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Green entrepreneurship in challenging times: a quantitative approach for European countries

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ABSTRACT

The aim of the study is to deep dive into the potential of green entrepreneurship and its drivers in a time of multiple challenges when green growth seeks to reconcile economic and sustainable development goals. The need for responsible business models has become evident in recent years, and companies that offer green products or services are creative, eco-friendly growth incubators and important economic actors that can change the future of society. We used a logistic regression model for 7326 companies from 36 European countries to identify what influences the decision to go green, including supply and demand factors, measures for resource efficiency and targeted policies. We found that the company's age, its financial performance, the country's level of development, as well as the incentive measures have a significant potential of stimulating green entrepreneurship. Our results highlight the overwhelming importance of financing. Firms in less developed countries face difficulties in developing green products and services, so support programs are needed to build green entrepreneurship in some regions. Many entrepreneurs in less developed countries are highly educated, creative, and innovative, so they can successfully run sustainable business models if the transfer of good practices is accompanied by an infusion of capital.

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1. Introduction

Climate change, environmental degradation, and financial constraints are major challenges for the economy in achieving the goals of sustainable development. Although the business environment and the natural environment seemed to be incompatible and impossible to reconcile, the companies being seen as the main polluters and consumers of resources, the current trend is to ensure the transition towards the green economy: green entrepreneurship, green jobs, green growth, all these indicating a

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special concern for the environment and the creation of innovative, sustainable business models. Increasingly, from large industrial giants to small entrepreneurs, consumers but also policymakers, all contribute to the paradigm shift, understanding that only by respecting the environment, the long-term well-being can be achieved (Ye et al., 2020).

The grand challenges of the recent period related to climate change and environmental degradation have led to the launch at European Union level of a very ambitious growth strategy for the period 2019–2024, suggestively called 'A European Green Deal'. To ensure a future with 'zero pollution, affordable and secure energy, smarter transport and high-quality food', one trillion euros will be allocated to actions targeting all sectors of the economy and focusing on: 'environmentally friendly technologies, innovation, cheaper and healthier transport, decarbonized energy sector and efficient buildings' (European Commission, 2019a).

At the heart of this strategy is the European industry, considered both the source of the climate stress and the possible driver of the changes mentioned in the strategy. Thus, industrial activity causes 90% of biodiversity loss and water degradation, 20% of total emissions in the European Union, while using only 12% of materials obtained from recycling. The industries targeted by the strategy are, mainly, the resource-intensive ones (steel and cement, textiles, construction, plastics, electronics), which will be encouraged to modernize and stimulate recycling and products reutilization. An opportunity for all industrial activities will be 'the development of new markets for climate neutral and circular products' (European Commission, 2019b) and the consolidation of a digital single market (COM, 2020).

Small and medium-sized enterprises (SMEs) are seen at the European Union level as the 'backbone' of the economy due to their contribution to economic growth. In Europe, there are 25 million SMEs, which produce more than 50% of Europe's GDP, provide almost 70% of all jobs and account for 99% of all EU businesses, half of them carrying out innovation activities (European Commission, 2020). However, becoming green and digital seems to be much more difficult for SME's than for large companies. Thus, only 25% of all SMEs provide green goods or services, and only 17% have managed to integrate digital technologies in their activity, which demonstrates the need for measures aimed at facilitating SMEs' access to specialized consulting, targeted financing, and the single market (European Commission, 2020).

Recent studies investigating the performance of the 46 countries that adhered to the 2009 OECD Declaration on Green Growth show that innovation activity in environmental sectors has slowed since 2011, after a significant progress in the 2000s. The main providers of green technologies remain OECD countries, but emerging countries such as China and India are growing rapidly (OECD, 2017). In general, emerging countries made progress in the development of markets for environmental goods and services, but policies are needed to support them through instruments such as: environmental regulations, prices, green procurement, and eco-labelling (Capozza & Samson, 2019).

