investigate renewal or innovation within that organisation [6]. In practice, as argued by Bosman, Grard, and Roegiers [7], an individual, competence-based approach supporting entrepreneurship has become the most common structure for (staff) training programs and courses, e.g., in the field of entrepreneurial behaviour.

In parallel to the emergence of research literature focusing on entrepreneurial competencies, a lot has been written about universities' entrepreneurial and societal missions as well as their increasingly emphasised role in innovation systems. Hitherto, the academic literature has addressed the phenomenon through a myriad of overlapping concepts, including 'entrepreneurial university' [8], 'engaged university', see, e.g., [7,8], and the university 'third mission', see, e.g., [9,10], all of which widely refer to a range of different activities beyond education and research. These new roles played by universities have been increasingly articulated in higher education policies [11], which strengthen the university' role in the knowledge economy [12]. While many reform agendas have been created to support efficiency, effectiveness, and accountability within higher education institutions, e.g., by developing demand-based interdisciplinary research with businesses and industry partners [13], the entrepreneurial competencies needed for carrying out such initiatives has been less discussed in the context of higher education studies. Yet previous studies have indicated that reinforcing entrepreneurship education as well as entrepreneurial attitudes within the academic communities can be beneficial for producing highly skilled future entrepreneurs, allowing higher education systems to make a contribution to regional and national development [14].

It is obvious that both organisational and individual capacities to cope with uncertainty are increasingly important also in the higher education sector, especially in the time of the COVID-19 crises, which has challenged everyday operations of the higher education sector. Entrepreneurial capacities have been associated with organisational and individual abilities to cope in an uncertain and complex environment [15] in the context of entrepreneurial university [8]. As some scholars have even argued, that 'entrepreneurialism' can only be linked to individuals instead of organisations [16], and our paper seeks to generate in-depth knowledge on the entrepreneurial competencies needed for organisational change in the context of higher education institutions. Through a quantitative analysis based on a staff survey conducted in the Tampere University of Applied Sciences, we produce new insights on the different competence areas effectively driving change towards an entrepreneurial organisation.

The paper is structured as follows: Firstly, in the literature review, we summarise the shift towards entrepreneurial universities since the late 1990s, after which we present the chosen framework for assessing entrepreneurial competencies. Secondly, we provide an overview on the case study and a discussion on the methods. Thirdly, we present the results from the questionnaire. Lastly, we discuss on the key findings and make suggestions for further research.

2. Entrepreneurial Competencies Driving Organisational Change

2.1. From Entrepreneurial Universities to Entrepreneurial Competencies

It has been argued that 'entrepreneurial activity' can have a positive impact, not only to economic growth, but also to wealth and productivity [17]. Since the late 1990, the debate on the rise and impact of entrepreneurialism have been on the increase, also in regard to public organisations such as universities. In Clark's original conceptualisation of the 'entrepreneurial university' [8], 'entrepreneurialism' refers primarily to higher education institutions' internal dynamics and strategies [18]. The concept has been described as a framework for understanding organisational changes as 'dynamic, continuous, and incremental processes' based on collegial entrepreneurialism rather than direct top-down initiatives and/or management strategies [18]. However, the entrepreneurial university also underlines the commitment of the universities' personnel, being that reinforcing entrepreneurship demands 'department ownership' [8]. This can lead to the development of 'enterprise culture', which is open to change, as well as both creation and exploitation of innovations among students and staff members [14].

Overall, the research literature discussing entrepreneurship underlines that raising entrepreneurial efficacies will also raise perceptions of venture and entrepreneurial intentions in general [19]. Additionally, according to Wilson, Kickul, and Marlino [20] self-efficacy may play an important role in shaping and/or limiting perceived career options. Moreover, Neto et al. [21] found out in their study that self-efficacy actually predicts entrepreneurial behaviour of individuals. Thus, self-efficacy plays a key role in organisations' development, although it has been more associated with individual learning. As an example, Bandura [22] explains that students' beliefs about their efficacy regulate their learning, motivation, and mastering accomplishments. Moreover, teachers' beliefs about their personal efficacy and capacity to motivate and promote learning can affect the types of learning environments they create in practice for their students, as well as the level of academic progress they can accomplish in cooperation with their students. Furthermore, faculties' and schools' institutional beliefs about their collective instructional efficacy can contribute significantly to the schools' academic achievements and entrepreneurial activities as 'institutional determinants' increasing student entrepreneurship [14]. According to Borba [23,24], students and staff with high self-esteem and self-efficacy usually perform well, and they can better promote the development of their organisation towards goal-orientated actions, wider success, and collaborations.

Being so, we conclude that self-efficacy is not only an individual process, but it can be understood as a phenomenon formulated both through individuals and groups. Thus, self-efficacy, as a shared resource driving individual and organisational entrepreneurial competencies, is also our starting point for measuring the entrepreneurial organisation from the staff's perspective. In the following section, we present the framework for assessing entrepreneurial competencies within the context of higher education.

2.2. Framework for Assessing Entrepreneurial Competencies

According to Seikkula-Leino [25], the ground of entrepreneurial learning and behaviour involves a range of individual different competencies, such as: (1) Trust and respect, (2) each person is unique, (3) open interaction, (4) approaching goals and new opportunities, (5) competence and success oriented behaviour, (6) and working life, networks, and development. Seikkula-Leino's approach builds on Borba's [23,24] psychological and educational work focused on the development of self-esteem and self-empowerment, which can also be formed through group activities supporting staff self-esteem and self-efficacy—see also [22,26,27]—as well as through experiential learning, see, e.g., [28]. These elements, in combination, are also inherent in entrepreneurship research, e.g., through opportunity creation on both individual and organisational levels, see, e.g., [29,30].

Building on Seikkula-Leino's [25] and Ruskovaara et al.'s [31] previous work, we have chosen the following framework to assess entrepreneurial competencies (see Table 1) in the context of higher education. These entrepreneurial competencies form the theoretical basis of the research and designing of the survey, which was conducted for finding out how these entrepreneurial competencies are reflected in the thinking and everyday functions of both managers and employees within the chosen case university.

Table 1. Description of entrepreneurial competencies driving organisational change.

Competence Area	Description
Trust and respect within the working community	There is trust between the employees and the management, and in the organisation as a whole. There is trust enough to allow mistakes that may lead to new solutions or ideas.
Each person is unique	The personnel have an understanding of individual respect, and the personnel are given the space and opportunity to act individually. This also promotes new innovative ways to work in the organisation.

Table 1. Cont.

Competence Area	Description
Open interaction	A cooperative approach is encouraged at work. The personnel are proud of the team spirit in the workplace. The staff shares ideas. Furthermore, the organisation does not cooperate only internally. Interaction expands to communities outside of the organisation.
Approaching goals and new opportunities	The achievement of personal and group goals is supported in the workplace. The personnel are encouraged to seek out new opportunities and ways of doing things to achieve goals. The community participates in decision making. Changes in a working community bring improvements to the work.
Job satisfaction and competence	The personnel's skills are recognized, and the personnel have an opportunity to leverage their strengths in the workplace. There is a feeling that the staff is able to significantly influence one another's results. The staff evaluates whether objectives have led to results.
Working life, networks, development	The workplace supports the development of understanding of different fields and professions, and networking and partnerships with working life and the society around that. A workplace encourages the development/further development of ideas, solutions, or services for customers or other target groups. There is continuous development of competences. Moreover, understanding of entrepreneurship and/or entrepreneurial business is shared within the organisation.

Source: Authors' own elaboration after Seikkula-Leino [25] and Borba [23,24].

3. Case Study Overview

The Finnish Universities of Applied Sciences (UAS) actively conduct collaborative RDI activities with a range of different stakeholders, but these external linkages tend to be more often results of bottom-up initiatives rather than institutional bridging mechanisms (e.g., [32]). However, the Finnish UASs are considered to be significant promoters of innovation, particularly through their group-based and networked learning environments [33]. A strong entrepreneurial competence base of the UAS staff members could further reinforce the establishment of linkages with external partners and other collaborative initiatives [14].

The chosen case institution, namely the Tampere University of Applied Sciences (TAMK), is one of the biggest UASs in Finland, with well-established working life connections and a strategic aim to develop towards entrepreneurial organisation. It is a multidisciplinary UAS with 13,000 students and about 800 staff members, offering a range of BA and MA degree programmes in health and wellbeing, business studies, and technology. It's mission statement underlines the importance of developing collaboration with external partners and higher education's societal role: 'Our strong orientation towards working life ensures the best learning possibilities for our students. Furthermore, we are involved in research, development and innovation which specifically target the development needs of working life.' TAMK is also part of the newly established Tampere Higher Education Community, following the merger of the former University of Tampere and Tampere University of Technology in 2019, thus it represents a unique case in the Finnish UAS scene.

3.1. Research Design, Questions, and Target Group

Previous studies imply that the development of an entrepreneurial culture is not straightforward in an academic context [34]. This is argued, in particular, in the previous studies of Seikkula-Leino et al. [35,36] and Devici and Seikkula-Leino [37], discussing how entrepreneurship has been integrated into teachers' education. These studies underline that especially the development of entrepreneurial competencies and skills among the higher education staff members is not uncomplicated. These findings provided a profitable starting point for our study, allowing us to build on existing viewpoints related to entrepreneurial competencies in the context of higher education. Thus, we wanted to further investigate how different staff members working in a university perceive entrepreneurialism within the organisation, and how it could be reinforced while also examining individual employees'

assessments of their entrepreneurial capacities. Furthermore, the entrepreneurial competencies of the supervisors were studied through both staff's evaluations and their own assessments.

It has been argued that the first step towards driving (organisational) change successfully is to ensure that the employees themselves have assimilated the strategic reform [35–37], thus we decided to limit our research to the academic personnel. The research questions of this study are the following:

1. How are the entrepreneurial competencies assessed in a (higher education) organisation?
 - 1.1 How do the employees evaluate the entrepreneurial competencies of their organisation?
 - 1.2 How do the supervisors evaluate the entrepreneurial competencies of their organisation?
 - 1.3 Are there any differences between the employees' and supervisors' evaluations of their organization's entrepreneurial competencies?
2. How do personnel self-evaluate their entrepreneurial competencies?
 - 2.1 How do the employees self-evaluate their entrepreneurial competencies?
 - 2.2 How do the supervisors self-evaluate their entrepreneurial competencies?
 - 2.3 Are there any differences between the employees' and the supervisors' self-evaluations of the entrepreneurial competencies?
3. How are the entrepreneurial activities of the supervisors visible in the organisation?
 - 3.1 How do the employees evaluate the entrepreneurial competencies of their supervisors?
 - 3.2 How do the employees' evaluations of the supervisors' entrepreneurial competencies accord with the supervisors' self-evaluations of their entrepreneurial competencies?

As we explained above, the target group of the study includes different staff members working in higher education institutions (HEI). TAMK provided an interesting case HEI, as it has a strategic aim to strengthen entrepreneurial skills and competencies. Overall, the case study provided a suitable platform for investigating how these organisational goals can be detected in individual staff members' attitudes and beliefs. As Cohen, Manion, and Morrison [38] argue, the generalisability of such single experiments (e.g., case and pilot studies) can be extended through replication or multiple experiment strategies, allowing case studies to contribute to the development of a growing pool of data for eventually achieving a wider generalisability. Thus, the results obtained from our pilot study contribute to 'analytic' rather than 'statistical' generalisation to build on further studies.

The survey was conducted in Spring 2020 by sending the questionnaire to 198 respondents working at Tampere University of Applied Sciences by email. This specific group of staff member has been actively or, to some extent, actively involved in the development of an entrepreneurial organisation in TAMK. Altogether, 56 of the responses were received from 17 supervisors and 39 employees. In total, our response rate in this random sampling is about 29%, which can be considered reasonably good in this kind of quantitative research setting.

3.2. Assessment Tools and the Data Analysis

In our previous studies, the assessment tools have been successfully used in the corporate world (e.g., Wihuri Group, Property Management Association, Raisio, pharmacies etc.) between 2012–2015. These individual studies confirm the reliability of the assessment tools; as an example, Cronbach's alpha levels varied in different categories between 0.67–0.96, which can be interpreted as 'satisfactory' [39]. Minor changes were made to the metrics to increase its usability in the context of higher educational institutions; the assessment tools utilised in this study are based on Seikkula-Leino's [25] approach on entrepreneurial behaviour presented in the previous section. In addition, the SKILLOON student assessment tools, based on similar theoretical approach, were utilised in the development of the tools for this study. SKILLOON (www.skilloon.com), is an official education concept of Education Finland supported by the Finnish National Board of Education. SKILLOON involved assessment tools, entrepreneurial activities, and student mentoring programmes. SKILLOON is created in research cooperation with schools and universities, and it is used for education and research purposes.

The assessment tool targeted to personnel, the SKILLOON staff assessment survey, had four different assessment tools, each of which included six sets of research questions. The first assessment tool was targeted to both employees and supervisors, and it contained an evaluation of the different (entrepreneurial characteristics) of the organisation. The second and third assessment tool focused on self-assessment of the employers and the supervisors, and finally, the fourth assessment tool was targeted to employers, who assessed the employers. Each of these four sections contained between five to seven questions of claims. The respondents specified their level of agreement or disagreement on a symmetric agree/disagree scale between 1–10, whereas 1 meant that the respondent fully disagrees with the claim, and 10 that the respondent fully agrees. Each competence area forms an individual summation notation, by calculating each respondents' mean for each set of questions.

In order to assess the quality and representativeness of the data, we inspected the pattern and frequencies of missing values. One respondent was excluded from the analysis in the supervisors' self-evaluation section due to non-response. In addition, three respondents (employees) lacked an answer to one question in different sections, and these were treated as missing values in the analysis. The examples of survey questions and claims are summarised in Table 2.

Table 2. The examples of SKILLOON staff assessment tools and claims.

Competence Area, Examples	Evaluation of the Organisation (The 1st Assessment Tool)	
Trust and respect within the working community	1. The staff share the same opinion about the common rules.	
	2. There is open communication between the employees and the management, and this enables, for example, the proposal of 'crazy' ideas.	
	3. There is trust between the employees and the management.	
	4. Employees can count on the promises made by management.	
	5. The rules governing employees are clear.	
	6. We see that mistakes that are made lead to new solutions or ideas.	
Open interaction	1. It is clear that the personnel are proud of the team spirit in the workplace.	
	2. Cooperation is encouraged at work.	
	3. The atmosphere in the workplace means that people keep ideas to themselves.*	
	4. Employees want to work for the benefit of the whole organisation and not only to complete their own tasks.	
	5. The employees have a feeling of unity.	
	6. We actively develop network cooperation with parties outside our working community.	
*Question number 3 was reversed. This was taken into account in our analysis by reversing the answers for this question.		
Competence Area, Examples	Self-Evaluation of Supervisors (The 2nd Assessment Tool)	Self-Evaluation of Employees (The 3rd Assessment Tool)
Each person is unique	As a member of the management team ...	
	1. I make an effort to get to know the personal lives of the employees.	
	2. I send personal messages (e.g., congratulations, condolences, thanks).	
	3. I regularly consider the uniqueness of each employee;	
	4. I take into account the efforts of employees.	
	5. I provide opportunities for employees to get to know each other's interests.	
	6. I allow space for employees to take risks when doing new things.	
1. I will take note if my colleague or other member of the work community has succeeded in something.		
2. I don't mind if I act differently to other employees.		
3. I like to take into account the personal lives of others (birthday, hobbies, children, spouse, etc.).		
4. I show my appreciation for others.		
5. I am not afraid of failure, but I boldly try new things.		
6. I encourage other employees to do new things.		

Table 2. Cont.

Competence Area, Examples	Self-Evaluation of Supervisors (The 2nd Assessment Tool)	Self-Evaluation of Employees (The 3rd Assessment Tool)
Approaching goals and new opportunities	As a member of management team ... 1. I strive to map employees' thoughts and ideas on development regularly. 2. I help staff develop a shared vision of what is most important in our workplace for the client or other target group. 3. I make sure that everyone is aware of our mission content. 4. I offer opportunities for shared responsibility. 5. I provide detailed feedback to help each employee achieve their goals. 6. I guide employees towards seeing the positive aspects of change.	1. I strive to find new opportunities in my work. 2. There are clear goals in my work. 3. I strive to reach my goals. 4. I try to influence decision-making. 5. I understand what the goals of our organisation are. 6. I am excited about new challenges in my work.
Competence Area, Examples	Evaluation of the Supervisors by Employees (The 4th Assessment Tool)	
Job satisfaction and competence	As an employee I think that the management ... 1. Offers the support I need so I can fulfil the expectations set for me. 2. Enables me to demonstrate my competence. 3. Directs my improvement at work through various methods (e.g., through observation, discussion, leveraging customer feedback, etc.). 4. Clearly states what is good in my work and what could be improved. 5. Helps me to identify the significance of my activities regarding the personal activities of others (target groups/customers, other employees, etc.). 6. Evaluates how I have achieved results.	
Working life, networks, development	As an employee I think that the management ... 1. Supports the development of my understanding of the various sectors and areas of working life. 2. Directs me towards networking in order to support the development of my work. (Networks include companies, educational institutions, organisations, social actors, etc.). 3. Encourages me to develop/further develop ideas, solutions, or services for customers. (A customer may also be a person or entity who does not pay for a service.) 4. Supports me in developing new solutions that improve my own operations. 5. Supports the continuous development of my own skills. 6. Contributes to strengthening my understanding of entrepreneurship and/or entrepreneurship business. 7. Encourages the search for partnerships from different sectors of society.	

4. Results

In this section, we present the key results from each of the four assessment tools of the survey.

4.1. How Are the Entrepreneurial Competencies Assessed in A (Higher Education) Organisation?

4.1.1. How Do the Employees Evaluate the Entrepreneurial Competencies of Their Organisation?

The sum variables were formed from the responses of 39 employees. The averages of the sum variables in every assessment tool are quite high, as we can see from Table 3. The highest average is in assessment tool 'Trust and respect within the working community' and the lowest average is in assessment tool 'Job satisfaction and competence'. Only the lowest average in assessment tool 'Job satisfaction and competence' is slightly smaller than in other assessment tools. This could be explained by the fact that in this assessment tool, one of the questions was reversed—there might be people that haven't noticed this. On the other hand, there is a reversed question also in assessment tool 'Open interaction', but there was no visible deviation within the results. Overall, the employees considered their organisation to be rather entrepreneurial.

4.1.2. How Do the Supervisors Evaluate the Entrepreneurial Competencies of Their Organisation?

The sum variables were formed from the responses of 17 supervisors. The highest average is in assessment tool 'Working life, networks, development' and the lowest average is in assessment tool 'Each person is unique'. The averages of every six sum variables were high and they were all

at the same level. This can be verified from Table 3. In general, the supervisors highly evaluate the entrepreneurial competencies of their organisation.

4.1.3. Are There Any Differences between the Employees' and the Supervisors' Evaluations of the Entrepreneurial Competencies of Their Organisation?

Even though the averages of supervisors are slightly higher than the averages of employees in each assessment tool (Table 3), the boxplots in Figure 1 indicate that there is more dispersion in the responses of employees. Moreover, the employees have more extreme responses. In these boxplots, the orange and blue colours are for supervisors and employees, respectively. This could be explained by the fact that there were significantly more employees ($n = 39$) than supervisors ($n = 17$) among the respondents. Both the highest and the lowest averages of supervisors and employees are in different assessment tools. It was examined by analysis of variance (ANOVA) whether there were differences between the responses of supervisors and employees. The p -values in each assessment tool are in Table 3. Thus, based on these p -values, there was a statistically significant difference in assessment tool 'Job satisfaction and competence' between the answers of supervisors and the answers of employees: The supervisors evaluate the entrepreneurial competencies in this assessment tool significantly higher than the employees.

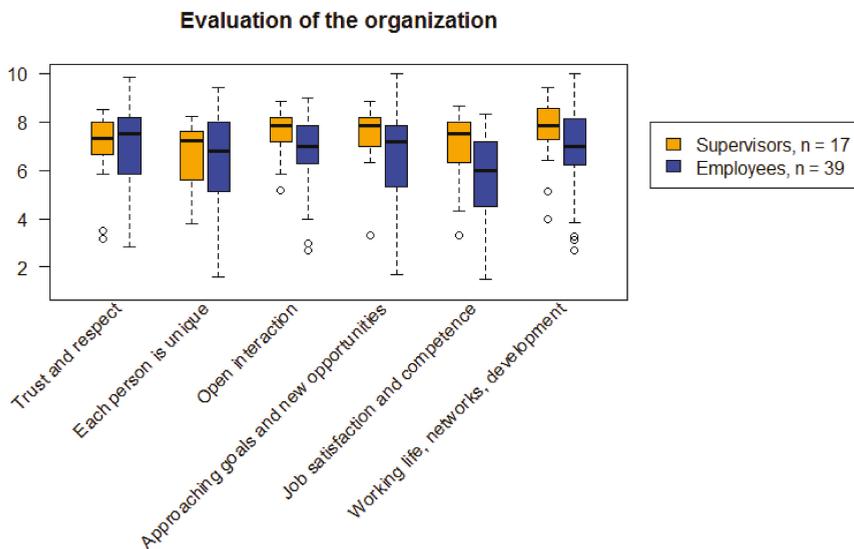


Figure 1. Evaluation of the organisation by each competency area, $n = 56$.

Altogether, the personnel's perception on the entrepreneurial competencies of their organisation is quite good, and there are no significant differences between the means of assessments of supervisors and the means of assessments of employees, except in assessment tool 'Job satisfaction and competence'. However, in this assessment tool, the supervisors evaluate the competencies of their organisation to be higher than the employees.

Table 3. Evaluation of the organisation, n = 56.

	Evaluation of the Organisation, Supervisors	Evaluation of the Organisation, Employees	Sig.
	Mean	Mean	
1. Trust and respect within the working community	6.98	6.9	0.9502
2. Each person is unique	6.58	6.43	0.768
3. Open interaction	7.52	6.82	0.1025
4. Approaching goals and new opportunities	7.24	6.46	0.1006
5. Job satisfaction and competence	6.99	5.73	0.008955 **
6. Working life, networks, development	7.6	6.86	0.127

*, **, *** indicate significant at the level of 5%, 1%, and 0,1% respectively.

4.2. How Do the Personnel Evaluate Their Own Entrepreneurial Competencies?

4.2.1. How Do the Employees Self-Evaluate Their Entrepreneurial Competencies?

The sum variables were formed from the answers of 39 employees. The averages in every assessment tool are very high as we can see from Table 4. The highest average is in assessment tool 'Open interaction', and the lowest average is in assessment tool 'Job satisfaction and competence'. In general, the employees evaluate themselves to be very entrepreneurial.

4.2.2. How Do the Supervisors Self-Evaluate Their Entrepreneurial Competencies?

The sum variables were formed from the responses of 16 supervisors, since one respondent among the supervisors did not answer any questions of the last two assessment tools. The averages are high or very high in all assessment tools, as we can see from Table 4. The highest average is in assessment tool 'Trust and respect within the working community', and the lowest average is in assessment tool 'Job satisfaction and competence'. The supervisors evaluate themselves to be very entrepreneurial.

4.2.3. Are There Any Differences between the Employees' and the Supervisors' Self-Evaluations of the Entrepreneurial Competencies?

Based on these results, we conclude that both the supervisors and the employees evaluate their entrepreneurial competencies to be rather high. Considering the assessment tool 'Trust and respect within the working community', the supervisors seem to evaluate themselves higher than the employees based on the means. In all other assessment tools, the employees have higher means. The highest average of employees and the highest average of supervisors are in different assessment tools. On the other hand, the lowest average of employees and the lowest average of supervisors are in the same assessment tool 'Job satisfaction and competence'. It was examined by analysis of variance whether there were differences between the means of supervisors' answers and the means of employees' answers in how they evaluate themselves. The differences are statistically significant in competency areas 'Each person is unique', 'Open collaboration', 'Approaching goals and new opportunities', and 'Job satisfaction and competence'. In each of these competence areas, the TAMK's employees seem to evaluate themselves higher than supervisors. The boxplots in Figure 2 also suggest the same conclusion obtained using statistical methods. By comparing Tables 3 and 4, we can conclude that the personnel evaluate their individual entrepreneurial competencies to be higher than the collective capacities of the organization. This applies to every assessment tool.

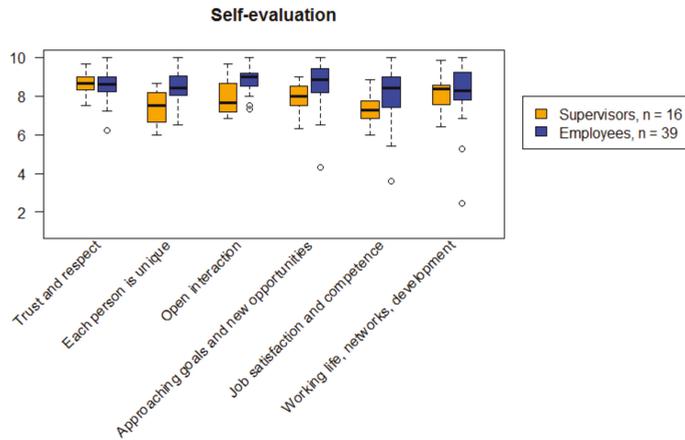


Figure 2. Self-evaluation by each competency area, n = 55.

Table 4. Self-evaluation, n = 55.

	Self-Evaluation, Supervisors,	Self-Evaluation, Employees,	Sig.
	Mean	Mean	
1. Trust and respect within the working community	8.63	8.52	0.9929
2. Each person is unique	7.48	8.41	0.000167 ***
3. Open interaction	7.95	8.83	0.0005413 ***
4. Approaching goals and new opportunities	7.9	8.62	0.002278 **
5. Job satisfaction and competence	7.28	7.98	0.009078 **
6. Working life, networks, development	8.11	8.26	0.504

*, **, *** indicate significant at the level of 5%, 1%, and 0,1% respectively.

4.3. How Are the Entrepreneurial Activities of the Supervisors Visible in the Organisation?

The supervisors’ self-evaluation and the employees’ assessment of the supervisors are both above average with overall means 7.89 and 6.34, respectively. Therefore, we can conclude that TAMK has a good entrepreneurial competence in particular amongst its supervisors.

4.3.1. How Do the Employees Evaluate the Entrepreneurial Competencies of Their Supervisors?

As summarised in Table 5, the employees evaluate the entrepreneurial competencies of their supervisors quite highly, with averages ranging from 5.97 to 7.14. The employees agree most in ‘Trust and respect within the working community’ and disagree most in ‘Job satisfaction and competence’. Both the maximum mean, 7.14, and the maximum median, 7.50, is in ‘Trust and respect within the working community’, and the lowest mean is in ‘Job satisfaction and competence’. Therefore, these assessment tools should be examined in more detail.

In the assessment tool ‘Trust and respect within the working community’, question 1. ‘As an employee I think that the management is reliable (e.g., keeps its promises)’ has a rather low dispersion, and the average of the question is 7.95, and the median is 8.0, which is a very good result. Thus, it can be concluded that the employees most often agree that the management is reliable. In ‘Job satisfaction and competence’, question 4. ‘As an employee I think that the management clearly states what is good in my work and what could be improved’ has the lowest score, a mean of 5.28, and median 5.00. The content of the question is worth paying attention to in the further development of the organisation.

Table 5. Employees evaluate supervisors, n = 39.

	Mean	Median	Standard Deviation
1. Trust and respect within the working community	7.14	7.5	1.99
2. Each person is unique	6.04	6.5	2.06
3. Open interaction	6.11	5.67	2.07
4. Approaching goals and new opportunities	6.15	6.83	2.25
5. Job satisfaction and competence	5.97	6.33	2.32
6. Working life, networks, development	6.6	7.14	2.06

4.3.2. How Do the Employees’ Evaluations of the Supervisors’ Entrepreneurial Competencies Accord with the Supervisors’ Self-Evaluations of Their Entrepreneurial Competencies?

Supervisors evaluate their own entrepreneurial competencies to be higher compared to the employees’ assessment on the entrepreneurial competencies of the supervisors. This can be seen in each of the assessment tools (Figure 3). Once again, the employees’ responses are more dispersed, which may be due to the fact that there are significantly more employees (n = 39) than supervisors (n = 16) among the respondents. One supervisor lacked responses to self-evaluations assessment tools 5 and 6, reducing n to 16.

Otherwise, the results of sections ‘Employees evaluation of supervisors’ and ‘Supervisors self-evaluation’ are parallel in all the competence areas. The responses summarised in Table 6 indicates that ‘Trust and respect within the working community’ has the highest mean in both self-evaluation and evaluation of the supervisors, 8.63 and 7.14, respectively, while ‘Job satisfaction and competence’ has the lowest, 7.28 and 5.97, respectively.

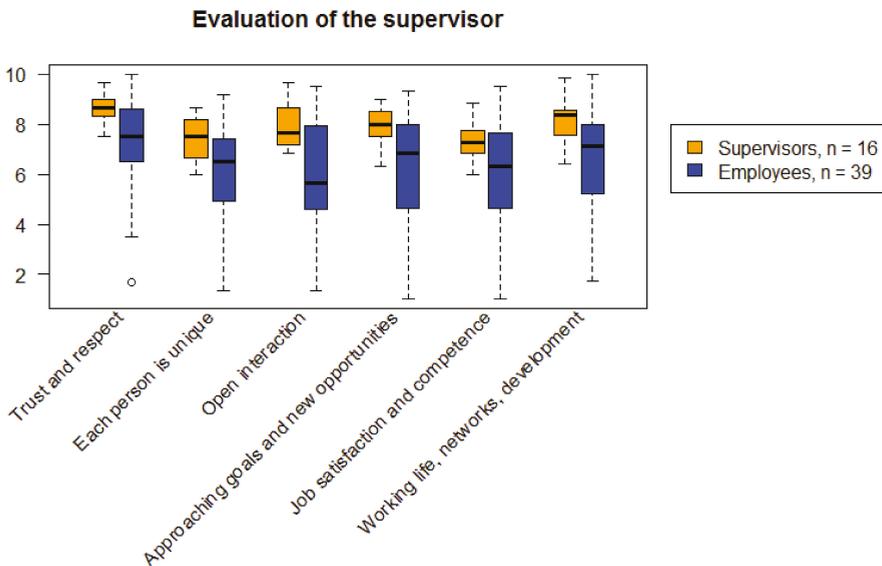


Figure 3. Evaluation of the supervisor by each competency area, n = 55.

Table 6. Comparison of the supervisors' self-evaluation and employees evaluating supervisors, n = 55.

	Supervisors' Self-Evaluation	Evaluation of the Supervisors	Sig.
	Mean	Mean	
1. Trust and respect within the working community	8.63	7.14	0.000111 ***
2. Each person is unique	7.48	6.04	0.000559 ***
3. Open interaction	7.95	6.11	2.63×10^{-5} ***
4. Approaching goals and new opportunities	7.9	6.15	6.77×10^{-5} ***
5. Job satisfaction and competence	7.28	5.97	0.002704 **
6. Working life, networks, development	8.11	6.6	0.000439 ***
Total	7.89	6.34	2.79×10^{-5} ***

*, **, *** indicate significant at the level of 5%, 1%, and 0.1% respectively.

Because of unequal variances and unbalanced data, the comparison of the two respondent groups' means was done using Welch's *f*-test. The differences in group means are statistically significant (see Table 6). Although in some sum variables the group means differed a lot, all are above 5.5, which can be considered a rather good result. But it should be noted that the average differences in the groups are at their highest 1.84 ('Open interaction'), which is a big deviation and may need some further examination. However, this can be partly explained by the different group sizes of the respondents, and perhaps the data is somewhat biased if, for example, more satisfied supervisors and less satisfied employees have responded to the survey.

When examining assessment tool 'Open interaction' question by question, it can be seen that the results are parallel, but the average responses of employees are, on average, almost two points lower than those of supervisors in questions 2–6. It can be concluded that supervisors and employees have different views on how well management invests in open interaction within the organisation. Also, the supervisors evaluate their entrepreneurial competencies in open interaction to be much higher than the employees do.

4.4. Consistency of the Assessment Tools

Internal consistency of the assessment tools was measured with Cronbach's alpha. These assessment tools have been used a lot, and they have been developed along the way. Furthermore, as presented before, they have been proven to work well in assessing entrepreneurial competencies in the context of private organisations. Table 7 indicates that all the alphas are good or excellent, ranging from 0.60 to 0.95, except in 'Employees self-evaluation', which is a new section. In assessment tools '1. Trust and respect within the working community', the alpha is 0.47, and in '3. Open interaction', the alpha is 0.52. However, considering that there are only 39 observations and that this section is in use for the first time, the alphas are sufficient for using the tool. This implies, that there are two questions within the two assessment tools that need to be reformulated for further use. There is also a new assessment tool 'Working life, networks, development', but it works very well, the alphas being between 0.79 and 0.95. Overall, there are a total of about 120 statements in all of our research metrics. Therefore, we do not consider this to compromise the results of the study, as only a few statements are not completely ideal. However, further examination of the tool is still needed.

Overall, we assess that the reliability and validity of the assessment tools are on a sufficient level for responding to the set research questions [39]. The phenomenon has been examined through a multidisciplinary approach, and with a range of different assessment tools and two different respondent groups. However, there is still room for further development of the assessment tools and research design, both of which are discussed in the following section together with the obtained results.

Table 7. Measuring the consistency of the assessment tools by Cronbach's alpha.

Evaluation of the Organisation	Cronbach's Alpha
1. Trust and respect within the working community	0.91
2. Each person is unique	0.87
3. Open interaction	0.83
4. Approaching goals and new opportunities	0.91
5. Job satisfaction and competence	0.88
6. Working life, networks, development	0.91
Supervisors Self-Evaluation	
1. Trust and respect within the working community	0.68
2. Each person is unique	0.61
3. Open interaction	0.7
4. Approaching goals and new opportunities	0.64
5. Job satisfaction and competence	0.6
6. Working life, networks, development	0.79
Employees Self-Evaluation	
1. Trust and respect within the working community	0.47
2. Each person is unique	0.69
3. Open interaction	0.52
4. Approaching goals and new opportunities	0.81
5. Job satisfaction and competence	0.77
6. Working life, networks, development	0.88
Employees Evaluating Supervisors	
1. Trust and respect within the working community	0.92
2. Each person is unique	0.89
3. Open interaction	0.89
4. Approaching goals and new opportunities	0.95
5. Job satisfaction and competence	0.95
6. Working life, networks, development	0.95

5. Discussion and Conclusion

In this paper, our aim was to investigate how entrepreneurial thinking and actions on both the individual and organisational levels were realized in practice after the case university's strategy reform. Our approach enabled analysing what kind of entrepreneurial competences are needed in the context of higher education to drive organisational change, which can have also a significant socio-economic impact in the long-term. Overall, the results obtained from our pilot study are positive in regard to the activities of the organisation and the individuals, both of which were estimated to be entrepreneurial. In regard to previous studies [34–37], it can be estimated that Tampere University of Applied Sciences has succeeded in implementing an efficient entrepreneurship strategy across the board, although there are also areas in which further development is needed.

The results indicate that the supervisors tend to estimate their entrepreneurial competencies higher than the employees. This implies, that the entrepreneurial strategies of the organisation are well communicated to different management levels, while the employees are less engaged and equipped to contribute to transformative change towards entrepreneurial organisation to support entrepreneurial attitudes within the university community [14]. However, as previous studies on the 'entrepreneurial university' have argued, top-down initiatives or organisational strategies alone are not sufficient for drivers of organisational change, but collegial entrepreneurialism should be supported through collegial entrepreneurialism [18]. The literature has also emphasized the role of the universities' personnel [8] in creating an 'enterprise culture'. Being so, identifying and further development of the entrepreneurial competencies among staff members would facilitate higher education institutions' path towards entrepreneurial organisations. As a practical recommendation, more attention could be paid

to interaction and personal feedback of the employees. This is also likely to provide valuable feedback to the HR of organizations and the development of targeted management training programmes with an aim to equip the managers with new skills for providing constructive feedback, which supports open communication and raise further discussion on the organisational goals. Undoubtedly, the development of an entrepreneurial organisation also emphasises psychological starting points for meeting people, and thus also for strengthening the self-efficacy of individuals [26,27].

On the other hand, the number of participants in the pilot study is limited. The question also arises as to whether those persons who, in principle, have been more oriented towards entrepreneurialism, have responded to the survey. That is why, in the future, even more extensive organisational measurements are required to assess the entrepreneurial capacities effectively. Admittedly, qualitative research integration would also have the potential to generate a deeper understanding of the phenomenon. Similar measurements, also in different sectors and societal contexts, would provide more in-depth information on the extent to which entrepreneurialism appears as a contextual feature. Based on this knowledge, it would be possible to create even more customised development models or training programmes targeted for the development of an entrepreneurial organisation (e.g., management training and HR development).

Previous studies imply that the entrepreneurial culture is not given in the academic context [34–36], and thus future research is still needed in the area. Moreover, many studies aim to investigate the entrepreneurial culture within particular target groups (e.g., teachers) representing a part of the university personnel, although a more holistic view to the development of positive attitude towards entrepreneurial capacities can also increase student entrepreneurship [14]. Being so, our research is even ground-breaking in the sense that we have not found any previous studies with a similar starting point—namely, identifying both employees' and supervisors' perceptions of their personal and their organisation's entrepreneurial capacities and exploring these aspects simultaneously.

As a part of the survey, employees also evaluated their supervisors. To that extent, our different assessment tools provide unique information on the phenomenon. The tools themselves triangulate [38] the manifestation of entrepreneurialism in an organisation through a variety of ways, even though our metrics provide only quantitative information. Furthermore, our tools are also based on an interdisciplinary premise integrating entrepreneurship, psychology, and behavioural science research, which contributes to the knowledge base of entrepreneurship research by 'borrowing' theoretical approaches from other research fields [40]. In this way, we have triangulated the phenomenon based on academic discussion within different disciplines, such as higher education studies.

In the future, we will also emphasise organisational development based on the Seikkula-Leino's competency model [25]. With these indicators, we will be able to study further, e.g., the effectiveness of different national and institutional development programmes. We estimate that our organisational development concept based on previous studies on entrepreneurial competencies (SKILLOON tool) could potentially contribute to the development of different entrepreneurial organisations and entrepreneurial culture, which is permissive, appreciative, and supports feelings of success and self-efficacy in all levels of the organisation. Furthermore, this approach can help to create a wider understanding of the theoretical basis of entrepreneurial organisation and its culture by identifying the elements that support effective managerial and strategic capacities to transform knowledge into entrepreneurial activity [3]. This type of culture does not only create a basis for entrepreneurial activity, but, at the same time, it promotes the wellbeing of management and employees, creating a solid foundation for building a sustainable organisational culture whilst also supporting student entrepreneurship [14]. Developing such a culture would contribute to the ability to operate more stably and in a more agile manner in a global and rapidly changing environment. It would also indirectly contribute to the strengthening of a sustainable society, in which people solve the challenges ahead and even find new and unpredictable innovative openings for the development of quality of life—allowing us to put into practice the latest global strategies driving entrepreneurship within the society (see, e.g., [1,2]).

6. Data Availability Statement

The dataset generated for this study will not be made publicly available because of the sensitive nature of the questions. All study participants were assured that the data will remain confidential and will not be shared. Therefore, all requests concerning the access to the dataset should be directed to the corresponding author.

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Article

Relationship between Entrepreneurial Team Characteristics and Venture Performance in China: From the Aspects of Cognition and Behaviors

Xue-Liang Pei ^{1,2}, Tung-Ju Wu ^{3,*}, Jia-Ning Guo ¹ and Jia-Qi Hu ¹

¹ College of Business Administration, Huaqiao University, Quanzhou 362021, China; peixueliang@hqu.edu.cn (X.-L.P.); 1716112005@stu.hqu.edu.cn (J.-N.G.); 1416111024@stu.hqu.edu.cn (J.-Q.H.)

² East Business Management Research Centre, Huaqiao University, Quanzhou 362021, China

³ School of Management, Harbin Institute of Technology (HIT), Harbin 150001, China

* Correspondence: tjwu@hit.edu.cn

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Abstract: Entrepreneurial and innovative activities are becoming a global economic and social phenomenon, especially in emerging economies. This study focuses on a typical emerging economy, China, and its entrepreneurial and innovative activities. On the basis of current research, the literature review and the chain of “cognition–behavior–outcome” are used for constructing the theoretical model for the relationship among entrepreneurial team cognition characteristics, behavior characteristics, and venture performance. A total of 101 valid copies of questionnaire are collected from entrepreneurial team members, as the research objects, and the structural equation modeling (SEM) method is applied to test the theoretical hypotheses. The research results reveal (1) significant effects of entrepreneurial team cognition characteristics and behavior characteristics on venture performance and (2) partial mediating effects of entrepreneurial team behavior characteristics on the relationship between cognition characteristics and venture performance. The research results are the expansion of research on entrepreneurial teams as well as the important reference for entrepreneurial team management and behavioral practice.

Keywords: entrepreneurial team; cognition characteristics; behavior characteristics; venture performance

1. Introduction

The effective implementation of sustainable growth and the development of organizations through entrepreneurship and innovation is a pressing matter for countries around the world, especially among those with emerging economies. According to the data of the National Development and Reform Commission of China from 2015, when the China government proposed the slogan of “mass entrepreneurship brings a mass of innovations” and implemented national policies that encouraged innovative entrepreneurship. Until to 2018, it already had 11,808 entrepreneur incubation organizations countrywide, with over 6.7 million new registered companies in 2018. Moreover, 3.5 million related jobs were created in total [1]. Innovative entrepreneurship is increasingly becoming an important driver of Chinese economic growth and sustainable development. Therefore, entrepreneurial and innovative activities are becoming a global economic and social phenomenon, one that is increasingly drawing the attention of theoretical and practical fields alike [2].

Moreover, the current contribution rate of emerging economies to the global economy is continuously increasing and is becoming the main source of the global economy’s stability. Because of this, entrepreneurial and innovative activities within emerging economies should be given

more attention. However, Singh and Gaur [2] believe that most of the present literature on entrepreneurship and innovation management focus on the research of relatively developed economies (e.g., North America and Europe), and that literature focusing on entrepreneurship and innovation management in emerging economies is scarce and not frequently published. Furthermore, owing to the higher level of obscurity and uncertainty in the business environments of emerging economies, it is imperative that the rules of entrepreneurial and innovative activities within these economies are more carefully uncovered [3]. On the basis of the foregoing, this study focuses on a typical emerging economy, China, and its entrepreneurial and innovative activities.

In the innovative and entrepreneurial activities of emerging economies, entrepreneurial ventures play an important role in the national economy and social development [4]; particularly, under the rapid development of information technology and the constant change of customer needs, entrepreneurial ventures, with the characteristics of flexibility, innovation, closeness to customers, and prompt responses, became critical economic power [5]. In the establishment and development process of entrepreneurial ventures, team entrepreneurship showed higher success rate than individual entrepreneurship, and the leadership and management patterns gradually changed from individual to team entrepreneurship [6]. In this case, research on the relationship among entrepreneurial team characteristics, the composition, and venture performance in entrepreneurial venture management became topics in the past years [7].

