

Sustainability Commitment, Early-stage Entrepreneurial Activity and Entrepreneurial Eco-system Quality: A European Perspective

Sanja Pfeifer¹, Djula Borožan², Nataša Šarlija³

Abstract: This paper aims to explore the level of the sustainability commitment of early-stage entrepreneurs, recognizing that such commitment depends, at least in part, on supporting governmental programs and policies, cultural and social norms, perceptions of the priorities given to sustainability issues and quality of other components of the national entrepreneurial ecosystems. Datasets that feed into the k-means cluster analysis come from the adult population survey conducted by the Global Entrepreneurship Monitor in 2023. The analysis of the data from 20 European countries that participated in the survey, shows that there are significant differences between two distinctive clusters of countries depending on the extent to which sustainability aspects and value creation goals are considered among entrepreneurs engaged in the early-stage entrepreneurial activity. Furthermore, the results show significant differences between these two clusters in terms of the quality of national entrepreneurial eco-systems. The results suggest that the quality of the national support has an important, yet not expected, influence on the sustainability considerations among early-stage entrepreneurial activity. A better understanding the complexity of the entrepreneurial eco-systems and their interactions with the extent of the sustainability considerations among new entrepreneurs may help to close the gap in the sustainability entrepreneurship research and fulfil the goals of the sustainable development agenda.

Keywords: social, environmental and economic value creation, early-stage entrepreneurial activity, GEM European countries, k-mean cluster

JEL Classification: L26, M13, Q01

1 Introduction

Sustainable entrepreneurship is regarded as a form of entrepreneurial activity that involves creating a balance between the entrepreneurial venture's social, environmental, and economic benefits. Sustainable entrepreneurs are expected to discover, create and exploit entrepreneurial opportunities that create economic, social and environmental value (Roomi et al., 2021:4). As such, they are considered catalysts (Filser et al. 2019) or “game changers” (Vuorio, 2017) in the transition to sustainable development. According to the latest Global Entrepreneurship Monitor Report (GEM, 2024) a growing number of entrepreneurs are considering and prioritizing environmental and social implications of their business decisions or taking steps to minimize environmental damage and maximize social benefits. Despite this growing number of entrepreneurs committed to sustainability, their overall impact on sustainable development appears to be insufficient (Roomy et al., 2021). The importance of sustainable entrepreneurship has been repeatedly emphasized in the United Nations 2030 Agenda for Sustainable Development (UN, 2015). With only 17% of the Sustainable Development Goals (SDG) achieved and just six years left until 2030 deadline (UN, 2023) enhancing and encouraging sustainable entrepreneurial activities is considered crucial for, among others, providing decent jobs, promoting economic development, decoupling the economic growth from environmental degradation and preventing social injustice.

Previous research reported significant and relatively persistent differences in the level of entrepreneurial values, attitudes or activities across countries (Grilo and Thurik, 2006), resulting from the complex interaction of the individual, micro- or and macro conditions (Bosma and Schutjens, 2011). While the relationship on national and regional differences between entrepreneurial attitudes, entrepreneurial intentions or behavior is already empirically confirmed in the international context (Wennekers et al. 2007; Arenius and Minnity, 2005), the relation between early-stage or new entrepreneurs' commitment to sustainability across countries are still largely unexplored. Therefore, the purpose of this paper is to identify

¹J. J. Strossmayer University in Osijek/Faculty of Economics and Business, Trg Lj. Gaja 7, HR-31000 Osijek, sanja.pfeifer@efos.hr

² J. Strossmayer University in Osijek/Faculty of Economics and Business, Trg Lj. Gaja 7, HR-31000 Osijek, djula.borozan@efos.hr

³J. J. Strossmayer University in Osijek/Faculty of Economics and Business, Trg Lj. Gaja 7, HR-31000 Osijek, natasa.sarlija@efos.hr

diversity of the European countries regarding sustainable entrepreneurship, and to reveal novel insights in the conditions for sustainable entrepreneurship across Europe.