Moreover, a report on the Progress towards the Sustainable Development Goals (SDG) (United Nations, 2020) shows some improvements in reducing poverty and mortality among mothers and children, and in developing policies and agreements

for sustainable development and environmental protection. However, two problems remain critical: climate change and inequalities between and within countries. Also, the progress observed in the surveyed period (until the end of 2019) is hampered by the new health crisis, in front of which the most vulnerable categories are women, children, the elderly and people with associated diseases, migrants and refugees, informal workers. The most affected by the economic crisis caused by the COVID-19 pandemic seem to be small and medium-sized enterprises. Their development is a real challenge, given that the support measures offered by the government may be insufficient to ensure at least their survival.

In this context, entrepreneurship is considered a key factor in dealing with the great challenges of today's society. Its role is of major importance in implementing the SDG. SMEs can contribute both to sustainable growth by providing jobs in accordance with environmental requirements, and to inclusive growth by making jobs accessible to vulnerable people. Entrepreneurship can be a determinant of the green growth through innovation and the adoption of new technologies. However, especially in developing countries, innovation and technology transfer to this category of companies are expensive, and governments are encouraged to facilitate their access to finance and markets (United Nations, 2016).

As emphasized by Demirel et al. (2019), the analysis of green entrepreneurship in a cross-country framework is little tackled in the literature and very necessary, especially from the perspective of its role and place in emerging or less advanced economies. In this article, we intend to cover this gap by performing a comprehensive analysis, based on entrepreneurship data from 36 countries.

The main aim of the study is to deep dive into the potential of green entrepreneurship and its drivers in the context of a green-based economy in Europe. In this respect, we will investigate several facets of the decision to go green. First, we want to test if relatively recently founded companies are more aware of the importance of sustainable development than the old, traditional ones, and are focusing more on green products and services. Second, we want to analyse that the widespread perception that going green is expensive by testing whether companies with better financial performance are those choosing green entrepreneurship and investigating whether green entrepreneurship is more present in developed, richer countries. And third, as the general political and economic context has a major influence on any business decisions, we will test if public policies and measures to support green entrepreneurship are strong incentives for companies to decide to go green or develop more in this direction.

Using the logistic regression analysis methodology, we will develop an econometric model based on nine explanatory variables to identify the internal as well as external factors that influence the decision of European entrepreneurs to adopt a green behaviour.

2. Literature review

According to OECD, 'green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and

Table 1. The results of the logistic regression estimation.

Explanatory variables		B	Wald	Exp(B)
Age of the company	< 10 years (<i>ref</i>)	–	–	–
	10 – 19 years	–0,131***	2,973	0,877
	20 – 29 years	–0,189**	5,486	0,828
	30 years or older	–0,156***	3,376	0,855
Number of employees	1 to 9 employees (<i>ref</i>)	–	–	–
	10 to 49 employees	–0,025	0,111	0,975
	50 to 249 employees	–0,137	1,772	0,872
	250 employees or more	–0,027	0,035	0,973
Sector of activity	Industry (NACE categ. B, D, E and F) (<i>ref</i>)	–	–	–
	Manufacturing (NACE categ. C)	–0,124	2,025	0,884
	Retail (NACE categ. G)	0,170**	4,576	1,186
	Services (NACE categ. H, I, J, K, L and M)	–0,210**	6,451	0,810
Turnover	100 000 euros or less (<i>ref</i>)	–	–	–
	More than 100 000 to 500 000 euros	0,109	1,349	1,116
	More than 500 000 to 2 million euros	0,229**	5,249	1,259
	More than 2 to 10 million euros	0,274**	5,816	1,316
	More than 10 to 50 million euros	0,509*	13,779	1,663
	More than 50 million euros	0,718*	17,146	2,050
Increase in turnover Developed country		0,189*	7,771	1,208
		0,409*	46,311	1,505
Actions undertaken by the company to be more resource efficient	No action	–	–	–
	Many actions	0,997*	70,494	2,710
	Some actions	0,642*	28,733	1,899
	Few actions	0,398*	10,706	1,489
Selling the products or services	To consumers	0,395*	37,778	1,485
	To companies	0,089	1,525	1,093
	To public administration	0,182*	8,553	1,200
Support measures	Financial incentives for developing products	0,680*	149,369	1,974
	Assistance with identifying potential markets or customers	0,599*	93,261	1,821
	Technical support and consultancy for the development of products	0,432*	47,945	1,540
	Consultancy services for marketing or distribution	0,677*	98,452	1,968
Constant		–2,890*	308,691	0,056
Number of observations				7326
Cox & Snell R Square				0.119
Nagelkerke R Square				0.167
Overall percentage in classification table				70.6