In China, “Fujian Merchants” are a unique group of businessmen who are characterized by “dedicate yourself and you will win”, which is the most intuitive embodiment of entrepreneurship [8]. For example, the China Mass Entrepreneurship Index in 2016 (MEI-2016) released by Southwest Jiaotong University shows that Fujian Province ranks among the top ten provinces in terms of innovation and entrepreneurship in China [9]; the 6th Fujian Merchants Forum in 2019 is themed with “condensing the mind, condensing the intelligence; innovating, creating, and entrepreneurship” [10]. Among the innovation and entrepreneurship activities of Fujian Merchants, Quanzhou is the city with the highest economic aggregate, the largest contribution, the largest number of overseas Chinese businessmen, and the oldest history of entrepreneurship. It is also the starting point of the ancient “Maritime Silk Road”, with enrich entrepreneurial culture accumulation [11]. Moreover, Xiamen is one of the earliest special economic zones in China, and it is also one of the cities with the best innovation and entrepreneurship environment in China now [12]. On the basis of above, this article selects the “Fujian Merchants” that are most typical with innovation and entrepreneurship in China, and takes the entrepreneurial teams of Quanzhou and Xiamen as the research objects to survey the entrepreneurial activities in emerging economies represented by China from a sustainable perspective.

The high risks, high failure rate, and high uncertainties of entrepreneurial ventures revealed the difference in entrepreneurial team characteristics from traditional businesses [13]. For instance, capital chain break, core technician loss, and external macro environment change might appear in the process of entrepreneurial venture development to result in entrepreneurial team loss and even disbandment [14], while in traditional businesses, they do not. Hence the necessities to further research the relationship between entrepreneurial team characteristics and venture performance [7].

Meanwhile, current research on the relationship between entrepreneurial teams and venture performance has focused on the internal mechanism of the structure and characteristics of entrepreneurial teams (e.g., heterogeneity, knowledge sharing, conflict resolution, and innovation ability) affecting venture performance, while the theoretical regulation behind the effect of entrepreneurial team characteristics on venture performance is yet to be interpreted [15]. In this case, team cognition theory is introduced to this study, wherein entrepreneurial team characteristics are divided into cognition characteristics and behavior characteristics, and the chain of “cognition–behavior–outcome” is followed to analyze the relationship between entrepreneurial team characteristics and venture performance [7,16].

Furthermore, owing to the higher degree of ambiguity and uncertainty in the business environment of emerging economies, it is more necessary to carefully explore the rules of entrepreneurship and

innovation activities from a sustainable perspective in both theory and practice. It can promote the development of innovation and entrepreneurship activities.

2. Theoretical Basis and the Proposal of Research Hypothesis

2.1. Definition of Related Concepts

2.1.1. Entrepreneurial Teams and Their Characteristics

There is no universal definition of an entrepreneurial team within the academe. However, in the context of academic literature, the most widely accepted definition is that proposed by Kamm et al. [4], wherein they believe that an entrepreneurial team is a group of two or more people based on common prospects and interests who cooperate to establish a new enterprise for the purpose of gaining better economic profits. After this, Gartner et al. [17] expanded the concept of entrepreneurial teams, believing that the concept not only includes the multiple individuals who cooperated to start the enterprise, but also those individuals who have direct and important impacts on the formulation of the strategy of the company. Ensley and Carland [18] and Mol, Khapova, and Elfring [7] combined the afore-stated views and defined the characteristics of individuals within the entrepreneurial team from the perspectives of economic profit, team cooperation, and strategy formulation. Therefore, we proposed that the term “entrepreneurial team” refers to a group formed in the early establishment period of the company made up of individuals with shared responsibility, who have complementary talents and common entrepreneurial goals and prospects, and is a group wherein these individuals cooperate to set and implement business strategies.

There are many different schools of thought when it comes to the structure and characteristics of entrepreneurial teams [15]. On the basis of the objectives of this research, we divide entrepreneurial characteristics into cognitive characteristics and behavioral characteristics based on team cognition theory.

2.1.2. Venture Performance

Venture performance is the goal behind the establishment and development of entrepreneurial companies, and is also a focal point of discussion in the entrepreneurial research field [7,19]. Scholars believe that the impact on the behavior of the entrepreneur mainly manifests itself in the form of venture performance [16]. Furthermore, venture performance is not just the enumeration of various related indicators, but rather a more systematic whole that should yield related indicators through the analysis of the environment of the company, the entrepreneurial team, and the individuals composing that team [20]. Furthermore, venture performance should also include the results of entrepreneurship as well as the entrepreneurship process [21]. On the basis of the foregoing, this study holds that venture performance refers to an important reference indicator that evaluates the degree to which firms are able to complete certain tasks or reach certain goals throughout the entire entrepreneurial process.

2.2. Theoretical Analysis of the Relationship between the Cognition Characteristics and Venture Performance of an Entrepreneurial Team

Cognition characteristics of an entrepreneurial team refer to cognition basis and emotion difference among entrepreneurial team members. From the aspect of an organization, an entrepreneurial team is the establishment stage of a traditional business organization. Traditional research on the high management team of an enterprise indicated that the heterogeneity of background and experiences among high management team members would result in different cognition bases, thereby causing cognitive conflict. The cognitive conflict of such high management teams could improve the strategic decision making of an enterprise to further improve the business performance [22]. On the other hand, researchers considered that the different works engaged by high-level management team members would result in task conflict, which, essentially, is a kind of cognitive conflict to improve business

performance [23]. According to the research on entrepreneurial teams, Roure and Maidique [24] indicated that an entrepreneurial team with higher skill heterogeneity could better improve the business performance with strategic decision making. Kamm and Nurick [25] mentioned that an entrepreneurial team with higher skill heterogeneity could effectively cope with risks and uncertainties in the entrepreneurial process. Carpenter [26] further determined the direct effects of the cognition characteristics of the heterogeneous skills, background, and experiences of an entrepreneurial team on venture performance. Accordingly, it is proposed that H1: cognitive conflict in the cognition characteristics of an entrepreneurial team presents remarkably positive effects on venture performance.

From the viewpoint of emotion difference in cognition characteristics of an entrepreneurial team, researchers considered that the heterogeneity among entrepreneurial team members not being reasonably used would not encourage team members to pursue creative conflict. Further, it will affect the positive emotion among members. In this study, normal communication channels might be blocked to form emotional conflict and further hinder teamwork [27]. Emotional conflict was generally regarded as negative. Chen [16] indicated that the emotional conflict of an entrepreneurial team would weaken the cooperation among its entrepreneurial team members, thereby negatively influencing venture performance. Accordingly, it is also proposed that H2: emotional conflict in cognition characteristics of an entrepreneurial team shows notable negative effects on venture performance.

2.3. Theoretical Analysis of the Relationship between the Behavior Characteristics and Venture Performance of an Entrepreneurial Team

The behavior characteristics of an entrepreneurial team refer to the behavioral performance of the same. In comparison with traditional businesses, entrepreneurial ventures have to do better on innovation ability and strategic sustainability in order to survive in the environment with rapid changes and uncertainties; the importance thus is higher. In terms of innovation ability, Kuratko, Ireland, & Hornsby [28] stated that an entrepreneurial team would form the innovation ability through exploring new problems or opportunities to enhance venture performance. Regarding strategic continuity, Covin and Miles [29] stated that an entrepreneurial team should purposively re-define the organization and market and confirm strategic objectives to further improve venture performance. On the basis of the foregoing, it is proposed that H3: innovation ability in behavior characteristics of an entrepreneurial team reveals significantly positive effects on venture performance and H4: strategic sustainability in behavior characteristics of an entrepreneurial team presents remarkably positive effects on venture performance.

2.4. Theoretical Analysis of the Relationship between the Cognition Characteristics and Behavior Characteristics of an Entrepreneurial Team

The cognitive and behavioral characteristics of entrepreneurial teams originated from the cognitive behavioral theory of psychology. In the field of entrepreneurial management, research scholars believe that the cognitive conflict of entrepreneurial team members can increase the individual confidence and ability of members, and, therefore, solve various problems encountered during the entrepreneurial process, with the overall effect of increasing the innovation ability of the entrepreneurial team [30]. On the basis of the foregoing, we propose that H5: the cognitive conflict of the cognitive characteristics of an entrepreneurial team has a notable positive influence on innovation ability.

The cognitive conflict aspect of an entrepreneurial team can also accelerate the processes of considering and solving problems within the entrepreneurial team, thereby increasing the ability of the entrepreneurial team in setting strategies and improving strategic sustainability [31]. Hence, we propose that H6: the entrepreneurial team cognitive characteristic of cognitive conflict has a notable positive influence on strategic sustainability.

At the same time, because the entrepreneurial team cognitive characteristic of emotional conflict will weaken the normal sentiments between team members, it is deemed, therefore, to have a negative influence on the innovation ability of the entrepreneurial team [16]. Thus, this we propose that H7:

the entrepreneurial team cognitive characteristic of emotional conflict has a notable negative influence on innovation ability.

Furthermore, the entrepreneurial team cognitive characteristic of emotional conflict damages the emotional bonds between team members, thereby putting obstacles in the way of normal communication channels among them. This impairs the ability of members to understand each other and weakens their understanding of the environment and decisions of the company. This, in turn, makes decision quality and company efficiency low to the point that the strategic sustainability of the entrepreneurial team is affected negatively [32]. Thus, we propose that H8: the entrepreneurial team cognitive characteristic of emotional conflict has a markedly negative influence on strategic stability.

The intermediary role played by entrepreneurial team behavioral characteristics in the relationship between cognitive characteristics and venture performance has not been directly discussed in the current literature. However, indirectly, scholars in the field of organization team research have researched and demonstrated the intermediary effect produced by organization team behavior on the relationship between cognitive characteristics and team performance [33,34]. Taking this view and applying it to the field of entrepreneurial companies, while also adhering to the theoretical framework of “cognition–behavior–performance”, this study holds that there is a marked intermediary effect produced by the behavioral characteristics of entrepreneurial teams on the relationship between cognitive characteristics and venture performance. On the basis of the foregoing theoretical foundation, the researchers interviewed entrepreneurial team members online, one-on-one, from 20 different entrepreneur incubation parks. These interviews extracted factors related to the research of this study that influence team productivity and company performance. The researchers found that the innovation ability and strategic sustainability of entrepreneurial teams are important factors that have an impact on the relationship between entrepreneurial team cognition and venture performance. To summarize the theoretical analysis and the practical research, we hold that the cognitive conflict of teams can have an impact on venture performance and also influence the behavioral characteristics of entrepreneurial teams, including innovation ability and strategic sustainability, thereby affecting venture performance.

As the cognitive characteristics of entrepreneurial teams have a notable impact on innovation ability and on venture performance, we propose that H9: the innovation ability of entrepreneurial teams plays a pronounced intermediary role in the relationship between cognitive characteristics and venture performance. In addition to the foregoing, cognitive characteristics of entrepreneurial teams have a notable impact on strategic sustainability and the latter has a notable impact on venture performance. Therefore, on the basis of the “cognition–behavior–performance” framework, we propose that H10: the strategic sustainability of entrepreneurial teams plays a pronounced intermediary role in the relationship between cognitive characteristics and venture performance.

Hence, Figure 1 demonstrates the theoretical model of this study.

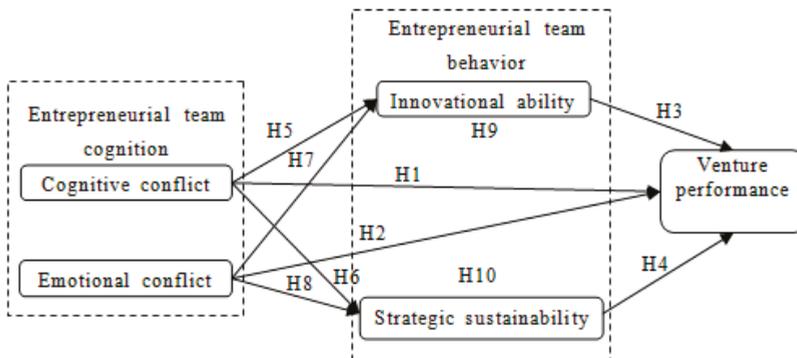


Figure 1. The framework of the relationship among entrepreneurial team cognition, entrepreneurial team behavior, and venture performance.

3. Research Method and Data Survey

3.1. Source and Process of Questionnaire Survey

The research subjects are entrepreneurial and innovative activities within emerging economies, mostly within the context of China. The Fujian province area is located in the southwest coast of China, an area with some of the most dynamic entrepreneurial and innovative activities outside of the major cities of Beijing, Shanghai, and Guangzhou. According to statistics from the Fujian province government, there were over 807,000 newly registered entrepreneurial companies in 2018, a 27.6% increase from 2017. Within Fujian, the cities of Quanzhou and Xiamen are some of the most economically developed areas and their entrepreneurial and innovative activities are among the most dynamic. According to statistics from the Fujian province government for the first half of 2019, the gross domestic products (GDPs) of Quanzhou and Xiamen make up almost 40% of the total GDP of the province [35]. It was for the foregoing reasons that the entrepreneurial companies within the entrepreneur incubation parks of Quanzhou and Xiamen were chosen as the subject of investigation.

Furthermore, “Fujian Merchants” are one of the most famous merchant groups, since a long time ago, and their typical characteristic is “dedicate yourself and you will win”, which is the most intuitive embodiment of entrepreneurship. Therefore, we select Quanzhou, which is the oldest traditional city in Fujian [11], and Xiamen which is the most rapidly developing and potential emerging city, as our research area [12]. Then, we surveyed the entrepreneurial teams and collected the research data from these two cities.

Since 2015, the China government has proposed the slogan of “mass entrepreneurship brings a mass of innovations”, and it intensively issued various policies to promote innovation and entrepreneurship activities in the same time. However, the relevant policies of innovation and entrepreneurship activities in Fujian Province are concentrated from the beginning to the end of 2015, and it will take time for the policies to be implemented. According to the data of innovation and entrepreneurship policy base of National Development and Reform Commission, Fujian Province is in the implementation stage of the policy between November 2015 and December 2017 [1]. Therefore, we chose to survey during November 2017 to May 2018.

Using online/offline questionnaire, entrepreneurial ventures in entrepreneur incubation parks in Quanzhou and Xiamen in Fujian Province were selected for data collection. A total of 225 copies of questionnaire were distributed from November 2017 to May 2018. By excluding the ones that were not seriously answered and the lack of data, a total of 101 valid copies were retrieved, with the retrieval rate of 44.88%. The valid sample characteristic statistics reveal that most respondents (62.38%) are female and aged between 21 and 30 (46.54%) and 30 and 50 (38.61%), and the market channels of the supervisors focus on physical stores (45.55%) and online (30.69%). For descriptive statistics regarding the research subject of this study, see Table 1.

Table 1. Descriptive statistics of research sample characteristics.

Characteristic	Categories	Sample Number	Percentage Value
Sex	Male	38	37.62%
	Female	63	62.38%
Whether or Not the Individual is a Founding Member of the Company	Is a Founding Member	69	68.32%
	Is Not a Founding Member	32	31.68%
Age	0–20	9	8.91%
	21–30	47	46.54%
	30–50	39	38.61%
	50+	6	5.94%

Table 1. Cont.

Characteristic	Categories	Sample Number	Percentage Value
How Long the Company has been Established	0–1	27	26.73%
	2–5	59	58.42%
	5–10	14	13.86%
	10+	1	0.99%
Main Market Channel for Company Operations	Internet	31	30.69%
	Direct-to-Customer	13	12.87%
	Storefront	46	45.55%
	Other	11	10.89%

3.2. Variable Measurement

3.2.1. Measurement of Entrepreneurial Team Characteristics

Different scholars have different methods for measuring the entrepreneurial cognitive characteristic of cognitive conflict. Jehn believes that task conflict exists in the circumstance where team members have different views on the content of a task currently being carried out. She uses four factors to measure task conflict: (1) the number of times team members have differing views on the work being carried out, (2) the frequency of differing views within the team, (3) the level of conflict in regard to the task, and (4) the level of difference between the various views [23]. Amason holds that cognitive conflict refers to a difference in task orientation that originates from differing viewpoints, and uses the following three questions to measure cognitive conflict: (1) “how much disagreement is there in regard to different ways of thinking?”, (2) “how many differences are there in decision content?”, and (3) “how many different types of views are there in the group?” [27]. Chen et al. [16], on the other hand, sees the task as the center of cognitive conflict, with differences regarding the various methods of arrival at the task objective as the most important force. Therefore, he uses the two criteria of “differences in thought” and “differences in decision content”, among others, to measure the cognitive conflict within entrepreneurial groups. We combine different measurement methods of cognitive conflict found within the existing literature, design question items to address the various necessary aspects (i.e., task conflict, differing views, differing management styles, and differing strategic plans), and measure such question items through a preliminary test. By calculating the Cronbach’s alpha after deleting a given question item, unreasonable items are omitted. In the end, three question items are used to measure the cognitive conflict of entrepreneurial team members. The specific items can be found in Table 2.

In measuring the entrepreneurial team cognitive characteristic of emotional conflict, this study mainly used the measurement method within Jehn’s intragroup conflict scale (ICS), specifically that part referring to the measurement of emotional conflict [23], and combined it with some practical adjustments made by Chinese scholars to make it appropriate to Chinese circumstances. We designed questions that measure emotional conflict from perspectives such as individual characteristics, relationships, emotions, and identification, and deleted unreasonable questions through the preliminary test. In the end, three question items were used to measure the emotional conflict of entrepreneurial teams, which can be found in Table 2.

Regarding the measurement of the entrepreneurial team behavioral characteristic of innovation ability, the most classic analysis is presently Schumpeter’s definition of innovation, wherein he holds that forms of innovation within a firm include the methods for the development of new products, the acquisition of new markets, and the procurement of new resources. On the basis of this view, Miller and Friesen measure innovation through the following three criteria: (1) emphasis on research and development, cutting-edge technology, and innovative sales; (2) the number of new products and or services sold; and (3) the level of change in products and or services [36]. Karagozoglu and Brown measure team innovation by asking managers about their willingness to abandon old ideas and explore new choices [37]. This study combines the research of these two scholars and borrows from practical adjustments made to this measurement to make it more appropriate for Chinese circumstances. This

research designed question items that measure team innovation by looking at products and services, market development, whether or not teams are keeping abreast of current trends, and the desire to innovate. Furthermore, unreasonable items were deleted through the preliminary test. In the end, three question items were used to measure the innovation ability of entrepreneurial teams, which can be found under Table 2.

Considering the impact of long-term position-making behaviors of entrepreneurial teams and implementing strategies on corporation performance. We measured the long- and short-term perspectives of behavioral characteristics by the entrepreneurial team behavioral characteristic of strategic sustainability. Moreover, Taneja and Chenault's work focused heavily on the issue of sustainable development for entrepreneurial firms [38]. We consider the concepts of long- and short-term orientation within Hofstede's theory of cultural dimensions, and put them in the context of the sustainable implementation of strategies of entrepreneurial firms. It measures strategic sustainability by looking at market share, business plans, and repeated innovation. There were no question items deleted through the preliminary test [39]. The specific items can be found in Table 2.

Meanwhile, the coefficient of internal consistency (Cronbach's Alpha, CA) and corrected item-total correction coefficient (CITC) are used for evaluating the reliability of the questionnaire. The reliability analysis results reveal that the team characteristics reliability coefficient (0.805) satisfies the basic reliability requirement. Applying statistical product and service solutions (SPSS) 19.0 to exploratory factor analysis, the results show that the cumulative variance explained that the extracted factors are at 67% and the factor loadings are higher than 0.5 that the validity conformity to the basic requirement.

3.2.2. The Measurement of Venture Performance

In evaluating venture performance, scholars have determined four main representative indicators: (1) arriving at a specified milestone, such as a new company completing the development of a product [40]; (2) the entrepreneurial firm made progress over the course of two or more stages of preparatory activities [41]; (3) whether or not the entrepreneurial process can be characterized as shutting down, still struggling, or operating normally [42]; and (4) the entrepreneurial firm made the first or second profit on a sale [19]. When this study evaluates venture performance, it is mainly concerned with consulting the measurement method laid out by Venkatraman and Ramanujam, which combines the aforementioned four indicators [43]. No items were deleted through the preliminary test. The specific items are found in Table 2.

Meanwhile, the reliability analysis results reveal the reliability coefficient of venture performance (0.890) satisfying the basic requirement for reliability. The exploratory factor analysis result shows the cumulative variance showed the extracted factors 56% and that the factor loadings are higher than 0.5, reaching the basic requirement for validity.

Table 2. Items used to measure entrepreneurial team characteristics.

Variable	Item
The Cognitive Conflict of Team Members	Members of the original entrepreneurial team frequently have different opinions on how to manage the company
	Disagreements among members of the original entrepreneurial team are, to a large extent, about work tasks
	Members of the original entrepreneurial team frequently have differing opinions on what course to take in managing the new company
The Emotional Conflict of Team Members	There is obvious personality conflict among members of the original entrepreneurial team
	Among members of the original entrepreneurial team, we see ourselves as partners who are collectively pushing our company towards success
	Members of the original entrepreneurial team do work tasks as if they are their own tasks

Table 2. Cont.

Variable	Item
Innovation Ability	We are the first company to introduce this product/service to the market
	We are always looking for new opportunities related to our business
	Our team frequently keeps abreast of recent trends
Strategic Sustainability	We are willing to sacrifice profits to increase market share
	We take time to set a comprehensive business plan and then ensured that it is strictly administered
	We frequently test our business model on the market and adjust according to market feedback
Venture Performance	Overall, we provided satisfactory investment returns to our founders and investors and arrived at our anticipated goal(s)
	Our company reached our anticipated product or service development goal(s)
	Our company reached our anticipated user-based or customer-based goal(s)
	Our company reached our anticipated regional market entry goal(s)

This study further evaluated the overall measurement model through the use of confirmatory factor analysis (CFA). The results of this analysis show that the measurement model has a relatively good degree of fit ($\chi^2 = 125.42$, $df = 94$, $p = 0.017$, $\chi^2/df = 1.334$, GFI (goodness-of-fit index) = 0.905, AGFI (adjusted goodness-of-fit index) = 0.958, CFI (comparative fit index) = 0.973, NFI (non-normed fit index) = 0.948, RMSEA (root mean square error of approximation) = 0.040, SRMR (standard root mean-square residual) = 0.037). The load factor of each measurement item fell between 0.707 and 0.947, and all had a p -value greater than $p < 0.001$. The construct reliability (CR) results yielded values greater than 0.7, showing that the underlying variables all have good internal consistency. The values of the average variance extracted (AVE) results all are greater than 0.5, which demonstrates that the average ability of the measurement indicators to explain the underlying variables is good. Therefore, it can be seen that the underlying variables have good construct reliability and validity. When a measurement model has differentiated validity, the correlation coefficients between its underlying variables must be smaller than the internal correlation coefficient of the underlying variables. This study utilized the correlation matrix between the underlying variables to verify that such was the case. The results show that the square root average of the average variance extracted estimate is higher than the correlation coefficient between the underlying variables, which demonstrates that the differentiated validity is good, as shown in Table 3, which depicts the average values of each variable, their standard variation, the square root of the AVE, and the correlation coefficients between each variable. As can be seen in Table 3, the square root of the AVE is greater than any other correlation coefficient in any row or column.

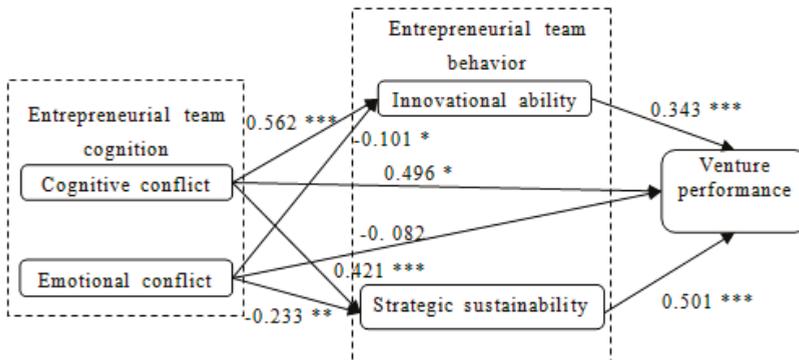
Table 3. Means, standard deviation, correlation coefficient, and discriminative validity

Variable	Average Value	Standard Deviation	1	2	3	4	5
1 Cognitive Conflict	3.16	1.02	0.68				
2 Emotional Conflict	3.46	0.86	−0.32 **	0.66			
3 Innovation Ability	2.88	1.09	0.54 **	−0.10 *	0.69		
4 Strategic Sustainability	3.67	0.78	0.42 **	−0.230 **	0.54 ***	0.70	
5 Venture Performance	3.84	0.83	0.469 ***	−0.154	0.343 ***	0.503 ***	0.72

Note: * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$. Bold data are square root, which explains the variance. Data underneath the diagonal line are the correlation coefficient between the variables, all are two-tailed tests.

4. Results

This study used the structural equation modeling (SEM) method to test the previously proposed hypotheses. According to the SEM approach, the coefficient analysis results are as follows (seen in Figure 2): (1) the entrepreneurial team cognitive characteristic of cognitive conflict has a significant positive influence on venture performance (standardized regression weight = 0.496, $p < 0.001$), thereby confirming hypothesis 1; (2) the entrepreneurial team cognitive characteristic of emotional conflict had no significant influence on venture performance (standardized regression weight = -0.082 , $p > 0.1$), thereby eliminating hypothesis 2; (3) the entrepreneurial team behavioral characteristic of innovation ability had a significant impact on venture performance (standardized regression weight = 0.343, $p < 0.001$), thereby confirming hypothesis 3; (4) the entrepreneurial team behavioral characteristic of strategic sustainability had a significant positive influence on venture performance (standardized regression weight = 0.501, $p < 0.001$), thereby confirming hypothesis 4; (5) the entrepreneurial team cognitive characteristic of cognitive conflict had a significant positive influence on innovation ability (standardized regression weight = 0.562, $p < 0.001$), thereby confirming hypothesis 5; (6) the entrepreneurial team cognitive characteristic of emotional conflict had a significant negative influence on innovation ability (standardized regression weight = -0.101 , $p < 0.05$), thereby confirming hypothesis 6; (7) the entrepreneurial team cognitive characteristic of cognitive conflict had a significant positive influence on strategic sustainability (standardized regression weight = 0.421, $p < 0.001$), thereby confirming hypothesis 7; and (8) the entrepreneurial team cognitive characteristic of emotional conflict had a significant negative influence on strategic sustainability (standardized regression weight = -0.233 , $p < 0.001$), thereby confirming hypothesis 8.



Note: * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$.

Figure 2. Path graph and standardized parameter estimation.

In order to further test the intermediary effects of entrepreneurial team behavioral characteristics, this study undertook an intermediary effect test according to Brown’s multifactor mediating model [44]. In accordance with Brown’s view, the effects of the model were separated into direct effects, total effects, total indirect effects, and individual indirect effects. Firstly, the entrepreneurial team cognitive characteristic of emotional conflict had no significant effect on venture performance. Furthermore, the entrepreneurial team cognitive characteristic of cognitive conflict significantly impacts innovation ability. The path coefficients between the entrepreneurial team cognitive characteristic of cognitive conflict, innovation ability, and venture performance were all significant, and in the case of innovation ability, its individual indirect effect of 0.193 (0.562×0.343) was smaller than its direct effect of 0.496, which shows that there is a partial intermediary effect produced by innovation ability, thereby partially confirming hypothesis 9. Finally, the entrepreneurial team cognitive characteristic of cognitive conflict will significantly impact strategic sustainability. Moreover, the path coefficients between the

entrepreneurial team cognitive characteristic of cognitive conflict, strategic sustainability, and venture performance were all significant, and in the case of strategic sustainability, its individual indirect effect of 0.211 (0.421×0.501) was smaller than its direct effect of 0.496, demonstrating the partial intermediary effect produced by strategic sustainability, thereby partially confirming hypothesis 10.

5. Discussion

This study focuses on entrepreneurship and innovation within emerging economies and delves into the relationship between the characteristics of entrepreneurial firms and venture performance from the perspective of cognition and behavior. Furthermore, it explores the mechanism by which the cognitive and behavioral characteristics of entrepreneurial team impact venture performance. The research design of this study is based on two primary foundations: (1) regard for entrepreneurship and innovation within emerging economies and (2) emphasis on the sustainable development of entrepreneurial companies. As such, the study is in accordance with the views put forth by Taneja and Chenault [38]. Applying the theoretical framework of “cognition–behavior–performance” to the relationship between entrepreneurial team behavior and cognitive characteristics and venture performance, this study proposes a theoretical framework wherein the behavioral characteristics of entrepreneurial teams serve an intermediary role in the relationship between the entrepreneurial team cognitive characteristics and venture performance. After this, the SEM approach was used to analyze data from 101 entrepreneurial teams in the entrepreneur incubation parks of Xiamen and Quanzhou in Fujian Province. The research results show that, in the context of entrepreneurial companies, the cognitive characteristic of cognitive conflict has a significant positive influence on venture performance, but the cognitive characteristic of emotional conflict has no influence on innovation ability. In addition, in the context of entrepreneurial companies, the behavioral characteristics of innovation ability and strategic sustainability both have a significant positive influence on venture performance. Furthermore, in the context of entrepreneurial companies, the cognitive characteristic of cognitive conflict has a significant positive influence on innovation ability, and the cognitive characteristic of emotional conflict has a significant negative influence on innovation ability. Moreover, in the context of entrepreneurial companies, the cognitive characteristic of cognitive conflict has a significant positive influence on strategic sustainability, and the cognitive characteristic of emotional conflict has a significant negative influence on strategic sustainability. Finally, in the context of entrepreneurial teams, the behavioral characteristics of innovation ability and strategic sustainability both play an intermediary role in the relationship between the cognitive characteristic of cognitive conflict and venture performance. The theoretical and practical contributions of this study, as well as the limitations of this research, are summarized below.

5.1. Theoretical Contributions

The relationship between entrepreneurial team characteristics and venture performance is an important issue within the field of entrepreneurial management research. Past research has tended to focus on the impact of entrepreneurial team heterogeneity on the development and competitive advantage of entrepreneurial firms [27]. The section of this study that explored the impact of cognitive and behavioral characteristics of entrepreneurial teams on venture performance confirmed this previously held view. Moreover, in the context of an emerging economy such as China, the cognitive conflict, innovation ability, and strategic sustainability of entrepreneurial teams all markedly increase venture performance. At the same time, however, research results also discovered that, in the context of entrepreneurial teams, the cognitive characteristic of emotional conflict has no obvious negative influence on venture performance. This result is consistent with Chen’s view [16]. The relationship between emotional conflict and venture performance must be researched further.

Moreover, the influence of the entrepreneurial team behavioral characteristics of innovation ability and strategic sustainability on venture performance is further discussed. Current research has tended to focus on the relationship between the innovation of entrepreneurial teams and venture performance.

This study's research also confirmed this close relationship in the context of entrepreneurial and innovative activities within emerging economies and further verified the markedly positive impact of innovation ability on venture performance. In addition, we focused on the positive influence of strategic sustainability behavior on venture performance. This both reflected and confirmed the theoretical value and meaning of long-term orientation in entrepreneurial management, a finding consistent with the most recent research.

Finally, the notable intermediary role played by entrepreneurial team behavioral characteristics in the relationship between entrepreneurial team cognitive characteristics and venture performance also reflects the importance of the innovation ability and strategic sustainability of entrepreneurial teams to the firm. Just as Taneja and Chenault expressed a focus on the sustainable development of entrepreneurial firms, entrepreneurial teams that possess innovation ability and have a long-term orientation are better able to lead the entrepreneurial firm to success [38]. Furthermore, the resulting discovery of this intermediary effect produced by entrepreneurial team behavioral characteristics is a theoretical extension and application of the "cognition-behavior-performance" theoretical framework within the entrepreneurial management field.

5.2. Implications for Practice

In the management process of entrepreneurial companies, entrepreneurial teams play an important role. Entrepreneurial teams that possess different cognitive structures notably increase the innovation ability of the entrepreneurial company, and thereby make the company more adaptive in responding to market and environmental changes, thereby increasing venture performance and leading to the accumulation of competitive advantages. In addition to this, entrepreneurial teams that possess different cognitive structures give the entrepreneurial company a more long-term orientation when setting strategy, developing markets, and settling on a business model, thereby increasing the sustainable development of the firm.

This research also revealed the role played by behavioral characteristics of entrepreneurial teams in the development process of the entrepreneurial firm. This is especially the case in emerging economies where, owing to the vagueness and uncertainty present in these business environments, entrepreneurial teams must deal with external markets and adapt to them. Moreover, in the context of emerging markets, where there are rapid changes in both the technological environment and the imperfect institutional environment, entrepreneurial teams must combine innovation ability and strategic sustainability in order to allow the entrepreneurial firm to better respond to the external environment and achieve sustainable development.

5.3. Limitations and Future Research

This research has the following limitations. (1) This research only focused on the cognitive and behavioral characteristics of entrepreneurial teams and does not take into consideration other characteristics. (2) This research's consideration of the impact of other factors on venture performance is not comprehensive. (3) Although this research focuses on innovative and entrepreneurial activities within emerging economies, the study lacks an in-depth look into the selection of its research subject and a concrete definition of the circumstances of emerging economies. These all must be explored further in future research.

6. Conclusions

This study explored the relationship between entrepreneurial team cognitive characteristics, behavioral characteristics, and venture performance in the context of China, a representative emerging economy, based on the theoretical framework of "cognition-behavior-performance". It analyzed the notable impact of entrepreneurial team cognitive and behavioral characteristics on venture performance. In addition to this, this research also demonstrated the intermediary effect produced by entrepreneurial team behavioral characteristics on the relationship between entrepreneurial team

cognitive characteristics and venture performance. The theoretical contributions of this study are as follows: (1) we examined the relationship between entrepreneurial team characteristics and entrepreneurial performance in the context of emerging economies from the perspective of sustainability, and extended the traditional theory of the relationship between those; (2) we revealed the partial mediating effect of entrepreneurial team's innovation ability and strategic sustainability on the relationship between entrepreneurial team cognition and entrepreneurial performance. It showed the impact of entrepreneurial team's long-term strategy on entrepreneurial performance, and enriched the current theory of the relationship between entrepreneurial team's behavior and entrepreneurial performance. The practical contribution of this article is to propose that the entrepreneurial team should pay more attention to the long-term strategy making and ability cultivation, in order to enable entrepreneurial enterprises to achieve sustainable development.

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Article

Diagnosis of Administrative and Financial Processes in Community-Based Tourism Enterprises in Ecuador

Bertha Cecilia Jaramillo-Moreno ^{1,2,*}, Irene Paola Sánchez-Cueva ¹,
Dayana Gisell Tinizaray-Tituana ¹, Juan Carlos Narváez ¹,
Enrique Armando Cabanilla-Vásquez ¹, María José Muñoz Torrecillas ²
and Salvador Cruz Rambaud ²

¹ Carrera de Turismo Ecológico, Universidad Central del Ecuador, Av. Universitaria, Quito 170129, Ecuador; irenepaolasanchez@gmail.com (I.P.S.-C.); dgtinizaray@uce.edu.ec (D.G.T.-T.); juancarlosnarvaez94@gmail.com (J.C.N.); eacabanilla@uce.edu.ec (E.A.C.-V.)

² Department of Economics and Business, Universidad de Almería, La Cañada San Urbano, s/n, 04120 Almería, Spain; mjmtorre@ual.es (M.J.M.T.); scruz@ual.es (S.C.R.)

* Correspondence: bcjaramillo@uce.edu.ec; Tel.: +593-2255-6885

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Abstract: In recent years, community-based tourism has become a source of income within indigenous and rural communities, either as a principal or complementary activity. However, the management of the administrative and financial processes of this type of enterprise was unknown. In this sense, this paper aims to analyze the state of these processes within the so-called Community-Based Tourism Enterprises (CBTEs) in the provinces of Pichincha, Napo, and Imbabura (Ecuador). For this purpose, a matrix was designed to collect information on the administrative and financial processes that an enterprise should have, detailing all their elements with their respective assessment. Also, an interview was administered to the 28 community leaders (one for each CBTE) to diagnose each issue of business management. In this diagnosis, it was concluded that, despite having a certificate from the Ministry of Tourism (MINTUR), the Community-Based Tourism Enterprises have not implemented important administrative and financial processes such as a strategic plan, operational plan, market study, cost analysis, process manual, market plan, initial situation, results status, final status, or financial indicators. Therefore, in the long term, this leads to poor management of business resources, which can result in the closure of these enterprises.

Keywords: administrative process; community-based tourism enterprises; financial process; tourism enterprises

1. Introduction

Community-Based Tourism Enterprises (CBTEs) are an important reference point within Ecuador's tourism industry. However, it is not clear how these enterprises manage their administrative and financial processes, or whether they have even implemented some of these processes. There is no evidence of previous studies about this topic, but this does not mean that it is not important to know how these enterprises carry out financial and administrative controls. Furthermore, it could be one of the main determining factors as to whether the enterprises remain in the market.

The objective of this paper is to present the results of the diagnosis of the administrative and financial processes in CBTEs in the Ecuadorian provinces of Pichincha, Imbabura, and Napo. This research is exploratory in nature and consists of a compilation of 28 cases (CBTEs), which are subject to a detailed diagnosis of their administrative and financial processes.

The concept of tourism has changed over time from being massive and careless; damaging architectural, natural, and cultural resources, and leaving aside the interest of the communities [1].

It has evolved to become an activity that seeks the sustainability of the host community, based on the preservation of resources and maintaining a good quality of life for present and future generations. This concept appeared in the 1980s when the World Commission on Environment and Development defined it as “sustainable development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” [2,3], focusing on the balanced use of resources in order to reach long-term economic, social, and environmental development of nations, with a responsible and collective commitment. As also stated by the World Tourism Organization (WTO), sustainable tourism is defined as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, industry, the environment and host communities” [4].

As a result of a constitutional mandate adopted inside the National Development Plan 2017–2021 [5], Ecuador is a part of this sustainable development process, with nine objectives framed in three fundamental axes: Lifetime rights for everyone, economy at the service of society, and more society better State. The purpose of this strategic plan is to improve the living conditions of citizens in a permanent and sustainable manner, towards “Sumak Kawsay” [6] the well-being of Ecuadorians. Article 14 of the Ecuadorian Constitution states: “The right of the population to live in a healthy and ecologically balanced environment that guarantees sustainability and good living (Sumak kawsay) is recognized”. In addition to environmental conservation, the protection of ecosystems, biodiversity and the integrity of the country’s genetic heritage, the prevention of environmental damage, and the recovery of degraded natural areas are declared to be of public interest [7].

In recent years, tourism has experienced significant growth, especially in 2017 with a 7% increase in tourist arrivals. By 2019, tourist arrivals increased only 4%, which is equivalent to 1461 million visitors worldwide, 15% of which are in the Americas [8]. In Ecuador, as well, tourism has become an important economic activity that generates significant foreign exchange for the country. In 2018, it contributed US\$ 2392.1 million to the national economy, representing 2 percent of GDP [9]. According to the World Travel and Tourism Council (WTTC), this represents a total contribution (direct, indirect, and induced) of 5.5% to Ecuador’s total GDP [10], which places it in third place as a source of non-oil revenue [11].

In this sustainable context, community tourism is clearly an important part, because it aims for local development by community’s inclusion [12]. The Caribbean States Association defines it as an alternative for rural communities to generate other incomes towards economies by using cultural, natural, and local resources [13]; by poverty reduction, new job creation, and the equal distribution of resources generated by this activity to all community members. Ecuador is a pioneer country in this type of tourism, even more since it is a mega-diverse country in cultural, natural, and social aspects [14]. It was the first country in the world to have a national union, such as the Plurinational Federation of Community Tourism of Ecuador (known as the FEPTCE), which defines community tourism as a relationship between the community and visitors in an intercultural perspective: In organized trip development, consensual participation of its members, guaranteeing adequate natural resources management, heritage appreciation, nationalities cultural and territorial rights, and equitable distribution of the generated benefits [15].

In a review of the literature, we found an increasing number of papers on Community-Based Tourism (CBT). To get an approximate idea of the interest of this subject among researchers, Mtapuri et al. (2015) [16] reported 400 articles on CBT covered in 136 different journals since its emergence in the 1980s. Many of these researches analyze real cases of Community-Based Tourism Enterprises (CBTEs) located mainly in Africa (e.g., in Kenya [17–19], Botswana [20], Namibia [21], Ethiopia [22,23], and South Africa [24,25]), in South America (e.g., in Nicaragua [26], Barbados [27], Brazilian Amazon [28], and Colombia [29]), and in Asia (e.g., in Philippines [30]).

There is a general agreement in the existing literature regarding the potential contribution of CBTs to poverty alleviation and sustainability of tourism industry and local communities (e.g., [17,19,22,23,26,31–34]). Also, about one of the main challenges of CBTEs: A weak managerial

capacity among communities to run these CBTEs [20–22,24,26,28,33]. However, there are also successful cases such as the Community-based ecotourism in Menz Guassa in Ethiopia, where “indigenous community leaders were capable of operating and managing community based ecotourism businesses effectively and inspiring individuals from the local population to participate in the tourism business” [23].

There are non-profit organizations that have established standards for the management of sustainable destinations, such as “maximize the economic and social benefits of communities and minimize impacts” [35]. Within these criteria, certain elements of the administrative process have been considered such as organizational management of the destination, monitoring, planning, promotion, and visitor satisfaction, among others [35]. However, all this has been developed in a general perspective without specifying administrative and financial processes necessary for good enterprise development and permanence.

There are some statements about the relevance of the administrative-financial process of CBTEs. For example, in the Community Tourism Good Practices Manual of the Solidarity Tourism Network of the Napo River Ribiera-REST [36] (p. 33), it is stated as an administrative criterion, that “the Community Tourism initiative should maintain an efficient administration that allows to know the status of its management and the characteristics of its visitors with a basic accounting of income and expenditures”.

An administrative process cannot only be based on the company’s financial controls as Fayol proposed in the 20th century. Nowadays, the use of four fundamental management principles has been accepted: Planning, implementation, monitoring, and evaluation [37], whose fulfillment leads to the achievement of business objectives. Within these fundamental principles of management, there are some specific processes, which help to achieve these business purposes, leading to efficiently fulfill the operational cycle of organizations. According to D’Alessio Ipinza [38], it is a model that accurately represents how the company works, without considering that some areas are more important than others, since all of them are significant for its correct functionality.

Until now, there are some proposals from CBTEs for a general management model. Despite the fact that a few of these enterprises were developed by non-governmental organizations, they do not have a full community adaptation process. As such, there was inadequate implementation follow-up to assess long-term results. In consequence, many Community Tourism Centers become extinct (or inactive), which shows how important is to have optimal organizational structure as the key to success [39] for any type of undertaking.

In a former interview with the FEPTCE president, Galindo Parra (2017) stated that: “most CBTEs started their activities spontaneously and supported by non-governmental organizations (NGOs) with human, physical and economic resources, so they could carry out these community projects, principally to promote cultural conservation and authenticity through the provision of community tourism services”. However, the NGOs have not continuously monitored the development of these undertakings, which, in many cases, leads to these centers’ mismanagement or even their extinction.

The paper is structured as follows. After this introduction, Section 1 describes the geographical area (provinces of Pichincha, Napo, and Imbabura). On the other hand, Section 2 describes the research methodology. Section 3 includes the results of the research which are discussed in Section 4. Finally, Section 5 summarizes and concludes.