While indicators of sustainability entrepreneurship are still debated, GEM research provides methodologically sound and harmonized cross-country data on sustainability considerations among entrepreneurs. Starting from 2021, GEM research measures sustainable consideration across new or already established entrepreneurial activity. These considerations may be interpreted as the proxy of sustainable early-stage entrepreneurial activity. Our study aims to analyze diversity between European countries for sustainable commitment of new entrepreneurs. The analysis applies k-means cluster analysis to divide 20 European countries participating in the GEM research in 2023 into distinctive clusters based on the prevalence of early-stage entrepreneurs who are committed to sustainability. In addition, the study aims to explain what differentiates these clusters and how they are characterized by the interplay between individual- or contextual factors (for example: individual entrepreneurial attitudes, perception of the social norms and perception of the quality of national entrepreneurial ecosystems).

Individual and specifically psychographic factors such as the perception on start-up opportunities, self-assessment of the capabilities to start a venture, or perception of the fear of failure are found relevant to explain prevalence rates of the nascent, new and established businesses across 17 European countries (Bosma and Schutjens, 2011). Wennekers et al. (2007) found a negative correlation between uncertainty avoidance and business ownership. Many studies related national differences in entrepreneurial activity to the values in society or national entrepreneurship formal or informal procedures and regulations (Uhlener and Thurik (2007).

Most of the literature related to sustainability points to individual-level factors such as values, empathy and altruism as significant and important descriptors of the individual's willingness to become a social entrepreneur (Dees, 2012, Hockerts, 2015). The likelihood of recognizing sustainable entrepreneurial opportunities is found higher among individuals who are more empathetic and sympathetic (Patzelt and Shepherd, 2011). Contextual factors such as socio-economic as well as formal and informal institutions and procedures influence the formation of these values and behaviors at the individual level. Since contextual factors remain largely constant over time, they have a long-term effect on the level of sustainable commitment of entrepreneurs (Ralson et al., 2014). Muñoz and Dimov (2015) suggest that sustainable enterprises emerge either because of a supportive social environment or as a response to a non-supportive social environment. In addition, societies that attach high value on freedom, self-expression, and quality of life are conducive to higher sustainability commitment of entrepreneurs. For example, Hechavarria et al. (2017) found that individuals in countries with high postmaterialist values are more likely to prioritize social and environmental value creation goals over economic goals.

This paper aims to explore the level of the sustainability commitment of early-stage entrepreneurs, recognizing that such commitment depends, at least in part, on supporting government programs and policies, cultural and social norms, perceptions of the priorities given to sustainability issues and quality of other components of the national entrepreneurial ecosystems. Therefore, this study is primarily focused on answering two research questions: How diversified are European countries regarding the sustainable commitment of new entrepreneurs, and what factors play a significant role in explaining these differences?

The remainder of the paper describes data and methodology. Section 3 presents the identified cluster and discusses the differences in individual- or contextual level descriptors. The paper concludes by pointing to the contribution of this study, limitations of the current study and expectation of further research.

2 Data and methods

The data for this research was collected within the framework of the GEM project (www.gemconsortium.org) and includes 20 European countries that participated in the research in 2023. GEM collects data from 2 sources: (i) Adult population survey (APS) and (ii) National expert survey (NES). APS collects data from the representative sample of 2,000 adult residents aged 18-64, while NES data are collected from the convenient sample of experts (at least 36) based on the criterion of reputation and experience in the areas that determine the entrepreneurial environment of a country.

In line with the research on the intentions or actual entrepreneurial behavior, we assume that sustainability consideration can be used as a proxy or a latent potential of the early-stage entrepreneurs to become sustainable entrepreneurs. We also assume that such latent sustainable entrepreneurial activity is influenced by psychographic (such as networking with established entrepreneurs, seeing good opportunities to start a business, fear of failure attitudes, self-assessment of the capabilities to start a business), contextual and macro-level factors (such as quality of the entrepreneurial ecosystems, and social norms that prioritize sustainability issues). In total, 23 variables were selected for the analysis following the previous research: 13 variables were taken from NES and 11 variables from APS datasets. In addition, real GDP per capita (expressed in international dollars) sourced from the World Bank's World Development Indicator database was also used. The description of the APS and NES variables can be found in Table 1.