The parameter is statistically significant at: * 1%; ** 5%, or *** 10% level

Source: Authors' estimation using IBM SPSS Statistics 21.

environmental services on which our well-being relies' (OECD, 2015). In this context, green SMEs are the ones that 'contribute to the protection of the climate, environment, and biodiversity through their products, services, and business practices' (Koirala, 2019). SMEs can be: eco-innovators, who enter the market with 'radical and disruptive innovations', being rather small and newly established companies; eco-entrepreneurs, who, like traditional entrepreneurs, pursue certain opportunities and eco-adopters who only envisages the compliance with environmental regulations (Koirala, 2019).

Eco-innovative SMEs seem to be the most important category of green entrepreneurs for SDG as evidenced by the extensive body of literature interested in the

factors that determine eco-innovation, in its three forms: eco-product innovation, eco-process innovation or eco-organizational innovation. Among the factors influencing eco-innovation most often mentioned in the literature, we highlight: internal/supply-side factors (company's age, size, sector of activity, stage of the industrial life cycle, proactive management), external/demand-side factors (competition, demand, other market pull characteristics) and environmental regulations (Kesidou & Demirel, 2010; Cano et al. 2013; Bossle et al., 2016; Coad et al., 2016; Hojnik & Ruzzier, 2016; de Medeiros et al., 2018; Cai & Li, 2018; Demirel et al., 2019; Frieder & Müller, 2019; Saari & Joensuu-Salo, 2019).

The analysis of 442 Chinese companies showed that the most important factor for adopting eco-innovation is competitive pressure, while companies' behaviour in the direction of eco-innovation is a driving factor of the economic performance through environmental performance (Cai & Li, 2018). Lei et al. (2021) affirmed that green credit exhibits a local-neighbourhood effect on green economy. The green credit can not only improve the local green economy but also generate spatial spill over effect to promote the development of green economy in surrounding areas.

In a study conducted for 1566 companies in the UK, the authors demonstrated that innovation is determined by demand factors, while the level of investment in innovation is positively correlated with factors related to costs, organizational behaviour, and strict regulations (Kesidou & Demirel, 2010). Evidence from the Brazilian industry based on data collected from 100 managers attests that for eco-product innovation the driving factors are technological expertise and the existence of proactive leaders (de Medeiros et al., 2018). For eco-process innovation the most important determinants are market pull factors (competitive pressure, customer demand), internal factors (proactive management) and economic incentives (Hojnik & Ruzzier, 2016).

In a study conducted for SMEs in the 27 EU member states, Cano et al. (2013) showed that collaboration with research institutions or universities and the attention paid to the demand for green products are the most important incentive for all types of eco-innovation. Yet, several lines of evidence attest that in emerging countries entrepreneurs are not prepared to take the risk of investing in green business, neither the government nor the universities are able to fulfil their role of supporting the development of green entrepreneurship (Silajdzic et al., 2015).

Most SMEs that carry out activities with environmental content are not necessarily eco-innovators, but rather eco-entrepreneurs or eco-adopters. A study that used data from thousands of SMEs showed that the factors underlying their environmental behaviour are similar to those of innovative SMEs: types of consumers, sectors of activity, environmental regulations. There are yet differences in determinant factors between the two types of activities: green processes and green products and services provided (Hoogendoorn et al., 2015).

The drivers underlying the decision to carry out green activities depend on the firm's age. For example, for green start-ups, the determining factors of decision making are life cycle, knowledge, institutions, and financing (Demirel et al., 2019). Thus, start-ups are expected to play a more prominent role in the early stages of the life cycle of a technology, given that on a competitive market the most important element

is innovation. The government and local public institutions usually contribute through regulations to facilitate the creation and financing of green enterprises. However, an important issue is the knowledge-spillovers and information asymmetries (Demirel et al., 2019)

The importance of the company's age in adopting new technologies is also highlighted by Coad et al. (2016). The authors point out that investments in research and development are riskier for young companies than for mature ones, given that these investments can be supported only in conditions of high growth rates. Yin et al. (2022) showed that the age of firms is a significant factor for green entrepreneurship initiatives, the seniority of the firm being associated with a higher level of knowledge and financial resources that can contribute to the successful implementation of green entrepreneurship.