Description of the Geographic Area

Ecuador is a country located in the continent of South America, on the equatorial line, bound on the north by Colombia, on the south and east by Peru, and on the west by the Pacific Ocean, with an area of 283,520 km². According to the last population census (2010), Ecuador has a population of 14,483,499 inhabitants, distributed among mestizos (71.9%), Afro-Ecuadorians (7.2%), indigenous (7%), whites (6.1%), and montubios (7.4%) [40]. It has a varied climate due to the three geographical areas, which divide the country: Highlands (Andes mountains), Coast (on the Pacific coast), Eastern (Amazon

jungle), and the Insular region (Galapagos Islands) [41]. Depending on the area and its altitude, the climates range from tropical to cold, with two defined seasons in all regions, such as wet and dry. Furthermore, it has an extensive mountainous area defined by the Andes Mountains and a large fluvial network crossing all over the territory.

Ecuador is a multi-ethnic and pluricultural country composed by 24 provinces, and 221 cantons; two of which, Quito and Cuenca, have been recognized as Cultural Heritage of Humanity by UNESCO. This recognition is also held by the Galapagos Islands, and Sangay National Park. Within the indigenous population, 13 nationalities and 14 villages have been identified [42], with specific culture, tradition, dialect, and economy, located between the three regions, further diversifying the appeal that Ecuador can offer to the world.

Three provinces have been selected for this research: Pichincha, Napo, and Imbabura, because of their proximity to the capital (Quito), where the Universidad Central del Ecuador mainly develops its academic, scientific, and outreach activities. In addition, they are the provinces with a high number of CBTEs established according to the database provided by the FEPTCE.

Pichincha is a province located in the highlands in the central north area of the country (Figure 1), divided into eight cantons, each with its urban and rural parishes. It has an average altitude of 2816 meters above sea level, a varied climate depending on the altitude, and the city of Quito is its capital [43]. It has great flora and fauna diversity and important natural and cultural beauties, making it an attractive province to visit.

Imbabura, like Pichincha province, is located in the highlands in the central north area of the country (Figure 1). The climate types are hot and dry in the Chota Valley passing through to a temperate climate in the cantonal capitals to cold, high in the mountains of the Imbabura and Cotacachi hills, to hot and humid in the Intag and Lita sector. Imbabura is divided into six cantons, Imabura being its capital. It has two important reserves (Cayambe-Coca Ecological Reserve and Cotacachi-Cayapas Ecological Reserve) with high biodiversity, represented by numerous plant and animal species and genetic resources. The province also has abundant water and mineral resources [44].

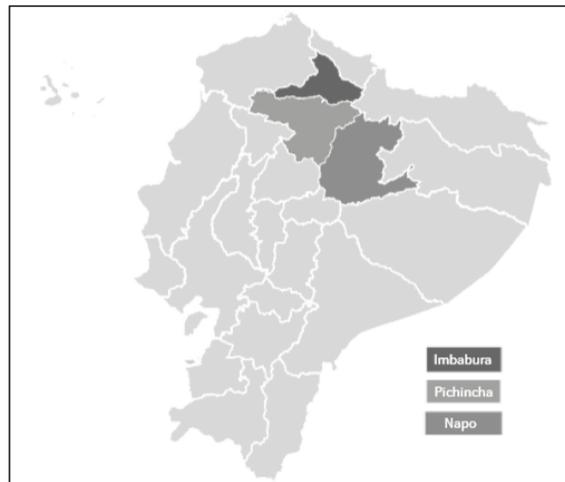


Figure 1. Location of Pichincha, Imbabura, and Napo (Ecuador). Source: Own elaboration.

Napo is located partly in the Ecuadorian Amazon region and partly in the Andean slopes, reaching up to the Amazon plains (Figure 1). It is a place marked by high biological diversity, with five cantons, and Tena is its capital. The climate varies according to the diversity of the geofoms present and most

of the area is subject to a large annual excess of precipitation. It is a place to learn about the customs and traditions of the Amazonian Quichua people who maintain their way of life [45].

Currently, tourism is considered an important sector inside the sustainable development of territories and is a complicated growing global phenomenon, which provides benefits for both travelers and destinations [46]. According to the research carried out by Cabanilla [14], the CBTEs are located throughout the Ecuadorian zones, with 44.44% of them in the provinces of Imbabura, and Pichincha, in the highlands, as well as Manabí, and Santa Elena. The parishes with the highest concentration of these enterprises are in the province of Napo.

2. Materials and Methods

2.1. Data Collection Instrument

The data were obtained through a collection matrix where the majority of management elements pertaining to administrative and financial processes were considered, such as planning, implementation, monitoring, and evaluation. To do this, a bibliographic review was necessary based on 12 administrative and financial texts [38,47–57]. Based on the information collected, the first model was elaborated obtaining a unified structure of the administrative and financial processes as follows: Planning (12 elements), Organization (12 elements), Direction (7 elements), and Control (13 elements). After that, a validation was carried out with a tourism expert who helped to adapt it to the national reality with the following changes: Organization (7 elements related to registrations within government entities or federations and compliance with tax requirements were increased) and Direction (6 elements related to the specification of the means of promotion were increased). Then, two more validations were applied to the matrix, one with three administrative and financial experts where the matrix was divided by processes, one by the administrative, and the other by the financial for a better diagnosis of the proposed topics (see Figure 2), and the last with FEPTCEs former president, because he knew the CBTEs reality in depth. This authority gave its approval for the use of the instrument. Furthermore, the matrix design had to be simple in such a way that was understandable to those who provided the information in the data collection.

2.2. Matrix Elements

The matrix (Figure 2) was divided into four sections: The first one provides the enterprises' basic information, which allows us to understand the current CBTE situation, such as community members participation, services offered, and informative data. The second and third sections detail each administrative and financial element of the processes (47 and 9, respectively), each one being basic for the management venture, such as: Strategic planning, marketing research, cost analysis, rules and regulations, process manuals, publicity, client satisfaction and evaluation, financial statements, among other aspects.

The last section contains the validation, which implies a score 1 if the CBTE implements the management element, or 0 otherwise, and it is multiplied by 1 to 3 according to the development of the component. This valuation scale was established because despite enterprises having certain processes in place, these are only partially fulfilled, which is why it was necessary to put a rating ranging from 3 to 1 (Figure 3). Moreover, there is no obligation to present any process element evidence in the data collection.

			DIAGNOSIS OF ADMINISTRATIVE AND FINANCIAL PROCESSES IN COMMUNITY BASED ENTERPRISES					
			HAVE		SCORE			WEIGHT
			YES	NOT	HIGH	MEDIUM	LOW	
N°	CBE NAME							
	LOCATION							
	VENTURE TYPE							
	NUMBER OF PARTICIPATING FAMILIES IN THE CBE							
	NUMBER OF PEOPLE WORKING IN THE CBE							
	SERVICES OFFERED							
	PERSON RESPONSIBLE FOR THE CBE							
	PHONE							
	MAIL							
	WEB PAGE							
FINANCIAL PROCESSES	PLANNING	ESTABLISHED BUDGETS						
		ACCOUNTING SYSTEM						
	IMPLEMENTATION	RECORD OF INCOME AND EXPENSES						
		FACTURATION SYSTEM						
	CONTROL	STATE OF INITIAL SITUATION						
		STATEMENT OF INCOME						
		STATE OF FINAL SITUATION						
		CHECKING BALANCE						
	FINANCIAL INDICES							
	ADMINISTRATIVE PROCESSES	PLANNING	PHILOSOPHY AND VALUES					
MISSION AND VISION								
OBJECTIVES, STRATEGIES AND POLICIES								
INSTITUTIONAL STRATEGIC DEVELOPMENT PLAN								
ANNUAL OPERATION PLAN								
SPECIFIC PROJECTS								
INSTITUTIONAL SWORD								
MARKET RESEARCH								
COMPETITION STUDY								
COST ANALYSIS								
STRUCTURAL PHASE		TRAINING PLAN						
		REGISTRATION AS CTC AT THE MINTUR						
		SUPER COMPANY REGISTRY						
		OTHER REGISTRATION						
		GENERAL REGULATIONS						
		ESTABLISHED PROCESSES						
		PROCESSES MANUAL						
		MARKETING PLAN						
		STRATEGIC ALLIANCES						
		MEMBER ORGANIZATION, FEDERATION, OTHERS						
ORGANIZATION		EMPLOYEE RECRUITMENT PROCESS						
		DEFINED WORK POSTS						
		COMPETENCES IN THE WORKPLACE						
		LESS EMPLOYEES AFFILIATION						
		WORKERS' COORDINATION						
		SUPPLIER ANALYSIS						
		PROVIDER HIRING SYSTEM						
		DECISION MAKING						
		MOTIVATION PROGRAM						
		COMMUNICATION SYSTEM						
DIRECTION	AFTER-SALES RELATIONSHIP							
	PERMANENT ADVERTISING							
	WEB PAGE							
	SOCIAL NETWORKS							
	OPERATING AGREEMENTS							
	RADIO							
	TV							
	TRIPPLICS AND DPTICS							
	CONTROL OF ESTABLISHED PRICES							
	PROMOTION CAMPAIGNS							
CONTROL	EMPLOYEE PERFORMANCE EVALUATION							
	FOLLOW-UP AND EVALUATION OF THE PEDI							
	FOLLOW-UP AND EVALUATION OF THE PCA							
	FOLLOW UP CUSTOMER SATISFACTION							
	EQUIPMENT MAINTENANCE SYSTEM							
	SYSTEM OF INFRASTRUCTURE MAINTENANCE							
	QUALITY CONTROL							

Figure 2. Diagnosis matrix for administrative and financial processes. Source: Own elaboration.

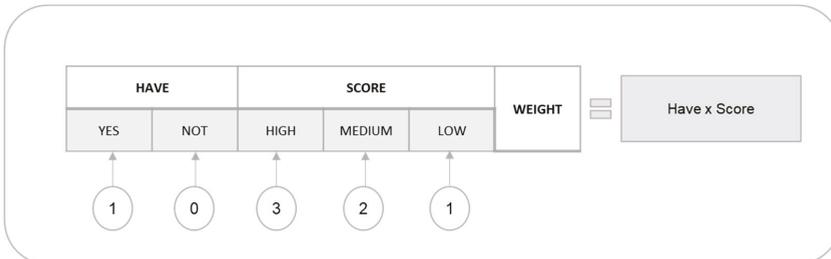


Figure 3. Valuation scale of the matrix for administrative and financial processes. Source: Own elaboration.

2.3. Optimal Valuation of Administrative and Financial Processes

The optimal valuation to be obtained is 168 points, distributed into 141 for the administrative process and 27 for the financial process (see Table 1). These values are the result of adding the weight obtained in each element (Figure 3).

Table 1. Optimal values of the matrix for administrative and financial processes. Source: Own elaboration.

Optimum Values						
Administrative Processes				Financial Processes		
Structural Phase		Operational Phase				
Planning	Implementation	Monitoring	Evaluation	Planning	Implementation	Control
33	48	39	21	3	9	15
	81		60		27	
		141				
			168			

2.4. Sample

The specific framework of the research was composed by all active CBTEs in the provinces of Pichincha, Ibambura, and Napo. For that reason, an FEPTCE database was required, which provided information about the different tourism enterprises, and the Tourism Ministry's legal registry. With that information, an on-site visit was necessary to classify each of them to determine which one accomplished Community-Based Enterprise status, based on the Tourism Ministry's classification of enterprises within Plandetour 2020 [58]. Finally, the sample has been composed by 28 CBTEs for the present diagnosis: Four in Pichincha, one in Imbabura, and 23 in Napo (Table 2).

Table 2. Identified Community-Based Tourism Enterprises (CBTEs) from databases. Source: Own elaboration.

Province	FEPTCE Database	Mintur 2018 Legal Registry	Active CBTEs for the Research
Pichincha	25	0	4
Imbabura	37	0	1
Napo	30	8	23
TOTAL	92	8	28

2.5. Data Collection and Analysis

The data used in the paper were obtained through an in-depth interview conducted with the leaders of 28 communities according to the design sample, which helped to fill the diagnosis matrix. An in situ visit was performed by three thesis undergraduate students from the Tourism Degree at the Central University of Ecuador [59–61] under the supervision of the first author of this manuscript. Each interview had a minimum duration of one hour, which helped to clarify each matrix aspect and understand each community's reality. The information granted by the community leaders could not be verified by evidences because we were not an official governmental entity. However, the reliability of the answers was reached through control questions in which the interviewer was able to verify the veracity of the answers given by the community leaders.

The tabulation and statistical analysis of the data was done using the SPSS V. 24 statistical software. Different statistical techniques were used. First of all, a descriptive analysis was performed in order to compare the final values of each venture with the optimal value, and so as to understand the financial and administrative reality of the CBTE. Then, Kendall's Concordance Coefficient and Mann-Whitney U test was applied to see the differences between administrative and financial processes of the CBTEs.

3. Results

3.1. Performance of Administrative and Financial Processes by Province

Figure 4 shows the status of the administrative and financial processes with respect to the optimal values. The three provinces have yet to improve and in many cases establish administrative and financial elements that will help them to manage their enterprises properly.



Figure 4. Assessment of administrative and financial processes by province. Source: Own elaboration.

Figure 5 show the behavior of its sub-processes in the administrative and financial processes of the three provinces studied.

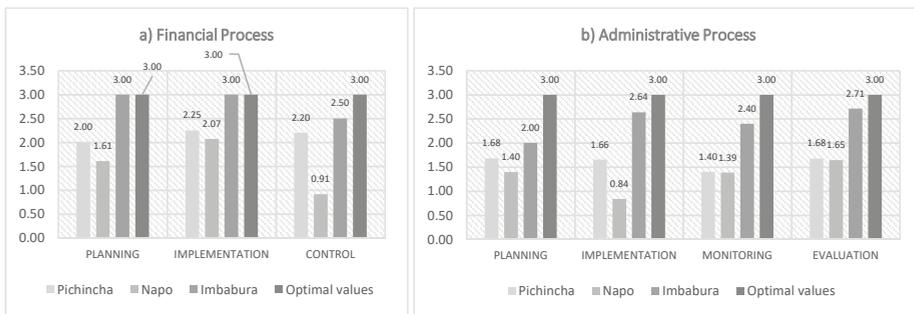


Figure 5. Assessment of each element of administrative and financial processes. Source: Own elaboration.

3.2. Performance of Administrative and Financial Processes by CBTE

Table 3 shows the values obtained in the diagnosis of each element of the administrative and financial processes in the provinces of Pichincha and Napo. The province of Imbabura was left out, because the three communities that carry out the community tourism activity are managed by a tour operator.

Table 3. Assessment of each element of administrative process by CBTE. Source: Own elaboration.

Planning Elements	Administrative Process Frequency							
	Pichincha n = 4				Napo n = 23			
	None	Low	Medium	High	None	Low	Medium	High
Philosophy and values	1	1		2	5	11		7
Mission and vision	2			2	4	1	11	7
Objectives, strategies and policies		1	3		3	2	11	7
Strategic plan	2		2		10	3	9	1
Operational plan		1	2	1	10	3	9	1
Specific projects			3	1	3	1	13	6
Institutional swot	1		2	1	8		8	7
Market survey	2		1	1	17		5	1
Competitive landscape	1		2	1	13		9	1
Costing analysis	1		2	1	15		7	1
Training scheme	1	1		2	3		19	1

Table 3. Cont.

Administrative Process Frequency								
Implementation Elements	Pichincha <i>n</i> = 4				Napo <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
MINTUR certificate	3			1	16			7
Register of companies' superintendence	4				18		3	2
Registration other			3	1	10		12	1
General regulations			2	2	3		5	15
Established procedures			2	2	17		2	4
Process manual			2	2	16		2	5
Marketing plan	1	1		2	15		7	1
Strategic alliances		2		2			10	13
Member organization, federation, others	1		1	2	5		8	10
Recruitment process employees	3			1	23			
Defined jobs			2	2	23			
Job skills	1		2	1	23			
IESS affiliation employees	2		1	1	22			1
Employee coordination			3	1	13		9	1
Supplier analysis	3		1		20		2	1
Supplier qualification system	2		1	1	20		2	1
Monitoring Elements								
Monitoring Elements	Pichincha <i>n</i> = 4				Napo <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
Decision making			2	2		2	9	12
Motivational programme	1		2	1	8		13	2
Communication system			2	2	3		18	2
Post-sale relationship	2			2	16		5	2
Permanent advertising			2	2	7		14	2
Web page	2			2	15	5		3
Social networks	2			2	10		6	7
Operating agreements	2		1	1	15		4	4
Radio	4				9		10	4
Television	4				8		12	3
Leaflets, diptychs	4				9		10	4
Price control	2		1	1	7		14	2
Promotion campaigns	1		1	2	5	1	13	4
Evaluation Elements								
Evaluation Elements	Pichincha <i>n</i> = 4				Napo <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
Performance evaluation of employees	1	1	1	1	5		8	10
Monitoring and evaluation of strategic plan	2		1	1	5	10	3	5
Monitoring and evaluation of operational plan			3	1	11	5	3	4
Customer satisfaction survey	1	1	1	1	9		12	2
Equipment maintenance system	1	1		2	4		10	9
Infrastructure maintenance system	1	1		2	2	1	9	11
Quality assurance		2	1	1	3		19	1

With respect to the financial processes, as seen in Table 4, the elements corresponding to planning and implementation are mostly implemented, although not 100%. However, the control elements that are indispensable are not considered by the companies, so it is clear that there is no adequate financial control within the CBTEs, which is fundamental within any type of business.

By considering the previous results and when applying the statistical test of Kendall (Tables 5 and 6), according to the significance obtained, both in the provinces of Pichincha and Napo, there are no differences between the administrative and financial processes among the CBTEs, so a change in these processes should be considered to help improve these enterprises.

Table 4. Assessment of each element of financial process by CBTE. Source: Own elaboration.

Planning Elements	Financial Process Frequency							
	Pichincha <i>n</i> = 4				Napó <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
Established Budgets	1		1	2	6		14	3
Implementation Elements	Pichincha <i>n</i> = 4				Napó <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
	Recording of income and expenditure	1	1	2	2	1	16	4
Invoicing system	1	1	2	2		16	5	
Tax registration	1	1	2			18	5	
Control Elements	Pichincha <i>n</i> = 4				Napó <i>n</i> = 23			
	None	Low	Medium	High	None	Low	Medium	High
	Initial situation		1	1	2	11	5	5
Status of results		1	1	2	11	5	5	2
End state		1	1	2	11	5	5	2
Trial balance		1	1	2	11	5	5	2
Financial Indexes	1		1	2	11	5	5	2

Table 5. Administrative process Kendall's W statistical test. Source: Own elaboration.

Administrative Elements	Pichincha Province <i>n</i> = 4	Napó Province <i>n</i> = 23
Planning	0.184	0.379
Implementation	0.573	0.529
Monitoring	0.596	0.324
Evaluation	0.235	0.330
Administrative Process	0.458	0.431

Table 6. Financial process Kendall's W statistical test. Source: Own elaboration.

Financial Elements	Pichincha Province <i>n</i> = 4	Napó Province <i>n</i> = 23
Planning	none	none
Implementation		0.130
Control	0.25	
Financial Process	0.25	0.567

According to the significance obtained in the Mann-Whitney statistical U test (Tables 7 and 8), there are no differences between the provinces of Napó and Pichincha, which reaffirms the information shown above, that the administrative and financial processes within the Community-Based Tourism Enterprises should be improved in some cases, and applied in others.

Table 7. Administrative process statistical test. Source: Own elaboration.

Administrative Elements	U of Mann-Whitney ^a	Sig. Asymptotic (Bilateral)
Planning	44.000	0.884
Implementation	20.000	0.038
Monitoring	43.500	0.852
Evaluation	45.000	0.942
Administrative Process	41.000	0.712

^a Pooling variable: PROVINCE (Pichincha and Napó).

Table 8. Financial process statistical test. Source: Own elaboration.

Financial Elements	U of Mann-Whitney ^a	Sig. Asymptotic (Bilateral)
Planning	33.000	0.323
Implementation	40.000	0.632
Control	21.500	0.051
Financial Process	34.000	0.352

^a Pooling variable: PROVINCE (Pichincha and Napo).

3.3. Community-Based Tourism Enterprises of Pichincha and Napo Provinces

Finally, Figure 6 shows the results obtained by the 28 CBTEs analyzed in this research.

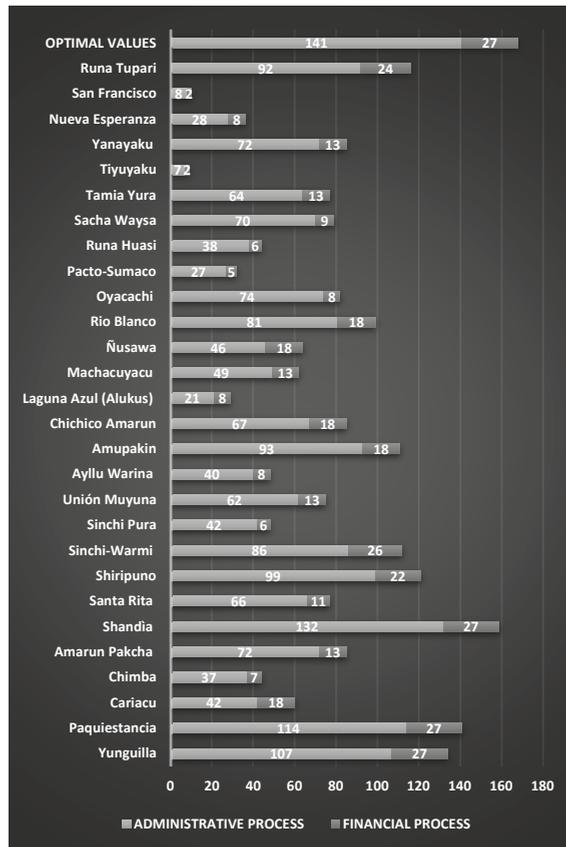


Figure 6. Evaluation of administrative and financial processes of each CBTE. Source: Own elaboration.

4. Discussion

4.1. Performance of Administrative and Financial Processes by Province

According to the collected data, it was verified that not all tourism enterprises accomplish the Community-Based Tourism Enterprise status, and that is why a sampling of 28 enterprises for this diagnosis was used, as previously stated. Once the interviewers obtained the necessary information to fill each CBTE's matrix through the community leader's information, the data were analyzed, and the

results of each province were compared with the optimum values to determine the real administrative and financial behavior inside the CBTEs.

In Imbabura's case, the CBTE selected for the diagnosis is a tourism operator named Runa Tupary founded in 2000 with FEPTCE active members and Imbabura's community leaders. This tourism operator organizes tourism activities inside four communities and distributes a small portion of the gains between them. Imbabura is the province which is closest to the optimum values, especially inside the financial process (Figure 5), but it is because this particular venture has a more corporate than communitarian structure, creating a lack of knowledge about the management of economic resources and questioning the efficiency of tourism regulatory bodies. The model used by Runa Tupary is an applicable model, as long as each CBTE manages its own accounting system, a situation that currently does not hold. There are feasible management models such as the creation of a community-based tourism operator, which is responsible for the administrative and financial management of the related enterprises, but these should be applied according to the needs of each community and especially considering the number of families which are part of it.

In the province of Pichincha, four CBTEs were identified: Asociación Camino El Cóndor Cariacu, Asociación Para el Desarrollo de las Comunidades- La Chimba, Camino al Cóndor Paquiestancia, and Corporación Micro-empresaria Yunguilla. The results in these four CBTEs showed that the financial and administrative models are not adequate for their needs, and in some cases even because they do not have any model to manage their enterprises. Moreover, as verified, tourism is considered a complementary activity inside their internal economies, so that it is why only a small portion of the budget is invested in tourism services improvement. In addition to this, according to one community leader Vinicio Kilo (2018), CBTEs do not work because there is low interest among the communities' members and a growth in movement of young people to other provinces.

Napo province is considered one of the provinces where the CBTEs are most established in Ecuador [62]. After the census, 23 centers were selected for the present diagnosis, from which eight have the Tourism Ministry certification as Community-Based Tourism Enterprises. Despite this, Napo becomes the province with the lowest values compared to the optimum values because, as observed, neither the communities nor the Ministry give enough importance to the administrative and financial processes in the enterprise's constitution. Moreover, there is no training on these topics and that is why some enterprises are in a critical economic situation despite the fact that tourism is the only economic activity inside some communities.

4.2. Performance of Administrative and Financial Processes by CBTE

As formerly stated, the results were obtained by the diagnosis of 28 CBTEs, one in Imbabura, four in Pichincha, and 23 in Napo. This section will not discuss the case of Imbabura province, because the situation of these enterprises was already clarified in the previous section.

The results obtained in the matrix show that, within the administrative processes (Table 3), the companies do not consider as a priority nor count on: strategic and operative plans, market surveys, competition landscape. Nor do they implement the guidelines governing the procedures of every enterprise, such as mission, vision, values, policies, etc. Other unnoticed elements are cost analysis and ongoing employee training, which are important elements in a successful business.

Within the implementation elements, it is observed that most of the processes are not developed within the companies, such as implemented procedures, process manual, marketing plan, employee recruitment process, defined jobs, job skills, employee IESS affiliation, employee coordination, supplier analysis, supplier qualification systems. All these processes are important elements, which help the organization towards good performance.

On the other hand, apart from the elements of monitoring and evaluation, which are mostly being implemented within these companies, there are others that are important such as the post-sale relationship and the use of new technologies such as social networks for promotion, which are not

being developed. This, in a certain way, leads these companies neither to be known nationally and internationally nor to build a long-term relationship with current customers.

Tables 9 and 10 show the similarities and differences between the administrative and financial diagnosis of CBTEs.

Table 9. Similarities and differences of the administrative processes of the 28 CBTEs studied.

Similarities	Differences
In 99% of the diagnosed communities, tourism is a secondary activity within the economic development of communities.	7% of CBTEs have skills and abilities like speaking foreign languages.
In 27 communities, community members oversee the organization, planning, direction, and control of the tourism enterprise.	1% of CBTEs have diversified tourist products and services available to tourists.
In all cases, the decisions of the venture are taken in a general assembly by all community members.	8% of communities delegate business management to professionals who know the subject. And another 8% are supporting their inhabitants to become professional in administrative and tourism issues.
In 99% of cases, there is no continuous training in administrative issues.	30% of CBTEs are registered in the Ministry of Tourism. The others argue that the complicated paperwork and requirements complicate registration with this government body.
Almost 80% of CBTEs have a continuous change of the person in charge of the administration of the venture, causing a break in the continuity of its management.	In the province of Napo, five of the 23 CBTEs are entirely managed by women of the community.

Table 10. Similarities and differences of the financial processes of the 28 CBTEs studied.

Similarities	Differences
90% of ventures have a basic financial system (mainly income and expense recording).	Less than 8% of ventures have the financial processes fully in place. It is important to emphasize that this is because the management of the venture is in the hands of people outside the community who have the knowledge and training in these issues.

5. Conclusions

This document contributes to create interest and knowledge about the management of administrative and financial processes of Community-Based Tourism Enterprises, since currently there is no work on this topic. Many researches are focused on studying and analyzing environmental impacts, community participation, anthropological issues, or economic and social impacts of tourism enterprises within communities, but there is no clear interest in knowing how these enterprises are managed and if they do it properly, leaving a gap in knowledge, since business success depends on the adequate management of financial and administrative processes.

Another contribution of this research is to publish the administrative and financial development of the CBTEs with the intention of generating awareness about the importance of implementing these processes in community enterprises. In addition, this paper can help to generate interest in the academy to continue carrying out research of this type, mainly in the community area, which has been left aside.

The methodology used in this research can be used in all types of tourist and/or commercial enterprises of small and medium size. This is because the diagnostic matrix has all the basic administrative and financial elements that every business needs to function correctly. The main limitations exhibited by this type of research is to make contact with the leaders of the community

centers and to gain the trust of these leaders in order to obtain as sincere as possible answers when gathering the information included in the diagnostic matrix.

Currently, Community-Based Tourism Enterprises do not have a technical document that allows them to adequately implement the administrative and financial processes in their enterprises, and this is one of the factors that causes some to disappear and others to be in critical condition. In research about China, the results confirm that the financial performance of tourism enterprises can serve as a leading indicator in order to understand the overall business development [63]. It must also be considered that management of tourism operators requires different plans of action because of the peculiarities between these enterprises, especially since problems often arise in the strategic and operational planning processes [64]. The administrative and financial management inside CBTEs should be much more case specific, since there are other important elements to be considered, such as culture and the socio-economic structure of communities, so that this kind of analysis helps to understand how these enterprises manage these processes.

It was identified that a certification granted by the Ministry of Tourism does not guarantee the optimal functioning of these enterprises, because the administrative and financial issues are not considered within the certification requirements.

It is important to mention that currently community-based tourism represents the secondary source of income within the communities as can also be seen in the research carried out by Manyara and Jones [17], Lapeyre [21], and Vargas [31]. Therefore, this activity itself could not maintain the economies of the families because it represents a low economic income, which can be seen in other studies such as the case of Nicaragua carried out by Zapata et al. [26]. This is why community members are mainly engaged in agricultural and livestock activities.

The participation of government entities is important, especially the Ministry of Tourism with permanent training in administrative and financial issues. In this way, the CBTE can have better organization, planning, and implementation in the use of its resources.

It was clear that CBTEs have not designed, and much less implemented, the administrative and financial processes that help them to have proper management of the enterprises, but it could be evidenced that they have considered trainings, academic studies, and the learning of new technologies to improve their quality and to be competitive.

With these results, it is necessary to design a standard administrative and financial model for CBTEs that is easy and simple to use, which considers the main elements of these processes and guarantees good business management. This can be seen in the studies carried out by Salazar et al. [65] and García et al. [66] on the importance of implementing administrative and financial processes within the management and administration of business resources.

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Article

Flourishing Women through Sustainable Tourism Entrepreneurship

Murude Ertac * and Cem Tanova

Faculty of Tourism, Eastern Mediterranean University, 99628 Gazimagusa, North Cyprus, via Mersin 10, Turkey; cem.tanova@emu.edu.tr

* Correspondence: murude.ertac@emu.edu.tr

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Abstract: As a small island in the Mediterranean Sea, Cyprus must develop a sustainable tourism model. Although the ongoing political problems in Cyprus provide additional challenges, the number and activities of women ecotourism entrepreneurs demonstrated an inspiring growth over the last decade in the northern part of Cyprus. The well-being and flourishing of these women entrepreneurs influence their participation and further involvement in the sector. Psychological empowerment plays a significant role in achieving a flourishing society, and our results reveal that ecotourism can be used to create positive change in women's lives. We study how the mindsets and flourishing levels of these ecotourism entrepreneurs are related and how empowerment can change the direction of this relationship. Our research model was developed based on the self-Determination theory. Surveys were distributed to 200 women ecotourism entrepreneurs in rural areas of Northern Cyprus. We demonstrate that women who have growth mindsets, i.e., those that believe people's characteristics such as abilities are not fixed, experience lower levels of flourishing, perhaps contrary to what some might expect. This result may be due to the presence of gender inequality and may be an outcome of living in a region where a frozen conflict places additional external constraints on women entrepreneurs. However, as we predict, psychological empowerment changes the direction of this relationship. When psychological empowerment is high, women with a higher level of growth mindset experience a greater level of flourishing, even in an unfavorable context. This is the first study which analyzes women ecotourism entrepreneurs in Northern Cyprus. Moreover, this is the first study that focuses on the relationship between growth mindset, flourishing and psychological empowerment. The results can be used by governmental and non-governmental organizations as a source in their decision-making processes while managing and coordinating microfinance opportunities for rural development to support women's empowerment and well-being.

Keywords: ecotourism; women entrepreneurship; self-determination theory; psychological empowerment; flourishing; growth mindset

Highlights

Growth mindset and the flourishing level of women ecotourism entrepreneurs have a significantly negative relationship in Northern Cyprus.

Psychological empowerment has an interaction effect that changes the direction of this relationship, toward a significantly positive relationship.

Ecotourism is a tool to empower women living in rural areas.

1. Introduction

As a Mediterranean island with ample sunshine and beautiful beaches, Cyprus has long been a tourism destination. Although the political problem that divides the north and south has resulted in

two separate administrations, both sides had focused on mass tourism strategies for rapid economic results but have recently become increasingly concerned with the potential damage that mass tourism may have on the environment and the issue of sustainability. In the past, policy makers developed incentive systems to attract large-scale investments, but now there is more interest in encouraging smaller-scale and sustainable tourism offerings which involve the local population. Northern Cyprus has seen an increase in women ecotourism entrepreneurs, who have been encouraged by community development programs and festivals [1].

Tourism is one of the routes through which women can be integrated into economic and social life [2], and entrepreneurship may help women, particularly those who live in rural areas where the job opportunities are limited, to increase their self-reliance and empowerment. Especially for the women who live in rural areas, the development of ecotourism can provide work opportunities. Taking part in ecotourism activities gives those women the freedom to earn their own money and be economically independent, which also enhances their social condition [3].

Although there has been increased interest in academic studies of ecotourism and entrepreneurship in general, we still lack an understanding of the factors that lead to well-being among ecotourism entrepreneurs [4]. In particular, the factors influencing the success of women ecotourism entrepreneurs whose empowerment and involvement can have significant social impact have not received adequate attention in the existing literature. To provide a better understanding of the impact of ecotourism on the lives of the women ecotourism entrepreneurs who typically did not have prior professional experience, we investigated how their mindsets, based on how empowered they feel, influence their well-being and feelings of flourishing.

Studies on mindset have generally argued that those with a growth mindset will perceive social and personal attributes as changeable, will have more positive emotional experiences and thus will have higher levels of thriving, flourishing and fulfillment [5,6]. However, more recent research has revealed that the positive results of growth mindset require certain contexts in which these positive outcomes could be possible [7]. In the current study, in the context of Northern Cyprus, where gender inequality and a frozen conflict place restrictions on women, we expect to see a negative relationship between growth mindset and the level of flourishing due to these restrictions. Based on the previous studies [8–10] we expect that women entrepreneurs who believe in themselves and want to take actions to control their lives will be more frustrated if they are held back as a result of these external factors and their flourishing level is lessened.

Contribution of the Study

The current study examines the mindset and flourishing relationship among ecotourism entrepreneurs in Northern Cyprus and explores how psychological empowerment through sustainable tourism can enable them to reach higher levels of thriving and flourishing. The study provides findings from a context that may be considered less supportive for growth mindset women entrepreneurs. Furthermore, by investigating how the impact of empowerment may influence the mindset–flourishing relationship, the study contributes to the theoretical discussions in the mindset literature.

2. Theoretical Background and Hypotheses Development

2.1. Theoretical Background

2.1.1. Well-Being and Flourishing

Flourishing means having a good life. It is a feeling of well-being, both physical and mental. It means the highest level of psychological well-being [11–13]. The concept of well-being can be defined as a multi-dimensional construct that considers hedonic (experience of pleasure) and eudemonic (the experience of meaning or accomplishment) ideas of prosperity [14]. However, the eudemonic and hedonic dimensions work simultaneously. A life rich in both hedonic and eudemonic aspects leads to

the maximum level of well-being or flourishing. Therefore, combined feelings of accomplishment, which are higher-order (eudemonic) experiences, and feelings of pleasure, which are lower-order (hedonic) experiences, differentiate the concept of higher levels of well-being from the concept of the mere absence of suffering. When we experience personal achievement, meaningful creative contribution, altruistic experiences, these will not only count as eudemonic experiences but also provide hedonic pleasure.

Evaluating the flourishing levels of individuals is important because findings prove that flourishing is essential for societies and organizations [15]. Just as accounting is used to understand the financial health of organizations and countries, we are seeing more interest in taking measurements of well-being to understand their emotional health. Policy makers are becoming more interested in developing policies that will enhance the well-being of societies in a more balanced way. The World Health Organization (WHO), the European Public Health Association (EUPHA) and the European Commission (EC) have emphasized the importance of linking planning and health instead of treating them as separate domains [16].

Studies show that flourishing also brings benefits to the community in terms of improved public health [15,17].

VanderWeele and VanderWeele et al. indicate that flourishing is not limited to improved psychological well-being but also includes every facet of an individual's life [18,19]. Therefore, different areas of flourishing have been studied. Feeling happy and fulfilled, psychological and physical health, desires and ambitions, personality and honor, and social interactions can be listed as the different areas of flourishing. Furthermore, economic stability is also an important element in preserving flourishing.

Deci and Ryan (1985) suggest that in order to experience well-being, the basic psychological needs of competence, relatedness and autonomy must be met, as specified by the self-determination theory [8].

2.1.2. Implicit Person Theories

Carol Dweck, a well-known writer in the field of motivation, popularized the concept of “mindset” to demonstrate that the general beliefs that we have about whether people's characteristics are stable or malleable—our lay theories—will influence our attitudes and behaviors [20]. Dweck (1986) proposed that mindsets can be classified as fixed and growth [21]. People who have fixed mindsets believe that people's personal traits, such as knowledge, inventiveness and ability, are foreordained and stable characteristics [22]. Individuals with fixed mindsets accept that if a person is insufficient in some way, their situation will remain unchanged. On the other hand, people who have growth mindset trust that people's fundamental capacities can continue to improve through hard work and commitment. They believe that these natural traits are the initial stages for achieving accomplishments through learning, hard work and endurance. These assumptions or beliefs are also referred to as the implicit person theory (IPT), a particular presumption about the adaptability of a person's qualities that affect his or her conduct [21–23].

Dweck and her colleagues have focused on implicit person theories [24,25]. A person who possesses a fixed “implicit person theory”—also called entity theorist—will have a fixed outlook about people and trust that people's capacities are based on their fundamental abilities and are stable [20]. This leads them to think that these capacities are the reason for their level of success or failure. Such individuals are more likely to believe that their outcomes are due to their unchanging dispositional capacities and ignore situational factors [26].

2.1.3. Self-Determination Theory

Self-determination theory (SDT) is a comprehensive theory of motivation that encompasses several sub-theories. A distinction is made between autonomous motivation—feeling tempted to do something because we find it interesting or perceive it as our own wish—versus controlled motivation—feeling that something must be done because of some pressure or to satisfy someone else. However, SDT does

not treat controlled and autonomous motivation as dichotomous, but accepts that they represent the theoretical maximum points of a continuum. As the level of autonomy increases, the type of motivation changes from controlled to autonomous.

SDT encompasses the Basic Psychological Needs Theory, which states that autonomy competence, relatedness and psychological needs must be met [8]. Thus, women ecotourism entrepreneurs need autonomy and freedom to decide and act independently, the competence to perform effectively and deal with financial, operational and managerial issues, and relatedness to find support from their contacts.

The cognitive evaluation theory, as a sub-theory of SDT, argues that the context may be supportive or controlling. A controlling context would use external conditional rewards or penalties, which for individuals already performing the task and getting intrinsic rewards from the task itself would mean a loss of autonomy. For example, in a non-profit organization where people were presumably engaged in their tasks due to the alignment of their personal values and goals with the organization, a loss of autonomy and intrinsic motivation was experienced after the introduction of merit pay systems [9]. For entrepreneurs that went into business with a desire to use their creativity and innovation, an environment with too many external conditions can lead to frustration. Women ecotourism entrepreneurs will experience this when they are operating under pressure from society to conform to certain norms that restrict their autonomy, competence and relatedness.

The causality orientation theory is also a sub-theory of SDT and focuses on the individual differences of general orientation in different people. Those with an autonomy orientation have a higher need for autonomy and those with a control orientation will be more comfortable with externally imposed deadlines and clear rules.

According to the self-determination theory, individuals from all societies have an essential psychological need for autonomy, capability and relatedness. It is argued that if these requirements are bolstered by social settings, flourishing is enhanced [8–10]. When the social context supports autonomy, and the individual has an autonomy orientation, this will increase motivation [9]. Furthermore, at a social level, Putnam [27,28] and Helliwel et al. [29] argue that the well-being of societies is also dependent on the social capital of individuals. Conversely, if the environment is controlling and the individual has an autonomy orientation, this may result in a loss of motivation. If the cultural context and other external environmental factors put restrictions and limitations on those necessities, the level of flourishing will decrease.

2.1.4. Women's Entrepreneurship and Ecotourism in Northern Cyprus

The inflexible roles and responsibilities of women that are imposed by society and cultural norms inherited from past generations should not be overlooked when discussing the position of women in work life. Women and men are exposed to certain gender restrictions from their birth to their death.

A UN Report on women shows that 70% of the global population who suffer from low living conditions are women. Although women work more than men, only 10% of world income goes to women, and they own less than 1% of the world's total assets [30]. Moreover, the number of uneducated women around the world is much higher than the number of uneducated men due to the inequalities that women face in society [28]. This is what encourages researchers to investigate ways to improve women's lives by searching for ways in which they can become involved in the workforce and take part in the world economy. As is widely known, if women change, the whole environment around them changes.

Women entrepreneurs, who are the focus of our research, contribute to the general economy of their country through their newly established businesses. Their willingness to achieve long-term success in the tourism industry affects the economy in a positive way. Worldwide, an increased number of women have started to participate in entrepreneurial exercises for money-related reasons as well as for psychological and social empowerment reasons. Most of these women entrepreneurs, however, also expect to have a balanced family life while engaging in their business activities [31,32].

According to prior research, women are more likely to be engaged in entrepreneurship that is directed at social and environmental problems [33]. Evidence confirms that necessity-based motivation factors are more common among female business entrepreneurs than among male business entrepreneurs. Various studies conducted in the USA, for instance, have demonstrated that female business entrepreneurs tend to be less affected than their male counterparts by the motivation to be more powerful, richer and to be their own boss. Rather, women tend to be inspired by earning an income in order to improve their standard of living [34].

In developing countries, studies have revealed that, for women, necessity motivation has a greater effect compared to opportunity motivation [35]. In developing countries, there is an increasing rise in the number of female entrepreneurs who conduct economic activities. The researchers mention that these women contribute to the general economy with their generous commitments. Heyzer [36] pointed out that those women who take part in the economy as small business owners have a significant effect on strengthening and improving women's living standards.

One of the routes through which women can be integrated into economic and social life is tourism [2]. With the development of tourism, numerous work opportunities for women have led them to employment and entrepreneurship. In addition, tourism gives them the freedom to earn their own money and be economically independent, which also enhances their social condition. Tourism is an important, employment-stimulating sector which is thriving around the world. It is estimated by the World Tourism Organization that approximately 96.7 million individuals are employed in the tourism sector; if indirect occupations are added to this amount, the sum is approximately 254 million employees [37,38]. This energetic industry is the principal source of national income, job creation and private sector growth in numerous nations.

In recent years, ecotourism has emerged as a means of long-term, sustainable community development [39]. Done properly, community-based ecotourism (CBET) should add to the natural preservation of wildlife and the environment and provide job opportunities for the community to obtain income [40]. To accomplish sustainable development in tourism, women should be encouraged to take part in tourism activities [3]. Excluding some special studies [38], gender has not been the main focus of research in ecotourism. However, there are many aspects of the gender perspective in ecotourism, as it is an important vehicle for women's entrepreneurship, especially in rural areas.

Knowing the importance of supporting women's entrepreneurship for its economic, social and psychological benefits, in our research, we chose women entrepreneurs who were involved in ecotourism activities in Northern Cyprus as our study population.

2.1.5. Cyprus as a Frozen Conflict Area

Cyprus is categorized and accepted as being a frozen conflict state, as there has been an ongoing political conflict between the recognized Republic of Cyprus and the unrecognized Turkish Republic of Northern Cyprus. The negotiations have continued for more than 40 years. In the meantime, Turkish Cypriots continue to live in an unrecognized country, faced with the consequences of a frozen conflict. Although the political problems thwart the possibility of a solution, people try to build a life where they satisfy their needs and try to achieve their goals. Like anywhere else, some choose to become entrepreneurs. In particular, women who live in rural areas, where job opportunities are limited, want to feel independent and empowered through entrepreneurship.