Table 1 APS and NES variables used in the research

APS variables	NES variables
The percentage of the population that: – knows someone who started a business in the past 2 years (KNOENT) – sees good conditions to start business in next 6 months (OPPORT) – has knowledge/skills to start business (SUSKIL) – would be prevented to start a business because of fear of failure (FEAR)	The average grade of the selected component in the national entrepreneurial ecosystem: – Easiness to get financing for entrepreneurs (NES_FIN) – Government concrete policies, priority and support (NES_GPOL) – Government policies bureaucracy, taxes (NES_GBUR) – Government programs (NES_GPRO) – Entrepreneurial level of education at Vocational, Professional, College and University (NES_EDU) – Professional and commercial infrastructure access (NES_PCI) – Cultural, social norms and society support (NES_CUL)
The percentage of entrepreneurially active population that: – has the motivation to start a business - to make a difference in the world (TEA_YES) – consider social implications (TEASDGSOC) – consider environmental implications (TEASDGENV) – prioritize the social and/or environmental impact above profitability (TEASDGPRI) – has taken steps to minimize the environmental impact (TEASDGST1) – has taken steps to maximize the social impact (TEASDGST2)	The average grade of the following component of the SDG implementation system: – Good practices of social contribution and responsibility in new and growing firms (NES_SDGS) – Priority assigned to economic performance in new and growing firms (NES_SDGE) – Priority assigned to good environmental practices by new and growing firms (NES_SDGEN) – Priority assigned to sustainability by new and growing firms (NES_SDGC) – Priority assigned to business sustainability by governments/policy makers through new regulations/laws (NES_SDGG)
The average percentage of SDG variables – A composite indicator representing the extent of socially and environmentally conscious entrepreneurial activity (TEA_PROXY)	The average grade of the national entrepreneurial ecosystem – A composite indicator representing the average of 13 components of the national entrepreneurial context (NECI)

Source: GEM APS and NES datasets, 2024

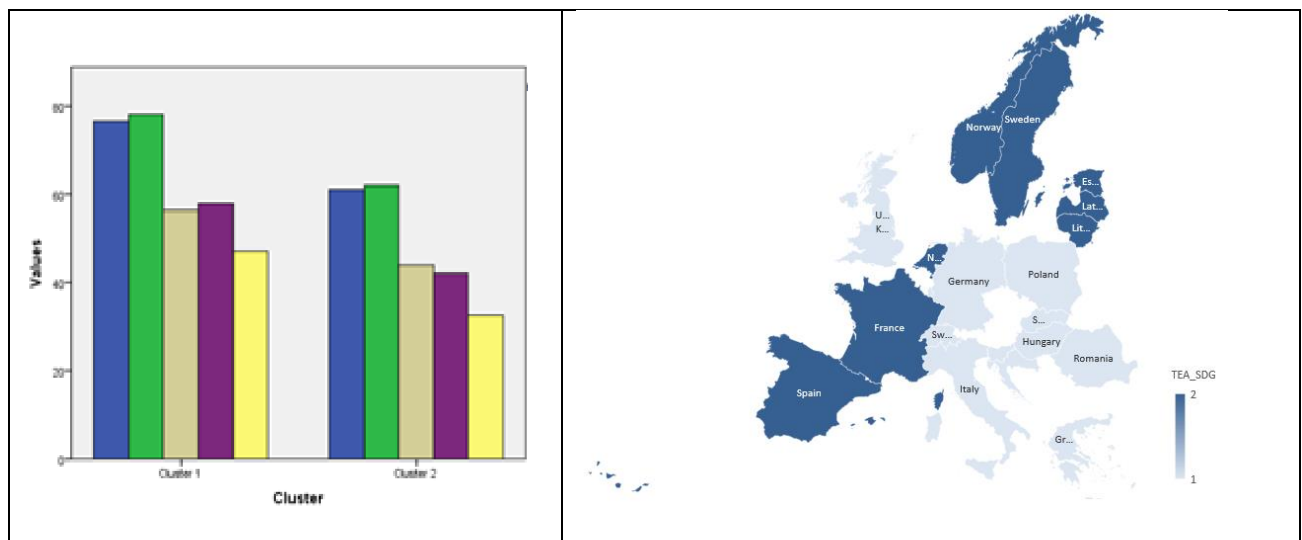
To cluster early-stage entrepreneurs, two methods were utilized: hierarchical clustering and k-means clustering. The former was employed to suggest the initial number of clusters, while the later, the most popular clustering method (Ikotun et al., 2023), was used to analyze the complex relationships between cases—in this instance, entrepreneurs in European countries). The k-means algorithm begins by selecting k cases as initial cluster centers, then calculates the distance between each cluster center and each case. Each case is assigned to the nearest cluster, and the averages of all clusters are updated. This process is repeated until the criterion function converges, meaning the updated cluster means no longer