Audretsch et al. (2014) show that companies with initial capacity for innovation and cooperation in research and development projects are more likely to become Young Innovative Companies (defined as those companies under the age of 6, with less than 250 employees and with more than 15% of the revenues invested in research and development activities). Moreover, a study based on data from green start-ups in France, Germany and the United Kingdom operating in the energy sectors (Ball & Kittler, 2019) showed that entrepreneurs perceive support mechanisms as an important factor in reducing market uncertainty given that consumers are financially stimulated to adopt eco-innovation.

Hamdouch and Depret (2012) argue that green entrepreneurship is more present in developed countries and regions because green products or services are relatively more expensive than traditional ones. This is caused by a longer return cycle, higher social responsibility costs, and higher investment in research and development to create innovative production processes. To alleviate these shortcomings, several measures are used to promote green entrepreneurship: increasing consumer awareness of current environmental issues, simplifying regulations and legislation, as well as developing education and training for green jobs (Vatansever & Arun, 2016).

The consumption of green products has registered an increase, being more and more preferred by the public, especially by the generation of millennials, the most sensitive to environmental problems (Zhang et al., 2019, Muo & Azeez, 2019). Obviously, companies have noticed consumers' appetite for green products, turning it into a competitive advantage. Business companies need to organize marketing campaigns which highlight the healthy gains obtained from acquiring green products to increase their sales. Eco-labelling and point of purchase of green products are also elements that can affect consumer's purchase decision (Sedky & Abdel Raheem, 2021). Western governments have not remained indifferent, with programs to support green entrepreneurship being quickly included as priorities on political agendas (Nikolaou et al., 2011). Thus, a significant number of entrepreneurs were encouraged to choose to go green, resulting in a win-win situation for economic and environmental protection objectives, developed countries being the first to stimulate green growth (O'Neill & Gibbs, 2014). In addition, green efficiency contributes to controlling the impact of pollution with practical effects on economic sustainability (Felicio et al., 2021).

In less developed countries, green entrepreneurship is also less developed, entrepreneurs being more focused on profit - the traditional attitude. Aspects such as social responsibility, environmental protection or long-term sustainable development are not priorities for managers; they aim for fast results (Ceptureanu et al., 2018). High development costs, lack of access to finance, and the relatively unstable economic context are important barriers to green entrepreneurship in less developed countries. Moreover, the green economy model cannot be deployed because of development gaps (Batrancea et al., 2021).

For the environment-oriented businesses and for the eco-innovation process, the important drivers are the availability and quality of financial resources, especially for supporting development activities (Scarpellini et al., 2018). On the demand side, eco-innovation can be stimulated by policies and instruments such as: information and communication, cooperation, regulations, monitoring, and evaluation (Frieder & Müller, 2019). However, the role and impact of institutions and policies in supporting green entrepreneurship must be constantly evaluated and updated, as stated by Hörisch et al. (2017). The mentioned authors draw attention to the fact that the measures should be locally tailored rather than generally applied. Also, strict regulation can sometimes be an obstacle in developing eco-friendly business ideas.

But it is not only economic factors that influence green entrepreneurship. In societies that show a greater concern for the environment and for the preservation of cultural values, managers are more inclined towards sustainable entrepreneurship. There are numerous studies that have focused on socio-cultural factors, the research showing that they are important drivers of sustainable entrepreneurship (Shivani et al., 2006, Spence et al., 2008, Koe & Majid, 2014).

In line with other authors' findings (Saari & Joensuu-Salo, 2019), we also believe that green entrepreneurship can become a business paradigm due to the motivations and the results of this type of activity, which include sustainable and inclusive development. Moreover, this type of business can be favourable to profitability of companies and competitive position (Hojnik & Ruzzier, 2016). There is a growing need for an approach to entrepreneurship as a system of relationships (Entrepreneurial Ecosystem) to ensure the long-term success of the businesses (Cavallo et al., 2019). Therefore, the comprehensive research of all issues related to green entrepreneurship, eco-friendly oriented behaviours, as well as sustainable business models, along with the dissemination of the results among multiple stakeholders is of great importance.