95% of the private sector in Northern Cyprus, consist of small- to medium-size businesses [41]. Furthermore, 80% of these businesses are sole proprietorship or family businesses [42]. According to a study, the appeal of working in the government sector and the limited availability of information, coupled with political and economic barriers, diminish the push factors for entrepreneurship as a career alternative [42]. However, the amount of women entrepreneurs in Northern Cyprus can be considered high according to the EU standards [43]. Although the push factors are not strong, people—mainly women who cannot find a governmental job—are pulled into entrepreneurship. They do so to be more social and to earn their own money, in order to become self-sufficient [43].

At that point, ecotourism plays an important role in empowering those women entrepreneurs, as Cyprus offers historical and natural beauty to tourists. However, tourism activities are limited and very difficult due to the state of frozen conflict. Economic and political embargoes, such as the lack of direct flights and being excluded from international organizations, cause problems and limit the opportunities. These limitations and uncertainty put psychological constraints on entrepreneurs. Those who have a growth mindset believe in change and believe they can achieve their goals, but also know and see the reality of the country they live in. This awareness leads them to feel less flourished and constrained.

In addition to the above-mentioned economic and political constraints, as Purrini [44] mentioned, women who live in these conflict zones, particularly in the rural regions, should be empowered, as they cannot take part of the decision making process. Women entrepreneurs should be supported and encouraged with training and financial support because the lack of capital is a further major obstacle they face [45].

Due to the frozen conflict and its political consequences, Northern Cyprus has been mainly supported and influenced by Turkey since 1974. Therefore, Turkish culture and traditions have spread to the area. In the Gender Gap Report (2020) published by the World Economic Forum, Turkey is ranked 130 out of 153 countries, as shown in Table 1 [46]. This shows a clear gender inequality in the country and hence in Northern Cyprus as well. In 2016 and 2017, a study was conducted in Cyprus by the “Security Dialog Initiative”, which is a non-governmental organization, together with the Gender Score Cyprus Project, implementing the Social Cohesion and Reconciliation (SCORE) index to determine the state of gender inequality in Northern Cyprus. The findings confirmed that Turkish Cypriot society is affected by a traditional culture where toxic masculinity is endorsed. According to this study, husbands’ disciplinary actions toward their wives are backed by society. Also, society reduces the role of women to parenthood. The study shows that Turkish Cypriot women cannot freely express themselves in society; they feel that they are disadvantaged with regard to sharing family wealth, and they present lower levels of economic and political independence [47].

Table 1. Gender Gap in Turkey according to the Global Gap Index Report 2020.

Dimensions	Rank
Economic Participation and Opportunity	136/153
Educational Attainment	113/153
Health and Survival	64/153
Political Empowerment	109/153
Global Gender Gap Index	130/153

Powerful traditional gender roles lead society to expect women to be responsible for household duties and childcare. As a result of this work overload, women have very limited or no time to invest in themselves to improve their skills, have a hobby or join society and become involved in political activities. In addition to these findings, the most dramatic outcome of the study is that there is neither an awareness of gender inequality nor an understanding of the concept of gender equality. Both men and women accept gender inequality situations as norms and do not attempt to make any changes [47].

2.2. Hypotheses Development

2.2.1. Mindset and Flourishing

Previous studies have demonstrated the links between personality traits, well-being and flourishing [48]. Helliwell [49] found a direct connection between identity and well-being. Individuals with higher self-respect appear to be less inclined to experience despair. Hmieleski and Sheppard [50] argued that women entrepreneurs who are creative experience higher degrees of well-being and

start-up business success. However, the self-determination theory says that individuals from all societies have an essential psychological need for autonomy, capability and relatedness. If these needs are bolstered by social settings, flourishing is enhanced. On the other hand, if the cultural context and other external environmental factors put restrictions and blockages on these needs, the level of flourishing declines [8–10].

Our research was conducted in Northern Cyprus, where gender inequality and frozen conflict play an important role, since these factors place restrictions on women. Therefore, we anticipate a negative relationship between growth mindset and the level of flourishing as a result of these restrictions. When women entrepreneurs believe in themselves and want to take actions for their lives, but are restricted as a result of these external factors, their flourishing level will be lessened compared to that of women who may already be convinced that change is not possible and accept their fate.

Therefore, based on the self-determination theory, we expect to see a negative impact of growth mindset on flourishing. We expect that people with growth mindset will think they can change things and achieve the things they want. However, in the context of Northern Cyprus, where they cannot make a change and achieve their goals due to the contextual limitations they face, they will be more frustrated and will experience less flourishing. Therefore, we developed our first hypothesis as follows:

Hypothesis 1 (H1). *Growth mindset has a negative relationship with flourishing.*

2.2.2. Psychological Empowerment, Growth Mindset and Flourishing

Elias and Ferguson [51]. define empowerment as the right of people to make individual choices, make their decisions on their own and have dignity. Researchers argue that the process of empowerment aims to enable individuals to obtain more power to become more self-reliant and self-confident people, to create their own way of living and, therefore, to become part of the process of social change [52].

According to Spreitzer [53] (p. 1443), “psychological empowerment refers to the intrinsic task motivation that results in feelings of competence, impact, task meaningfulness and self-determination related to the work-role”. Empowering circumstances which provide the prospects for being independent pose a challenge, enhance accountability and make people appreciate what they have. In exchange, such appreciation leads to a sense of significance, proficiency, self-determination and power [54].

In the tourism context, when the inhabitants experience psychological empowerment they feel “pride” and “self-esteem”, as they feel unique and think they have significant abilities and products to give to tourists [55]. Studies indicate that when citizens are not only involved but also empowered, their impact becomes much greater and leads to more sustainable efforts [56–58]. makes the distinction between mere involvement and empowerment and argues that empowerment is the “top end of the participation ladder where members of a community are active agents of change and they have the ability to find solutions to their problems, make decisions, implement actions and evaluate their solutions” [56] (p. 631). Community-based ecotourism where citizens are actively empowered socially, politically and psychologically is a key element of sustainable tourism [58].

Under normal circumstances, the relationship between the growth mindset and flourishing is expected to be positive [49]. However, people with a growth mindset who are restricted and thus disappointed by the conditions of the country they live in, when they repeatedly experience that in spite of their enthusiasm and efforts they cannot introduce the change that they believe could have been possible, and feel unappreciated, will not see themselves as valuable and useful [8]. Among the individuals with a higher level of growth mindset who believe that people and situations are not fixed but changeable, the constraints will lead to a feeling of unfulfilled potential.

However, we believe that women with higher levels of growth mindset will indeed experience greater flourishing if they are psychologically empowered through tourism. If there are community-based tourism activities in the regions where they live and if they are involved in, and empowered by, these sustainable tourism activities, they will feel useful and experience meaning

in what they do [56]. Often, community-based tourism is supported by training and development and educational activities that contribute to empowerment. When women feel proud of themselves as they receive positive feedback from the tourists who appreciate their products, services and environment, they feel more competent, empowered to make decisions, useful and effective in their family and their community [58]. Women with a growth mindset who do not perceive or experience psychological empowerment know that they are capable of doing the things they want but, as a result of environmental pressures and obstacles, cannot. They cannot offer the services and products they want to offer freely to tourists when they are blocked by the people around them, such as their husband, father or neighbors, or restricted by the dominant norms of their community. Women with a growth mindset will feel even worse if they are accused of neglecting the household chores that they are expected to perform and have to ask permission to their husbands [8].

Based on the self-determination theory, we expect that maintaining women’s empowerment will enhance their level of self-determination and lead to an increase in their subjective well-being. We believe that this relationship will be particularly stronger among the women entrepreneurs who have higher levels of growth mindset. Therefore, we expect to find a moderation effect of psychological empowerment that reverses the negative relationship between growth mindset and flourishing. As a result of this expectation, we developed our second hypothesis as follows:

Hypothesis 2 (H2). *Psychological empowerment interacts with the relationship between growth mindset and flourishing.*

3. Method

3.1. Model of the Study

This research applied a cross-sectional survey and regression analysis to assess how psychological empowerment through tourism interacts with the relationship between growth mindset and the level of flourishing of women entrepreneurs living in rural regions of Northern Cyprus.

Figure 1 shows the conceptual model and the hypotheses of this study. This model tests the effect of growth mindset on the flourishing of women entrepreneurs who live in rural parts of Northern Cyprus and engage in ecotourism activities (Hypothesis 1). The study also tested whether psychological empowerment through tourism interacts with the relationship between self-growth mindset and flourishing (Hypothesis 2).

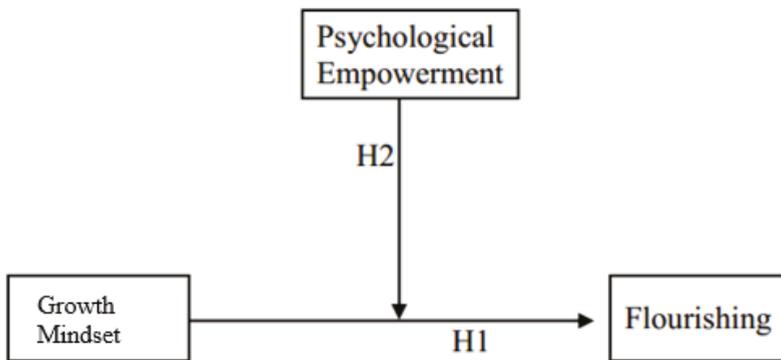


Figure 1. Conceptual Model.

3.2. Measures

To measure flourishing, the Turkish version of the Flourishing Scale, which has been adapted by Telief [59], was used in our study. To assess the psychological empowerment and growth mindsets of women entrepreneurs, the original scales were translated into Turkish and then translated back into English by two professional translators. They were compared with the original scales in order to check that the meanings of the items had been correctly translated into Turkish and would not be misinterpreted by the respondents. This process was performed according to the suggestions of Perrewé et al. [60]. Before distributing the questionnaires, a pilot study was completed to test that the questionnaires worked correctly. While preparing and distributing the questionnaires, the suggestions of Podsakoff, MacKenzie, Lee and Podsakoff [61] were applied to protect our study from common method bias.

3.2.1. Growth Mindset

Growth mindset was assessed with the 8-item implicit person theory created by Levy and Dweck [62]. This scale has 4 items associated with fixed mindset, like “As much as I hate to admit it, you can’t teach an old dog new tricks. People can’t really change their deepest attributes”, and 4 items associated with growth mindset, like “People can always substantially change the kind of person they are”. Respondents were asked to rate the items using a 6-point scale ranging from 1 (strongly disagree) and 6 (strongly agree). The previous research demonstrated the alpha coefficient of this scale to be 0.94, which shows the strong internal consistency of the scale [62]. We found the alpha coefficient of this scale to be 0.89 in our study.

3.2.2. Flourishing Scale

This scale consists of 8 items that evaluate respondents’ perceived success in major segments of their lives, for example their self-esteem, how competent they feel or if they think they have a purpose in life. Initially, this scale was named the “Psychological Well-being Scale”, but it was later changed to the “Flourishing Scale” to represent the content of the scale more accurately. The scale provides a single psychological well-being score [63]. The respondents were asked to rate answers on a 7-point Likert scale where 1 represents “strongly disagree” and 7 represents “strongly agree”. One item, for example, reads: “I lead a purposeful and meaningful life.” The scale’s reliability has been demonstrated [63]. The Turkish version of the scale also had reliable results, with an alpha coefficient of 0.80 [59]. When we applied this scale in our study, we found a, alpha coefficient of 0.83.

3.2.3. Psychological Empowerment

Resident Empowerment through Tourism Scale (RETS) was used to assess the psychological empowerment of women entrepreneurs engaging in ecotourism activities, as it is a reliable and valid measurement tool that assesses residents’ perceptions of empowerment [64]. The scale has 3 sections, to assess the psychological, political and social empowerment of residents through tourism. We have used the 5 items in the psychological empowerment subscale, consisting of statements such as “Tourism in ... reminds me that I have a unique culture to share with visitors.” or “Tourism in ... makes me proud to be a ... resident.” The value of the alpha coefficient was 0.92 for this scale, which represents a strong construct reliability.

3.3. Questionnaire Administration

Following the suggestion of Hinkin [65], we applied a pilot study with 12 women entrepreneurs to test the items on a small scale before applying the survey on a larger scale. First, after the pilot study, to evaluate the substance and legitimacy of the scale items, some phrasings was corrected, as some of the words were found to be reasonably confusing, as suggested by DeVellis [66]. Essential modifications were made, and equivocal words were reworded.

Exploratory factor analysis (EFA) was applied using Varimax Rotation in IBM SPSS Statistics program to find conceptually incompatible items with a correlation threshold of 0.40, as suggested by Kim and Mueller [67]. The analyses revealed 3 factors that cumulatively explain 62% of the deviation, with eigenvalues above 1. The consistency of the items in the instruments used in the study was checked with the threshold Cronbach's alpha [68] of 0.70. One item from the flourishing scale had a loading below 0.50 and was eliminated, as recommended by Hair, Anderson, Tatham, Black and DeVellis [66,69].

Confirmatory factor analysis (CFA), as indicated by Hinkin [65], was used to assess the goodness of fit of the model and the items used in the model. The high loadings in the CFA demonstrate that the study has construct validity. Average Variance Extracted (AVE) and Composite Reliability (CR) were also used to ensure the internal consistency and illustrate the convergent and discriminant validity of the study.

3.4. Participants and Procedure

Context Population and Sampling

The purposive sample method was used. A list of sample populations was obtained from the Businesswomen Association of Northern Cyprus. The list consisted of 305 women entrepreneurs who were involved in ecotourism activities, such as traditional handcrafting and producing traditional food. The population also included boutique hotel or guesthouse owners and small restaurant owners who specialize in traditional foods. These women live in rural areas, mainly in small towns within five main regions of Northern Cyprus. Most of them were housewives before they became entrepreneurs. In each region, there is a mentor who helps these women in their operations. Generally, the mentors are the leaders of local women's associations or, in some regions, mayors who are taking on the responsibility of leading ecotourism activities in their region and providing support to women entrepreneurs. We visited these towns to meet these women in person. The list we used was not particularly applicable, as most of the women were no longer engaged in these activities, and some of them were unreachable. Therefore, we found a woman entrepreneur from each town and through her, using the snowball technique, reached out to other women. We contacted 200 women and asked them to complete the questionnaire. Data were collected in the period between April and June 2018 by visiting the women and in their respective locations. Questionnaires were distributed to those women entrepreneurs, and we kindly requested that they complete these questionnaires after we explained to them our research purposes and how we maintained the confidentiality of our research. We asked them to complete the questionnaires, which consisted of four sections, including a demographic information section. Our aim was to gather information on self-growth mindsets, women's psychological empowerment through tourism and women's flourishing.

Figure 2 shows the locations where the data was collected, and Table 2 presents the demographic profiles of the respondents. The sample consisted of 200 women respondents from 15 villages located in rural parts of Northern Cyprus. Only 6 of them, representing 3% of the population, were younger than 25. This means that young women are less involved in the ecotourism sector in Northern Cyprus. Only 18 (9%) of them had undergraduate degrees, and 15 (7.5%) were postgraduate degree holders. This information shows that women with university education are less likely to be engaged in ecotourism entrepreneurship activities in rural areas.

Table 3. Goodness of fit of the model.

N = 200	Cut-Off Points
$\chi^2 = 759$	
df = 199, $p = 000$	
GFI = 0.863	1 = maximum fit (Tanaka & Huba, 1985)
NFI = 0.861	1 = maximum fit (Bentler & Bonett, 1980)
CFI = 0.91	1 = maximum fit (McDonald & Marsh, 1990)
RMSEA = 0.087	<0.08 = good fit (Browne & Cudeck, 1993)
$C_{MIN}/df = 2.523$	>1 and <5 = good fit (Marsh & Hocevar, 1985)
VIF = 1.010	< 3 = good fit (Hair et al., 2018)

Notes: GFI: Goodness of fit indices, NFI: Normed fit index, CFI: Comparative Fit Index, RMSEA: Root Mean Square Error of Approximation, C_{MIN}/df , relative χ^2 .

Table 4. Means, SD and correlations of the study variables.

Variables	1	2	3	Mean	SD	CR	α	AVE
1. Flourishing	-			6.22	0.82	0.88	0.833	0.51
2. Psychological Empowerment	0.381 **	-		4.53	0.75	0.93	0.919	0.71
3. Growth Mindset	-0.223 **	-0.143 *	-	2.42	1.18	0.91	0.894	0.57

Notes: Composite scores for each variable were computed by averaging the respective item scores. * Correlations are significant at the 0.05 level. ** Correlations are significant at the 0.01 level.

Table 4 shows the means, standard deviations and correlation estimates of the variables used in our study. As hypothesized, growth mindset and the level of flourishing of women entrepreneurs are negatively related ($r = -0.223, p < 0.01$). This result provides support for Hypothesis 1.

Table 5 shows that Hypothesis 2, which anticipated that psychological empowerment would moderate the relationship between growth mindset and flourishing, is supported, as we can see a significant level of interaction terms ($\beta = 0.260, p < 0.01$).

Table 5. Flourishing as predicted by Growth Mindset and Psychological Empowerment.

Variables	Step 1	Step 2
	$\beta(t)$	$\beta(t)$
Growth Mindset	-0.171 (-2.620) **	-0.156 (-2.523)
Psychological Empowerment	0.357 (5.449) **	0.235 (3.542) **
Interaction term	-	0.260 (4.996) **
F	20.754	23.838
R ²	0.174	0.267
ΔR^2	-	0.093 **

Note: Interaction terms = Growth mindset x Psychological empowerment level ** Significant at the 0.01 level (2-tailed).

Therefore, complete support was reached. The research outcome approved the model of interest, as all hypothesized relationships were supported. Figure 3 shows the interaction effect of psychological empowerment in the relationship between growth mindset and flourishing.

As clearly seen in Figure 3, this study proves that when the psychological empowerment is low, women entrepreneurs' level of flourishing declines when their growth mindset level increases. When we enter a low value of empowerment at 1 standard deviation below its mean, the estimated beta for mindset in predicting flourishing is negative (-0.27), whereas when we enter a high value of empowerment at 1 standard deviation above its mean value, the estimated beta for mindset in predicting flourishing is positive (0.15). This can be explained by the negative impact of gender inequality and the frozen conflict conditions in Cyprus. Women entrepreneurs are negatively affected when they believe that they can change and improve their skills, but also that they will not accomplish their dreams due to the limitations they face in their community. However, when we add psychological

empowerment to this relationship, the negative result is reversed to a positive one, which shows that if we empower women entrepreneurs psychologically through tourism, they will feel strong and empowered, and this will change the relationship between growth mindset and flourishing. When the women are psychologically empowered, their growth mindset will lead to a more fulfilled, happier life, although there are many constraints that they still have to face.

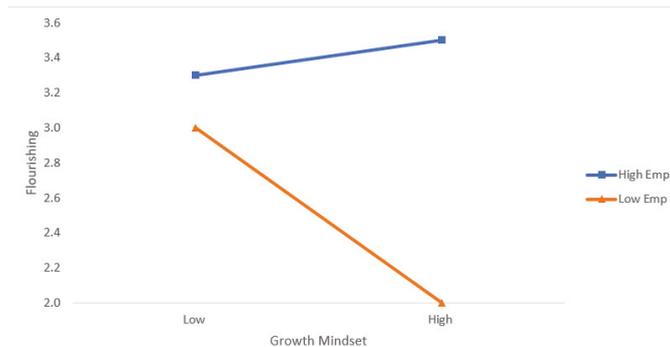


Figure 3. Slopes showing how Growth Mindset influences Flourishing differently under high and low Psychological Empowerment conditions.

5. Discussion and Conclusions

In the relatively unfavorable entrepreneurial ecosystem and restrictive social context of Northern Cyprus, empowerment through ecotourism activities can enable especially women with a growth mindset to experience higher levels of well-being. Psychologically empowering growth-mindset women entrepreneurs improves their autonomy and self-belief, which leads them to flourish. This will not only benefit the women who become ecotourism entrepreneurs but also society and the economy overall. There will be a positive impact on the GDP through an increased female employment rate, and the knowledge, skills and capabilities that women gain will contribute to the overall well-being of society. Furthermore, a UNESCO (2019) [71] report shows that empowering women has significant benefits for the environment and argues that when women have a larger role in governance in society, the sensitivity to the social and environmental impacts of policies increases.

However, we note that the impact of empowerment through tourism is less felt by women who have a lower growth mindset or fixed mindset. Those with a fixed mindset are likely to believe that characteristics are generally stable and impossible to change; therefore, they may not be so concerned or motivated in the first place to introduce change in themselves and their communities. Thus, they may be less likely to utilize the opportunities introduced by empowerment, and their level of well-being does not change as much as that of women with a high growth mindset, who feel more confident to pursue their dreams and create change in their lives by taking action.

Many scholars and practitioners also believe that it is possible to increase the growth mindset through interventions [7]. Especially in the field of education, there are many applications and recommendations on how teachers can develop a growth mindset amongst their students. For example, the use of a metaphor such as “the brain is similar to a muscle that needs to be exercised through learning and grows stronger and smarter as a result.” This metaphor is reinforced by the teachers and replaces any belief that our talents, abilities and capacity is fixed and there is nothing we can do about it. Similarly, Dweck [20] argues that this can be extended to leadership and management, where managers can develop cultures where people believe in their own and other people’s ability to change and develop. These cultures would value trial and error as part of the process of development and not penalize individuals for taking the initiative to try something new, even if it does not always succeed.

The mindset literature has generally advocated the value of growth mindset. Our study reveals that growth mindset without empowerment will not lead to flourishing. Thus, we contribute to the mindset literature and theories by showing how empowerment is a critical factor that can enable those with growth mindset to achieve higher levels of flourishing.

5.1. Practical Implications of This Study

We believe that if women change, their surroundings will change as well. From this perspective, this study proves that the key to happiness for women is to become psychologically empowered, and shows that ecotourism can be used as a means to create positive change in women's lives. Governmental and non-governmental organizations should support microfinance opportunities for rural development in such a way as to support women's empowerment and well-being. Additionally, the study clearly illustrates that the authorities should provide training programs to support women who live in rural areas of Northern Cyprus, to teach them new skills and to empower them. As the study demonstrates, higher levels of empowerment will enable the increased flourishing and well-being of women entrepreneurs. International organizations such as the United Nations and the European Union, which are already active in Northern Cyprus to help the community to develop and to reach a political solution in Cyprus, should also further support ecotourism and enhance their activities to help local NGOs and potential women entrepreneurs, who can be included in ecotourism. Moreover, as suggested by Sdino and Magoni, shared housing associated with ecotourism can be introduced for these women in order to help them earn their own money and contribute to ecotourism [72].

The programs to empower women ecotourism entrepreneurs should not only offer support by delivering know-how or helping to eliminate barriers but also include interventions to increase growth mindset. However, some findings show that the results of such interventions may be temporary [7]. Therefore programs to develop growth mindset must be systematic. Conscious efforts for the empowerment of women entrepreneurs are also needed to develop supportive environments where peer norms encourage challenge seeking and adaptive attitudes.

The findings of this study can be used by governmental, non-governmental and international organizations to design new programs and organize capacity-building activities such as training programs, workshops and field trips at the grassroots level with current and potential women entrepreneurs.

5.2. Limitations and Future Research

A qualitative study should be conducted to gain deeper insights related to our findings. Additionally, the scope of our study included only women entrepreneurs in Northern Cyprus, and future studies may replicate this study in other geographical regions to see how cultural and other contextual factors affect the relationship between growth mindset, psychological empowerment and the flourishing of women entrepreneurs.

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Article

Social Entrepreneurial Intention and the Impact of COVID-19 Pandemic: A Structural Model

Inés Ruiz-Rosa ^{1,*}, Desiderio Gutiérrez-Taño ² and Francisco J. García-Rodríguez ²

¹ Departamento de Economía, Contabilidad y Finanzas, Facultad de Economía, Empresa y Turismo, Universidad de La Laguna, 38071 San Cristóbal de la Laguna, Santa Cruz de Tenerife, Spain

² Departamento de Dirección de Empresas e Historia Económica, Facultad de Economía, Empresa y Turismo, Universidad de La Laguna, 38071 San Cristóbal de la Laguna, Santa Cruz de Tenerife, Spain; dgtano@ull.es (D.G.-T.); fgarcia@ull.es (F.J.G.-R.)

* Correspondence: ciruiz@ull.es

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Abstract: The interest in promoting social entrepreneurship projects lies in their ability to develop innovative solutions to social and environmental problems. This ability becomes even more important in situations of global crises such as that arising from COVID-19. Based on the Theory of Planned Behavior (TPB), an explanatory structural model of social entrepreneurial intention was tested, and the impact of the COVID-19 crisis on this intention was evaluated. To do this, a quantitative investigation was conducted using a survey of Spanish university students, obtaining a total of 558 responses: 324 before the COVID-19 crisis and 234 during the crisis period (February and June 2020). The results obtained make it possible to validate the explanatory model of social entrepreneurial intention from the perspective of the TPB. In addition, it shows that social entrepreneurial intention decreases in times of deep socioeconomic crises and high uncertainty, such as that caused by COVID-19.

Keywords: social entrepreneurial intention; social entrepreneurship; COVID-19; theory of planned behavior

1. Introduction

The need to solve social and environmental problems in an innovative way and generate social value is increasingly necessary not only by the public sphere but also by private initiatives [1–3]. In this sense, Horne et al. [4] find that entrepreneurship has great potential to contribute to the Sustainable Development Goals (SDGs).

In this sense, social and environmental entrepreneurship refers to an enterprise project whose objective is to solve a social and/or environmental problem. Moreover, Maer and Noboa [5] understand social entrepreneurship as a process that involves people (social entrepreneurs) who show a tendency toward a specific type of behavior (social entrepreneurship behavior) and who try to carry out that behavior to achieve a tangible result (a social enterprise). The application of the talent, experience, and resources of entrepreneurs in solving social and environmental problems has become a great competitive advantage in many countries [6,7].

Despite growing interest in the concept of social entrepreneurship [8], there is still no clear academic consensus regarding the conceptual delimitation of the term itself, as well as the most appropriate theoretical approach for its analysis, including its antecedents [1,9–12]. Likewise, taking into account the importance of this type of entrepreneurship to mitigate the consequences of economic crises [13], it is necessary to know how such situations affect the behavior or social entrepreneurship intentions of individuals.

Considering the above, this study had a dual objective. On the one hand, to delimit an explanatory structural model of social entrepreneurial intention, analyzing the relationships between

this variable and its antecedent variables. On the other hand, the study also aimed to test the effect of a socio-economic crisis with a high level of uncertainty, such as that posed by COVID-19 on social entrepreneurial intention.

To do this, this study first defined the concept and scope of social entrepreneurship. Next, the perspective of the Theory of Planned Behavior (TPB, hereafter) was used to try to delimit the formation of social entrepreneurial intention [14,15]. This theory proposes that entrepreneurial intention depends on the influence that three variables have on it: personal attitude, subjective norms, and perceived behavioral control [15].

The structural model defined was thus empirically tested using a sample of university students, as this population is considered one of the most sensitive to the development of social entrepreneurship projects [9]. The TPB was applied to social and/or environmental entrepreneurial intention, and the model was analyzed for two different periods: before the COVID-19 crisis, and during the pandemic period. A quantitative study was conducted using a survey of university students (University of La Laguna, Spain) obtaining a total of 558 responses: 324 before the COVID-19 crisis and 234 during the crisis period (February and June 2020). This allowed us to analyze whether the crisis had had a positive or negative impact on the social and/or environmental entrepreneurial intention of the sample.

This paper is organized as follows. In the next section, we present the theoretical context and the hypotheses to be tested in relation to the characterization of social entrepreneurial intention and the relation between crises and social entrepreneurial intentions. We subsequently describe the research model as well as sample selection and data collection before reporting the main results. Finally, we conclude with a discussion of results, theoretical and practical implications, limitations, and our main conclusions for further research.

2. Theory and Hypotheses

2.1. TPB and Social Entrepreneurial Intention

There is a growing interest, both by academic and government institutions, in promoting social and/or environmental entrepreneurship [3,5,11,16,17]. This is justified because these entrepreneurial projects can provide solutions to social and environmental problems in ways that are often more efficient and sustainable than those developed by the public sector [18]. Likewise, Ferri and Urbano [2] state that the social and/or environmental problems emerging in many countries, both developed and developing, have increased the importance of social and/or environmental entrepreneurship as an option to generate social value through social innovation [19,20].

However, despite this growing interest, there is still no clear academic consensus regarding the concept of social entrepreneurship and how to identify and measure it [1,9–12]. In this work, the concept of social entrepreneurship requires social and/or environmental entrepreneurs. The motivation of these entrepreneurs plays a fundamental role. Thus, while traditional entrepreneurship aims to generate profits, social entrepreneurship aims to solve a social and/or environmental problem [5,11,21]. These entrepreneurs are motivated by a strong desire to generate social value [5,22], they are able to identify opportunities focused on solving social and/or environmental problems [23,24] and, therefore, have a collective, and not an individualistic, view of reality [25]. This same author [25] introduces the term “sustainable social value”. This concept of sustainability refers to the intention to maintain social activity over time, which, in turn, requires generating business activity with the aim of guaranteeing financial sustainability [26].

In short, social and/or environmental entrepreneurship projects are hybrid models [1,19,27–29] that function like traditional companies but incorporate an objective of a social and/or environmental nature [30]. Since social entrepreneurs are facing social and/or environmental challenges, it is important to understand the variables relating to social entrepreneurial intentions in order to stimulate those variables [31]. For this reason, it is a priority to know the formation process of social entrepreneurial

intention, since it constitutes the previous step to the implementation of any entrepreneurship project and is the best predictor of actual entrepreneurship [14,15,32,33].

Along these lines, the TPB [14,15], used by Krueger and Carsrud [34] to build their entrepreneurial intention model, has become the model that best describes the entrepreneurial process [35] to the degree that it explains the entrepreneurial intention from the interaction, precisely, between personal and social factors. This same model has also been used by Forster and Grichnik [36] to explain the formation of social entrepreneurial intention. Prieto [37] defines social entrepreneurial intention as the purpose that a certain person manifests in starting a social company with the aim of generating social value through innovation.

The TPB proposes that entrepreneurial intention depends on the influence that three variables have on it: personal attitude, subjective norms, and perceived behavioral control [15]. Using this model, multiple academic studies have been carried out that try to analyze the formation of entrepreneurial intention and the relationship with its antecedents (e.g., [38–42]).

In this sense, personal attitude, according to the TPB [14], will depend on the assessment, positive or negative, that a certain person has in relation to the possibility of developing an entrepreneurial project. Indeed, there are several studies that find a positive relation between attitude and entrepreneurial intention (e.g., [39–41]). In our case, as we are analyzing social entrepreneurship, this assessment will be related to social entrepreneurial intention, thus it would be logical to think that:

Hypothesis 1 (H1). *There is a positive relationship between social entrepreneurship attitude and social entrepreneurial intention.*

On the other hand, subjective norms refer to the perceived social pressure to carry out, or not, a certain behavior, therefore this element becomes the main reflection of social and cultural values. An estimation of the subjective norm is obtained from the analysis of two variables: the beliefs about how other significant persons think that the individual should behave (normative beliefs) and the motivation that refers to the general tendency that exists in complying with the norms of a group taken as a reference [43]. In this sense, there is a diversity of results when it comes to justifying the relationship between subjective norms and entrepreneurial intention. While some studies have found a significant relation between both [44,45], others have not obtained any relation [46,47].

However, it would be reasonable to expect a positive relationship between this variable and social entrepreneurial intention to the extent that we understand that entrepreneurs are affected by the opinions of people linked to their closest environment about their social entrepreneurial intentions [48]. Following this reflection, the second hypothesis is proposed.

Hypothesis 2 (H2). *There is a positive relationship between subjective norms and social entrepreneurial intention.*

Finally, perceived behavioral control refers to the greater or lesser difficulty that a person perceives in performing the action in relation to his or her abilities to control the behavior [49]. Perceived behavioral control is linked to the self-perception of personal abilities and, therefore, is associated with the concept of self-efficacy [50]. In this sense, Smith and Woodworth [51] recognize that a person with a high social entrepreneurial self-efficacy will tend to act more persistently in their goal of creating social value. Therefore, it can be understood that the self-perception of the personal capacity to perform a certain action significantly influences the intention to do that action [44,47]. Following this logic of reasoning, the third hypothesis of this work is proposed.

Hypothesis 3 (H3). *Perceived behavioral control positively influences social entrepreneurial intention.*

Finally, following Heuer and Liñán [52] and Liñán and Santos [53], it can be understood that subjective norms represent a form of social capital that could influence the perception of the entrepreneurial person's personal attitudes and perceived behavioral control. It is for this reason that it

seems logical to assume that there could be a positive relationship between subjective norms and social entrepreneurship attitude and between subjective norms and perceived behavioral control linked to the perception of the personal capacity to develop a project [35,48]. To measure these relationships, the fourth and fifth hypotheses of this paper are proposed.

Hypothesis 4 (H4). *There is a positive relationship between subjective norms and social entrepreneurship attitude.*

Hypothesis 5 (H5). *There is a positive relationship between subjective norms and perceived behavioral control.*

2.2. Crises and Social Entrepreneurship

For Hundt et al. [54], the intention to start up an entrepreneurial project is conditioned, in addition to individual characteristics, by the conditions of the economic context, an aspect that must be taken into account to explain entrepreneurial intention, as well as its antecedents [55].

On the other hand, the promotion of entrepreneurship is one of the measures usually considered as a response to situations of economic crises [9], although according to the results obtained by Devece et al. [55], entrepreneurship out of necessity in situations of economic recession is less effective than that arising from the recognition of opportunities. In this sense, Aparicio et al. [56] find a positive relationship between the generation of entrepreneurial projects by opportunity and the economic growth of a given territory. This is why the development of entrepreneurial projects that take advantage of opportunities generates regional economic growth that is greater than that of entrepreneurship for necessity, since, while the latter is limited to solving short-term problems, opportunities can have a long-term impact [55].

Therefore, it would be essential in periods of recession to promote the creation of new businesses, focused on identifying opportunities, with the aim of encouraging economic activity [57]. In the special circumstances of the impact of the COVID-19 crisis, Maritz et al. [58] recognize that entrepreneurs will be key figures during and after the health crisis. Along these lines, [59] point out that the health requirements arising from the pandemic have facilitated the emergence of new business opportunities such as flexible manufacturing, online education, food safety, emergency management, analysis of medical care, care of the elderly, interest in healthy living, telemedicine, cultural services, adaptation of supply chains, remote communication, entertainment or fitness platforms, and the design of smarter cities, among others. Many of these business options could become opportunities for the development of social entrepreneurship projects, in accordance with the definition given above, which focus on solving social and/or environmental problems [23,24].

In short, fostering social entrepreneurship in these circumstances becomes a fundamental tool for generating social and/or environmental change [13]. However, according to the results obtained by Hundt et al. [54] when analyzing the impact of the 2008/2009 crisis on entrepreneurship, the context in which the entrepreneurs find themselves can affect their behavior. Indeed, among the conclusions obtained from the Global Entrepreneurship Monitor project [60], the rate of nascent entrepreneurship decreased notably during the period of 2008–2010 in the countries most affected by the crisis. Devece et al. [55] also conducted a comparative study of new company creation in Spain between 2005 and 2007 and 2008 and 2010, observing that the number of new companies created fell from 400,000 in the first period to 300,000 in the second. Therefore, following Arrighetti et al. [61], the perception of a crisis as a barrier negatively affects entrepreneurial intention, which leads to the last hypothesis of this work:

Hypothesis 6 (H6). *Social entrepreneurial intention is lower during COVID-19 than before.*

3. Empirical Study

3.1. Research Model

Based on what was stated in the previous section, we tested, on the one hand, the suitability of a structural model of social entrepreneurship based on Ajzen's TPB [14] and, on the other hand, the impact of the COVID-19 crisis on social entrepreneurial intention.

In this sense, the construct "entrepreneurial intention" was conceptualized as a latent variable depending on three others: the attitude toward social entrepreneurship, subjective norms, and perceived behavioral control. Finally, the crisis variable COVID-19 was added to the model.

Thus, our research model includes five factors (see Figure 1): social entrepreneurship attitude, subjective norms, perceived behavioral control, social entrepreneurial intention, and crisis variable COVID-19. Each factor was measured with multiple items. All items were adapted from extant literature to improve content validity.

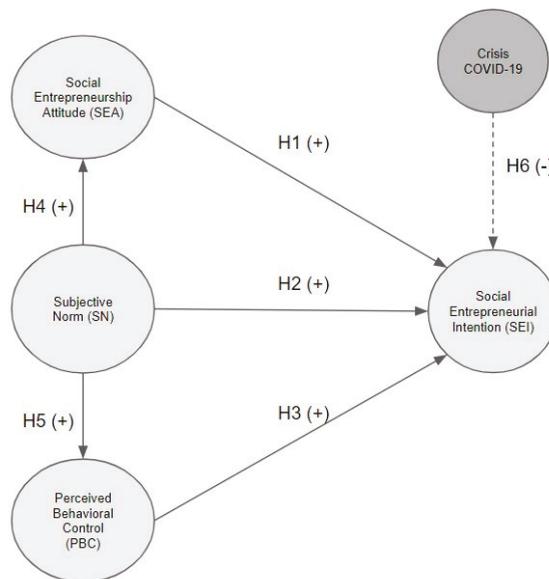


Figure 1. Research model.

3.2. Measures

A quantitative research design was used for this study through a survey of university students, as, according to the Global Entrepreneurship Monitor (GEM) Report on Social Entrepreneurship [62], this type of entrepreneurship is closely associated with young change-makers, who are idealistic in nature. In fact, the results of the GEM report show there is a greater representation of incipient social entrepreneurs than commercial entrepreneurs among young people between 18 and 34 years old. More specifically, according to Capella-Peris et al. [9], higher education students are one of the most relevant populations for the development of social and/or environmental projects.

The questionnaire developed for the study was structured in three parts. The first part introduced the context. The second part included the items of the constructs of the proposed model, which were measured by a 7-point Likert scale regarding the level of agreement (1 = Strongly disagree to 7 = Strongly agree). In the last part of the questionnaire, classification data were collected: gender, age, studies, and academic year. We included a definition of social and/or environmental entrepreneurship projects

in the survey. We proposed that there could be hybrid models that function like traditional companies but incorporate an objective of a social and/or environmental nature.

The questionnaire was sent to the students by their teachers in February 2020 and in May 2020.

Regarding the items used (Table 1), Armitage and Conner [63] propose three different approaches to measure entrepreneurial intention. One of them is based on the desire to perform an action, another on the probability of performing the action, and the last one centered on the intention to perform said action. These authors corroborate that the latter is slightly more efficient in predicting behavior. To measure social entrepreneurship attitude and subjective norms, the scales proposed by Liñán and Chen [49] were used. The items used to measure social entrepreneurship attitude are supported both by affective considerations (developing social and/or environmental entrepreneurship projects can be an attractive activity that could generate satisfaction) and other more objective aspects. Those linked to subjective norms refer to the perception that entrepreneurs may have about what people close to their environment (family, friends, colleagues) think about their interest in developing a social and/or environmental entrepreneurship project. Finally, to measure perceived behavioral control, the six items proposed by Zhao et al. [64] were used; they refer to the entrepreneur’s ability to identify opportunities, offer new products and services, manage projects, and have contact networks and leadership skills.

Table 1. Construct and associated items.

SEI	Social Entrepreneurship Intention
	Indicate your level of agreement with the following sentences
SEI1	I am willing to do anything to start a social project.
SEI2	My professional goal is to become a promoter of social projects.
SEI3	I am determined to create a social project in the future.
SEA	Social Entrepreneurship Attitude
	Indicate your level of agreement with the following sentences
SEA1	Being a social entrepreneur has more advantages than disadvantages for me.
SEA2	A career as a promoter of social projects is attractive to me.
SEA3	Promoting social projects would be a great satisfaction for me.
SN	Subjective Norms
	If you decided to create a social project, would people in your close environment approve of that decision?
SN1	Your closest family.
SN2	Your friends.
SN3	Your study partners.
PBC	Perceived Behavioral Control
	To what extent do you agree with following statements regarding your entrepreneurial abilities?
PBC1	Identify new opportunities.
PBC2	Create new products and services.
PBC3	Apply my personal creativity.
PBC4	Be a leader and communicator.
PBC5	Create a network of professional contacts.
PBC6	Successfully organise/manage a project.

Scale 1 to 7 (1 = Strongly disagree to 7 = Strongly agree).

3.3. Sample Selection and Data Collection

Data were obtained from the same students in two phases: the first one prior to the COVID-19 crisis in February 2020 and the second one in full crisis, in June 2020. The information was collected through a self-completed online questionnaire using the Lime Survey platform (version 3.6.3). Students at the University of La Laguna (Spain) were sent the links to the online questionnaire twice in each phase by email. These students belong to the following degrees: Building and Civil Engineering, Social Work, Industrial Relations, and Accounting and Finance. A total of 558 responses were obtained:

324 (58%) before the crisis (response rate 21%) and 234 (42%) responses in the crisis period (response rate 15%).

To verify that the sample size was sufficient, G*Power [65] was used, which suggests that for the test of the proposed model (Figure 1), a minimum sample of 129 individuals is required for a statistical power of 0.95. Therefore, it can be safely concluded that the sample size used was much larger than required for the purposes of this study.

Table 2 shows the profile of the respondents. Most of the responses obtained corresponded to women, 66.3%, and the largest number of questionnaires were completed by first-year students and the least in the last year of the degree, both of which correspond to the distribution of the analyzed population.

Table 2. Profile of respondents.

Gender	Total	Before (February) COVID-19	During (June) COVID-19
Female	66.3%	67.6%	64.5%
Male	33.7%	32.4%	35.5%
Degree studies			
Building and Civil Engineering	26.6%	23.7%	30.6%
Social Work	33.3%	36.1%	29.3%
Industrial Relations	18.4%	19.9%	16.4%
Accounting and Finance	21.7%	20.3%	23.7%
Academic year			
1st	54.3%	54.9%	53.4%
2nd	19.5%	20.7%	17.9%
3rd	22.4%	21.3%	23.9%
4th	3.8%	3.1%	4.7%
Total sample	558	324 (58%)	234 (42%)

3.4. Method of Analysis

To analyze the proposed theoretical model and test the hypotheses, the Partial Least Squares (PLS-SEM) technique was used, with the Smart PLS software v.3.3.2 [66]. The analysis of the measurement model involved the reliability and validity of the constructs, as well as the structural model through R^2 , the path coefficients, the confidence intervals, and the values of the Standardized Root Mean Square (SRMR) as a measure of approximate fit of the model for PLS-SEM [67]. A Common Method Bias (CMB) assessment was also performed.

Likewise, to identify the differences between social entrepreneurial intention before and during the COVID-19 crisis, a Student's *t*-test was carried out for differences in the means of construct values.

4. Results

4.1. Descriptive Analysis

From a descriptive analysis of the results, it can be seen (Table 3) that there is a clear social entrepreneurial intention on the part of the investigated population, with the mean of the items of the construct being slightly above the midpoint of the scale, between 4.50 and 4.78 (scale from 1 to 7).