changes significantly between successive steps. The final cluster means are then used to assign cases to their permanent clusters. Detailed information on this method can be found in Patel (2019) and Ikotun et al. (2023). One should note that this study uses squared Euclidean Distance as the measure of divergence between units. Additionally, a one-way analysis of variance (ANOVA) was conducted to determine whether the means are statistically significantly different from each other. Chi-square tests were also performed to profile and examine the statistical significance of the association between cluster membership and the variables of the entrepreneurial ecosystem and perception of the SDG system.

3 Research results

The hierarchical cluster analysis dendrogram initially suggested potential solutions with either two or three clusters. Subsequently, both configurations underwent k-means clustering. Upon evaluating the cluster centers, it was concluded that the two-cluster configuration proved to be the most statistically significant, stable, and meaningful. Figure 1 displays the final solution of the cluster analysis and illustrates the map of European countries categorized into clusters.

Figure 1 Results of clustering analysis



Source: Own processing

Note: Bars in both clusters refer to the following variables TEASDGSOC, TEASDGENV, TEASDGPRI, TEASDGST1, and TEASDGST2, respectively

The first cluster is the largest, encompassing 12 European countries (Croatia, Germany, Greece, Hungary, Italy, Luxembourg, Poland, Romania, Slovakia, Slovenia, Switzerland, and the United Kingdom). In comparison to Cluster 2, entrepreneurs in this cluster exhibit a stronger commitment to a positive impact on society and the environment. They are more inclined to consider the social and environmental implications of their business activities. Moreover, they prioritize social and/or environmental impact over profitability and take proactive steps to mitigate their environmental footprint. Consequently, this cluster is aptly labeled "*sustainability enthusiasts*".

Cluster 2 comprises eight European countries (Estonia, France, Latvia, Lithuania, the Netherlands, Norway, Spain, and Sweden). On average, the values across each APS dimension used for clustering are lower compared to Cluster 1. Specifically, while less than 50% of entrepreneurs in Cluster 1 (47.1% precisely) have taken steps to maximize social impact (note that in all other APS dimensions, more than 50% of entrepreneurs exhibited pro-sustainable behavior), in Cluster 2, less than 50% of entrepreneurs prioritize social and/or environmental impact over profitability (44.01%), have taken measures to minimize environmental impact (42.1%), or have focused on maximizing social impact (32.7%). This highlights a distinct entrepreneurial profile in Cluster 2 characterized by lower engagement in socially and environmentally oriented business practices compared to Cluster 1. Therefore, this cluster is labeled "*sustainability opportunists*".

ANOVA tests produced F-values for each of the five sustainability dimensions used as clustering criteria (TEASDGSOC, TEASDGENV, TEASDGPRI, TEASDGST1, TEASDGST2; 28.939, 32.051, 5.838, 18.034, 15.625; respectively, all $p < 0.001$), indicating significant contributions from all variables in the model. Notably, the dimensions of TEASDGSOC and TEASDGENV were identified as particularly influential in shaping the clusters compared to the others.

To thoroughly characterize the clusters, we examined whether there exists a statistically significant relationship with the variables of the entrepreneurial ecosystem and perception of the SDG implementation. The p-values of the chi-square test statistics are presented in Table 2.