3. Data and methodology

The review of the literature related to eco-innovation and eco-entrepreneurship enabled us to identify the possible determinants of green entrepreneurship, but also the need for other analyses, especially quantitative ones, to confirm these factors, respectively, to identify new ones or certain features of the green market that has not yet been highlighted. Given that the results of the investigated studies are rather mixed, through this study we intend to shed some light on certain aspects of green entrepreneurship, as pointed out in our research hypotheses:

H₁: Recently founded companies are more aware of the importance of sustainable development than the old, traditional ones.

H₂: Going green is expensive.

H₃: Public policies and financial measures are strong incentives for green entrepreneurship.

To verify the proposed research hypotheses, we used the data on entrepreneurship from the Flash Eurobarometer 456: 'SME's, resource efficiency and green markets' (European Commission, 2018). The data were collected at the end of September 2017 and includes information about companies from the 28 member states of the European Union, plus Albania, Iceland, Macedonia, Moldova, Montenegro, Norway, Serbia, Turkey, and USA. The data have been selected for the last available reference year, respecting the principles of completeness and comparability of the data. As soon as new data are available, it is intended to carry out a new study. The method of applying the questionnaire was telephone interview, computer-assisted (CATI). The database contains 200 variables and 15019 observations.

The interviewed companies have 1 or more employees and are active in one of the sectors B to M according to NACE codes. The survey covers both large companies and SMEs, the sample being selected from an international business database, with additions from national sources, in countries where this was necessary. Quotas were applied on the size of companies and sectors, to consider the national specifics, but also to ensure an adequate sample size for each country. In most EU Member States, the number of interviews was around 500, except for Cyprus, Malta, Luxembourg, where around 200 interviews were conducted. For non-EU countries, the number of interviews was between 100 and 400.

The main variable of the econometric analysis is derived from the question: 'Does your company offer green products or services?'. This was transformed into a binary variable: 1 = yes, the company offers green products or services, 0 = no, the company does not offer green products or services.

Some of the independent variables included in the model were related to the characteristics of the company: age, number of employees, sector of activity, value of turnover and evolution of turnover in the past two years.

Since one of the objectives of the research was to observe special characteristics depending on the level of development of the companies' country of origin, we divided the analysed countries according to the level of GDP/capita into two groups: developed countries (Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Norway, Sweden, the Netherlands, and United Kingdom) and 22 relatively less develop countries (Albania, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Macedonia, Malta, Moldavia, Montenegro, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain and Turkey).

The interest of entrepreneurs towards green products or services is often correlated with the respect for the environment, translated into resource efficiency measures. Therefore, we included in the analysis a categorical variable measuring the company's actions to be more resource efficient through saving water, saving energy, using

predominantly renewable energy, saving materials, minimising waste, selling the scrap material to another company, or recycling.

A set of three binary variables were used to quantify the company's main customers: selling the products or services mainly to consumers, to companies or to public administration.

Finally, we included in the analysis four support measures meant to stimulate the development of green entrepreneurship: financial incentives for developing products, services, or new production processes; assistance with identifying potential markets or customers; technical support and consultancy for the development of products, services and production processes; and consultancy services for marketing or distribution.

The quantitative analysis was performed using a logistic regression model. The objective of a regression model is to predict the values taken by a variable Y defined as $\{y_1, y_2, \dots, y_k\}$. For a logistic regression, Y can only take two values $\{1, 0\}$. We assume having a sample Ω of size n . The value taken by Y for an individual ω is denoted by $Y(\omega)$.

For J explanatory factors $\{X_1, X_2, \dots, X_J\}$, the vector of values for an individual ω can be written $(X_1(\omega), X_2(\omega), \dots, X_J(\omega))$.

In the binary framework, for a given individual, the probability for taking the value 1 is written as follows: $P[Y(\omega) = 1] = p(\omega)$, this probability being noted simply with p .

When the sample is randomly extracted from the population, if n_1 is the number of observations with value 1 from Ω , the p probability can be estimated by $\frac{n_1}{n}$.

The probability of taken the value 1 for an individual ω knowing the values taken by the explanatory factors is written $P[Y(\omega) = 1/X(\omega)] = \pi(\omega)$. Once again, for simplicity, we will note this probability with π .