The subjective norms or level of perceived support of the social environment for social entrepreneurial intention is high, with the items of this latent variable being between 5.54 and 5.93. Table 3 shows the results of the descriptive analysis (mean and standard deviation) of the items of the constructs of the proposed model. Social entrepreneurship attitude is also above the midpoint of the scale, and the average of the items is between 4.66 and 5.17. Similarly, perceptions of self-capacity and competencies (perceived behavioral control) to implement social entrepreneurship initiatives are

high, with the indicators measured for this latent variable being between 4.72 and 5.23, always above the midpoint of the scale, which ranges from 1 to 7.

Table 3. Descriptive analysis.

	Constructs and Associated Items	Mean	Standard Deviation
SEI	Social Entrepreneurial Intention		
	Indicate your level of agreement with the following sentences:		
SEI1	I am willing to do anything to start a social project.	4.68	1.336
SEI2	My professional goal is to become a promoter of social projects.	4.50	1.424
SEI3	I am determined to create a social project in the future.	4.78	1.335
SEA	Social Entrepreneurship Attitude		
	Indicate your level of agreement with the following sentences:		
SEA1	Being a social entrepreneur has more advantages than disadvantages for me.	4.66	1.283
SEA2	A career as a promoter of social projects is attractive to me.	4.76	1.366
SEA3	Promoting social projects would be a great satisfaction for me.	5.17	1.285
SN	Subjective Norms		
	If you decided to create a social project, would people in your close environment approve of that decision?		
SN1	Your closest family.	5.93	1.270
SN2	Your friends.	5.93	1.109
SN3	Your study partners.	5.54	1.259
PBC	Perceived Behavioral Control		
	To what extent do you agree with the following statements regarding your entrepreneurial abilities?		
PBC1	Identify new opportunities.	5.05	1.121
PBC2	Create new products and services.	4.73	1.169
PBC3	Apply my personal creativity.	5.23	1.194
PBC4	Be a leader and communicator.	5.05	1.305
PBC5	Create a network of professional contacts.	4.72	1.148
PBC6	Successfully administer/manage a project.	5.11	1.110

Scale 1 to 7 (1 = Strongly disagree to 7 = Strongly agree).

4.2. Assessment of the Global Model

The results revealed SRMR model fit values of 0.058, with values lower than 0.08 being considered acceptable for PLS-SEM [67].

Additionally, the CMB has been used along with Harman's single-factor approach [68]. A CMB is present if a single or general factor seems to represent the majority of the variance. A non-rotational factor analysis using the eigenvalue criterion greater than one revealed three different factors that represented 63.9 percent of the variance. The first factor captured 36.9 percent of the variance in the data. Since no single factor emerged and the first factor did not account for most of the variance, the CMB does not appear to be a problem.

It has also been verified that there are no indications of multicollinearity between the antecedent variables of each of the endogenous constructs since all the VIF (Variance Inflation Factor) values are less than 5.

4.3. Measurement Model Assessment

The individual reliability of the indicators of the constructs, formulated in the reflective Mode A, is assessed by examining the loadings (λ) of the indicators with their respective construct. As shown in Table 4, all item loadings in the final measurement model are greater than 0.707 [69]. In Table 4, the reliability of the construct is analyzed, and it is observed how all the values of Cronbach's Alpha and of the composite reliability [70] are above the minimum cut-off point of 0.70 [71].

Table 4. Assessment results of the measurement model.

Constructs and Associated Items		Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Social Entrepreneurial Intention			0.893	0.934	0.824
SEI1	I am willing to do anything to start a social project.	0.907			
SEI2	My professional goal is to become a promoter of social projects.	0.908			
SEI3	I am determined to create a social project in the future.	0.908			
Social Entrepreneurship Attitude			0.853	0.911	0.773
SEA1	Being a social entrepreneur has more advantages than disadvantages for me.	0.848			
SEA2	A career as a promoter of social projects is attractive to me.	0.910			
SEA3	Promoting social projects would be a great satisfaction for me.	0.878			
Subjective Norms			0.823	0.895	0.739
SN1	Your closest family.	0.845			
SN2	Your friends.	0.910			
SN3	Your study partners.	0.821			
Perceived Behavioral Control			0.836	0.878	0.547
PBC1	Identify new opportunities	0.815			
PBC2	Create new products and services.	0.799			
PBC3	Apply my personal creativity.	0.719			
PBC4	Be a leader and communicator.	0.701			
PBC5	Create a network of professional contacts.	0.734			
PBC6	Successfully administer/manage a project.	0.714			

All latent variables achieve convergent validity since their AVE measurements exceed the level of 0.5 [71]. The discriminant validity was assessed by using the recommended approach of Fornell and Larcker [71] and examining the heterotrait-monotrait (HTMT) of the correlations, which is considered a stricter criterion [72].

The results in Table 5 show that the constructs examined exceeded the requirements of Fornell and Larcker [71] since all the correlations were less than the square of the AVEs and also the heterotrait-monotrait (HTMT) of the correlations (values less than 0.85 [73], which is considered a stricter criterion [72]). Therefore, the measurement model was considered satisfactory and provided sufficient evidence in terms of reliability and convergent and discriminant validity.

Table 5. Result of discriminant validity.

Constructs	SEA	PBC	SN	SEI
Fornell–Larcker [69]				
SEA	0.879			
PBC	0.287	0.739		
SN	0.365	0.153	0.860	
SEI	0.727	0.349	0.358	0.908
Heterotrait-Monotrait Ratio (HTMT)				
SEA				
PBC	0.334			
SN	0.434	0.174		
SEI	0.829	0.389	0.418	

Note: The square root of AVEs is shown diagonally in bold.

4.4. Structural Model Assessment

The path coefficients (standardized regression coefficients) show the estimates of the structural model relationships, that is, the hypothesized relationships between constructs. The significance of the effects was assessed by bootstrapping [74]. Since the hypotheses specify the direction of the relationship of the variables, a one-tailed Student’s t-distribution with n-1 degrees of freedom, where n is the number of subsamples, was used. There were 5000 samples made [75] with the number of cases equal to the number of observations in the original sample. To assess the significance of the relationships, in addition to bootstrapping, confidence intervals were analyzed [76].

As can be seen in Table 6 and Figure 2, the personal attitude toward social entrepreneurship has the greatest significant relationship with social entrepreneurial intention (H1: $\beta = 0.647, p < 0.001$). Subjective norms (H2: $\beta = 0.097, p < 0.01$) and perceived behavioral control (H3: $\beta = 0.147, p < 0.001$) also have a positive and significant relationship with social entrepreneurial intention, although the latter relationship has lower direct influence.

Table 6. Results of hypothesis testing.

		Path Coefficient	Sig.	T Statistics	Confidence Intervals	Confidence Intervals Bias	Supported
Hypothesis 1	SEA -> SEI	0.647	***	21.156	[0.594; 0.695]	[0.594; 0.695]	Yes/Yes
Hypothesis 2	SN -> SEI	0.097	**	2.96	[0.042; 0.151]	[0.041; 0.150]	Yes/Yes
Hypothesis 3	PBC -> SEI	0.147	***	4.271	[0.092; 0.205]	[0.089; 0.202]	Yes/Yes
Hypothesis 4	SN -> SEA	0.356	***	8.22	[0.283; 0.428]	[0.279; 0.423]	Yes/Yes
Hypothesis 5	SN -> PBC	0.156	***	3.357	[0.084; 0.235]	[0.077; 0.228]	Yes/Yes

Bootstrapping using 5000 subsamples one-tailed t Student: ns: non-significant; ** $p < 0.01$; *** $p < 0.001$; t (0.05; 4999) = 1.645; t (0.01; 4999) = 2.327; t (0.001; 4999) = 3.092; Confidence Intervals [5–95%].

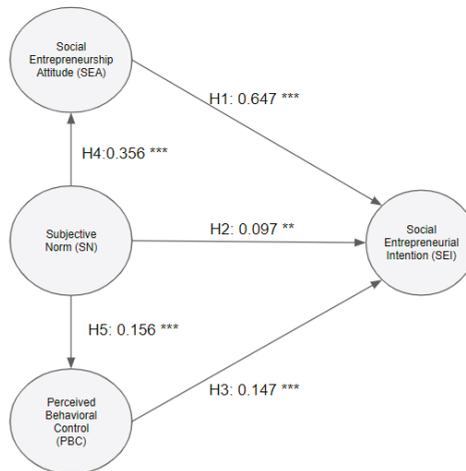


Figure 2. Results of analysis for social entrepreneurial intention. ns: non-significant; ** $p < 0.01$; *** $p < 0.001$.

The indirect relationship of subjective norms or social influence on social entrepreneurial intention was also tested through social entrepreneurship attitude (H4: $\beta = 0.356, p < 0.001$) and perceived behavioral control (H5: $\beta = 0.156, p < 0.001$) with indirect effects as seen in Table 7.

As stated above and in relation to the first aim of this work, to analyze the relationships between the variables identified as antecedents of social entrepreneurial intention, the hypotheses of the model are confirmed (H1, H2, H3, H4, and H5), although H2 is the weakest due to its low contribution and significance.

Therefore, we can affirm that there is a positive relationship between social entrepreneurship attitude, subjective norms, and perceived behavioral control and social entrepreneurial intention. In addition, there is a positive relationship between subjective norms and social entrepreneurial intention through the relationship with social entrepreneurship attitude and perceived behavioral control.

Table 7. Total, direct, and indirect effects.

	Direct Effects	Specific Indirect Effects	Total Effects
SEA -> SEI	0.647		0.647
PBC -> SEI	0.147		0.147
SN -> SEA -> SEI		0.230	
SN -> PBC -> SEI		0.023	
SN -> SEI	0.097		0.350
SN -> SEA	0.356		0.356
SN -> PBC	0.156		0.156

The coefficient of determination (R^2) represents a predictive power measure that indicates the amount of variance of a construct that is explained by the predictor variables of the endogenous construct in the model. The proposed model explains 55.4% of social entrepreneurial intention, 12.7% of social entrepreneurship attitude, and 2.4% of perceived behavioral control (Table 8).

Table 8. Decomposition of variance, predictive relevance, and effect size.

	Path Coefficient	Variable Correlation	R^2	Q^2	f^2
Social entrepreneurship intention			55.4%	0.451	
SEA -> SEI	0.647	0.724	46.8%		0.765
SN -> SEI	0.097	0.350	3.4%		0.018
PBC -> SEI	0.147	0.352	5.2%		0.044
Attitude toward social entrepreneurship			12.7%	0.096	
SN -> SEA	0.356	0.356	12.7%		0.145
Perceived behavioral control			2.4%	0.012	
SN -> PBC	0.156	0.156	2.4%		0.025

Effect f^2 : <0.15 small; <0.35 moderate; ≥ 0.35 large.

Additionally, indicator f^2 (Table 8) evaluates the degree to which an exogenous construct contributes to explain a specific endogenous construct in terms of R^2 [77].

We observe that the relationship between subjective norms and entrepreneurial intention has a small effect size, thus its influence is limited. The relationships between subjective norms and perceived behavioral control, as well as between perceived behavioral control and social entrepreneurial intention, also have a small effect size.

On the other hand, as a criterion to measure the predictive relevance of the constructs, the Stone–Geisser test was used [78,79], observing in Table 8 that the Q^2 values are greater than zero, which indicates that the model has predictive potential.

4.5. Assessment of the Relationship between COVID-19 and Social Entrepreneurial Intention

To test the influence of the health crisis caused by COVID-19, a *t*-test was carried out for the mean differences of the items of the social entrepreneurial intention construct measured in two periods: before the crisis and during the crisis.

Table 9 shows that all the items that make up the latent variable have a significantly lower value during the crisis than before the crisis, thus it can be concluded that social entrepreneurial intention has decreased, confirming hypothesis 6.

Table 9. *t*-Test of the mean differences of the social entrepreneurial intention.

Social Entrepreneurial Intention	Before (February) COVID-19	During (June) COVID-19	Dif.	Sig.
I am willing to do anything to start a social project.	4.78	4.55	−0.24	0.039 **
My professional goal is to become a promoter of social projects.	4.60	4.37	−0.23	0.063 *
I am determined to create a social project in the future.	4.91	4.62	−0.29	0.011 **

Scale 1 to 7 (1 = Strongly disagree to 7 = Strongly agree). Level of significance: <0.05 **; <0.1 *; no significance “ns”.

5. Discussion and Conclusions

This work analyzed, using the perspective of Ajzen’s TPB [14], the relationship between the antecedent variables that make up this model and social entrepreneurial intention. Subsequently, the impact of the COVID-19 crisis on social entrepreneurial intention was measured.

From the analysis of the relationships between the variables considered as predictors of social entrepreneurial intention (social entrepreneurship attitude, subjective norms, and perceived behavioral control) and the performance of the behavior (social entrepreneurial intention), it is observed that hypotheses 1, 2, and 3 are fulfilled, with hypothesis 2, regarding the incidence of subjective norms, being the one with a weaker significance.

This assumes that there is a positive relationship between the social entrepreneurship attitude of university students [80] and their social entrepreneurial intention. In addition, there is a positive relationship between the perceived behavioral control of university students’ ability to carry out social projects and their social entrepreneurial intentions. This confirms that the more positive the perceptions about one’s own abilities are, the stronger the social entrepreneurial intention will be.

Regarding the weak relationship between university students’ subjective norms and social entrepreneurial intention, this result coincides with that obtained in previous works by various authors such as Liñan and Chen [49], Autio et al. [46], and Krueger et al. [47], who used the TPB to measure the relationship between the variables that predict entrepreneurial intention. Liñan and Chen [49] suggest the non-significance of the relationship between subjective norms and entrepreneurial intention is due to the impact that this motivational factor has on this type of decision. In this case, it seems that the altruism that motivates the development of social and/or environmental projects [21] is more intense than the importance that the entrepreneurs themselves give to the perception of the opinions that their immediate environment has on the development of their project.

Hypotheses 4 and 5 were intended to measure the influence of subjective norms on social entrepreneurial intention through their relationship with social entrepreneurship attitude and perceived behavioral control. Both hypotheses are fulfilled, observing that there is more influence of subjective norms on social entrepreneurship attitude than on perceived behavioral control. This indicates that the perception of the opinions that people close to the individual have regarding the implementation of social and/or environmental projects affects more the attitude toward the behavior than the perception of their own ability and training for carrying out the entrepreneurial behavior.

The results that confirm hypotheses 1, 3, 4, and 5 of this work coincide with those obtained by Kruse [35]. This author analyzes, among other things, the direct and indirect effects on social entrepreneurial intention of antecedent variables according to Ajzen’s TPB [14]. In the case of hypothesis 2, which analyzes the impact of subjective norms on entrepreneurial intention, Kruse [35] obtains a non-significant result. Kruse’s [35] study is applied to a total of 335 German promoters of social entrepreneurship projects. However, in the work of Tiwari et al. [48], in which Ajzen’s TPB is applied to a sample of 390 students from the main technical universities in India, a positive impact, but of weak significance, is obtained for subjective norms in relation to entrepreneurial intention. These two different results show that the effect of the opinions from the environment (family, friends, colleagues) on social entrepreneurial intention is more relevant in people with entrepreneurial experience than in university students, with attitudes more prone to this type of initiative, in the line pointed out by Capella-Peris et al. [9].

Regarding the impact of the COVID-19 health crisis, it is observed that social entrepreneurial intention decreases after the pandemic. This result is explained to the extent that, following Kasych et al. [81], among the external barriers that exist linked to the development of social projects are those of an economic nature. It also coincides with the results obtained for traditional entrepreneurship in times of crisis (e.g., Devece et al. [55]) for which a clear negative impact is manifested.

In summary, and according to our results and also those obtained by Kruse [35], it seems that Ajzen's TPB [14] constitutes an ideal perspective to explain the formation of social entrepreneurial intention, taking into account the incidence of its antecedents, both directly and indirectly. Moreover, it is verified that the impact of subjective norms on entrepreneurial intention through social entrepreneurship attitude is more important than through perceived behavioral control.

In addition, despite the importance of promoting the creation of social entrepreneurship projects with the aim of providing innovative solutions to social and environmental problems, a situation of economic recession becomes a relevant barrier in the implementation of this type of enterprise.

In practice, the results obtained suggest the desirability of promoting the development of social entrepreneurship projects within the educational field, especially in university education, to the extent that at these ages, the promotion of social motivation may have the greatest impact. In this sense, it has been proven that the altruism associated with the social entrepreneurial intention of young people is more intense than the perceived opinions of their immediate environment on the development of their project.

The above coincides with what was pointed out by Tiwari et al. [48] in the sense that social entrepreneurship attitude is one of the variables that should be promoted in educational systems since its impact on entrepreneurial intention is greater than perceived behavioral control.

At the same time, it is logical to think that in an economic and social crisis climate, entrepreneurial intention decreases, since uncertainty generates a negative impact on the development of such intentions. In this sense, it would be interesting to develop educational actions that promote, especially among university students, the ability to identify entrepreneurial opportunities in the social field, even in times of economic crisis, taking into account that entrepreneurship by opportunity generates a greater impact in the long-term [56].

On the other hand, in the paper of Zaremohzzabieh [82], two alternative models were proposed and then evaluated, suggesting alternative formulations of the antecedents of social entrepreneurial intention by modifying the relationships between key TPB constructs and intentions. The findings revealed that the strength of the two models enriches the TPB through additional factors. This could be an upcoming challenge for a future extension of our work.

Fiore et al. [83] show the importance of creating teams with different competencies, cognitive and decision-making skills in entrepreneurship education. The creation of multidisciplinary teams could also be a good option for subsequent studies on social entrepreneurship.

Finally, it would be valuable to train university students in the ability to identify business opportunities despite possible situations of economic and social crises. This effort must be accompanied by public policies focused on facilitating the implementation of this type of initiative.

This study has certain limitations that open new research avenues. First, the sample used was made up of university students from one European country, as is commonly used in research into entrepreneurial intention, taking into account that higher education students could be included in the millennial generation, who share similar attitudes, perceptions, and experiences. Thus, having similar characteristics, it is possible to generalize the conclusions obtained [84]. However, to add more value to this line of research, it is proposed to extend the analysis carried out here to broader samples in order to test the model of formation of social entrepreneurial intention among students not only from other nationalities but from different academic fields and cultural backgrounds. The results obtained would also help personalize the training linked to the development of social entrepreneurship projects to obtain better results. Second, the research has been transversally designed, obtaining data from two periods: before the COVID-19 crisis and during the pandemic period. To develop

causal inferences, further empirical studies would be necessary that analyze the post-pandemic period. Finally, it would be useful to perform other studies including some control variables such as if students have previously participated in an entrepreneurship training course [85], entrepreneurial antecedents of their parents, etc.

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Article

Obstacles to Sustainable Entrepreneurship amongst Tourism Students: A Gender Comparison

Vera Butkouskaya, Francesc Romagosa and Maria Noguera *

School of Tourism and Hotel Management, Autonomous University of Barcelona, 08193 Bellaterra, Catalonia, Spain; Vera.Butkouskaya@uab.cat (V.B.); Francesc.Romagosa@uab.cat (F.R.)

* Correspondence: Maria.Noguera@uab.cat

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Abstract: Students' start-ups are making a significant contribution towards sustainable entrepreneurship development. Thus, this article examines the obstacles to sustainable entrepreneurship amongst university students of tourism and focuses on gender difference. The empirical analysis was based on data from 290 tourism students' surveys accomplished in Spain, in the period from 2012 to 2018. Descriptive statistics were used for the data analysis and a *t*-test for gender comparison analysis. The research revealed that the students' entrepreneurial intentions did not affect their evaluation of the barriers preventing them from creating their own businesses. The main barriers to new business creation were mainly related to economic factors (both societal and university related), the level of innovation in society, and the students' self-confidence (mostly with regard to interest and motivation). Female students were more conscious of the possible obstacles to new business creation than male students. A significant difference between male and female students regarding personal obstacles was explained by the fact that the females considered their lack of entrepreneurial education as more significant than did the males. In addition, the female students tended to need more economic and practical support than male students. Finally, practical suggestions to encourage sustainable entrepreneurship amongst tourism students are discussed.

Keywords: sustainable entrepreneurship; tourism students; gender comparison

1. Introduction

Perhaps one of the most prominent topics of current times is sustainable development [1,2]. The sustainable development literature defines sustainability in two main ways. Firstly, sustainability concerns that which is to be sustained (e.g., nature, resources, and community). Secondly, sustainability concerns that which is to be developed (e.g., economy, individuals, and society) [3,4]. Previous studies from the entrepreneurship literature confirmed the role of small businesses in economic development, new job creation, counteracting inflation, increased productivity, and innovation [5–10]. Following recent research into social entrepreneurship and corporate social responsibility, and after examining data from the Global Entrepreneurship Monitor 2019 report, it can be said that entrepreneurs also play an essential role in providing individuals and society with non-economic gains [11]. Interdisciplinary studies from within the sustainable development and social entrepreneurship literature have introduced the concept of “sustainable entrepreneurship”. This research places the focus on economic, institutional, and psychological perspectives in discussing the development of people, economy, and society [4,12].

Sustainable entrepreneurship is playing a vital role in the transition towards a more sustainable future [2,13]. Small firms are historically the most innovative, playing an essential role in bringing new technologies onto the market. This increases competition as a positive lever of economic development [6,7]. Moreover, following the GEM 2019 report, social entrepreneurship is often associated specifically with young change-makers who are idealistic in nature [11]. Entrepreneurial

intention is widely accepted in the literature to be the critical factor affecting the actual number of businesses started by individuals [4,5,14,15], including young entrepreneurs [16]. However, research by the International Labour Organization [17] indicates that the young (between 15 and 24 years old) are three times more likely than adults to be unemployed. Researchers comment that, even when they have entrepreneurial intentions, students often desist from starting their own business because they are affected by certain external and internal factors [14,18]. They suggest that business organisations and universities should not only develop students' entrepreneurial intentions, but also support them in creating their own businesses [10,19]. Governments are implementing policies that support young entrepreneurs [17]. Universities are introducing programmes that involve collaboration with businesses, motivating students to develop their entrepreneurial and experiential skills [14,20,21]. The primary goal of the European Commission has for some years been to tackle youth unemployment by increasing the number of start-ups as a key long-term performance criterion [8,21]. Thus, research into sustainable entrepreneurship amongst the young is a priority [13,16,22,23].

The potential obstacles to new business creation as described in the literature are numerous (e.g., the environment, the universities, internal and personal factors, and so on) [10,15,18,24]. However, their true impact has not really been ascertained [25]. Research demonstrates that finance-related factors affect youth entrepreneurial intentions more than do university educational programmes [5]. However, financial incentives are not always possible in difficult economic conditions [25]. Thus, an important area of research is dedicated to analysing the personal traits of young entrepreneurs and the substance of university programmes with the aim of encouraging university students to start their own businesses [15]. For instance, a lack of motivation and interest can be considered as a dual obstacle [18]. Recent studies differ in their estimation of the relative significance of different factors [14,19,20,26]. Thus, this article aims to clarify the value of each and, in keeping with the concept of sustainability, to underline the importance of non-financial incentives in sustainable entrepreneurship amongst tourism students.

The tourism sector is heavily dependent on entrepreneurship and cannot survive in the long run if it is not both sustainable and entrepreneurial. However, entrepreneurship, sustainability, and tourism are rarely linked in the research [27]. Some authors have suggested that sustainable entrepreneurship in tourism is a means of obtaining competitive advantage through the implementation of new technologies, an important instrument of social value creation [5,9,12,27,28]. The increasing competition between tourist destinations and the demand for new types of tourist products and services naturally requires involvement by the entrepreneurial sector [28]. The innovative power of entrepreneurship can help the economy to adapt dynamically to emerging environmental changes and sustainability challenges [6,12,28]. In addressing the importance of sustainable entrepreneurship for the tourism sector, this research focused on examining obstacles towards new business creation among tourism students, with a particular emphasis on gender.

The gender issue, which includes gender equality, is accepted as a topic of interest in the sustainable entrepreneurship literature [2,29]. Increasing the number of female start-ups is a goal for many governments, because empirical findings show that women are underrepresented in this respect [21]. However, researchers consider gender mainly as a factor [1,29] rather than a moderator, and overlook the gender differences analysis. In addition, studying gender differences in sustainable entrepreneurship amongst the young in the tourist sector is specifically critical [30,31]. Although females represent the majority of tourism students [8,15], previous studies have confirmed that female students have lower entrepreneurial intentions than male students [30,32]. Moreover, the recent GEM 2019 report points out the lower number of female social entrepreneurs (it is estimated that 55% of social entrepreneurs are male and 45% are female) [11]. Additionally, previous studies have demonstrated that females are more affected by external obstacles. For example, due to the higher level of risk avoidance, the impact of entrepreneurial oriented education programmes on females is lower [14,21,32]. Thus, with the aim of closing such a significant gap, this article compares female and male attitudes towards the main obstacles to new business creation among students in tourism-related programmes.

Based on the above discussion, this study aimed to review, collate, and prioritise the range of obstacles to sustainable entrepreneurship among tourism students from a gender perspective. The main research questions are: (1) What are the major obstacles to new business creation from the perspective of tourism students with entrepreneurial intention? (2) Are there any differences in students' evaluation of financial and non-financial factors, and formal and informal factors? (3) Are there differences in the perception of obstacles between female and male tourism students?

From the theoretical perspective, in the context of sustainable entrepreneurship research, this study aimed to prioritise the obstacles to new business creation among tourism students. Addressing the sustainable entrepreneurship context, the factors are grouped as financial and non-financial, formal and informal ones. Considering the broad scope of factors that can be barriers to new business creation, such a process will facilitate future research. In addition, in analysing the differences between male and female students in terms of the obstacles they might face in starting businesses, the study makes a valuable contribution to the debate, primarily because gender equity is an essential part of sustainable entrepreneurship, and there is a higher number of female than male students in tourism university courses [8,15].

From a practical perspective, this article aims to demonstrate the value of non-financial motivators rather than financial ones. The former can be important in encouraging economic growth and social development in critical economic conditions. They can provide a fillip to the tourism industry in Spain—the country where the study was carried out—as in recent years it has been facing some challenges [33]. It is especially critical because tourism is the main contributor for the country's economy. This research aimed to show more precisely the ways innovation and development can be encouraged in the tourism sector, which can help to solve the problems of unemployment and economic slowdown. The comparative gender analysis can provide both government and educational institutions with information for making more proactive decisions. Specifically, the content of motivational programmes for female students could be revised accordingly [21]. It is specifically important because females represent the majority of tourism students [8,15] but tend to have lower entrepreneurial intention than males.

This article starts with a literature review, in which the main obstacles to students' sustainable entrepreneurship are presented. Then, the data collection and analysis are explained. Afterwards, the results of the t-test are presented, and conclusions are drawn. The study finishes with a discussion of practical implementations and future research lines.

2. Literature Review

2.1. Student's Role in Sustainable Entrepreneurship in Tourism

The topic of entrepreneurship includes the study of three categories: why entrepreneurs act; how they act; and, what happens when entrepreneurs act [18,34]. The question "why" is addressed from a "psychological/sociological" aspect [25,34]. The question "how" is answered in terms of the managerial behaviour of the entrepreneur and the decisions which they can take. To answer the question "what", the research focuses on the economic outcomes of the actions of the entrepreneur.

In turn, sustainable entrepreneurship, being a combination of two research lines (sustainable development and social entrepreneurship), follows both economic gains and non-economic outcomes [4,12]. Tourism is one of the economic sectors in which a high degree of involvement by the sustainable entrepreneurial sector is needed. Due to the rapid growth in international markets and fast-changing customer needs, diversification of tourism products and destinations is required. Consequently, innovations are demanded in tourism [5,9,12]. The innovative and future-oriented power of sustainable entrepreneurship helps the economy to adapt dynamically to emerging environmental change [12,28]. However, it is important to mention that sustainable tourism entrepreneurship has been envisioned in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural heritage, essential ecological processes, biological diversity, and life support systems [28].

Sustainable entrepreneurship addresses these issues by focusing on economic, institutional, and psychological perspectives, so that people, economies, and societies can move towards a more sustainable future [4].

More specifically, following the GEM 2019 report, young idealistic entrepreneurs are considered to be most often associated with sustainable entrepreneurship [11]. Particularly, youth entrepreneurship is accepted as a solution to the problem of unemployment [5,8,10]. Youth start-ups have innovation potential and facilitate new technology development [1,6,24]. Growing on the topic of sustainability, youth also have the ability to modernise society through moral cognition and social value creation [1,5,24,35]. Existing research suggests that entrepreneurs with prior knowledge of ecological and social environments, the perceived threats to such environments, and an altruistic attitude towards others have a greater ability to recognise opportunities for sustainable development. Following this, recent research has confirmed that students' start-ups are making a significant contribution towards economic growth, innovation, social value creation, and, in general, sustainable entrepreneurship development [10,15,24].

In Spain, within the service sector, tourism is the main contributor to annual growth. Although sustainable entrepreneurship is considered as a solution for the competitive problem and opportunity to create sustainable advantage in tourism through innovation and social and regional development [12,28], no strategy at the national level to promote that type of entrepreneurship has been developed yet.

2.2. Obstacles to Students' Entrepreneurship

Entrepreneurial intention is one of the most important themes in discussions around youth entrepreneurship [5,14,15,18]. Intention and behaviour are highly correlated, and it has been widely accepted in the literature that entrepreneurial intention is directly related to the number of new start-ups [4,5,14,15,36]. In turn, the growth of start-ups is a source of entrepreneurship development [10,15,24]. However, the students with entrepreneurial intentions may be prevented from starting businesses because of external (macro and micro) factors, internal factors, and personal characteristics [10,14,18,19,22,37]. Following the theory of planned behaviour [37], personal traits such as proactiveness, risk perception, or a lack of certain social connections (e.g., family experience with business, family income status, ethnicity, or citizenship) may influence students in whether or not to establish new companies [5,14,19,20,36,38–40].

As mentioned above, sustainable entrepreneurship follows both economic gains and non-economic outcomes [4,12]. It also places the focus on economic, institutional, and psychological perspectives in discussing the development economy and society [4,12]. Addressing this, obstacles that inhibit students from opening businesses can be grouped into the following categories: exogenous or external environment (financial and non-financial factors), university related formal and informal factors, and endogenous (personal/individual) formal and informal barriers, amongst others [10,15,20,24]. Trivedi [18] made an initial attempt to put all of these elements together and to develop a new, empirically testable model of students' entrepreneurial intention, namely the entrepreneurial intention-constraint model (EICM). The author based this on the theory of planned behaviour, combining three trait variables, namely attitudes towards behaviour, perceived social norms, and perceived behavioural control [37], with the aforesaid categories.

2.2.1. Exogenous Environment

The influence of the external/macro-environment, such as society, the government, or institutions, on entrepreneurial activity can be felt in government financial support, norms, rules, administrative procedures, cultural influences, technological development, availability of relevant education, economic incentives, and so on [5,15,41].

Economic support in obtaining start-up capital plays a significant role in reducing risk perception and positively affects the intention to create a new company [9,16,18,19,42]. However, non-financial external factors also have an impact on students. For instance, government support plays an essential

role in building a student's entrepreneurial intentions [9,16,21]. In conditions of economic crisis, the government plays an essential role in nurturing local, homegrown entrepreneurship and encouraging an interest in start-ups in high-tech fields [19]. Furthermore, from the government point of view, particular support for female entrepreneurs, who are recognised to have lower entrepreneurial intentions than males, is needed [14,32]. Additionally, the facilitation of legal processes and the removal of bureaucratic impediments to start-ups can have a positive impact on behaviour [16,18,19,27]. Some researchers have suggested that social-cultural norms may affect decisions to open new companies [9,18,25,27,41]. In addition, technologies and innovation play an essential role in providing new ideas for start-ups [9,18,43]. They may stimulate specifically the creation of new companies by the younger generation, as they are more likely to base their entrepreneurial ideas on new technologies [5,35]. Finally, the lack of an adequate level of education or access to required business education support (e.g., workshops, training, counselling, and mentoring) can reduce the number of start-ups [16,18,19,41].

2.2.2. University Environment and Support

The role of the university in building students' entrepreneurial intentions includes formal (structural and educational) and informal (support and incentives) aspects. These factors, in turn, have financial and non-financial implications.

The formal aspects require a focus on establishing learning methods and entrepreneurial-oriented education programmes for students [8,20,31,44]. This means that, as a formal institution, the role of the university is to align its objectives and organisational structures with providing educational possibilities. The university should operate as an entrepreneur in terms of being flexible, adaptable, and business-oriented, and should focus on innovation [5,44]. Entrepreneurially oriented teaching methodologies, flexibility, and innovation in educational programmes enable students to obtain the skills needed to gain practical experience [45,46]. Entrepreneurially oriented educational programmes in universities have a positive impact on students' entrepreneurial intentions [32]. Entrepreneurial education increases student perception significantly, towards the desirability and feasibility of creating new businesses [14,20,44,47].

Informal university factors include collaboration with the real world of business and the provision of resources and incentives which enhance students' entrepreneurial interest, motivation, and self-efficacy [18–20,24,44]. Financial support includes providing economic help and extra incentives [26,44]. For instance, with the aid of financial support, perceived risks are reduced, and students become more interested and motivated [18]. By providing a creative atmosphere, the university can help students to find new business ideas [26]. Collaborative support from the university is related to building lines of communication between education and the outside world through interaction with successful business owners [20,44]. Real-life examples, mentoring, and advice from practitioners foster the development of students' self-efficacy [18,20]. Collaboration with real business help students to build the required networks for starting firms [20].

2.2.3. Endogenous Barriers

Endogenous barriers can be formal (related to perceived education and experience) and informal (related to internal motivations and interests). More specifically, formal internal factors are related to students' opinion regarding their perceived levels of education/knowledge and experience during the education [20,44,45,48]. They are also related to self-efficacy (i.e., an individual's belief in their ability to perform specific tasks and availability to them of the required skills to create a business) [14,18,45]. Haynie et al. [49] argued that the system must provide young people with a better education, demonstrating a wide range of alternatives, helping them to learn how to identify and explore business opportunities. Informal aspects such as level of self-motivation, personal traits, and interest are proven to be directly related to intention [9,15]. The perceived high level of risks and stress related to new business creation may decrease the motivation of students, and the lack of time or partners may reduce their interest further [18,39,45].

Nevertheless, several studies on the topic of obstacles towards student entrepreneurship yield results that may be considered controversial [19]. Despite the prolific research on the relationship between education and entrepreneurial intentions, theoretical and empirical disagreements remain [14]. For instance, findings from Nabi et al. [26] suggest that the influence of entrepreneurial education is variable, and, in some cases, even leads to a decrease in entrepreneurial intention. Arranz et al. [20] pointed out that, contrary to expectations, entrepreneurial education has little effect on the development of entrepreneurial competencies. Thus, different studies report different results regarding the importance of the above factors.

In considering the aforesaid obstacles, we suggest the following hypotheses:

Hypothesis 1 (H1). *Students' attitudes towards the importance of obstacles (exogenous, university, or endogenous) preventing them from new business creation vary in intensity.*

Hypothesis 1a (H1a). *Formal and informal factors have different impact on students' entrepreneurial proactivity.*

Hypothesis 1b (H1b). *Financial and non-financial factors have different impacts on the students' entrepreneurial proactivity.*

Hypothesis 2 (H2). *Some factors (exogenous, university, or endogenous) have a higher impact on students' entrepreneurial proactivity than others.*

2.3. Gender

The sustainable development of societies, businesses, and, ultimately, countries is affected by a fundamental driving force: gender [2,41]. The gender issue, which includes gender equality, is accepted as a topic of interest in the sustainable entrepreneurship literature [2,29]. Empirical findings show that women are underrepresented as social entrepreneurs, and official reports confirm a smaller number of female start-ups [11,21]. Various studies confirm that men tend to have a higher level of entrepreneurial intention than women [14,30,32]. It is traditionally explained by the differences in attitudes between the genders towards factors that affect entrepreneurial intention [38]. A stereotype of entrepreneurs is that males are more entrepreneurial because of a behavioural trait towards risk-taking activity, while women try to avoid the effect of unpredictable exogenous factors [14,32]. Moreover, female students represent the majority of the students in the tourism university courses [8,15]. Thus, potentially, the growth of female students' start-ups can be considered as inducement towards sustainable entrepreneurship development in tourism. That is why it is accepted that governmental support for female entrepreneurs is needed.

Previous studies have demonstrated different attitudes of female students towards external obstacles, for example technology [42] and the level of education [41]. In addition, earlier findings show that the entrepreneurial education, as a formal university factor, does not generate equal benefits for all students; the effect is not as great for females [21,32,42]. Due to the higher level of risk avoidance, the impact of entrepreneurial oriented education programmes on females is lower [14,21,32]. Moreover, female students tend to perceive lower the final impact of educational programmes on their knowledge and experience than male students [21,50]. Thus, they feel less confident and capable of initiating start-up activity than males [21,51]. It may be the case that females are more risk-averse or realistic when it comes to entrepreneurial proactivity [32]. Additionally, previous research confirms that there is a gender difference in entrepreneurial career aspiration because of the higher perceived value of experience over education amongst females [19,38]. This confirms that the fear of failure is stronger amongst women [21,52].

Following that background, we suggest the following hypotheses:

Hypothesis 3 (H3). *Female students consider obstacles to opening a new company (external, university, and personal) to be more detrimental to their entrepreneurial activity than male students.*

Hypothesis 4 (H4). *There are significant differences in male and female students' attitudes towards obstacles to starting a new company (external, university, personal, formal/informal, and financial/non-financial).*

3. Materials and Methods

3.1. Questionnaire

To measure the entrepreneurial vocation of the youth, we adapted the methodology previously used in the literature [19]. We asked students about their attitude, intention, and behaviour to be an entrepreneur. They could answer yes or no (Table 1). To analyse the barriers to creating a start-up amongst tourism students, the final sample includes only students who showed the attitude and intention to create a new company but who had not yet done so.

Table 1. Survey items.

Factor	Code	Item
Entrepreneurial vocation (Answer Yes or No to the following questions)		
Entrepreneurial attitude	EA	"Do you consider it desirable to create or start your own company?"
Entrepreneurial intention	EI	"Have you ever considered becoming an entrepreneur?"
Entrepreneurial behaviour	EB	"I have created company already ... "
Exogenous environment Assess the extent to which the following environmental factors favour the creation of new companies today. * Rate from 1 (not important) to 5 (very important).		
Financial		
Economic	EXT-ECON	Access to financial resources
Non-financial		
Educational	EXT-EDU	Better level of education
Legal	EXT-LEGAL	Less bureaucracy and administrative procedures
Social-cultural	EXT-SOC-C	Social and cultural norms
Technological	EXT-TECH	Development of new technologies
Political	EXT-POLIT	Government support
Support for females	EXT-FEM	Support for the entrepreneurial woman
University/Institutional factors Which of the following aspects related to university do you think could be an obstacle or a difficulty if a student, professor or researcher wished to create a company? Rate from 1 (not important) to 5 (very important).		
Formal		
University structure (flexible, adaptable, and business oriented)	UNI-FORM1	University's objectives are not entrepreneurially oriented
	UNI-FORM2	University's organisational structure and management are not flexible
Educational programmes (entrepreneurial oriented, flexible, and innovative)	UNI-EDU1	Teaching objectives are not entrepreneurial oriented
	UNI-EDU2	Inadequate teaching methods (too traditional or obsolete)
Informal		
Collaboration with business world	UNI-BUS1	Inadequate relationships with the business world
	UNI-BUS2	Lack of infrastructure (i.e., business incubators) to create new companies
University support (financial support and non-financial incentive)	UNI-I1	Lack of economic aid to create new companies
	UNI-I2	Lack of non-financial incentives in creating a company
Endogenous barriers Which of the following aspects related to the entrepreneur person do you think could be an obstacle or a difficulty if a student, professor or researcher wished to create a company? Rate from 1 (not important) to 5 (very important).		
Formal		
Perceived experience and education	PERS-EXP	Lack of experience to create a company
	PERS-EDU	Lack of training to conduct a business
Informal		
Internal motivation and Interest	PERS-MOT	Lack of entrepreneurial spirit
	PERS-INT	Lack of interest to create a company

Note: * Reversed questions.

Following the literature review, the questions regarding the obstacles to creating a new business were adapted from various sources, and they were grouped as: Exogenous environment (including financial and non-financial environmental factors, such as economic [9,16,18,19,42], educational [16,18,19,41], legal [16,18,19,27], social-cultural [9,18,25,27,41], technological [5,18,35,43], political [9,16,21], and female support [14,32]); University/Institutional factors (divided into formal aspects, such as university structure or educational programmes [5,8,20,31,44], and informal aspects, such as the collaboration with the business world or the university support [18–20,24,26,44]); and Endogenous barriers (divided into formal, such as the perceived experience and education [14,18,20,44,45,48], and informal, such as the internal motivation and interest [9,15,18,39,45]).

The original questionnaire consisted of closed questions. Reverse questions were included to encourage careful reading of the statements. Factors regarding students' attitudes towards creating a new company were measured on a five-point Likert scale (from 1 "not important" to 5 "very important").

3.2. Sample

Primary data were collected using an online survey of university students of tourism and hospitality. The anonymity of the survey was guaranteed. The study was conducted at the School of Tourism and Hotel Management of the Autonomous University of Barcelona, Catalonia, Spain, in the period from 2012 to 2018 (seven survey rounds, one per year). In such a context, the response rate was very high. Only a small number of questionnaires lacked consistency or were incomplete; these were rejected. In addition, some fixed parameters were included, such as age, employment status, family income, and gender.

The original full sample consisted of 454 responses. Because the specific intention was to analyse student perceptions regarding factors which can be considered as obstacles to starting a new company, only those with entrepreneurial attitude and intention were selected. Thus, 154 respondents (33.9%) who answered no to the question about entrepreneurial intention and 10 respondents (2.2%) who had already created their own companies were eliminated from the original sample.

The final sample consisted of 290 respondents (Table 2). It appears that 72.4% were female, and 27.5% were male. The age range was 18.5 to 31.1 years; the average age was 24.8 years.

Table 2. The sample.

Number of Respondents		Number of Respondents	
Gender		Family Income, Monthly	
Male (M = 1)	80	Less than 1000 €	42
Female (F = 0)	210	Between 1000 and 2000 €	88
Total	290	Between 2000 and 4000 €	98
Employment status		Between 4000 and 7000 €	40
Working	154	Between 7000 and 10,000 €	12
Not working	136	More than 10,000 €	10
Total	290	Total	290

3.3. Data Analysis

Data analysis was carried out using SPSS ver. 22 (IBM, Armonk, NY, USA) and Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA, USA). The following statistical models were used: frequency analysis descriptive measures, a graphical method, and a sample *t*-test for a comparison of mean differences. During the data collection, we used the five-point Likert scale. All factors with a mean of more than three were accepted to be critical. The results of the data analysis are presented in Table 3.

Table 3. *t*-test results including comparative gender analysis.