Table 2 Elementary statistics and statistical differences in means of the APS and NES variables

Variable	Cluster 1		Cluster 2		p-value
	mean	st. dev	mean	st. dev	
GDP per capita	56180	27270	56452	17525	0.9804
Knows someone who started a business (KNOENT)	49.859	10.257	53.504	9.220	0.4289
Sees good conditions to start business (OPPORT)	47.847	13.061	54.944	13.839	0.26
Has knowledge/skills to start business (SUSKIL)	51.735	9.267	50.850	4.071	0.8035
Fear of failure (FEAR)	51.140**	6.390	44.273	4.551	0.0174
To make a difference in the world (TEA_YES)	44.700	13.882	38.109	8.612	0.2485
Social implications (TEASDGSOC)	76.503	5.216	61.124	7.624	<.001
Environmental implications (TEASDGENV)	78.178	4.730	62.013	8.092	<.001
Prioritization of Soc/env impact above profitability (TEASDGPRI)	56.428	13.305	44.066	6.702	0.0265
Minimize the environmental impact (TEASDGST1)	57.982	8.382	42.108	7.878	0.0005
Maximize the social impact (TEASDGST2)	47.211	8.043	32.685	8.063	0.0009
The average of SDG variables (TEA_PROXY)	63.260	4.328	48.399	3.990	<.001
Easiness to get financing (NES_FIN)	4.231	0.239	4.629	0.887	0.1527
Gov.policies, priority and support (NES_GPOL)	3.839	0.672	4.356	1.048	0.1934
Gov. policies bureaucracy, taxes (NES_GBUR)	4.508	0.573	5.201	1.107	0.0813
Government programs (NES_GPRO)	4.642	0.918	5.410	0.738	0.0639
Education: prof, college, univ (NES_EDU)	4.488	0.649	5.313	0.776	0.019
Professional/ commercial infrastructure (NES_PCI)	5.383	0.511	5.784	0.600	0.1257
Cultural, social norms (NES_CUL)	4.309	0.842	5.494	1.397	0.0288
Good practices of social contribution and responsibility in new and growing firms (NES_SDGS)	5.372	0.585	5.833	0.654	0.1169
Priority assigned to economic performance in new and growing firms (NES_SDGE)	5.106	0.452	5.568	0.703	0.0894
Priority assigned to good environmental practices by new and growing firms (NES_SDGEN)	5.734	0.610	6.231	0.495	0.0714
Priority assigned to sustainability by new and growing firms (NES_SDGC)	5.563	0.818	6.373	0.868	0.0486
Priority assigned to business sustainability by governments/policy makers through new regulations/laws (NES_SDGG)	4.590	0.660	5.328	0.915	0.05
The average grade of the entrepreneurial ecosystem (NECI)	4.558	0.380	5.113	0.790	0.0491

Source: Own processing

Our results show that individual psychographic factors (except the fear of failure) are insignificant in explaining the diversity of latent national potential for sustainable entrepreneurship. However, contextual factors such as government administration and taxation, government programs, tertiary education, and prevailing cultural or social norms play an important role. Surprisingly, Cluster 1 shows a lower quality of the overall entrepreneurial ecosystem compared to Cluster 2. On the other hand, Cluster 2 shows a higher perception of SDG prioritization by new or growing firms or by policy makers and a lower prevalence of early-stage entrepreneurs committed to sustainability.

4 Conclusions

This study confirms the diversity of European countries in terms of sustainable early-stage entrepreneurial activities. The k-means cluster analysis identifies two clusters of European countries and links their differences primarily to context/macro-level factors. The quality of the entrepreneurial ecosystem and the prioritization of SDG implementation by new and growing firms or government regulations seem to play the most important role in explaining the differences between the two distinct clusters.

The findings are partly consistent with previous research on national differences in entrepreneurial intentions and behavior. They highlight that contextual conditions play a role in promoting or enhancing sustainable entrepreneurship. The findings contribute to the literature on sustainable entrepreneurship from an international perspective. However, the

interplay of the individual and contextual/macro-level factors is interwoven, so the results should be considered mainly explorative. The main limitations of our study is the focus on the European countries, and a relatively small number of variables considered. Further research could therefore include examining the differences between all GEM participating countries, using a multi-year approach that tracks the sustainability commitment of early-stage entrepreneurs longitudinally, and includes broader set of variables.