Variable	Full Sample		Females		Males		<i>t</i> -test (df = 290)	
	(n = 290)		(n = 210)		(n = 80)			
	M	SD	M	SD	M	SD	<i>t</i> -value	
Exogenous Environment								
Financial Factors								
EXT-ECON	4.49	0.872	4.54	0.838	4.31	0.952	2.493 *	S
Non-Financial Factors								
EXT-TECH	4.20	0.792	4.22	0.794	4.13	0.786	1.000	R
EXT-EDU	4.09	0.849	4.15	0.826	3.92	0.898	2.487 *	S
EXT-POLIT	4.01	0.954	4.05	0.935	3.88	1.002	1.652	R
EXT-FEM	3.97	1.011	4.11	0.934	3.55	1.122	5.159 **	S
EXT-LEGAL	3.80	0.934	3.83	0.890	3.69	1.056	1.407	R
EXT-SOC-C	3.79	0.882	3.83	0.863	3.65	0.930	1.873	R
University								
Informal Factors (incentives and connections with real business)								
UNI-I1	4.16	0.924	4.24	0.881	3.91	1.010	3.331 **	S
UNI-I2	3.96	1.003	4.02	0.971	3.78	1.079	2.174 *	S
UNI-BUS2	3.80	1.007	3.86	1.009	3.62	0.983	2.134 *	S
UNI-BUS1	3.64	0.933	3.71	0.940	3.45	0.890	2.452 *	S
Formal Factors (formal structure and educational programs)								
UNI-FORM1	3.62	0.899	3.63	0.899	3.61	0.905	0.169	R
UNI-EDU2	3.62	1.069	3.65	1.077	3.54	1.045	0.945	R
UNI-FORM3	3.46	0.884	3.48	0.884	3.43	0.888	0.513	R
UNI-EDU1	3.42	0.823	3.43	0.819	3.36	0.837	0.806	R
Endogenous barriers								
Informal Factors								
PERS-MOT	4.21	0.950	4.24	0.963	4.13	0.908	1.032	R
PERS-INT	4.13	1.067	4.20	1.021	3.93	1.182	2.835 *	R
Formal Factors								
PERS-EDU	3.90	0.946	3.97	0.955	3.68	0.884	2.303 *	S
PERS-EXP	3.89	0.976	3.92	0.985	3.81	0.949	0.971	R

Note. M, mean; SD, standard deviation; df, degrees of freedom; *p*, *p*-value. Factors are rated from 1 (not important) to 5 (very important). Decision about differences in means: R, rejected; S, supported. * $p < 0.05$, ** $p < 0.001$.

Results from the comparative mean analysis show that the students perceived the importance of various factors differently. Among exogenous factors, the most serious obstacles were the following: economic, technological, educational, and political with the M (mean) above 4 in the range from 0 to 5. Among university-related factors, the most important were informal (incentives and real business connections). Informal endogenous factors (motivation and interest) were more important than formal one (perceived education and experience). Thus, H1 was confirmed; students had different attitudes towards factors that could be considered obstacles to new business creation.

Informal university and informal endogenous obstacles were perceived to be greater than formal ones. Thus, H1a was confirmed. In addition, both financial exogenous and university factors were considered to be more critical than non-financial ones. Therefore, the results confirm H1b. Amongst the factors analysed, formal university factors (structure and educational programmes) were considered to be the least critical of all. Thus, H2 was also confirmed.

The gender analysis showed that female students regarded all the obstacles as more valuable than did the male students. This confirmed H3. More specifically, there were significant differences

in the evaluation of exogenous factors between female and male students: economic (Mf = 4.54 and Mm = 4.31, $t(290) = 2.493$, $p < 0.05$), educational (Mf = 4.15 and Mm = 3.95, $t(290) = 2.487$, $p < 0.05$), and legal support for female entrepreneurs (Mf = 4.11 and Mm = 3.55, $t(290) = 5.152$, $p < 0.001$).

There were also significant differences in informal and financial university-related barriers, more specifically in the evaluation of the importance of incentives (UNI-I1: Mf = 4.24 and Mm = 3.91, $t(290) = 3.331$, $p < 0.001$ and UNI-I2: Mf = 4.02 and Mm = 3.78, $t(290) = 2.174$, $p < 0.05$). In addition, female students saw the university link to real business as significantly more critical than male students—more specifically, insufficient relationships with the business world (Mf = 3.86 and Mm = 3.62, $t(290) = 2.134$, $p < 0.05$) and lack of infrastructure (business incubators and so on)—in the attitude or intention to create companies (Mf = 3.71 and Mm = 3.45, $t(290) = 2.252$, $p < 0.05$).

In the evaluation of personal factors, female students evaluated their perceived entrepreneurial education as a significantly more critical informal endogenous factor (Mf = 3.97 and Mm = 3.68, $t(290) = 2.303$, $p < 0.05$). This confirmed H4; female students evaluated financial and informal barriers as being more important than did male students.

4. Discussion

From the theoretical perspective, the research results confirm the significance of all the factors (exogenous, university-related, and endogenous) that were analysed. Notably, it supports the previous suggestions on the role of the following exogenous factors: economic [9,16,18,19,42]; educational [16,18,19,41]; technological [9,18,43]; government support [9,16,21], including support for females [14,32]; legal [16,18,19,27]; and socio-cultural [9,18,25,27,41]. Financial factors were considered to be the greatest hindrance [5]. However, students evaluated all other factors as being almost as important. Following calls in previous research to find a new non-financial way to motivate students to start new businesses [25], this study demonstrates that, even though it is not the most central element, tourism students evaluate very highly the impact of non-financial informal motivation.

Moreover, the study supports prior research that noted the critical role of both formal [8,20,44,47] and informal [18–20,24,44] university-related factors. Many earlier studies are focused on the analysis of the formal factors and impact of entrepreneurial education on students' entrepreneurship [14,20,32,44,47]. However, this research demonstrates that students considered formal university factors (such as structures and educational programmes) of least significance. The lack of informal factors (such as incentives and connections with real business) are more damaging to their entrepreneurial development than formal factors. This confirms the role of context (such as interactions between market actors) for the sustainable entrepreneurship development. In addition, this research strengthens a previous suggestion that, amongst university-related factors, students regarded financial motivators to be more significant than education programmes [5].

In addition, this research advances the suggestion made in previous studies regarding the vital role of endogenous barriers, both formal (such as perceived levels of education and experience) [16,20,45,48] and informal (such as motivation and interest) [9,15], as obstacles to the creation of new businesses amongst the young [15,18]. The outcomes of the analysis also indicate that informal factors are more relevant than formal ones.

Additionally, the results of the comparative gender analysis support recent research that has demonstrated that females evaluate more critically than male students all factors relating to new business creation [14,21,32]. It holds the suggestion that women are more risk-averse to the idea of starting companies than men [38]. Moreover, there are some significant differences in factor evaluation between female and male students. As was expected, support for female entrepreneurs was significantly more important for female students than for male students. However, that is not the most critical factor for females. They value (significantly more than males) stronger financial support (at both government and university levels), and the availability of education and training in the region. In addition, internal motivation and interest are more important for female young entrepreneurs than

female support programmes. It may be that financial support reduces risk aversion, which affects female more than male potential entrepreneurs [14,32].

From a practical perspective, as demonstrated above, to increase the number of new start-ups, economic support should be provided both at the government and university levels [5], although non-financial factors also play a critical role. Students are interested in creating innovative start-ups, which is the fuel for the sustainable entrepreneurship. Thus, government policies should focus more on the development of new technology, which could have a positive impact on the number of innovative student projects. It could further provide an additional competitive advantage for some tourist destinations by increasing the attractiveness and popularity of services. In addition, the support for the students can also include incentives or tax discounts. Additionally, given the responses to university-related factors (especially the results showing informal factors to be more important than formal), universities should implement programmes with a focus on developing collaboration with businesses and motivating students towards developing entrepreneurial skills and building up their experience [14,20,21].

Specifically, based on the research results regarding university-related factors, considerable attention should be dedicated to encouraging students to recognise the value of educational programmes. Previous studies confirm the value of entrepreneurial education to the students' perception of the desirability and feasibility of new business creation [14,20,44,47]. However, interestingly, the participants valued more informal university-related factors (such as incentives and collaboration with real business). This may be because students tend to neglect the role of education as a facilitator in new business creation [21,50].

As informal factors are important, universities should also focus on building real-life collaborations with businesses [20,44]. These provide students with opportunities to build business networks, to experience real-life examples, to obtain mentoring, and to receive advice from practitioners [18,20]. Additionally, as has been suggested previously [18–20,24,44], students have appreciated incentives in the form of physical facilities. Providing work and collaborative spaces, developing creative areas, and establishing groups to facilitate the creation of new ideas can have a positive impact on sustainable entrepreneurship [26].

Endogenous factors (both perceived education/knowledge and motivation/interest) are the most important. Thus, the research confirms that both external agencies and universities should not only develop students' entrepreneurial intentions but also cultivate a positive attitude towards creating their own businesses [10,19]. Providing more opportunities to acquiring real-life experience (i.e., boosting experiential learning) could help to solve the problem of unemployment and increase levels of the students' self-confidence [45]. This, in turn, may help to increase the number of start-ups by the young generation.

Increasing female start-up activity is a priority for many governments because empirical findings have shown that women are underrepresented in new business creation [21]. However, more than the positive effect of "female support" programmes [14,32], female students in tourism expect financial and non-financial support. This could be in the form of economic aid, incentives, and opportunities to collaborate with real businesses. Interestingly, female students feel less self-confident regarding their level of education than male [21,50]. Thus, more entrepreneurially oriented courses should be offered to female students.

The study supports the validity of female entrepreneurs' programmes; these have already been developed and implemented at governmental level.

5. Conclusions, Limitations and Future Lines of Research

Motivated by the need to prioritise research in the area of sustainable entrepreneurship [2,29–31], specifically among youth [13,16,22,23], this study focused on three main points of analysis. Firstly, it analysed and prioritised the factors that can be the obstacles to new business creation among youth. As has been noted, findings confirm the significant value of the all the factors that have been considered

herein [14,19,20,26]. Secondly, it contributes to the sustainable research agenda by focusing on the comparative analysis of financial, non-financial, formal, and informal factors. It makes a valuable contribution to research given that the focus of sustainable entrepreneurship is mainly on economy and society [4,12]. Thirdly, it attempts to come to a more in-depth understanding of the gender effect on the evaluation of obstacles among tourism students. It also contributes towards the gender aspect of sustainable entrepreneurship research [2,29].

Finally, the focus of this research on the analysis of Spanish tourism students' entrepreneurial activity contributes towards ensuring the sustainable development of the Spanish economy, and thus its society. This study is especially valuable given that Spanish tourism has experienced several challenges in recent years [33].

Based on the data from a survey of 290 tourism students in Spain, this article presents the results of an in-depth empirical analysis of exogenous, university-related, and endogenous factors to provide theoretical and practical input.

As a main conclusion, our study shows that students, even those with entrepreneurial intentions, see different obstacles (external, university-related, and internal) to new business creation [14,18]. Financial factors, external and university-related (such as access to the financial resources and university aid to create new companies), represent the most critical ones affecting the entrepreneurial intentions of tourism students. However, there is also a notable number of non-financial factors that are very important for tourism students. For example, the level of new technological development and access to better education as external factors; non-financial incentives and infrastructure (i.e., business incubators) to create new companies as university-related factors; and the level of motivation and interest as internal factors. Moreover, the informal factors, both university-related and internal, are considered by students as more important than formal ones. Thus, the research demonstrates that not only financial motivators are valued by the students. Students perceive at a high level the value of non-financial and informal motivators for new business creation. Following this, we could assume that the youth entrepreneurs, as their values align with the social oriented objectives, are the future of the sustainable entrepreneurship. In other words, the growth in number of students' start-ups is an antecedent of the sustainable entrepreneurship development.

The gender comparison analysis confirms that female students evaluate all factors as more critical than males (significantly more, financial and educational). As a main conclusion, female students have higher level of risk aversion. However, they do not see the government support as the most useful solution. Females evaluate more than males the following factors: financial incentives, education availability, and personal motivation and interest.

As a main practical implementation, this research underlines the possibility of using factors other than financial motivators (such as technology development or business incubators). Government policies on the development of new technology can increase the number of innovative start-ups. On its part, university practices towards developing business incubators and facilitating real business connections can help students to develop the social context (business network). As a result, both non-financial and informal motivators will fuel the sustainable entrepreneurship. Moreover, putting into practice the fact that students underestimate the valuable role of entrepreneurially oriented educational programmes [14,20,44,47], universities should review their strategies and make these programmes more interesting.

Furthermore, considering the significant higher number of tourism management students [8,15], to cultivate the development of sustainable entrepreneurship in tourism, governments may review the "female support" programmes. Moreover, more entrepreneurial oriented educational programmes should be offered to females, as they evaluate their perceived value of education as a critical factor compared to males.

As with any study, this study has some limitations. It only included respondents from one tourism school in a single country (Spain). Future studies might include gender comparisons of students with various specialisations from different countries. In addition, future research could investigate in more

detail the difference between female and male students' attitudes towards entrepreneurial education programmes. Previous research has suggested that entrepreneurial education may be detrimental to entrepreneurial intention [26]. However, our results demonstrate that female students' value highly the role of education in this regard.

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Article

Cultural Antecedents of Green Entrepreneurship in Saudi Arabia: An Institutional Approach

Wafa Alwakid ^{1,2,*}, Sebastian Aparicio ^{3,4} and David Urbano ⁵

¹ Department of Business, Universitat Autònoma de Barcelona, Edifici B Campus UAB, Bellaterra (Cerdanyola del Vallès), 08193 Barcelona, Spain

² Department of Business Administration, Jouf University, Al Jouf 75471, Saudi Arabia

³ Durham University Business School, Durham University, Mill Hill Lane, Durham DH1 3LB, UK; sebastian.aparicio@durham.ac.uk

⁴ Fundación ECSIM, Medellín, Colombia

⁵ Department of Business and Centre for Entrepreneurship and Social Innovation Research (CREIS), Universitat Autònoma de Barcelona, Edifici B Campus UAB, Bellaterra (Cerdanyola del Vallès), 08193 Barcelona, Spain; david.urban@uab.cat

* Correspondence: wafanaif.alwakid@e-campus.uab.cat

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Abstract: Recent decades have brought cultural changes toward the increase of environmentally-friendly initiatives such as green entrepreneurship. Some countries are failing to develop environmental initiatives, whereas others are transitioning and advancing toward this new trend. In particular, Saudi Arabia has initiated efforts toward becoming an ecologically-friendly society. Motivated by this, we explore whether cultural characteristics are associated with green entrepreneurship in Saudi Arabia. Institutional economics is adopted to frame our hypotheses and analysis. The hypothesized relationships were empirically tested in a sample of 84 observations from 21 cities during the period 2015–2018. Data were collected from reports by the Saudi General Authority and analyzed through regression models. The main results show that cultural characteristics, such as environmental actions, environmental consciousness, and temporal orientation, increase the level of green entrepreneurial activity across cities in Saudi Arabia. The findings of this study contribute to existing knowledge on green entrepreneurship, as well as to the discussion of implications for policy and practice related to environmentally-friendly productive activities.

Keywords: green entrepreneurship; sustainable entrepreneurial activity; culture; institutional approach; developing countries; Saudi Arabia

1. Introduction

Research on sustainable entrepreneurship has considerably grown in recent decades, which has enabled scholars to link entrepreneurship and sustainable development [1]. Ultimately, researchers have utilized the term “sustainable entrepreneurship”, along with added expressions such as “green entrepreneurship” or “environmental entrepreneurship” [2–5]. Although there are slight differences among these terms, in general, this type of entrepreneurial activity is seen as part of a new global societal trend in an era where the focus on green policies is stronger than ever. Furthermore, green-related entrepreneurship has become an important subfield of entrepreneurship research [2]. Such societal challenges bring a need for better knowledge of both the antecedents and consequences antecedents of green entrepreneurial activity. In this paper, we consider green entrepreneurship, in line with an intensified call for conducting business in a “greener” way. A preoccupation with green entrepreneurial activity has thus arisen [6–8], boosted by a culture of green entrepreneurship that shapes new breeds of entrepreneurs [9] and contributes to molding social norms that support this “greenism” [10].

In this study, it is suggested that the socio-cultural norms that enhance green entrepreneurial activity in Saudi Arabia offer the opportunity to observe the early roots of post-material culture [11]. In Saudi Arabia, cultural identity is the feeling of belonging to a group and is part of a person's self-concept and self-awareness. This relates to generations, nationality, religion, race, language, social class, region, or any social group that has its own unique culture [11]. In this way, cultural identity is not only a distinctive feature of the individual, but of a similar group of people who share the same views [12]. Likewise, culture plays a direct and vital role in achieving the three strategic pillars of Saudi Arabia's 2030 vision, which are: (1) building a prosperous economy, (2) building a vibrant society, and (3) building a homeland [13]. One of the main objectives tangential to these three pillars involves increasing environmentally-friendly activities, including green entrepreneurship. However, there is a lack of evidence that enables us to gain a full understanding of whether different cultural characteristics are helpful in accomplishing this sustainable production objective.

From an institutional economics point of view [14,15], the role of formal (particularly economic regulations) and informal institutions (particularly culture) in sustainability has been discussed [16]. Meek et al. [17] and Urbano et al. [18] also discussed how informal institutional factors may explain more differing types of entrepreneurial activities, including green entrepreneurship, than formal institutions. In this sense, according to Adler [19] and Andries and Stephan [20], there are institutional factors characterized by cultural differences in environmental activities and actions. Encouraging an environmental consciousness that embraces these aspects is one way to expand sustainability [21,22]. It is also vital to comprehend how entrepreneurship accounts for social values, beliefs, and culture, which change over time and space [23,24]. In this regard, organizational processes have a temporal dimension, often implicit and without discourse, that clearly characterizes the entrepreneurial process [25]. It is still unknown, however, whether these three institutional factors as cultural characteristics (i.e., environmental actions, environmental consciousness, and temporal orientation) directly explain green entrepreneurship [9,17,22] in developing countries such as Saudi Arabia.

Thus, in this study, institutional economics [14,15] is used to enhance our comprehension of cultural influences (i.e., informal institutions) on green entrepreneurship in Saudi Arabian cities. Drawing on this, it is suggested that national culture affects environmentally-friendly policies [16]. In particular, we analyze the influence of three cultural factors on green entrepreneurship: (1) environmental actions, (2) environmental consciousness, and (3) temporal orientation. To test the suggested hypotheses, we rely on balanced panel data, with a sample of 84 observations during the 2015–2018 period. After testing the fixed-effects models for 21 cities in Saudi Arabia, we find that the three assessed cultural factors positively explain green entrepreneurial activity across cities in Saudi Arabia.

While the field of green entrepreneurship is relatively new and empirical documentation has started to make a contribution to existing knowledge, there is still no consensus on defining this term [10,22,26,27]. With this in mind, our contribution to the literature is twofold. Firstly, many scholars have studied the influence of informal institutions and values on the intentions and actions of entrepreneurs [17]. Scholars have assessed different informal factors in their studies, but this paper reveals a further connection between informal institutional factors, particularly cultural ones, and green entrepreneurship. Secondly, being both an oil producer and a new member of a consortium that focuses on the environmental consequences of economic activities, Saudi Arabia is an excellent case study of this subject, and scholars and practitioners may find these results useful for learning and decision making. Furthermore, the relationship between (informal) institutions and green entrepreneurship offers a fertile means of explanation that can contribute to policy-making. Knowledge of the consequences of green entrepreneurial practices may allow for forecasting the long- and short-term changes in society, and also for understanding which types of incentives could be provided in order to direct social and sustainable development [21]. A significant set of green-aware companies would be expected to change and encourage others to adopt green entrepreneurship.

After this brief Introduction, Section 2 contextualizes the case of Saudi Arabia, and Section 3 introduces the conceptual foundations for the literature analysis and hypothesis development.

In Section 4, the methodology and data are explained, and then, the findings are presented and assessed in Section 5. Finally, Section 6 focuses on the conclusions, implications and limitations for potential research avenues.

2. Green Entrepreneurship in Saudi Arabia

Previous academic work indicated a positive correlation between entrepreneurship and economic expansion [18]. Furthermore, entrepreneurship encourages the economy to improve through creative methods [28]. In general, the more active the entrepreneurship is, the more positive the influence on economic growth will be [18,28]. In addition, the actions of entrepreneurship are deemed an indication of the vital determinants concerning localized economic progression [29]. Indeed, policy-makers expect that entrepreneurship has a positive influence on the country's wealth and employment [29]. Likewise, several scholars have argued that when institutions are not properly working, the influence of entrepreneurship might be negative [29].

Indeed, this is the case of developing countries [29]. Accordingly, Saudi Arabia is enjoying an emerging global economic boost, relying at present on oil, but with ambitious strategies to diversify the economy away from these natural resources and toward the promotion of entrepreneurial expansion [30]. Currently, Saudi Arabia is living through a significant social and economic renaissance by guiding itself confidently toward a lucrative future, as well as creating a diversified and sustainable financial backbone by attracting knowledge-based investors [31]. As it grows, a corporate business has forwarded strategies, heralding the requirement to monitor entrepreneurship closely.

Due to worldwide affiliation toward the economy as the basis of supporting the state's competitive prowess, through close attention to youth creativity, the Saudi government has actively supported entrepreneurship to establish a competitive and sustainable Saudi nation [31]. Within Saudi Arabia, there are many obstacles and constraints that entrepreneurs must face, including the non-existence of an independent regulatory strategy and framework for the responsible progression of enterprises. This is considered to be one of the most significant challenges facing entrepreneurship. In addition, Saudi Arabia's involvement with the World Trade Organization concluded with several failed endeavors, unable to compete with international initiatives and resources [31]. Despite this, the Saudi government envisions a tendency toward green entrepreneurship among the younger generation [32]. Hence, Saudi Arabia has encouraged its youth to enhance free business through the offer of scholarships, examples being the Fastest 100 Growing Companies Award, the Prince Salman Award for Entrepreneurship, and the Most Competitive Youth Award [33]. This level of encouragement and innovative progression clearly motivates entrepreneurs to pursue green activities [33].

According to the 2019 Global Entrepreneurship Monitor report, almost 76.3% of the adult population in Saudi Arabia believes that the country offers better opportunities to start a business [34]. Part of this success can be attributed to the use of green entrepreneurship, which has allowed businesses to appreciate that there are environmental, economic, and social factors in running their businesses. Therefore, these businesses attempt to seek innovative solutions to the way in which products and services are procured and consumed. Similarly, Saudi Arabia has scaled-up its business operation models, which can assist in greening the Saudi Arabian economy. Saudi Vision 2030 believes that the Saudi Arabian economy should offer opportunities that can stimulate the economy, while at the same time generating revenues for other sectors [35].

The result is that businesses operate in an environment that is safe and healthy, which is important for the survival of any business and guarantees a competitive advantage over others. Entrepreneurship requires that a business discovers new ideas that can be used to make the business flourish over time. Through this, new business ideas are created while the businesses experience exponential growth. With regard to innovation, Saudi Arabia now has policies that mean to help entrepreneurs, while at the same time stimulate growth for a competitive edge [36]. In order to support innovation and entrepreneurship, the country uses Saudi Arabia Vision 2030 as a mechanism to encourage a national culture that ultimately promotes the growth of enterprises, as they play a critical role in the economy.

3. Literature Review

To comprehend the possible mechanisms behind the relationship between culture and green entrepreneurship, we used institutional economics [14,15]. It is suggested that institutions involve the deeper aspects of social strata, acting as authoritative guidelines and curbs in behavior [14,15]. North [14,15] classified institutions as formal (i.e., constitutions, contracts, common law, government policy) and informal (i.e., attitudes, values, norms, beliefs, or in broader terms, the culture of a society). Generally, institutions can be viewed as rules within society, shaping human interaction [14] (p. 3). Despite the lack of formal sanctions, they are pervasive and direct behaviors. Formal institutions can change quickly, yet informal ones are slower to change [37]. The institutional economics framework offered by North [14,15] may contribute to our understanding of how culture affects productive activities such as green entrepreneurship. Although there have been a number of studies analyzing formal institutions as initial steps toward entrepreneurial activity (see Bjørnskov and Foss [38], Urbano et al. [18], and Zhai et al. [39] for thorough literature reviews), it has been argued that informal institutions are more influential within society [18,40,41]. An additional conclusion relates to interactions between formal and informal institutions, with many regulations potentially working better depending on the cultural values of society [42]. Informal institutions limit the influence of formal bodies and vice versa [43].

Similar ideas, particularly focused on culture, have explored green entrepreneurship [17,18]. Although there is not a consensus about what green entrepreneurial activity means [44] (see Appendix A for different definitions), we adopt the approach offered by Gast et al. [10], who defined this sort of activity as “the process of identifying, evaluating and seizing entrepreneurial opportunities that minimize a venture’s impact on the natural environment and therefore create benefits for society as a whole and for local communities” [10] (p. 46). This is similar to the work of Silajdžić et al. [45] (p. 377), who suggested that green entrepreneurs “are those who start businesses based on the principle of sustainability with strong underlying green values and who sell green products or services”, and also Yi [46] (p. 4), who suggested that green entrepreneurship is “a kind of social activity that aims at protecting and preserving the natural environment”. Hence, green entrepreneurship is characterized by some basic features of entrepreneurial activity coupled with giving priority to the skills and initiative of the entrepreneurial seeking success through the social or environment innovations for sustainability [1].

Culture may be seen as heavily influential when pursuing sustainability [47] (p. 236). Several studies view culture as a significant variable in sustainability-related actions [48–51]. For instance, cultural habits play a vital role in assessing variation within corporate social responsibility (CSR) [52]. Similarly, regarding consumer views of corporate responsibility, studies advocate global culture-related differences [53,54]. Some scholars that have examined the relationship between the rate of green entrepreneurship and culture have provided a deeper understanding of how culture is defined in international and inter-cultural business management research [55,56]. Having a socially supportive culture affects the level of national entrepreneurship and its quality. In this paper, we focused on green entrepreneurship and its association with culture, through cultural habits as proxies of informal institutions, as Stephan et al. [54] suggested. Although there might be other important institutional factors affecting sustainable development, including green entrepreneurship [16,18], cultural aspects observed through actions, consciousness, and temporal orientation reflect what societies think and do to support entrepreneurship and other productive activities in the pursuit of sustainability [17].

Hence, the main cultural dimensions that we examined are environmental actions, environmental consciousness, and temporal orientation, which might have an association with green entrepreneurship. In regard to the latter (i.e., temporal orientation), it is suggested that long-term economic development reflects shared values and beliefs (i.e., informal), as well as laws and bureaucracy (i.e., formal institutions) that regulate human interactions [15]. This is due to cultural norms forcing limitations on formal institutional development [36]. The sedentary nature of cultural change also presents obstacles for extreme institutional change [56]. People thus observe dominant practices (e.g., in green entrepreneurship) and reflect them through their own values, attitudes, and behaviors. There is

no doubt that total entrepreneurial activity acts as a catalyst for economic growth [23,41], so those values, attitudes, and behaviors are transferred from entrepreneurs to society. The mechanisms are quite simple: institutions boost entrepreneurship, as they create the context for economic growth and other developmental outcomes [18]. From this point of view, the environmental actions focused on entrepreneurship can shed light on the processes that are common in a green approach to economic activity. Green entrepreneurs are a different type of entrepreneur [9]. Instead of building their life on profit-making, they are also concerned about social justice [9] (p. 828). Personal motivation and a forward-thinking approach to sustainability are also important characteristics of entrepreneurs [9] (pp. 837–840).

In general, green entrepreneurship plays a rising role in the protection of the environment [46]. Based on this idea, Ndubisi and Nair [57] suggested that there is a need for companies to adopt a green approach. This is embedded in a culture of reflexive development, where concern about environmental issues and the need for sustainability become the societal norm. This creates another link between existing institutions and environmental consciousness, which consists of the propensity to encounter examples of green entrepreneurship in the immediate area, as well as values reflected by entrepreneurs. It is important to contextualize the situation of green entrepreneurs [58], which is consistent with theories of post-modernization and reflexive modernization [11]. People become aware (or conscious) of the side-effects of technology and try to control them. This is exactly the case with environmental consciousness for green entrepreneurs, who tend to live in relative abundance and develop a culture of concern about the quality of the environment and sustainability. They are active both in the existing businesses that pursue a process of greening, but also as part of new businesses that become green as soon as they are set up [27].

The institutional perspective [14,15] enables us to understand the reasons why governments encourage all members in society to support sustainability initiatives actively such as green entrepreneurship [59]. Such a culture created is visible through social norms and policies that foster green entrepreneurial activity. Indeed, companies that promote green measures are even more visible for societies: they are easier to notice and create an institutional framework that individuals can observe and internalize. Evidence for this interpretation is found in a number of studies, such as Thang et al. [60], Papadopoulos et al. [61], Silajdžić et al. [45], and Karimi and Nabavi [62], which demonstrated relationships between social and structural interventions and subsequent attempts by organizations to engage in “greening” of their entrepreneurial activities. These studies showed different attempts of introducing green entrepreneurial practices in Vietnam [60], Greece and Cyprus [61], Bosnia and Herzegovina [45], and Tehran [62]. All these countries were engaged in a period of economic and social change, which required involvement and intervention with wider stakeholders.

Interpreting an institutional change entails that culture can be applied at various levels [56]. When considered at the aggregate level, one may observe cultural descriptive norms and practices, whereas at the individual level, cultural values trigger attitudes and behaviors focused on the environment. Policies that promote green entrepreneurship and corresponding green behaviors are based on a culture of caring for others, combined with promoting performance, as demonstrated or hypothesized by various scholars [16,22,27,63]. Several authors [9,19,64,65] have also noted such key cultural dimensions, which need further attention. Hence, in this paper, we focused on environmental actions, environmental consciousness, and temporal orientation.

It is worth noticing that embracing sustainability does not automatically lead to practicing it [44]. Cultural values may precede practices since they dictate behavior [66]. There are cultural differences regarding the initial mode of activity; some cultures emphasize action and outcomes [19], and in developing countries, environmental actions are of prime importance [21]. Green entrepreneurs run businesses to achieve dual environmental and business objectives to ensure their sectors are more sustainable [67,68]. For those wishing to be greener in their businesses, there is a disparity between self-principle customers’ interests, affecting public behavior [22]. Their motivation to act

is initiated by the desire to prevent and solve specific environmental issues or to alter their sectors; hence, wider alternatives and more environmentally-friendly practices become normalized [69]. Where businesses previously placed priority on cost-saving, environmental benefits may be of only minor concern, suggesting that a global, mainstream view of green principles is in its infancy. Consumers are partially motivated by sustainability itself, but are also motivated by simultaneously occurring underlying and/or societal sustainability issues [70]. Evans and Abrahamse [71] forwarded the argument that appealing to these underlying issues may expand sustainability commitment. While saving money may attract individuals to sustainable habits, it may have limited influence if wider consumption practices continue [22]. We thus suggest the hypothesis that:

Hypothesis 1 (H1). *Environmental actions are positively associated with green entrepreneurship in Saudi Arabia.*

There has recently been increasing environmental consciousness or interest in protecting the environment around the world [21]. Indeed, environmental awareness has recently increased in society at every level [17]; however, there are differences in cultures, and people's relationships differ regarding the natural environment [17]. In some cultures, individuals have complete control over their environment, while others live in environmental harmony and view people and nature as one. In yet other cultures, individuals are controlled by the environment, accepting the power it conveys [19]. Entrepreneurship and wealth/economic growth are closely linked, hence heavily promoted and encouraged in the modern world [41]. The environmental consciousness also leads green entrepreneurship to affect green innovation and social-environmental responsibility [72]. Recently, with increased interest in environmental and social issues, entrepreneurship conjoins the objectives of sustainable development and the accumulation of wealth [73,74].

This consciousness may be observed across age groups. However, there is increasing evidence from different cultural contexts showing that the younger generations (treated as a proxy for those of typically undergraduate age) are especially interested in environmental conscientiousness, actively seeking educational opportunities that support green entrepreneurship and/or sustainability initiatives. For example, Soomro et al. [32] and Yi [46] provided evidence about the positive association between environmental consciousness through education and its subsequent intent to engage young people in green entrepreneurial activities. These studies were carried out in Pakistan and China, respectively, indicating a broader global awareness of environmental conscientiousness and pointing toward the potential wider generalizability of this particular study on the basis of transferable concepts in rapidly developing economies. Similarly, evidence from Serbia also found that the social desirability for environmental education is translated into economic and environmental practice [75].

Environmental consciousness is related to the social image, which supports individuals to become green entrepreneurs and take care of the environment [76,77]. In emerging markets, there is a sensitivity to environmental issues and an effort to combine them with green entrepreneurship [77]. Furthermore, in developing countries, the need to produce environmentally-friendly and ecological resources has swayed entrepreneurs to give careful consideration to environmental issues in their objectives [21]. Entrepreneurs are now motivated to consider environmental issues to meet their social responsibility, so the exploration of green entrepreneurship extends research through non-financial desires [78]. Green entrepreneurs negotiate disparity between business activities, environmental mission statements, and wider contexts relating to sustainable and growth-focused economies [22]. As such, entrepreneurs interested in sustainability, as influencers, prioritize environmental issues over profits where possible, being conscious of the optimal effort to reduce damages to the environment. They may present a win-win situation for both economic growth and the environment and may meet their own personal goals. These entrepreneurs gradually enhance the environment and educate a wide audience on benefits related to environmental protection through products and services [27]. Green entrepreneurs are labeled as novel entrepreneurial investors, aiming to integrate environmental

awareness with business advancement through holistic measures; a unique logical approach as compared to conventional entrepreneurs [74]. Indeed, the commitment to the environment displayed by green entrepreneurs enhances their reputation compared to other entrepreneurs [64]. On this basis, we propose that:

Hypothesis 2 (H2). *Environmental consciousness is positively associated with green entrepreneurship in Saudi Arabia.*

Our final cultural factor deals with temporal orientation, utilized in the literature to evaluate cognitive involvement throughout history, the present, and into the future [79,80]. There are cultural differences regarding an individual's temporal orientation, that is to say orientation to the past, present, or future [25]. In past-oriented cultures, tradition is central to the wisdom of societal life [25], whereas future-oriented societies disregard the past and focus entirely on the future, resulting in an extensive long-term timeline [81]. In contrast, present-oriented cultures have a limited timeline, focusing on short-term gains [25]. This concept is vital, since it influences the manner in which individuals incorporate their perceptions of past experiences, present situations, and future objectives into their opinions, cognitions, and the way they behave [82]. For example, several authors have discovered that a present time perspective focuses less on future strategic processes than other differing cultures [81,83]. Individuals embedded in a present time perspective focus predominantly on the present, perceiving that future planning is futile, unlike those with a future time perspective [79]. Green entrepreneurs offer clear solutions regarding social transformation [84], creating long-term outcomes and an enhanced positive future.

Time itself is a factor that may help us to understand changing attitudes toward entrepreneurship [85]. For instance, organizational processes involve temporal dimensions that are implicit with no discourse, and temporal issues clearly and accurately describe the entrepreneurial process [25]. Past experiences and comprehension of previous activity are the basis on which present actions are taken, moving forward to future wealth gain. These temporal dimensions are carried out over many levels within entrepreneurial campaigns [25]. Entrepreneurs and the individuals working alongside them act in the present to ensure future gains [25]. Some of the characteristics of entrepreneurs derive from personal experiences and history, including temporal orientation (past, present, or future), along with the future time-based perspective, choosing deadlines, taking advantage of evolving opportunities, perceiving and anticipating problems and phase development concerns, as well as aims and ambitions for the future. This interpretation was observed in both Grinevich et al. [68] and Yi [46], who demonstrated the importance of both temporal and conceptual interpretations of green entrepreneurship is relative to prevailing circumstances. To a lesser extent, the earlier work of Papadopoulos et al. [61] supported this interpretation, although it was acknowledged that the main concerns of entrepreneurs were responding to government initiatives related to green entrepreneurship, which were still limited at that time. These are critical issues that need careful consideration for successful entrepreneurship [25]. At the industry or environmental level, time figures into the entrepreneurship equation on the basis of a quick response; the enhanced pace of technology results in obsolete software slowing down the process, leading to possible critical blockages in terms of meeting the demands of customers, suppliers, stockholders, and venture backers [25].

At the country level, there is an enhanced realization in entrepreneurial research that economic activity can be better comprehended within temporal, historical, spatial, institutional, and social contexts since they give individuals an enhanced opportunity to invest and set distinct boundaries for future activities [86]. A vital aspect of the social sustainability endeavor is that it emphasizes the business-based long-term benefits that society expects [87]. This is due to the fact that one of the objectives of sustainability is that of inter-generational equity [88]. The requirements of today's generations must not limit or compromise future generations [89]. It follows that in the future, society needs to be more aware of long-term impacts. Drawing on this idea, there is evidence on the

effect of green entrepreneurship on the organization's financial performance [72,77], which involves future planning. Furthermore, utilizing the green logic alongside the social and economic aspects in a flexible manner constitutes temporal adjustments [59]. Companies within these future-oriented cultures may well involve themselves in social sustainability practices, contributing to social justice, enhanced social recognition, and trust with and between stakeholders and society [89]. Based on these ideas, the following hypothesis is suggested:

Hypothesis 3 (H3). *Temporal orientation is positively associated with green entrepreneurship in Saudi Arabia.*

4. Methodology

4.1. Data and Variables

Extensive literature has prioritized the identification of major factors contributing to cultural differences. The concept behind this view is that human societies endure the same problems, for which there are many proposed solutions, and where each culture within society makes a choice. This suggests that societies may be classified in accordance with major cultural dimensions [90], which may in turn explain green entrepreneurial activities [17]. In order to understand this relationship, we used variables and data from a number of different sources, which are explained below.

4.1.1. Dependent Variable

For the dependent variable, we measured green entrepreneurship according to the Organisation for Economic Co-operation and Development (OECD) [91], which defines this particular type of entrepreneurial activity as an environmental commitment. This definition is also consistent with the conceptual foundation we adopted thanks to Gast et al. [10]. According to Kraus et al. [92], sustainability studies have focused mainly on issues involving the environment, which is an important issue in Saudi Arabia [13]. The information for our dependent variable came from annual reports (General Authority for Meteorology and Environmental Protection). This variable showed the percentage of small- and medium-sized enterprises (SMEs) that were environmentally friendly out of the total number of SMEs in the city. This variable was in line with Miska and Schiffinger's [59] focus on corporate sustainability practices and performance orientation practices as factors affecting green entrepreneurship. We note that there may be some methodological critique of using a dependent variable throughout a percentage [93], but in line with Liu and Xin [94], it was considered appropriate in the conditions of this study because the dependent variable was standardized.

4.1.2. Independent Variables

Environmental actions, which consisted of motivation for action and emphasize the value of the activity, were the independent variables. The motivation ratio was the development and growth of environmental capabilities. The value of the environmental actions was the percentage of the accomplished goals of the defined environmental measures in each city. According to Kraus et al. [92], environmental activities carried out are not only due to environmental awareness, but to meet legal regulations, minimize costs, and link to a community's sense of sustainability. In addition, green entrepreneurs show environmental actions by achieving dual environmental and business objectives and by wishing to transform sectors to become more sustainable [67,68]. The information for these variables came from annual reports (General Authority for Statistics in Saudi Arabia—Knowledge statistics) (see Table 1). The framing of mainstream and set "green" issues revealed evidence of the tensions and politics present when creating a green economy. Gibbs and O'Neill [22] presented a novel and interpretive concept, with the evolving issue of "being" and "becoming" a green entrepreneur, rather than the fixed categories presented in previous literature.

Table 1. Description of the variables.

	Variable	Description	Source
Dependent variable	Green entrepreneurship	This variable shows the percentage of the number of SMEs that are environmentally friendly out of the total number of SMEs in the city. Green entrepreneurship can be measured as environmental commitment [91]. The variable was standardized.	Annual reports of the General Authority for Statistics in Saudi Arabia.
	Environmental actions	The percentage of accomplished goals of the defined environmental measures in each city. The ratio involves the development and growth of environmental capabilities by the local government. There are environmental actions in achieving both environmental and business goals [67,68]. The variable was standardized.	
Independent variables	Environmental consciousness	The percentage of the maintenance of natural resources. This variable considers the reduction/control in the use of natural resources relative to outputs, by living in balance with natural forces [12]. The variable was standardized.	Annual reports of the General Authority for Statistics in Saudi Arabia.
	Time orientation	The percentage of public and private organizations that have adopted environmental measures in each city. As entrepreneurship needs to compete by taking advantage of fast-changing market conditions [94], this variable takes into consideration the speed at which organizations embrace environmental initiatives. The variable was standardized.	
	Annual growth rate	The value of a city's recourses for the agricultural sector. The variable was standardized.	
Control variables	The population of each city	The population of the area. The variable was standardized.	Annual reports of the General Authority for Statistics in Saudi Arabia.
	Size of the city	The size of the city in squared kilometers (km ²). The variable was standardized.	
	Education	The percentage of people who have a tertiary education in each city. The variable was standardized.	

General Authority for Statistics in Saudi Arabia: <https://www.stats.gov.sa/ar#>.

We considered environmental consciousness as the percentage of the maintenance of the natural resource, e.g., prudent use of water. The rate considered the reduction/control in the use of natural resources relative to outputs, by living in balance with natural forces [12]. Kirkwood and Walton [78] considered the environmental consciousness of green entrepreneurs as involving the manner in which they conduct their businesses while keeping to their environmental commitment. Hence, environmental preferences may allow for benefits exceeding simple cost-savings, since customers forge deals with entrepreneurship that are associated with a positive image and are recognized as “modern” [92]. The data for this variable came from annual reports (General Authority for Statistics in Saudi Arabia—Knowledge statistics). Kirkwood and Walton [78] studied the motivations and the key green aspects of entrepreneurs interested in sustainability issues, as well as the degree of the greening of the organization, so our variable could be comparable and useful and could build on the existing literature.

In temporal orientation, the percentage of public and private organizations that have adopted environmental measures in each city was considered. The information for this variable came from annual reports, which showed the speed at which organizations embrace environmental initiatives (General Authority for Statistics in Saudi Arabia—Knowledge statistics). Shipp et al. [82] examined the average percentage of temporal orientation. Entrepreneurs operating in such environments often need to compete by taking advantage of the fast-changing market conditions in terms of creating novel products or services, thus satisfying the requirements of emerging environmental needs [95].

4.1.3. Control Variables

We included other variables in our models to control for additional factors that might partly explain green entrepreneurship. The annual agricultural growth rate represents the value of a country's resources, which becomes increasingly sensitive to competitive forces in world markets. Environmental issues are also sensitive to world markets, as they shape the potential for economic growth by conditioning survival. In Saudi Arabia, unsustainable use of resources is an important issue, triggered mainly by the inadequacy of natural resources [13]. This challenges the sustainability of green entrepreneurship and requires many resources that depend on the annual growth rate of the agricultural sector [13]. The data used for this were from the annual reports of General Authority for Statistics in Saudi Arabia. The annual growth rate took into consideration the average value of the city's resources that each city produced yearly in the agricultural sector. We also controlled for the population of the city, as green entrepreneurship is aimed at minimizing threats to environmental resources, such as increased population rate [95,96].

One approach suggested for sustainability is a reduction in population growth [97]. Saudi Arabia is one of the world's most populous countries, growing from 4 million in 1960 to more than 33 million in 2018 [12]. The data here came from the annual reports of the General Authority for Statistics in Saudi Arabia, and the value of this control variable was the population in each area. The size of the city was also included as a control variable, as it may affect the number and quantity of environmental resources; a larger city is more likely to have access to more environmental resources than a smaller city [13]. We also controlled for the level of education; culture may be affected by the level of education, which may be needed for sustainable developmental objectives at all levels and social arenas, to transform society by re-classifying and updating education and to aid individuals in developing the skills and values required for sustainable development [98]. In addition, extant literature showed a significant and positive influence of education and sustainability orientation on green entrepreneurship inclination [32]. Furthermore, there was research suggesting that education had a positive correlation with entrepreneurial activity [99], and this variable was measured as a percentage of people with tertiary educational levels in each city. Both independent and control variables were also standardized. A summary of the variables we used in this study is presented in Table 1.

4.2. Method and Model

Fixed effects (FE) models were used to test whether environmental actions (EA), environmental consciousness (EC), and temporal orientation (TO) affect green entrepreneurship. In this regard, Equation (1) shows our main specification, which is estimated through linear regression:

$$\text{Ln}GE_{it} = \alpha + \beta_1 \text{Ln}EA_{it} + \beta_2 \text{Ln}EC_{it} + \beta_3 \text{Ln}TO_{it} + \phi_k \text{Ln}CV_{k,it} + \varepsilon_{it} \quad (1)$$

where GE_{it} is green entrepreneurship in city i at time t ; EA_{it} represents the vector of environmental actions across city i and time t ; EC_{it} denotes environmental consciousness; TO_{it} is temporal orientation; ϕ_k represents the estimators for the k control variables (CV_{it} —population, size of the city, annual growth rate of agriculture, and education); and ε_{it} is the error term that captures those variables that might affect green entrepreneurship, but were unknown in this study. All variables were transformed into natural logarithms for a direct interpretation [41].

A city-level analysis enhances the more detailed exploration of entrepreneurship trends, both within and between states, as these can vary significantly [100]. In addition, since different cities may increase the level and regularity of observations, this may lead to having a higher level of confirmed and verified results. Considering different cities in an array of locations allowed us to evaluate any significant influence, while the panel data technique allowed us to observe time effects using a cross-regional approach [101]. Panel data are also better able to measure and identify effects not detectable simply in pure cross-section or pure time series data [101]. In this study, we focused only

on the fixed effects, since utilizing the full fixed model and carrying out the selection on the random effects within it resulted in additional noise, stemming from unnecessary fixed effects [101].

As noted, the advantages of this methodology in this study included that we were able to obtain a sample from Saudi Arabia with a regular time series. We also found that our final dataset contained a representative sample of this homogeneous group. Our completed sample consisted of panel data with 84 observations and 21 cities during the period spanning from 2015 to 2018.

5. Results

The statistics for the non-standardized variables in the study are presented in Table 2. Green entrepreneurship varied from 20.42 to 77.65%, with an average of 45.73%. Environmental actions ranged from 39.89 to 76.33%, with an average of 51.62% (standard deviation (SD) = 7.27%); environmental consciousness ranged from 34.52 to 86.53% (M = 56.56%, SD = 10.77%); and temporal orientation varied from 37.92 to 86.00% (M = 59.21%, SD = 10.89%). Pearson's correlation was run to assess the relationship between green entrepreneurship and environmental actions, environmental consciousness, as well as temporal orientation. The test revealed that some of the variables had significant positive relationships and some insignificant relationships. For example, environmental actions had no correlation with environmental consciousness ($r = 0.131$), although there was a small correlation between green entrepreneurship and environmental actions ($r = -0.024$) and temporal orientation ($r = -0.008$). Furthermore, there existed a correlation between green entrepreneurship and temporal orientation ($r = 0.216$), as well as between green entrepreneurship and environmental consciousness ($r = -0.014$). Lastly, there was a moderate correlation between environmental consciousness and temporal orientation ($r = 0.182$). Table 2 shows that the three cultural diminutions were statistically correlated with green entrepreneurship; thus, the correlations met our initial expectations.

Table 2. Descriptive statistics and correlation matrix.

	Variable	N	Mean	Std. Dev.	Min	Max	VIF	1
1	Green entrepreneurship	84	45.736	12.780	20.42	77.65		1
2	Environmental actions	84	51.620	7.272	39.89	76.33	1.120	-0.024
3	Environmental consciousness	84	56.595	10.778	34.52	86.53	1.410	-0.014
4	Temporal orientation	84	59.209	10.888	37.92	86.00	1.230	0.036
5	Population of the area	84	1983	2399	4761	8597	2.070	0.249 *
6	Size of the city	84	1230	1188	1200	5400	1.910	0.278 *
7	Annual growth rate	84	3.921	0.600	3.01	5.84	1.070	0.336 *
8	Education	84	62.177	7.123	47.85	81.45	1.150	0.653
			2	3	4	5	6	7
2	Environmental actions	84	1					
3	Environmental consciousness	84	0.131	1				
4	Temporal orientation	84	-0.008	0.182	1			
5	Population of the area	84	0.187	0.295 *	-0.256 *	1		
6	Size of the city	84	0.216 *	-0.079	-0.294 *	0.601 *	1	
7	Annual growth rate	84	-0.111	0.114	0.057	-0.086	-0.000	1
8	Education	84	-0.081	0.101	-0.247 *	0.224 *	0.222 *	0.060

* $p < 0.10$. Note: N, number of observations; Std. Dev., standard deviation; VIF, variance inflation factor.

Multicollinearity analysis was conducted prior to conducting the regression analysis, to check whether there were any problems due to linear combinations. A common technique, used to test for multicollinearity among the predictor variables in this study, is the variance inflation factor (VIF). Values above 0.90 were suggestive of a multicollinearity problem [102]. A VIF value in excess of 10 is also concerning [103]. In our case, we found an average VIF value equal to 1.42. This implied that multicollinearity was not a problematic issue or a concern for this study. We acknowledge that in smaller samples such as ours, there may be some methodological concerns with respect to collinearity, especially noted in the variable of education. However, given the pre-existing knowledge of the role of

education in these conditions [98,99] and that a potential collinearity is not harmful enough [104,105], we considered all independent and control variables relevant to support the internal consistency of our findings and analysis.

Table 3 illustrates all of the linear regression models, and only the controlled variables were included in Model 1, which was a starting point in predicting green entrepreneurship with demographic and economic variables. The other three models were then set, each with only one predictor representing each hypothesis. The first regressed green entrepreneurship on environmental actions (Model 2). The second considered the influence of environmental consciousness on green entrepreneurial activity (Model 3), whilst the third regressed green entrepreneurship on temporal orientation (Model 4). The control variables were then added to the three models, with one independent variable representing all hypotheses (Models 5, 6, and 7). Finally, an additional Model 8 was explored, which included all predictors (i.e., independent variables and controls). Throughout this empirical strategy, we tested whether differing linear combinations created different results or whether a robust specification was found otherwise. In addition, for robustness purposes, a new set of models without the control variable education was performed. Appendix B shows that the results for the main variables remained similar as compared to Table 3.

Table 3. Regression analysis (DV = green entrepreneurship).

	1	2	3	4	5	6	7	8
Environmental actions		0.215 * (0.113)			0.265 ** (0.111)			0.282 ** (0.115)
Environmental consciousness			0.274 ** (0.109)			0.292 ** (0.107)		0.305 *** (0.102)
Temporal orientation				0.275 * (0.147)			0.244 (0.160)	0.342 ** (0.132)
The population of the area	−0.056 *** (0.008)				−0.075 *** (0.012)	−0.065 *** (0.008)	−0.052 *** (0.009)	−0.080 *** (0.012)
Size of the city	0.000 (0.001)				0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Annual growth rate	0.246 ** (0.116)				0.268 ** (0.110)	0.250 ** (0.112)	0.197 (0.129)	0.204 * (0.106)
Education	0.080 (0.094)				0.096 (0.089)	0.092 (0.080)	0.113 (0.093)	0.156 ** (0.061)
Constant	0.564 * (0.294)	0.813 *** (0.221)	0.784 *** (0.179)	0.773 *** (0.247)	−0.039 (0.348)	0.046 (0.303)	0.177 (0.398)	−1.162 ** (0.517)
Observations	84	84	84	84	84	84	84	84
R ² within	0.081	0.054	0.076	0.055	0.16	0.166	0.121	0.31
R ² between	0.000	0.016	0.005	0.003	0.006	0.004	0.002	0.016
R ² overall	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.001

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. DV: Dependent variable.

Testing the hypothesis suggested a positive association between environmental actions and green entrepreneurship in different regions of Saudi Arabia, as stated in Hypothesis 1. We found that culture, such as environmental actions, had a positive influence on green entrepreneurship. Green entrepreneurs have to enhance the value of green entrepreneurship by balancing running a business with sustainability ideals [67]. A further variable employed to understand green entrepreneurship was that of environmental consciousness. Hypothesis 2 states that environmental consciousness is positively associated with green entrepreneurship in Saudi Arabia. We found that environmental consciousness was positively related to green entrepreneurship. The same positivity of influence was noticeable for the second hypothesis, but overall, the influence of environmental consciousness was not contrary to expectations, being positive. Green entrepreneurs could incrementally enhance the environment through their own businesses, and with their products and services, they are potentially able to educate a wide audience regarding many advantages in environmental protection [64]. Hypothesis 3, which suggested that temporal orientation was positively associated with green entrepreneurship in Saudi Arabia, was also fully supported. Individuals focus

their attention on temporal orientation (past/present/future) and clarify responses to implicit and explicit temporal orientation [82]. Temporal orientation had a significantly positive influence on green entrepreneurial measures within Saudi Arabia.

6. Discussion and Conclusions

At the present time, there is limited knowledge about the association between culture and green entrepreneurship with specific reference to Saudi Arabia. In particular, our study examined the influence of cultural factors (i.e., environmental actions, environmental consciousness, and temporal orientation) on green entrepreneurial activity in Saudi Arabia. We found that there was a positive relationship between culture and green entrepreneurship, which varied across regions. Our results might encourage entrepreneurs to adopt a green approach that aims to develop an entrepreneurial activity that solves environmental problems. This could mean that culture has had a strong influence on environmental commitment in Saudi Arabia to solve environmental issues.

We also found that environmental actions increased the level of green entrepreneurial activity in Saudi Arabia. Cultural practices act as an improved indication of sustainability endeavors [16]. Actions and motivations derive from the need to approach environmental issues, resulting in alternative and enhanced environmentally-friendly products and practices that are widely disseminated [69]. Additionally, we discovered that environmental consciousness had a positive influence on green entrepreneurship, given that green entrepreneurs have to consider the balance between business and environmental approaches [22]. Green entrepreneurs were thus identified as novel entrepreneurial players, in search of ways to fuse environmental awareness and business acumen in a holistic way [74]. Indeed, it is their overall objective regarding the sanctity of the environment that separates them from other entrepreneurs [64]. The main influence of temporal orientation on green entrepreneurship was also found to be positive and significant. The strategies of many successful entrepreneurs often involve time-based origins [25].

6.1. Implications for Theory

Green entrepreneurs are emotionally engaged by building a strong bond with society. Green entrepreneurs can also be cognitively engaged in understanding the clear mission and purpose of a new business by receiving information and appropriate feedback from social needs. If green entrepreneurs have a strong bond with society, then they feel that they are valued by local and national entities; thus, their opinions and actions may be taken into consideration to propose solutions for sustainable development processes [21]. This allows entrepreneurs to develop an emotional engagement that helps their venture to succeed in its sustainable goals by understanding contextualized societal culture. An important implication for the analysis of informal institutions [14,15], particularly for culture as an antecedent of green entrepreneurial activity, was found in this study. For example, the cultural dimensions of green entrepreneurship, in its three forms, are beneficial for more sustainable business activity in harmony with the environment. This may be the first step toward a more environmentally-friendly-focused society, leading to the conservation of resources for future generations.

Green entrepreneurship is a novel field of research, which needs further exploration regarding the role of entrepreneurial activity as a means for sustaining the environment and ecosystems, whilst forwarding both economic and non-economic gains for investors and society in general [73]. Research into informal institutions needs a theory-based consultation regarding the notion of such institutions being vital for certain outcomes in green entrepreneurship. Our findings present a more generalized perspective by illustrating the fact that informal institutions (culture) also ensure added general consensus, reinforcing the influence on green entrepreneurship (e.g., environmental actions, environmental consciousness, and temporal orientation). In this sense, further theoretical understanding may better guide scholars studying Saudi Arabia to further advance the comprehension of culture as the awareness of society toward sustainability. It may also serve

to encourage the advertising of results related to sustainability in order to increase legitimacy and support from the entire population, as well as from entrepreneurs.

6.2. Implications for Practice

We focused on different cities in different regions of the Kingdom of Saudi Arabia. Government and private individuals are both key instigators of entrepreneurial actions. It is hence vital that entrepreneurs enhance their understanding of how these approaches are determined and shaped. Consideration of uncertain influences on business-based sustainability strategy, such as the cultural characteristics evaluated in this study, may well be of benefit to entrepreneurs in assessing, more appropriately, the significance of the informal institutional application of pressure on both corporate and strategic activities. As our findings illustrated, cultural influence on sustainability may apply to many cities sharing similar cultures, rather than being limited to individual ones. By achieving the formation of productive clusters, entrepreneurs that operate on an intra-city basis may benefit from such an approach. Our study offers insight to aid entrepreneurs in coping with the challenges of strategically balancing sustainability practices as international ventures with the expectation to be local between cities that have common shared cultural values and corporate sustainability.

Future entrepreneurs may be interested in finding and applying environmentally-friendly solutions for green market needs, and market needs overall. Their contribution to social development can also effectively create enhanced opportunities in green entrepreneurship. In doing so, they not only contribute to their own careers, but also to the employment of others.

6.3. Limitations and Future Research

In spite of these strengths, there are other limitations to this study. Firstly, as the present paper explored the relationship between culture and green entrepreneurship, represented by environmental commitment in Saudi Arabia, it would be beneficial to consider other cultural dimensions that may affect green entrepreneurial activity [17]. For example, it would be supportive to consider variables at the city level, such as crime rates, air pollution, unofficial companies, etc. Secondly, we used secondary data for the 2015–2018 period; subsequent studies should focus on a wider time span to achieve long-term analyses, in which dynamic effects may also illustrate the different or similar responses of entrepreneurship when institutional factors change in developing countries [106]. Thirdly, future research may extend the analysis to cross-country comparisons, such as examining other regions in the Arab Gulf. Fourthly, there are no global databases for green entrepreneurship, so future research could experiment with various proxies for green entrepreneurship and could determine whether the results remain stable across variables and techniques. We are aware that a lack of data sources poses a challenge to overcome, particularly when attempting to conduct cross-country comparisons, due to the limited number of indicators and the differences in measurements across countries [107]. Further efforts are needed to create homogenous information concerning green entrepreneurship, as well as its antecedents and those consequences beyond economic terms [108]. Future research should improve the quality and scope of the indicators, for both dependent, as well as independent variables, which may increase reliability and the ability to analyze causal relationships in a cross-sectional setting [18].

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Appendix A

Table A1. Definitions of green entrepreneurship and related concepts.

	Labels	Definitions	Citations
1	Green entrepreneurial activity	"The process of identifying, evaluating and seizing entrepreneurial opportunities that minimize a venture's impact on the natural environment and therefore create benefits for society as a whole and for local communities"	[10]
2	Green entrepreneurship	[Green entrepreneurs engage in ...] "a kind of social activity that aims at protecting and preserving the natural environment"	[46]
3	Environmental orientation	"The recognition by managers of the importance of environmental issues facing their firms by mainstreaming green product strategies"	[61]
4	Green logic	"Part of a complex institutional environment, facing a sharing platform, alongside the social and economic logic"	[68]
5	Green entrepreneurs	"Those who start businesses based on the principle of sustainability with strong underlying green values and who sell green products or services"	[45]

Appendix B

Table A2. Regression for green entrepreneurship without the control variable education.

	1	2	3	4	5	6	7	8
Environmental actions		0.215 * (0.113)			0.259 ** (0.115)			0.270 ** (0.118)
Environmental consciousness			0.274 ** (0.109)			0.288 ** (0.107)		0.296 ** (0.106)
Temporal orientation				0.275 * (0.147)			0.219 (0.156)	0.304 ** (0.136)
The population of the area	-0.058 *** (0.008)				-0.076 *** (0.012)	-0.067 *** (0.008)	-0.055 *** (0.009)	-0.082 *** (0.012)
Size of the city	0.000 (0.000)				0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Annual growth rate	0.248 * (0.121)				0.269 ** (0.116)	0.252 ** (0.117)	0.204 (0.135)	0.214 * (0.116)
Constant	0.732 *** (0.231)	0.813 *** (0.221)	0.784 *** (0.179)	0.773 *** (0.247)	0.175 (0.360)	0.246 (0.277)	0.449 (0.292)	-0.741 (0.487)
Observations	84	84	84	84	84	84	84	84
R ² within	0.074	0.054	0.076	0.055	0.149	0.157	0.107	0.284
R ² between	0.000	0.016	0.005	0.003	0.006	0.004	0.002	0.016
R ² overall	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.002

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

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Article

The Efficiency of R&D Expenditures in ASEAN Countries

Pawel Dobrzanski ^{1,*} and Sebastian Bobowski ²

¹ Department of Mathematical Economics, Wroclaw University of Economics and Business, 53-345 Wroclaw, Poland

² Department of International Economic Relations, Wroclaw University of Economics and Business, 53-345 Wroclaw, Poland; sebastian.bobowski@ue.wroc.pl

* Correspondence: pawel.dobrzanski@ue.wroc.pl

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Abstract: The aim of this study is to determine whether funds spent on research and development are used efficiently in Association of Southeast Asian Nations (ASEAN) countries. Fifteen countries in the 2000–2016 period have been examined. Measuring the efficiency of research and development spending was performed using the non-parametric Data Envelopment Analysis (DEA) methodology, which allows for the assessment of input–output efficiency. The research includes the following input and output variables: annual public and private spending on innovation, high-technology exports as a percentage of manufactured exports, patent applications to the World Intellectual Property Organisation (WIPO) by priority year for million inhabitants, trademark applications (TA) for million inhabitants and information and communications technology (ICT) exports as a percentage of manufactured exports. Hong Kong and the Philippines are perhaps the most efficient with respect to research and development (R&D) when analysed using the constant return to scale (CRS) approach. However, according to the variable return to scale (VRS) approach, the most efficient ASEAN countries are Hong Kong, Indonesia, Singapore and the Philippines. The study also confirms that increased spending on innovation is resulting in non-proportional effects.

Keywords: Innovation; DEA Methodology; Relative efficiency

1. Introduction

The importance of innovation in shaping economic growth is fundamental to new growth theory, which assumes that long-term growth can be achieved through endogenous technological progress [1]. This theoretical concept has been confirmed in numerous empirical studies [2–5]. Improving innovation is particularly important for developing countries that are trying to improve their competitiveness and stimulate economic growth. As concluded in the study of Liu et Al. [6], the whole world is benefitting from the R&D inputs of advanced countries and international R&D spillovers help to improve technologies, but at the same time the worldwide technological gap is still enlarging.

Nowadays, governments focus on the development of innovation policies and strategies. This strategy assumes a steady increase in R&D spending; however, such spending does not necessarily go hand-in-hand with the efficient use of such funding. Such inefficiency may be one of the reasons for the deepening innovation gap.

The Association of Southeast Asian Nations (ASEAN) countries were selected for this analysis due to the dynamic growth of the region. Ten countries belonging to the ASEAN group are characterised by a wide variety of macroeconomic indicators, levels of development and innovation. Also, the experience of ASEAN countries in the areas of shaping and conducting innovation policies and creating national innovation systems are diverse.

Despite over 40 years of cooperation among ASEAN member states (AMS) in the fields of science, technology and innovation (STI), little has been achieved in the establishment of a region-wide innovation policy. Notwithstanding this, there have been many important initiatives at the regional level aimed at enhancing the innovation capacities of AMS. In 1978, the ASEAN Committee on Science and Technology (ASEAN COST) was established to promote and coordinate STI and human resource development policies across ASEAN, as well as to stimulate the intra- and extra-ASEAN transfer of technologies. Such technological transfer has been inscribed in the institutional framework of ASEAN summits and the ASEAN Ministerial Meetings on Science and Technology (AMMST). Both AMMST and ASEAN COST meet yearly to address STI policy issues, with the latter regularly hosting representatives of the European Union, China, Japan, South Korea and the United States. ASEAN COST has been instrumental in spearheading the creation of the first ASEAN Plan of Action on Science and Technology in 1985. At the second ASEAN Informal Summit on 15 December 1997 in Kuala Lumpur, the ASEAN Vision 2020 was announced, which pointed to STI policies as one of the pillars of a future technologically competitive ASEAN, with highly skilled workers and strong networks of R&D institutes. Shortly after the establishment of the ASEAN Economic Community (AEC) in December 2015, the ASEAN Plan of Action on Science, Technology and Innovation 2016–2025 was announced to promote an innovative, competitive, integrated and sustainable ASEAN by 2025. A set of strategic actions was aimed, among other things, at promoting cooperation between the public and private sector, small and medium entrepreneurship, skilled staff mobility, the transfer of R&D results and commercialisation. ASEAN COST has subsequently been relocated from the ASEAN Socio-Cultural Community (ASCC) to the AEC Blueprint 2025, thus stressing the role of innovation, investment in R&D and STI in improving productivity and industrial competitiveness of ASEAN. However, ASC Blueprint 2025 still addresses STI in the field of education to establish a creative, innovative and responsive ASEAN.

The aim of this research is to verify whether funds spent on R&D are used efficiently in ASEAN countries. Innovativeness is a popular topic discussed in numerous scientific articles, where it is studied through the prism of expenditure, its effects and innovation policy. However, the efficiency of R&D spending, while seldom addressed, is certainly worth exploring.

The rest of the paper is organised as follows. Section 2 presents a review of the literature regarding innovation policies in the ASEAN region and investigates innovation efficiency across ASEAN. Section 3 presents the research methodology. Section 4 describes the results of the data, while we discuss the meaning of these results in Section 5. Section 6 concludes this research.

2. Literature Review

2.1. Region-Wide Innovation Policy in ASEAN

To date, there have been few in-depth studies of innovation policies in ASEAN or their economic impacts. These studies include analyses by the Economic Research Institute for ASEAN and East Asia (ERIA). Hahn and Narjoko [7] studied innovation at the level of microenterprises and establishment in East Asian countries. Kuncoro [8] conducted research on innovation among medium and large enterprises in Indonesia under globalisation, finding a disorganised approach to R&D expenditure in the private sector between the mid-1990s and mid-2000s, with R&D declining in years 2000–2006. Ito [9] observed that many enterprises in Indonesia shifted from high-end to low-end products, which would suggest that the assumption of increased R&D expenditure and innovation might be inaccurate. Indonesia, like many AMS, has been challenged by the middle-income trap due to a development strategy relying on their cost advantage in the labour-intensive manufacturing/industrial market [10]. As argued by Ambashi et al. [11], the rapid rise in the cost of energy and related commodities upon which primary industries depend at the beginning of the 21st century has discouraged private sector innovation in many AMS and has led manufacturers to avoid high-end products. In this regard, there

is a lack of incentive to spend on R&D and innovation in the long run by both public and private sectors in many AMS [9].

The *Global Innovation Index 2019* rankings recognise eight AMS among 129 countries/economies (except Lao PDR and Myanmar), with Singapore in the highest rated (8th) position, followed by Malaysia, Vietnam, Thailand, the Philippines, Brunei Darussalam, Indonesia and Cambodia (in 35th, 42nd, 43rd, 54th, 71st, 85th and 98th positions, respectively). Malaysia was ranked second after China in the upper-middle income group, and Vietnam first in the lower-middle income group. Noteworthy, Singapore was ranked first in the Innovation Input Sub-Index 2019, surpassing, among others, Switzerland, the United States and the Scandinavian countries; however, with respect to the Innovation Output Sub-Index 2019, Singapore was only ranked in the 15th position. Noteworthy, South East Asia is described as a region of continuous improvement in innovation.

The United Nations Development Program (UNDP) assessed AMS in terms of the Technology Achievement Index (TAI), recognising an increase in regards to technological development and innovation in 1999–2008 in Brunei Darussalam, Malaysia, Singapore, Thailand, but especially in Vietnam. The Asian Development Bank Institute divided AMS into two categories in terms of technological and innovation capacities based on data from 1999 to 2008: Singapore as the frontier and the rest of AMS. Interestingly, while Singapore's performance proved to be comparable to that of Japan and South Korea, followers were ranked similarly to China and India.

Ambashi et al. [11] stressed that ASEAN as a whole is characterised by economic growth, surpassing the technological and innovation achievements of most individual AMS. Intal et al. [12] categorised these AMS into five groups, taking into account their stages of innovation (Table 1).

Intal et al. [12], building upon the work of Rasiah [13], studied the innovation policies of AMS in regards to basic and high-tech infrastructure, network cohesion and global integration. Less developed AMS (e.g., Cambodia, Lao PDR and Myanmar) are encouraged to stabilise politically, inspire demand for innovation, competition and openness to foreign markets. Indonesia, the Philippines, Thailand and Vietnam—classified to learning phase—are expected to learn-by-doing and to imitate, advance social institutions to play the role of formal intermediaries between economic agents, and to be open to foreign markets and foreign direct investment (FDI). As argued by Ambashi et al. [11], AMS might establish and develop their own national innovation system (NIS) based on the typology described above, taking into account various capabilities and limitations. A multidimensional approach to innovation policy could embrace both industrial and trade policy measures, R&D expenditure and incentives, as well as human resources development. Importantly, the national governments of AMS may consider seek for balance between market and non-market mechanisms of intervention to proceed with innovation-based industrialisation. In this regard, ASEAN as a whole might consider to work on a region-wide innovation policy that would induce synergy between the innovation policies of AMS.

Table 1. Typology of innovation policies in AMS.

Phase	Basic Infrastructure	High-Tech Infrastructure	Network Cohesion	Global Integration
(1) Initial conditions Cambodia, Lao PDR, Myanmar	Political stability and efficient basic structure	Emergence of demand for technology	Social bonds driven by the spirit to compete and achieve	Linking with regional and global markets
(2) Learning Thailand, Philippines, Indonesia, Vietnam	Strengthening of basic infrastructure with better customs and bureaucratic coordination	Learning-by-doing and imitation	Expansion of tacitly occurring social institutions to formal intermediary organisations to stimulate connections and coordination between economic agents	Access to foreign sources of knowledge, imports of material and capital goods, and inflows of foreign direct investmentIntegration in global value chain
(3) Catch-up Malaysia	Smooth links between economic agents	Creative destruction activities start through imports of machinery and equipment, licensing, and creative duplication	Participation of intermediary and government organisations in coordinating technologyinflows, initiation of commercially viable R&D	Licensing and acquisition of foreign capabilities, upgrading synergies through technology imports, emergence of strong technology-based exports
(4) Advanced	Advanced infrastructure to support meeting demands of economic agents	Developmental research to accelerate creative destruction activities. Frequent filing of patents in the United States starts	Strong participation of intermediary and government organisations in coordinating technology inflows, initiation of commercially viable R&D	Access to foreign human capital, knowledge links, and competitiveness in high-tech products and collaboration with R&D institutions
(5) Frontier Singapore	Novel infrastructure developed to save resource costs and stimulate short lead times	Basic research R&D labs to support creative accumulation activities generating knowledge. Technology shapers generate invention and design patents extensively	Participation of intermediary organisations in two-way flows of knowledge between producers and users	Connecting to frontier nodes of knowledge, and competitive exports of high-tech products

Sources: [11,12].

Both Japan and South Korea are examples of countries that have successfully established their NIS and developed domestic innovation with the support of properly designed industrial and trade policies, relying on strategic technological and knowledge resources imported from the Western economies [14]. In the case of Japan, licensing agreements, strategic alliances with Western businesses as well as reverse engineering have played a crucial role in their NIS. Using highly-skilled low-wage human resources, Japanese enterprises imitated Western products to create something new and unique as opposed to relying on the transfer of foreign technologies and knowledge through FDI, as has been the case in China and Singapore. Domestic industries were supported by the government through R&D and export incentive schemes. Similarly, instead of relying on inward FDI, South Korea developed an industrial policy aimed at the effective use of licensing agreements and arm's length connections with Western enterprises to build domestic innovation capacities, with strategic support dedicated to large business conglomerates. China's NIS has relied heavily on technology transfer through FDI since the late 1970s, attracting Western businesses with a network of economic and technological development zones supported by industrial policies and export promotion. Both central and local governments enhanced the development of industrial clusters through regulatory reforms, financial incentives and networking between SMEs, research institutes and universities [12]. In relation to China, India demonstrates relatively low manufacturing and innovation competitiveness, thus its innovation ecosystem has made less progress in such aspects as innovation and business sophistication and higher education. Inadequate R&D expenditure—far below the target of 2% of GDP set in 2013—has been dominated by the public sector, with special regard to the central government. On the other hand, while the private sector remains relatively active in R&D activities in pharmaceuticals, information and communications technology (ICT) and transportation, it is still only a relatively minor contributor [15]. Since the 1980s, India has attempted to become a kind of software hub, capitalising upon the prior success of South Korea and Taiwan. In 1990, the government established the Software Technology Parks (STPs), where Indian enterprises pioneered a Global Offshore Delivery Model.

2.2. National Innovation Policies in ASEAN

To date, six AMS have established NIS, categorised either to frontier phase of innovation policy (Singapore), catch-up phase (Malaysia) or learning phase (Indonesia, the Philippines, Thailand and Vietnam).

2.2.1. Indonesia

Indonesia has moved toward a service-led and knowledge-based economy since the mid-2000s. Previously, however, Indonesia's development strategy and economic growth used to rely heavily on natural resources and trade in the import-substitution industries, followed by the accumulation of labour and capital instead of science and technology. Key challenges included institutional and regulatory bottlenecks, as well as a deficit of highly-skilled workers. Importantly, both public and private R&D expenditure was government-centric and far below the average for the lower-middle income transitional economies. As observed by Ambashi et al. [11], foreign enterprises are discouraged from conducting R&D activities in Indonesia due to the relatively low quality of intellectual property rights (IPR) with no significant changes in this regard after 2010.

In 2010, the National Innovation Committee was established to make innovation policy more systematic and better governed; however, it was very soon dissolved under the guise of streamlining bureaucracy. The coordinating role of the Directorate General for Innovation Strengthening, under the supervision of the Ministry of Research, Technology and Higher Education (MRTHE), is highly questionable due to lack of political mandate in multilayered hierarchy. Despite the government-centric character of Indonesian R&D projects, they were historically poorly coordinated and short-lived because of a lack of any formal, integrated NIS with no governing framework. Indonesia's NIS (SINAS), which is still under implementation, was established on the basis of the Medium-Term Development

Plan 2015–2019, which aimed to increase Indonesia’s capacities in STI. This initiative should be regarded as a step toward the implementation of more effective and formal innovation system.

2.2.2. Malaysia

In Malaysia, dynamic economic growth and technological development has been enhanced since the 1980s by inward FDI, moving this economy up in the value chain from primary to manufacturing products. Among key documents addressing science, technology and innovation development at both macro and micro level, there has been the First National Science and Technology Policy (NSTP1) 1986–1989; the Industrial Technology Development: A National Action Plan 1990–2001; Second National Science and Technology Policy (NSTP2) 2002–2010; and National Policy on Science, Technology and Innovation, 2013–2020. Among the key objectives of the strategies were enhancing national R&D capacities, the commercialisation of R&D results through the National Innovation Model, establishing partnerships between public universities and industries, and the development of new knowledge-based industries.

The Malaysian government failed to achieve two of the basic objectives of the NSTP2, assuming an increase in R&D expenditure (up to 1.5% of GDP) and personnel (up to 60 per 10,000 inhabitants) by 2010. The National Policy on Science, Technology and Innovation, 2013–2020 put an emphasis on sharing and communicating the objectives of STI policies among stakeholders, enhancing R&D capacities of both public and private sectors, and promoting good governance to secure high quality institutional and regulatory framework of STI. The New Economic Model (NEM), announced in 2010, emphasised innovation. The NEM (2010) departed from the strategy of manufacturing export based on low-cost labour immigration in favour of domestically-developed innovation capacities.

The Malaysian NIS has evolved gradually, with the Ministry of Science, Technology and Innovation (MOSTI) and Ministry of Higher Education (MOHE) playing key roles. MOSTI supervises several entities involved in biotechnology, ICT, industry, sea-to-space as well as ST, such as National Institutes of Biotechnology Malaysia (NIBM) and Academy of Sciences (ASM), while MOHE governs a network of centres of excellence with solid international reputation, mainly thanks to research results and publications [16]. Both MOSTI and MOHE are primary donors to R&D activities in public and private sector, however, other ministries such as Ministry of International Trade and Industry, Ministry of Energy, Green Technology and Water, the Ministry of Agriculture and Agro-based Industry, and the Ministry of Finance provide financing schemes to selected stakeholders.

As already noted, Malaysia is currently in the catching-up phase, thus still needs to improve and advance its NIS to follow frontiers, such as Singapore. Firstly, there is a need to consolidate the numerous departments, agencies and institutes inside the NIS to avoid overlaps and to make interconnections between the different schemes and initiatives, making these clearer and more transparent. Secondly, the availability of R&D incentives for industry are limited because of the administrative burden and information deficit. Thirdly, universities could be more active in knowledge transfer, spill-over and dissemination, and thus be more flexible and open to various stakeholders. Fourth, the number of patent applications might be increased, including involvement of SMEs and better IP governance.

2.2.3. The Philippines

The Philippines had no emphasis on innovation policy until the late 2000s; however, many STI plans and projects were launched following 1993 under the Ramos administration. The first National Innovation Strategy (2000–2010), or Filipinnovation, was focused on investment in human capital, STI and related management systems, and upgrading the Filipino mindset. There were four strategies in the Philippine Development Plan 2011–2016 aimed at making national industries and services sectors globally competitive and innovative. The Duterte administration (2016–2022) implemented a strategy of promoting and increasing innovation under four national programs: the Collaborative Research and Development to Leverage Philippine Economy Program (CRADLE), the Niche Centers in the Regions

for R&D Program (NICER), the R&D Leadership Program (RDLead) and the Business Innovation through S&T for Industry Program.

The Philippines are currently classified as being in the learning phase; nevertheless, there are many important obstacles to implement and develop NIS. Firstly, there is a need to enhance cooperation and spill-over among various stakeholders, such as industry, government and academia, including specificity of sectors and companies involved. Secondly, intellectual property rights (IPR) could be better protected and effective, striking a balance between incentives and restrictions dedicated to FDI. Thirdly, regular cooperation between universities and the private sector is necessary to develop products and to commercialise R&D results. Fourth, both public and private R&D expenditure might be higher, including introduction of effective financing schemes dedicated to start-ups under internationally recognised standards.

2.2.4. Singapore

Singapore has experienced dynamic economic growth and technological development since 1965 due to inward FDI attracted by a business-friendly macroeconomic environment, low taxes and a highly-skilled labour force. In 2016, the Research, Innovation and Enterprise 2020 Plan was launched to increase the innovation capacities of the private sector. Financial resources are distributed within the white space under the supervision of the National Research Foundation.

An important component of Singapore's innovation policy is the development of knowledge-based industrial clustering [17]. The timing of government intervention depends on the maturity and specificity of a sector. The Economic Development Board (EDB) was established to serve as a one-stop shop to attract FDI and talents under the slogan of Singapore's innovation strategy: 'Home for Business, Home for Talent, Home for Innovation'. The geographical proximity of rapidly growing markets, such as China and India, has made Singapore a regional hub for many Western multinational corporations (MNCs) willing to tap into the economic dynamism in this part of the world.

It is critical for Singapore to maintain a competitive and consistent institutional regulatory framework for NIS, and to keep all relevant stakeholders, including the private sector, actively involved. As concluded by Ambashi et al. [11], Singapore is challenged nowadays by its transition from being a technology adopter to a technology innovator through the development of a technological entrepreneurial community. It seems then that knowledge-based industrial clustering is the key.

2.2.5. Thailand

Thailand experienced dynamic economic growth from the 1960s to the mid-1990s due to its successful transition from an agrarian to a manufacturing economy by attracting inward FDI. However, industrialisation with inadequate development of domestic technological capacities, accompanied by rising labour shortages and cost pressure, has resulted in a middle-income trap. This, in turn, has resulted in a growing emphasis on innovation to increase productivity and development through industrial upgrading instead of the diversification of export markets and sectors.

In institutional terms, Thailand's innovation policy is fragmented and ineffective, including the functioning of NSTI Policy Committee and the National Research Council. Next to tax incentives, under 12th National Economic and Social Development Plan, the government assumes an increase in the R&D expenditures up to 2% of GDP with private sector shares up to 70% by 2021. In order to increase R&D personnel, the Thai government has established a set of scholarship schemes serviced by the Ministry of Science and Technology (MOST), as well as selected government agencies, such as the Thailand Research Fund, the Office of the Higher Education Commission, and the Institute for the Promotion of Teaching Science and Technology.

Thailand, is currently categorised as being in the learning phase. As such, Thailand needs to increase the level of public investment in R&D and to make the system more demand-driven, to implement transparent systems of evaluation and monitoring of public R&D expenditure, to establish

an institutional core/coordinator of innovation policy and to promote human resources development, considering, among others, unfavourable demographic trends.

2.2.6. Vietnam

Vietnam has evolved gradually from centrally planned to socialist market economy, experiencing high rates of growth in the 1990s and 2000s. The innovation-oriented *Đổi Mới* policy (Pillars of the policy were as follows: development of institutional frameworks of the market economy; macroeconomic stability; and economic integration at regional and global level) since the mid-1980s has addressed both micro and macro level innovation. Nevertheless, *Đổi Mới* has proved insufficient to maintain high quality growth and labour productivity in the long term.

The institutional frameworks underpinning Vietnam's innovation policy was strengthened by the establishment of, among others, the National Council for Science and Technology Policy, the State Agency for Technology Innovation and the National Foundation for Science and Technology Development. In 2005 and 2009, IPR regulations were updated to meet the standards of international innovation system. STI development and innovation were prioritised in Socio-economic Development Strategy 2011–2020 and the Socio-economic Development Plan 2016–2020.

In conclusion, there are a number of important obstacles needing to be overcome before making the transition from the learning to the catching-up phase in terms of innovation policy. Firstly, the institutional environment of innovation policy is inconsistent, with different agencies and institutions involved in the design and implementation of STI policy, including IPR. Secondly, systems of financing R&D are ineffective, primarily being sponsored by public expenditure. Thirdly, R&D personnel are limited and lack higher skills due to the poor performance of the tertiary education system in Vietnam. Fourthly, cooperation between industry and academia, including technology transfers and spill-overs, is limited and weak, mainly because of limited resources. While addressing these obstacles, the Vietnamese central government should put emphasis on enhancing the private sector's involvement in innovation.

As previously observed, three less developed AMS (i.e., Cambodia, Lao PDR and Myanmar) lack NIS, prioritising different economic and social development objectives, such as poverty reduction, as well as the modernisation of agriculture and infrastructure. In both the Lao PDR and Myanmar, the Ministry of Science and Technology (MOST) is responsible for STI policies and STI legislation, which is expected to provide the framework for the future NIS. Importantly, less developed AMS cooperate under such programs as Science and Technology Research Partnership for Sustainable Development (SATREPS) and e-ASIA Joint Research Program (e-ASIA JRP) with institutions from Japan and South Korea, including Japan International Cooperation Agency (JICA), Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan Science and Technology Agency (JST) and Korea International Cooperation Agency (KOICA) [18]. On the other hand, resource-abundant Brunei Darussalam, which has not been classified in terms of the innovation policy typology, is currently involved in two Japanese programs (e.g., ASEAN exchanges of the Institute of Advanced Energy at Kyoto University and solar energy generation experimental facility of Mitsubishi Corporation). Considering rising R&D expenditure and the construction plans for the Bio-Innovation Corridor in the National Development Plan, Brunei Darussalam seems to be preparing itself for the post-oil and -gas era in the economic development.

2.3. Studies on Innovation Efficiency for ASEAN

Data envelopment analysis (DEA) studies of R&D spending efficiency are an increasingly popular topic in the scientific literature. The choice of variables and models leads to different conclusions and recommendations. Nevertheless, empirical studies on R&D spending efficiency are still limited and need to be supplemented, especially with respect to the developing countries of ASEAN economies. Table 2 presents a cross-country analysis of DEA innovation studies, which include some of the ASEAN and Asia-Pacific countries.

Table 2. Cross-country innovation studies for Association of Southeast Asian Nations (ASEAN) and ASIA-PACIFIC countries using DEA methodology.

Input and Output Variables	DEA Model Used	List of Countries in the Studied Sample	Efficient Countries
<p>Input variables: imports of goods and commercial services, gross domestic expenditure on research, degree of private business involvement in R&D, Employment in R&D, Total educational expenditures.</p> <p>Output variables: External patents by resident, Patents by a country's residents, National productivity</p>	Nasierowski W., Arcelus F.J. [18]	46 countries, 14 from ASEAN and ASIA-PACIFIC: Australia, China, Hong Kong, India, Indonesia, Israel, Japan, Malaysia, New Zealand, Philippines, Singapore, South Korea, Taiwan, Thailand	Fully efficient (in all three models and all two periods of study): Japan, Taiwan Partially efficient (at least in one model or in one year): Hong Kong
<p>Input variables: BERD, GERD, GOVERD, HERD Researchers.</p> <p>Output variables: Weighted Patents, Unweighted Patents</p>	Cullmann A., Schmidt-Ehmcke J., Zlozczysti P. [19]	28 countries, 3 from ASEAN and ASIA-PACIFIC: China, Japan, South Korea.	Among Asia countries Japan was the most efficient, then South Korea. China was characterized by a very low rate of knowledge production, suggesting that they are still in the phase of imitating and replicating existing technologies.
<p>Input variables: number of scientists in R&D, expenditure on education and R&D expenditures.</p> <p>Output variable: patent counts, royalty incomes and license fees, high-technology export and manufacturing exports.</p>	Abbasi E., Hajjoseini H., Haukka S. [20]	42 countries, 10 from ASEAN and ASIA-PACIFIC: Australia, China, Hong Kong, Iran, Israel, Japan, Kyrgyzstan, New Zealand, South Korea, Thailand.	Study results are very unclear and hard to understand.
<p>Input variables: General Expenditures on R&D (GERD), Total R&D personnel.</p> <p>Output variables: WIPO patents granted, Scientific and technical journal articles, High-technology and ICT services exports.</p>	Cai Y. [21]	22 countries, 4 from ASEAN and ASIA-PACIFIC: China, India, Japan, South Korea.	India and China have relatively high efficiency score and good ranking

Table 2. *Cont.*

Input and Output Variables	DEA Model Used	List of Countries in the Studied Sample	Efficient Countries
<p>Input variables: R&D expenditure stocks (million US dollars in year 2000); Total R&D manpower (full-time equivalent units).</p> <p>Output variables: patents applied for in the EPO and USPTO, Scientific journal articles, Royalty and licensing fees. (million US dollars in year 2000).</p>	Chen C.P., Hu J.L., Yang C.H. [22]	24 countries, 3 from ASEAN and ASIA-PACIFIC: Japan, Singapore, South Korea.	South Korea was efficient in some years of period of study.
<p>Input variables: prior accumulated knowledge stock participating in downstream knowledge commercialization with incremental knowledge; consumed full-time equivalent labor for non-R&D activities; number of full-time equivalent scientists and engineers; incremental R&D expenditure funding innovation activities; prior accumulated knowledge stock breeding upstream knowledge production.</p> <p>Output variables: Number of patents granted by United States Patent and Trademark Office; international scientific papers; added value of industries; export of new products in high-tech industries.</p>	Guan J., Chen K. [23]	22 countries, 3 from ASEAN and ASIA-PACIFIC: Japan, Singapore, South Korea.	Japan was efficient in two models.

Source: Authors' own study on literature review.