Acknowledgement

This manuscript presents partial results of the project supported by the Croatian Foundation for Science, grant IP-2020-02-1018.

References

- Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small business economics*, 24, 233-247.
- Bosma, N., & Schutjens, V. (2011). Understanding regional variation in entrepreneurial activity and entrepreneurial attitude in Europe. *The Annals of Regional Science*, 47, 711-742.
- Dees, J. G. (2012). A tale of two cultures: Charity, problem solving, and the future of social entrepreneurship. *Journal of Business Ethics*, 111, 321-334.
- Filser, M., Kraus, S., Roig-Tierno, N., Kailer, N., & Fischer, U. (2019). Entrepreneurship as catalyst for sustainable development: Opening the black box. *Sustainability*, 11(16), 4503.
- GEM (Global Entrepreneurship Monitor), (2023). *Global Entrepreneurship Monitor 2023/2024 Global Report: 25 Years and Growing*. London: GEM.
- Grilo, I., & Thurik, R. (2005). Latent and actual entrepreneurship in Europe and the US: some recent developments. *The International Entrepreneurship and Management Journal*, 1, 441-459.
- Hechavarría, D. M., Terjesen, S. A., Ingram, A. E., Renko, M., Justo, R., & Elam, A. (2017). Taking care of business: The impact of culture and gender on entrepreneurs' blended value creation goals. *Small business economics*, 48(1), 225-257.
- Hockerts, K. (2017). Determinants of social entrepreneurial intentions. *Entrepreneurship theory and practice*, 41(1), 105-130.
- Ikotun, A.M., Absalom, E.E., Abualigah, L.M., Abuhaija, B., & Jia, H. (2022). K-means clustering algorithms: A comprehensive review, variants analysis, and advances in the era of big data. *Information Sciences*, 622, 178-210.
- Muñoz, P., & Dimov, D. (2015). The call of the whole in understanding the development of sustainable ventures. *Journal of Business Venturing*, 30(4), 632-654.
- Patel, S. (2019). *K-means Clustering Algorithm: Implementation and Critical Analysis*. 1.ed. Scholars' Press.
- Patzelt, H., & Shepherd, D. A. (2011). Recognizing opportunities for sustainable development. *Entrepreneurship theory and practice*, 35(4), 631-652.
- Ralston, D. A., Egri, C. P., Furrer, O., Kuo, M. H., Li, Y., Wangenheim, F., ... & Weber, M. (2014). Societal-level versus individual-level predictions of ethical behavior: A 48-society study of collectivism and individualism. *Journal of Business Ethics*, 122, 283-306.
- Roomi, M. A., Saiz-Alvarez, J. M., & Coduras, A. (2021). Measuring sustainable entrepreneurship and eco-innovation: A methodological proposal for the Global Entrepreneurship Monitor (GEM). *Sustainability*, 13(7), 4056.
- Uhlaner, L., Thurik, R. (2007). Postmaterialism influencing total entrepreneurial activity across nations. *Journal of Evolutionary Economics*, 17(2), 161-185. doi: 10.1007/s00191-006-0046-0
- UN General Assembly (2015). *Transforming our World: The 2030 Agenda for Sustainable Development*; Resolution Adopted by the General Assembly on 25 September 2015; New York, NY, USA: United Nations
- UN (2023). *SDGs Report. sustainability Developmental Goals Report: Special Edition*, New York, USA: United Nations.
- Vuorio, A. (2017). Young adults and sustainable entrepreneurship: The role of culture and demographic factors. *Journal for International Business and Entrepreneurship Development*, 10(3), 209-230.
- Wennekers, S., Thurik, R., van Stel, A., & Noorderhaven, N. (2007). Uncertainty avoidance and the rate of business ownership across 21 OECD countries, 1976-2004. *Journal of Evolutionary economics*, 17, 133-160.