Nasierowski and Arcelus [19] studied the NIS efficiency of 46 countries, reporting differences in efficiency and the components of NIS policies (i.e., scale and congestion). This assessment of the impact of R&D on a country's productivity led the authors to conclude that most of the economies subjected to analysis were operating under a variable return to scale (VRS) model. Authors remarked at the dichotomy among countries in terms of their commitment to technological efforts; while some overinvested in certain technological domains, negatively impacting their overall efficiency, others underinvested in R&D, recording reduced returns. The latter empirical result seemed to confirm many of the findings present in the literature.

Cullmann, Schmidt-Ehmcke and Zloczynski [20] investigated the relative efficiency of knowledge production in OECD countries based on intertemporal frontier estimation. The authors addressed the impact of the regulatory environment using the single bootstrap procedure described by Simar and Wilson (2007). The authors confirmed the hypothesis that limited competition, encouraged by entry barriers in regulatory dimensions, negatively impacts R&D efficiency due to the ineffective allocation of resources and eroding incentives to innovate because of the lack of pressure imposed on existing companies by new market entrants, with special regard to entrepreneurs.

Abbasi, Hajihoseini and Haukka [21] proposed a DEA-based virtual index consisting of three input and four output indicators to measure the relative innovativeness of economies, further adopting a multi-stage virtual benchmarking process to propose best and rational benchmarks for NISs assessed as inefficient. The authors found the Tobit and ordinary least squares (OLS) regression model as a useful instrument for providing an empirical explanation of changes in the performances of individual economies with inefficient NIS. It was concluded that there is a potential to improve the efficiency of individual economies without additional inputs to NISs. Moreover, a rapid increase in the contribution of these countries to R&D would not improve their performance. Abbasi et al. [11] stress that innovation may be found as business-driven rather than technology-driven, taking into account that both the increased trade in goods and services in terms of shares in GDP and women's participation in industry might improve the efficiency of NIS.

Cai [22] adopted an NIS approach and new growth theory to calculate the efficiency of 22 economies, including BRICS and the G7. The author found that the first of these groups were highly diversified in respect to NIS performance, with China and India ranking relatively high. Key determinants of NIS efficiency include ICT infrastructure, education system, market environment, economies of scale, governance, natural resources, external links and enterprise R&D. The latter was identified as the most important in the context of the efficiency of NIS. On the other hand, Cai [22] also appreciated the impacts of ICT infrastructure, economies of scale and openness as critical for the diffusion of technologies and knowledge, and thus the efficiency of NIS. The BRICS economies were characterised as natural resources-dependent, with low quality of governance, threaten by the middle-income trap. Therefore, a set of reforms was recommended to enhance transformation into the innovation-driven growth pattern.

Chen et al. [23] investigated the efficiency of R&D using a panel dataset of 24 countries with selected output-oriented indices. An empirical study indicated that economies differed in terms of journal publications, whereas the results of R&D efficiency in patents and royalties proved to be quite similar. Chen et al. [23] noted considerably positive impacts of an innovation environment's components, such as R&D intensity, protection of IPRs, as well as knowledge stock and human capital accumulation on R&D efficiency indices. Furthermore, enterprise R&D, both funded by the private business sector and foreign capital, proved to be an important trigger of improvement on the R&D efficiency index in respect to licensing fees, royalties and patents. On the other hand, the journal-oriented R&D efficiency index was positively influenced by the R&D intensity of higher education institutions.

Guan and Chen [24] proposed a relational network DEA model to measure the efficiency of NIS through the decomposition of the innovation process into a network with a two-stage innovation production framework, consisting of an upstream knowledge production process (KPP) and a

downstream knowledge commercialisation process (KCP). Furthermore, the authors studied the effects of a policy-based institutional environment on innovation efficiency using a second step, partial least squares regression, to address such problems as multicollinearity, small datasets and a limited number of distribution assumptions. In the case of most OECD countries studied in the paper, a non-coordinated relationship between upstream R&D efficiency and downstream commercialisation efficiency was identified, resulting in significant rank differences. It was found that the overall innovation efficiency of NIS was considerably impacted by downstream commercialisation efficiency performance, thus this component of the innovation production network should be addressed by the future innovation-oriented policies in OECD economies. The empirical results of partial least squares regression analysis led to the formulation of a set of recommendations in terms of public policy interventions by the government aimed at improvements in NIS performance. Specifically, in the case of countries assessed as innovation leaders in terms of CRS efficiency measures (i.e., with relatively higher KPP and KCP efficiency performance), an improvement in innovation output may be difficult to achieve without increasing innovation input, while in the case of countries categorised as innovation followers (i.e., those with relatively lower KPP and KCP efficiency performance), both components require improvement. Without appropriate policies in place, an increase in innovation input will not improve innovation outputs or outcomes in these second group of countries. As a result, improved efficiency of the country may result in higher output and outcomes without additional innovation inputs. On the other hand, countries with diversified KPP and KCP efficiencies are recommended to introduce more stage-specific innovation policies; for instance, in the case of lower KPP and higher KCP efficiency performance, it might be useful to strengthen the protection of IPRs and to finance schemes for R&D projects, while countries with higher KPP and lower KCP should enhance market-driven innovation.

While the study of R&D spending efficiency is not in terms of economic analysis, empirical evidence still a fundamental requirement. This paper makes a number of contributions to the existing R&D spending efficiency literature. Firstly, this article provides a study of R&D efficiency in the context of ASEAN economies. We found no prior R&D efficiency studies published in the ASEAN or Asia Pacific context; as such, this paper fills a gap in the literature. The studies presented in Table 2 took into account only some of the ASEAN and Asia Pacific countries together with other economies from around the world. An analysis of countries from the same region will allow for the identification of regional innovative frontiers. Secondly, this analysis focuses on a long period of 17 years, from 2000 to 2016. Other studies usually took into account significantly shorter periods. Such a long period will allow for the identification of efficiency trends in the analysed economies.

3. Methodology

The main research method used in this study is the DEA methodology, which is a nonparametric method that relies on linear programming benchmarking to assess the relative efficiency of decision-making units (DMUs) with multiple outputs and multiple inputs. This methodology was introduced by Farrell [25] and developed by Charnes et al. [26]. The maximum performance value for each DMU relative to all DMUs in the studied group can be calculated with DEA. DEA constructs the efficiency production frontier over the data points which serves as a benchmark for efficiency measures. DEA is used to determine which DMUs operate as efficiency frontiers and which DMUs do not; moreover, this approach allows for the benchmarking of distance from the frontier at the nearest point [27]. Efficient DMUs are not necessarily production frontiers, but rather best-practice frontiers [28]. It is important to note that DEA measures relative technical efficiency, because DEA measures are based on a reference group of units that are compared with each other and engaged in the same production process.

DEA can use input or output oriented models. An input-oriented model seeks to identify technical efficiency as a proportional reduction in input usage with outputs remaining unchanged. Efficiency in an output-oriented model is represented by a proportional increase in outputs, while the proportion of inputs remains unchanged [29]. DEA models can use constant return to scale (CRS) or variable

return to scale (VRS). However, the interpretation of VRS is much more complex than CRS, with VRS used only to control increasing or decreasing returns [30]. Slack-based context-dependent DEA is important extension of DEA methodology, which illustrate target of improvement for the inefficient DMUs. Step-by-step improvement is a useful way to improve performance, and the benchmark target for each step is provided based on the evaluation context at each level of efficient frontier. The slack-based context-dependent DEA allows for a more complete evaluation of the inefficiency of a DMU's performance [31].

Relative efficiency is calculated as the ratio of the weighted sum of outputs to the weighted sum of inputs [32]. The principle of the CRS model is maximisation of this ratio, shown below in Equations (1)–(3) [26]:

$$\text{Max}\theta_0 = \frac{\sum_{s=1}^S u_r y_{rj}}{\sum_{m=1}^M v_m x_{mj}}, \quad (1)$$

subject to:

$$\frac{\sum_{s=1}^S u_r y_{rj}}{\sum_{m=1}^M v_m x_{mj}} \leq 1, \quad (2)$$

$$u_r, v_m \geq 0; s = 1, \dots, S; m = 1, \dots, M$$

where:

u_s —weight of output

v_m —weight of input

y_{rj} —output

x_{mj} —input

VRS calculation requires an additional constraint equation [33]:

$$\sum n_{i=1} \lambda_j = 1 \quad (3)$$

where θ is the efficiency score calculated for each DMU, λ is the corresponding solution vector for the optimisation and n is the number of DMUs.

The DEA methodology has many advantages. There is no need to define the function form of the relationship between input and outputs, and it can be used for the analysis of processes where the relationship between variables is of an unknown nature [34]. Secondly, DEA allows for the analysis of multiple inputs and outputs at the same time. Also, there is no need for a priori information regarding which inputs and outputs are the most important in the efficiency assessment [35]. Moreover, the causes of inefficiency can be analysed and quantified for each DMU [36].

Nevertheless, the DEA methodology also has some limitations. DEA does not take into account qualitative variables, which may result in some important factors being omitted from the analysis. Some authors are critical of DEA as overestimating efficiency, underlining that DEA provides information more about dominant DMUs [34]. Zhang and Bartels [37] also described a negative correlation between efficiency and the number of DMUs, with an increase in the number of DMUs reducing technical efficiency. Therefore, DEA necessitates the careful interpretation of results.

These issues also present certain limitations with respect to the current research. Firstly the variables we focused on were chosen based on available international statistics. The selected group of inputs and outputs have a crucial impact on the results of the efficiency measurement. Secondly, we initially selected only ASEAN economies for analysis, which gave us a smaller number of DMUs. To increase number of DMUs, additional Asia Pacific economies were selected for analysis. The analysis would be more complex if this study had analysed additional indicators, such as scientific and technical journal articles, human capital in innovation, etc. Nevertheless, expanding the number of indicators would also reduce the discriminatory power of the DEA. Lastly, it is necessary to observe that in the

analysed case, DEA is only an assessment of relative efficiency for the selected group of 15 countries. Expanding the research group may render the DMUs analysis ineffective.

4. Data

Calculations for the purposes of examination of the relationship between innovation expenditure and innovation results were performed in a Microsoft Excel spreadsheet and DEA Frontier software. From the ASEAN group, only seven (i.e., Indonesia, Cambodia, Malaysia, Philippines, Singapore, Thailand, and Vietnam) out of 10 countries were analysed due to a lack of available statistics. To obtain comparable peer groups and an appropriate number of DMUs, the study was extended to an additional eight countries from the Asia Pacific region (i.e., Australia, China, Hong Kong, India, Japan, Korea, Sri Lanka, New Zealand). The research period is inclusive of 17 periods from 2000 to 2016. The research methodology was DEA.

Diagnostic variables were selected based on available data from the World Bank. Input indicators included annual public and private spending on innovation (as % of GDP), represented by RDE. The four output indicators chosen for analysis were as follows: (a) high-technology exports as a percentage of manufactured exports, (b) patent applications (PA) according to WIPO by priority year for million inhabitants, (c) TA for million inhabitants, and (d) ICT exports as a percentage of manufactured exports. We took into consideration a number of important principle with respect to the selection of variables [38].

$$n \geq 3 * (s + m) \tag{4}$$

where

- s—number of inputs
- m—number of outputs
- n—numbers of DMUs

Given the limited data with respect to ASEAN countries, we added data from several Asia Pacific economies so as to produce more reasonable results via the DEA methodology. Based on the aforementioned formula, at least 15 DMUs should be analysed. It is important to take this rule into account otherwise the results may be erroneous, with some countries appearing more efficient when in reality they are not. In some cases, if the number of DMUs cannot be increased due to a lack of data, DEA window analysis can be applied. Another important rule in DEA is the coincidence between the inputs and outputs. Correlation coefficients between inputs and outputs should be verified. Output variables with a positive correlation to input variables can remain in the model. Pearson’s linear correlation coefficient was also calculated [39]:

$$r_{ij} = \frac{cov(X_i Y_i)}{s_i s_j} \tag{5}$$

where:

- cov (X_i Y_i)—covariance between *i*-variable and *j*-variable
- s_i—standard deviation of variable X_i
- s_j—standard deviation of variable X_j.

All selected variables fulfilled this assumption for all years from 2000 to 2016.

Table 3 presents the final set of analysed variables with their descriptions. Table 4 shows the input and output data for ASEAN and Asia Pacific countries in 2016. Due to the lack of available data, some indicators are marked ‘*’, indicating that the values had been taken from the preceding or the following period, or their average.

Table 3. Indicators and sources.

Variable	Full Indicator Name	Units	Source
RDE	The annual public and private spending on innovation	(as % GDP)	World Bank
PA	Number of patent applications, total *	(Per million inhabitants)	World Bank
TA	Trademark applications, total *	(Per million inhabitants)	World Bank
HTE	Exports of high-tech products	(% of exports)	World Bank
ICT	Exports of ICT products	(% of exports)	World Bank

Note: WIPO. Source: [40]. * lack of available data, some indicators are marked.

Table 4. Diagnostic data of inputs and outputs—ASEAN and ASIA-PACIFIC countries in 2016.

2016	Country/Indicators (2016)	RDE	HTE	TA	PA	ICT
1	AUS	1.58	14.78	2986.31	1172.78	1.31
2	CHN	2.11	25.24	1526.41	970.87	26.50
3	HKG	0.76	12.12	4931.58	1920.78	49.99
4	IDN	0.07	5.79	241.04	32.70	3.37
5	IND	0.63	7.13	223.76	172.56	0.95
6	JPN	3.14	16.22	1283.39	2507.05	8.31
7	KHM	0.12	0.43	104.43	4.12	1.90
8	KOR	4.23	26.58	3548.96	4075.07	22.27
9	LKA	0.10	0.84	510.68	27.02	0.39
10	MYS	1.30	42.97	1253.94	232.02	30.53
11	NZL	1.23	10.14	4824.00	1360.69	1.03
12	PHL	0.14	55.10	317.23	33.09	43.21
13	SGP	2.20	48.85	4055.44	1958.17	33.64
14	THA	0.63	21.51	749.50	113.56	15.79
15	VNM	0.37	26.93	517.24	55.28	31.24
16	Average for ASEAN countries	0.69	28.80	1034.12	346.99	22.81
17	Average for ASIA-PACIFIC countries	1.24	20.98	1804.93	975.72	18.03

Note: AUS—Australia, CHN—China, HKG—Hong Kong, IDN—Indonesia, IND—India, JPN—Japan, KHM—Cambodia, KOR—Korea, Rep., LKA—Sri Lanka, MYS—Malaysia, NZL—New Zealand, PHL—Philippines, SGP—Singapore, THA—Thailand, VNM—Vietnam. Source: Authors' own study based on [40].

5. Empirical Results and Discussion

The authors have chosen the input-oriented model to verify whether a DMU under evaluation can reduce its inputs while keeping the outputs at their current levels. The authors used the CRS and VRS methods. CRS reflects the fact that outputs will change by the same proportion as inputs are changed. In contrast, VRS reflects the fact that production technology can exhibit increasing, constant

and decreasing returns to scale. The results of CRS are presented in Table 5, while the VRS results are shown in Table 6.

Table 5. The efficiency of spending on innovation in 2016 (constant return to scale (CRS)).

DMU No.	DMU Name	Input-Oriented CRS Efficiency	Sum of λ	RTS	Optimal Lambdas (λ) with Benchmarks	BDMU	λ	BDMU
1	AUS	0.30563	0.743	Increasing	0.608	dmu3	0.134	dmu12
2	CHN	0.20323	0.848	Increasing	0.499	dmu3	0.348	dmu12
3	HKG	1.00000	1.000	Constant	1.000	dmu3		
4	IDN	0.67610	0.138	Increasing	0.043	dmu3	0.096	dmu12
5	IND	0.13098	0.198	Increasing	0.088	dmu3	0.110	dmu12
6	JPN	0.31664	1.312	Decreasing	1.305	dmu3	0.007	dmu12
7	KHM	0.15226	0.041	Increasing	0.020	dmu3	0.021	dmu12
8	KOR	0.38256	2.137	Decreasing	2.121	dmu3	0.016	dmu12
9	LKA	0.78184	0.104	Increasing	0.104	dmu3		
10	MYS	0.19970	0.941	Increasing	0.207	dmu3	0.734	dmu12
11	NZL	0.60543	0.978	Increasing	0.978	dmu3		
12	PHL	1.00000	1.000	Constant	1.000	dmu12		
13	SGP	0.39107	1.673	Decreasing	1.008	dmu3	0.665	dmu12
14	THA	0.23610	0.491	Increasing	0.129	dmu3	0.362	dmu12
15	VNM	0.36884	0.713	Increasing	0.063	dmu3	0.650	dmu12

Source: Authors' calculations in DEA Frontier.

Table 6. The efficiency of spending on innovation in 2016 (VRS).

DMU No.	DMU Name	Input-Oriented VRS Efficiency	λ	DMU	λ	BDMU	λ	BDMU
1	AUS	0.31339	0.604	HKG	0.291	IDN	0.105	PHL
2	CHN	0.20667	0.497	HKG	0.173	IDN	0.331	PHL
3	HKG	1.00000	1.000	HKG				
4	IDN	1.00000	1.000	IDN				
5	IND	0.19176	0.074	HKG	0.908	IDN	0.018	PHL
6	JPN	0.54461	0.723	HKG	0.272	KOR	0.004	SGP
7	KHM	0.57225	1.000	IDN				
8	KOR	1.00000	1.000	KOR				
9	LKA	1.00000	1.000	LKA				
10	MYS	0.20083	0.200	HKG	0.065	LKA	0.735	PHL
11	NZL	0.60586	0.976	HKG	0.024	LKA		
12	PHL	1.00000	1.000	PHL				
13	SGP	1.00000	1.000	SGP				
14	THA	0.25647	0.070	HKG	0.564	LKA	0.366	PHL
15	VNM	0.39229	0.048	HKG	0.309	IDN	0.643	PHL

Source: Authors' calculations in DEA Frontier.

Among Asia-Pacific counties, only two were found to be efficient in 2016 under the CRS assumption for the overall process: Hong-Kong and the Philippines. The Philippines was found to be the only an

efficiency frontier among ASEAN countries. The remaining countries scored between 0 and 1, and according to DEA methodology can be identified as inefficient. These countries can improve their efficiency or reduce their inefficiencies proportionately by reducing their inputs. In 2016, India obtained the worst result (0.131); while among ASEAN countries, we found that Cambodia, scored only 0.152. Both economies could improve their efficiency by reducing R&D expenditure up to 86.90% (1–0.131) and 84.80% (1–0.152), respectively. The DEA methodology also allow us to identify benchmarks (BDMU), which are effective units. Ineffective units should follow the innovation polices of benchmark DMUs or develop organisational solutions in order to recognise the best practices and their possible adaptation to improve their expenditure transformation processes. For example, the benchmark for New Zealand is Hong-Kong, while the benchmark for Thailand is Hong-Kong and the Philippines. Thailand should attempt to become more like the Philippines than as Hong-Kong, as suggested by higher lambda weight, respectively $\lambda = 0.362$, $\lambda = 0.129$. For overall process in 2016, two countries (i.e., Hong-Kong and the Philippines) are scale efficient, and have optimal returns-to-scale. This can be seen in Table 3 in the RTS column. In addition, 10 countries (i.e., Australia, China, Indonesia, Cambodia, Sri Lanka, Malaysia, New Zealand, Thailand and Vietnam) have an increasing returns-to-scale, while three countries (i.e., Japan, Korea and Singapore) have a decreasing returns-to-scale.

Under VRS, we make the assumption that there are six efficient countries: Hong-Kong, Indonesia, Korea, Sri Lanka, Philippines and Singapore. From the ASEAN region, the efficiency frontiers include Singapore, the Philippines and Indonesia. Similar to the CRS model, India and China were the least efficient (0.19176 and 0.20667, respectively). It is noteworthy that more countries are efficient under the VRS assumption, as all relatively CRS efficient DMUs are scale efficient too.

The DEA methodology allows us to investigate potential improvements, which is presented in Table 7 for all indicators in 2016 for both CRS and VRS methodologies. Less efficient countries might become more efficient by implementing proposed improvements. In terms of inputs, potential improvement refers to the percentage difference between the target amount and the actual amount of input and output for each country. In order to improve efficiency, a country can increase its outputs or decrease its inputs. It is noteworthy to mention that improvement suggestions obtained by countries for CRS and VRS models are not the same. In CRS, two out of 15 countries (i.e., Hong Kong and the Philippines) are efficient. Based on potential improvements results from DEA model can be concluded that Australia, China, Indonesia Japan, Korea and Singapore in order to improve the efficiency index should concentrate on increasing their number of trademark applications. In order to become more efficient Australia, China, Indonesia, India, Japan, Korea, Sri Lanka, Malaysia, New Zealand, Singapore and Thailand need to focus on increasing their ICT exports. Similar recommendations can be deduced from the second model (VRS). Also, inefficient countries can become efficiency frontiers by decreasing their R&D expenditure; this is especially true when these expenditures are very high and the country is not able to use all of them due to, for example, a lack of technology. However, it is worth paying attention to the pressure of politics.

To expand the analysis, the authors assessed the efficiency of spending on innovation for an additional 16 years (2000–2016), for which a similar procedure was carried out. The final results are presented in Tables 8–10.

The analysis calculated efficiency indicators for several ASEAN and Asia Pacific economies. The research input-oriented model was chosen using CRS and VRS methodology for analysis. In addition, the average efficiency indicator was calculated for a change in indicator between 2000 and 2016. The average efficiency score is the arithmetic average of efficiency scores across 17 years. Table 8 shows the final efficiency index for CRS and Table 9 for VRS.

Table 7. Potential improvement in outputs at the current level of inputs and outputs for ASEAN and ASIA-PACIFIC countries in 2016.

DMU No.	DMU Name	Input Slacks			Output Slacks			CRS Model Target			Efficient Output Target			Potential Improvement for Inputs or Outputs (%)						Potential Improvement for Inputs or Outputs (Values)															
		RDE	HTE	ICT	TA	PA	ICT	TA	PA	DMU No.	DMU Name	RDE	HTE	ICT	TA	PA	ICT	TA	PA	RDE	HTE	ICT	TA	PA	ICT	TA	PA	RDE	HTE	ICT	TA	PA	ICT	TA	PA
1	AUS	0.00	0.00	0.00	56.02	0.00	34.91	1	AUS	0.48	14.78	3042.33	1172.78	36.22	-69.44%	0.00%	1.88%	0.00%	2670.43%	-1.09	0.00	56.02	0.00	56.02	0.00	34.91	-1.09	0.00	56.02	0.00	56.02	0.00	56.02	0.00	34.91
2	CHN	0.00	0.00	0.00	1047.14	0.00	13.52	2	CHN	0.43	25.24	2573.55	970.87	40.01	-79.68%	0.00%	68.60%	0.00%	51.01%	-1.68	0.00	1047.14	0.00	1047.14	0.00	13.52	-1.68	0.00	1047.14	0.00	1047.14	0.00	13.52		
3	HKG	0.00	0.00	0.00	0.00	0.00	0.00	3	HKG	0.76	12.12	4931.58	1920.78	49.99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	IDN	0.00	0.00	0.00	52.53	2.90	4	IDN	0.05	5.79	241.04	85.23	6.27	-32.39%	0.00%	0.00%	160.66%	86.03%	-0.02	0.00	52.53	2.90	52.53	2.90	2.90	-0.02	0.00	52.53	2.90	52.53	2.90	2.90			
5	IND	0.00	0.00	0.00	244.83	0.00	8.20	5	IND	0.08	7.13	468.59	172.56	9.15	-86.90%	0.00%	109.41%	0.00%	860.77%	-0.55	0.00	244.83	0.00	244.83	0.00	8.20	-0.55	0.00	244.83	0.00	244.83	0.00	8.20		
6	JPN	0.00	0.00	0.00	5155.10	0.00	57.25	6	JPN	0.99	16.22	6438.49	2507.05	65.56	-68.34%	0.00%	401.68%	0.00%	688.61%	-2.15	0.00	5155.10	0.00	5155.10	0.00	57.25	-2.15	0.00	5155.10	0.00	5155.10	0.00	57.25		
7	KHM	0.00	0.97	0.00	34.64	0.00	7	KHM	0.02	1.40	104.43	38.76	1.90	-84.77%	224.68%	0.00%	859.97%	0.00%	-0.10	0.97	34.64	0.00	34.64	0.00	34.64	0.00	0.97	0.00	34.64	0.00	34.64	0.00	0.97		
8	KOR	0.00	0.00	0.00	697.40	0.00	84.46	8	KOR	1.62	26.58	10466.36	4075.07	106.73	-61.74%	0.00%	194.91%	0.00%	379.25%	-2.61	0.00	697.40	0.00	697.40	0.00	84.46	-2.61	0.00	697.40	0.00	697.40	0.00	84.46		
9	LKA	0.00	0.41	0.00	171.88	4.79	9	LKA	0.08	1.26	510.68	198.90	5.18	-21.82%	48.89%	0.00%	636.01%	122.70%	-0.02	0.41	171.88	4.79	171.88	4.79	4.79	-0.02	0.00	171.88	4.79	171.88	4.79	4.79			
10	MYS	0.00	0.00	0.00	189.94	11.55	10	MYS	0.26	42.97	1253.94	421.96	42.09	-80.05%	0.00%	81.86%	37.83%	-1.04	0.00	189.94	11.55	189.94	11.55	11.55	11.55	-1.04	0.00	189.94	11.55	189.94	11.55	11.55			
11	NZL	0.00	1.71	0.00	518.19	47.87	11	NZL	0.74	11.86	4824.00	1878.88	48.90	-39.46%	16.88%	0.00%	38.08%	4630.64%	-0.49	1.71	518.19	47.87	518.19	47.87	47.87	-0.49	0.00	518.19	47.87	518.19	47.87	47.87			
12	PHL	0.00	0.00	0.00	0.00	0.00	12	PHL	0.14	55.10	317.23	33.09	43.21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
13	SGP	0.00	0.00	0.00	1126.54	0.00	45.49	13	SGP	0.86	48.85	5181.98	1958.17	79.12	-60.89%	0.00%	27.78%	0.00%	135.23%	-1.34	0.00	1126.54	0.00	1126.54	0.00	45.49	-1.34	0.00	1126.54	0.00	1126.54	0.00	45.49		
14	THA	0.00	0.00	0.00	145.60	6.30	14	THA	0.15	21.51	749.50	2591.16	22.08	-76.39%	0.00%	0.00%	128.22%	39.88%	-0.48	0.00	145.60	6.30	145.60	6.30	6.30	-0.48	0.00	145.60	6.30	145.60	6.30	6.30			
15	VNM	0.00	9.65	0.00	87.38	0.00	15	VNM	0.14	36.38	517.24	142.66	31.24	-63.12%	35.81%	0.00%	158.06%	0.00%	-0.24	9.65	87.38	0.00	87.38	0.00	87.38	0.00	9.65	0.00	87.38	0.00	87.38				

Table 7. Cont.

Input-Oriented/ VRS Model Slacks		Input Slacks		Output Slacks		VRS Model Target		Efficient Output Target		Potential Improvement for Inputs or Outputs (%)					Potential Improvement for Inputs or Outputs (Values)								
DMU No.	DMU Name	RDE	HTE	TA	PA	ICT	DMU No.	DMU Name	RDE	HTE	TA	PA	ICT	RDE	HTE	TA	PA	ICT	RDE	HTE	TA	PA	ICT
1	AUS	0.00	0.00	94.91	0.00	34.39	1	AUS	0.49	14.78	3081.22	1172.78	35.70	-68.66%	0.00%	3.18%	0.00%	2630.60%	-1.08	0.00	94.91	0.00	34.39
2	CHN	0.00	0.00	1070.18	0.00	13.21	2	CHN	0.44	25.24	2956.59	970.87	39.70	-79.33%	0.00%	70.11%	0.00%	49.84%	-1.67	0.00	1070.18	0.00	13.21
3	HKG	0.00	0.00	0.00	0.00	0.00	3	HKG	0.76	12.12	4931.58	1920.78	49.99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
4	IDN	0.00	0.00	0.00	0.00	0.00	4	IDN	0.07	5.79	241.04	32.70	3.37	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
5	IND	0.00	0.00	366.05	0.00	6.58	5	IND	0.12	7.13	589.82	172.56	7.53	-80.82%	0.00%	163.59%	0.00%	690.38%	-0.51	0.00	366.05	0.00	6.58
6	JPN	0.00	0.00	3268.09	0.00	34.06	6	JPN	1.71	16.22	4551.49	2507.05	42.38	-45.54%	0.00%	254.64%	0.00%	409.75%	-1.43	0.00	3268.09	0.00	34.06
7	KHM	0.00	5.35	136.61	28.57	1.47	7	KHM	0.07	5.79	241.04	32.70	3.37	-42.78%	12.3831%	130.82%	692.92%	77.02%	-0.05	5.35	136.61	28.57	1.47
8	KOR	0.00	0.00	0.00	0.00	0.00	8	KOR	4.23	26.58	3548.96	4075.07	22.27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
9	LKA	0.00	0.00	0.00	0.00	0.00	9	LKA	0.10	0.84	510.68	27.02	0.39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
10	MYS	0.00	0.00	0.00	178.75	11.26	10	MYS	0.26	42.97	1233.94	410.77	41.79	-79.92%	0.00%	0.00%	77.04%	36.88%	-1.04	0.00	0.00	178.75	11.26
11	NZL	0.00	1.70	0.00	514.01	47.75	11	NZL	0.75	11.85	4824.00	1874.70	48.79	-39.41%	16.78%	0.00%	37.78%	4619.38%	-0.48	1.70	0.00	514.01	47.75
12	PHL	0.00	0.00	0.00	0.00	0.00	12	PHL	0.14	55.10	317.23	33.09	43.21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
13	SGP	0.00	0.00	0.00	0.00	0.00	13	SGP	2.20	48.85	4055.44	1958.17	33.64	0.00%	0.00%	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00
14	THA	0.00	0.00	0.00	48.35	3.77	14	THA	0.16	21.51	749.50	161.91	19.56	-74.35%	0.00%	0.00%	42.58%	23.88%	-0.47	0.00	0.00	48.35	3.77
15	VNM	0.00	10.86	0.00	69.14	0.00	15	VNM	0.15	37.79	517.24	124.42	31.24	-60.77%	40.33%	0.00%	125.06%	0.00%	-0.23	10.86	0.00	69.14	0.00

Source: Authors' calculations in DEA Frontier.

Table 8. The efficiency of spending on innovation for ASEAN and ASIA-PACIFIC in 2000–2016 (CRS).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	CRS	Average	Change 2000–2016	Rank	
CRS Effectiveness Index	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	CRS	Average	Change 2000–2016	Rank	
3	HKG	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1
12	PHL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1
4	IDN	0.689	0.798	0.747	0.845	1.000	0.917	1.000	0.769	0.789	0.792	0.732	0.717	0.734	0.712	0.569	0.564	0.676	0.768	0.768	-0.013	3
11	NZL	0.625	0.833	0.869	1.000	0.862	0.919	0.939	0.888	0.707	0.653	0.576	0.516	0.540	0.522	0.614	0.523	0.605	0.717	0.717	-0.019	4
14	THA	0.537	0.546	0.657	0.685	0.739	0.764	0.644	0.736	0.708	0.629	0.486	0.368	0.333	0.313	0.269	0.233	0.236	0.522	0.522	-0.301	5
9	LKA	0.253	0.276	0.330	0.367	0.413	0.475	0.502	0.488	0.543	0.425	0.411	0.498	0.594	0.600	0.584	0.631	0.782	0.481	0.481	0.529	6
13	SGP	0.443	0.426	0.439	0.531	0.543	0.597	0.569	0.486	0.302	0.393	0.457	0.366	0.398	0.382	0.408	0.442	0.391	0.445	0.445	-0.052	7
8	KOR	0.371	0.381	0.423	0.535	0.564	0.572	0.486	0.449	0.410	0.457	0.446	0.362	0.374	0.369	0.415	0.450	0.383	0.438	0.438	0.012	8
7	KHM	0.353	0.424	0.478	0.225	0.472	0.450	0.366	0.559	0.549	0.514	0.521	0.488	0.485	0.502	0.375	0.090	0.152	0.412	0.412	-0.201	9
6	JPN	0.425	0.471	0.471	0.533	0.534	0.471	0.388	0.351	0.335	0.383	0.385	0.313	0.335	0.293	0.323	0.347	0.317	0.393	0.393	-0.108	10
15	VNM	0.163	0.172	0.183	0.244	0.295	0.354	0.420	0.473	0.426	0.453	0.416	0.476	0.379	0.388	0.323	0.342	0.369	0.346	0.346	0.206	11
1	AUS	0.272	0.301	0.314	0.349	0.412	0.440	0.433	0.406	0.358	0.355	0.323	0.282	0.298	0.314	0.311	0.354	0.306	0.343	0.343	0.034	12
10	MYS	0.552	0.455	0.395	0.432	0.472	0.448	0.446	0.398	0.305	0.246	0.242	0.234	0.220	0.206	0.192	0.188	0.200	0.330	0.330	-0.333	13
2	CHN	0.081	0.095	0.110	0.126	0.138	0.127	0.125	0.122	0.112	0.110	0.125	0.132	0.135	0.150	0.170	0.199	0.203	0.133	0.133	0.122	14
5	IND	0.033	0.043	0.046	0.053	0.061	0.068	0.072	0.079	0.076	0.091	0.102	0.094	0.106	0.113	0.134	0.151	0.131	0.085	0.085	0.098	15

Source: Authors' calculations.

Table 9. The efficiency of spending on innovation ASEAN and ASIA-PACIFIC in 2000–2016 (VRS).

VRS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average	Change 2000–2016	Rank	
3	HKG	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1
4	IDN	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1
12	PHL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1
13	SGP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1
8	KOR	0.780	0.726	0.832	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.961	0.220	5
7	KHM	1.000	1.000	1.000	1.000	1.000	0.897	0.892	0.857	0.821	0.843	0.813	0.773	0.798	0.746	0.572	0.572	0.572	0.858	-0.108	6
11	NZL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.577	0.519	0.546	0.527	0.614	0.529	0.606	0.819	0.000	7	
6	JPN	1.000	1.000	1.000	1.000	1.000	0.761	0.707	0.737	0.734	0.738	0.652	0.684	0.531	0.585	0.583	0.545	0.780	-0.293	8	
9	LKA	0.469	0.455	0.481	0.543	0.485	0.589	0.573	0.658	0.755	0.649	0.636	0.771	0.864	0.920	0.991	1.000	1.000	0.696	0.189	9
10	MYS	1.000	1.000	1.000	1.000	1.000	0.449	0.446	1.000	0.310	0.247	1.000	1.000	0.278	0.242	0.264	0.189	0.201	0.625	0.000	10
14	THA	0.564	0.569	0.690	0.703	0.752	0.798	0.663	0.780	0.755	0.678	0.519	0.401	0.366	0.345	0.305	0.261	0.256	0.553	0.216	11
15	VNM	0.352	0.349	0.331	0.382	0.375	0.449	0.461	0.565	0.536	0.567	0.522	0.561	0.419	0.396	0.358	0.376	0.392	0.435	0.213	12
1	AUS	0.274	0.304	0.318	0.354	0.412	0.441	0.433	0.409	0.360	0.334	0.291	0.307	0.321	0.317	0.359	0.313	0.348	0.135	13	
5	IND	0.090	0.101	0.104	0.120	0.128	0.129	0.133	0.138	0.130	0.142	0.153	0.144	0.157	0.161	0.183	0.204	0.192	0.142	0.048	14
2	CHN	0.103	0.107	0.118	0.130	0.139	0.131	0.127	0.124	0.114	0.113	0.125	0.135	0.140	0.153	0.174	0.202	0.207	0.138	0.022	15

Source: Authors' calculations.

Table 10. Efficiency ranking for ASEAN and ASIA-PACIFIC in 2000–2016.

Country	Average CRS Effectiveness Index	Average VRS Effectiveness Index	Average Effectiveness Index	Rank
HKG	1.000	1.000	1.000	1
PHL	1.000	1.000	1.000	2
IDN	0.768	1.000	0.884	3
NZL	0.717	0.819	0.768	4
SGP	0.445	1.000	0.723	5
KOR	0.438	0.961	0.700	6
KHM	0.412	0.858	0.635	7
LKA	0.481	0.696	0.589	8
JPN	0.393	0.780	0.586	9
THA	0.522	0.553	0.538	10
MYS	0.330	0.625	0.478	11
VNM	0.346	0.435	0.390	12
AUS	0.343	0.348	0.345	13
CHN	0.133	0.138	0.135	14
IND	0.085	0.142	0.114	15
Average for ASEAN countries	0.579	0.782	0.680	
Average for ASIA-PACIFIC countries	0.494	0.690	0.592	

Source: Authors' calculations.

The results from Tables 8 and 9 were used to calculate final efficiency index and efficiency ranking presented in Table 10. It is necessary to highlight that presented results are only in the short-term view. Table 10 identifies Hong Kong and the Philippines as the most efficient countries, both being efficient for each year under both CRS and VRS. According to the VRS model, Indonesia (1.00) and Singapore (1.00) are efficiency frontiers; however, these countries scored worse results under the CRS model, thus explaining why these countries assume the third and fifth places in the ranking. Seven out of 15 analysed countries obtained scores above the average 0.592: Hong Kong, the Philippines, Indonesia, New Zealand, Singapore, Korea and Cambodia. Other countries obtained scores below the average efficiency index: Sri Lanka, Japan, Thailand, Malaysia, Vietnam, Australia, China, India. The worst efficiency index was obtained by China and India. At the beginning of the research period, China spent < 1%, although the value has since come to in excess of 2% since 2014. China's average spending on R&D in 2016 was 1.52% of the country's GDP. India, on the other hand, spent less than 1% on R&D. Conversely, the position of Japan may be surprising, because it is seen as one of the most innovative countries in the Asia Pacific region; however, it has among the highest R&D spending, which is more than 3% of GDP. As confirmed by quantitative research, high R&D spending funds does not produce proportionally larger results. This study additionally proves that increased spending on innovation causes non-proportional effects. R&D spending should be increased gradually to obtain optimal results. It is also worth to noting that the DEA methodology calculates relative efficiency, which examines the degree to which R&D expenditure has been transformed into potential innovation.

6. Conclusions

The results of the study complement the comparative analysis of ASEAN economies and provides new empirical material with which we can explain the innovation gap between countries. The paper gives a general overview of the level of innovation in ASEAN countries as compared with other Asia Pacific countries. Among all analysed countries, the CRS approach revealed the efficiency frontier as being Hong Kong and, in the case of ASEAN countries, the Philippines. The analysis also showed that among the ASEAN countries, the closest to being an efficiency frontier using the CRS approach are Indonesia, Thailand and Singapore, with Vietnam and Malaysia being less efficient. According to the VRS approach, however, the most efficient countries were Hong Kong, Indonesia, Singapore and the Philippines. According to the VRS model, Korea (0.961) is the closest to an efficiency frontier, and needs reduce its resource usage to 0.039% to become fully efficient. However, Korea also achieved a poor result in the CRS model, which is why it sits in sixth place in the ranking. Hong Kong, as argued by Wang [41], is an example of a country with a positive non-intervention policy aiming to minimise the government's influence on the market. Thus, while industry innovation is less active in Hong Kong, local industry nonetheless possesses a dynamic innovation base provided by smaller enterprises, most of which develop self-financed spontaneous innovation to provide a solid foundation in an innovation-based economy. Therefore, while lagging behind the other economies, starting with Singapore in terms of R&D expenditure and patent statistics, enterprises in Hong Kong demonstrate high innovation potential. Empirical results for China and India proved to be comparatively poor; although the first of these ranked second in absolute terms, with an annual contribution of over 2% of GDP, China lags behind other developed economies in terms of technology and innovation, especially when considering payments for intellectual property. As outlined in the Made in China 2025 development plan, there is a need to respond to the revolution in such fields as big data, artificial intelligence, the digitisation of conventional industries, robotics and cloud computing through joint efforts by the government, academia and industry, as well as smart manufacturing [11]. Such efforts might help to advance the country from the status of an imitative latecomer in technology, to an innovation-driven knowledge economy. On the other hand, the Make in India program emphasises the creation of clusters to synergise the potential of numerous smaller entities in India; however, there is still a problem with the lack of any long-term strategy or policy for higher education. As a result, there are many obstacles related to a lack of autonomy in governance, employment, intersecting disciplines, creativity bottlenecks, the segregation of teaching and research in STI-related institutions in India, accompanied by inadequate R&D expenditure.

ASEAN as a whole attempts to establish a region-wide innovation policy to make South East Asia an innovation hub. An important platform of cooperation is the ASEAN Committee on Science and Technology, under which there is the possibility of promoting innovation entailing cross-regional synergies. Potential initiatives include:

innovation surveys or censuses for the use of innovation infrastructure across AMS;
R&D platforms and databases to be used by regional agencies and institutes to promote and exchange findings; and
the coordination of R&D scholarship/grant/subsidies schemes, training and education programs across AMS.

This should enhance less-developed AMS to establish NIS. Furthermore, it is necessary to further liberalise and deregulate goods, services and the flow of capital (including ASEAN Framework Agreement on Services, ASEAN Trade in Services Agreement, ASEAN Plus FTAs and RCEP) to stimulate R&D expenditure under international competitive pressure. Last but not least, the freer movement of natural persons would encourage innovation development in ASEAN thanks to knowledge spill-overs. In this regard, regulatory reforms in the field of engineering services are crucial, as well as closer cross-regional collaboration among universities to strengthen the innovation ecosystem of South East Asia.

Despite the many efforts of ASEAN countries, several factors limit their capacity to improve their innovativeness, and hence their economic and social development. For example, with the exception of Singapore, funding across ASEAN countries is consistently low. The Philippines is among the most efficient of ASEAN countries, which was the first to implement NIS in the late 2000s. Indonesia also is close to an efficiency frontier. On the other hand, the position of Singapore, which is the most advanced in terms of NIS implementation and is one of the most developed countries in ASEAN, may be surprising. The evidence presented in this research documents the relative underperformance of the ASEAN region in innovation efficiency. Despite the small amounts spent on innovation, the results are not proportional. As mentioned previously in the methodology section, the research efficiency indicator explores the efficiency of R&D funding usage; therefore, countries with the highest efficiency score do not necessarily achieve the best innovative results. In ASEAN and the Asia Pacific countries, innovative capacities are still limited, and it would thus seem reasonable to gradually increase R&D spending, which in turn may produce better conditions for innovation-driven growth. The results of this study offer important insights for assessing and shaping innovation policies across the ASEAN region. However, it should be noted that results are very general to make concrete recommendations for the development of the NIS in the specific country. Individual country recommendation should also consider the impact of the development level of the country, the sectoral structure of the economy and time lag factor on the innovation input-output relationship.

International institutions are increasingly working towards extending the current statistics on innovation inputs, such as the stock of knowledge, human resources and research infrastructure. However, the current statistics tend to disregard actual innovation outcomes. Enterprises can transform innovation inputs into intermediate outputs, such as patents, and then into innovation outcomes. Innovation outcomes are the economic results of the introduction of innovation and should be taken into consideration, as patent applications themselves do not automatically result in economic outcomes. Ensuring the adequate measurement of innovation outcomes at the country level may require significant structural upgrading [42]. Moreover, the correct estimation of the time lag between transforming inputs into outputs should be taken into consideration. Such statistics, however, are not currently available. Should they become available, their inclusion in the DEA methodology may provide more a reliable overview of the level of efficiency in the economy.

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