The logit function for an individual ω is:

$$\ln \left[\frac{\pi(\omega)}{1 - \pi(\omega)} \right] = a_0 + a_1 X_1(\omega) + \dots + a_J X_J(\omega) \quad (1)$$

where a_1, a_2, \dots, a_J are the parameters we want to estimate.

The term $\frac{\pi}{1-\pi} = \frac{P(Y=1|X)}{P(Y=0|X)}$ is called odds.

Considering $C(X) = a_0 + a_1 X_1(\omega) + \dots + a_J X_J(\omega)$, we can come back to π with the logistics function:

$$\pi = \frac{e^{C(X)}}{1 + e^{C(X)}} = \frac{1}{1 + e^{-C(X)}} \quad (2)$$

$C(X)$ and π both allow to 'score' individuals, and thus to classify them according to their propensity to be '1' (Rakotomalala, 2015).

4. Results

We started our study with a short descriptive statistical analysis of data on green entrepreneurship, with the purpose of identifying the sectors of activity in which

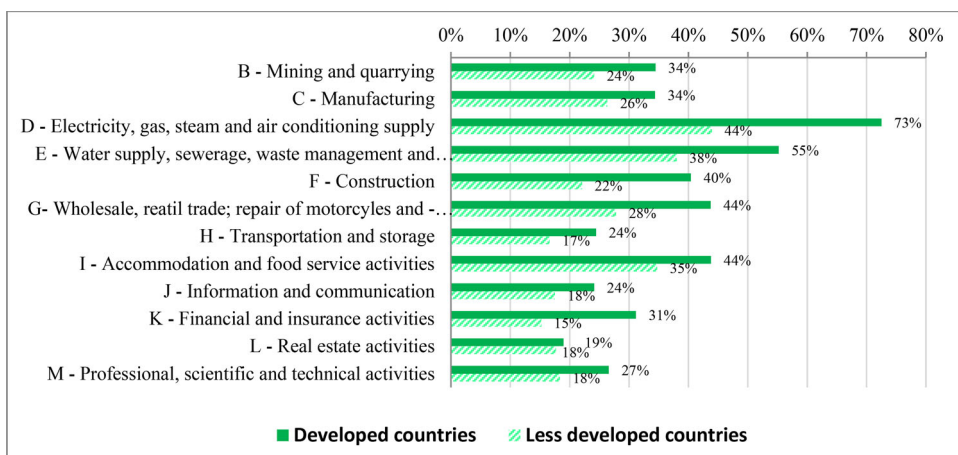


Figure 1. Share of green entrepreneurship by activity sectors and country's level of development (% of total companies).

Source: Authors' analyse using data from Flash Eurobarometer 456

companies that offer green products and services prevail, as well as the countries with high intensity of green entrepreneurship.

The analysis highlighted that in every sector the developed countries register higher shares of green entrepreneurship compared to the less developed countries (Figure 1). The economic sectors based on increased consumption of environmental resources such as energy, water use, and waste management have a strong appetite to adopt green business behaviour both in developed countries and in less developed ones. Electricity, gas, steam, and air conditioning supply stands out with 73% of responding companies in developed countries saying they offer green products or services. In less developed countries this is the sector that also has the highest share of green companies, but the difference compared to developed countries is more than obvious (29 percentage points).

An alarm signal appears in the Transportation and storage sector, which although it is an economic field with major impact on the environment, on the one hand through the high consumption of environmental resources and on the other hand through air emissions, the share of green entrepreneurship is one of the lowest (24% in developed countries and only 17% in less developed ones).

The sector with the smallest difference between developed and less developed countries regarding the share of companies offering green products or services is real estate, this being the least developed sector in terms of green entrepreneurship.

There are significant differences between developed and less developed countries in terms of the intensity of green entrepreneurship, the share of companies offering green products and services being 37% in developed countries, 12 percentage points higher than in less developed countries. The distribution map of green entrepreneurship in Europe indicates that indeed developed countries are much more focused on eco-friendly sustainable development (Figure 2).

Sweden is the only country where more than half of the companies (51%) offer green products and services. Swedish companies successfully integrate sustainable business models, and their strategies and management decisions support the

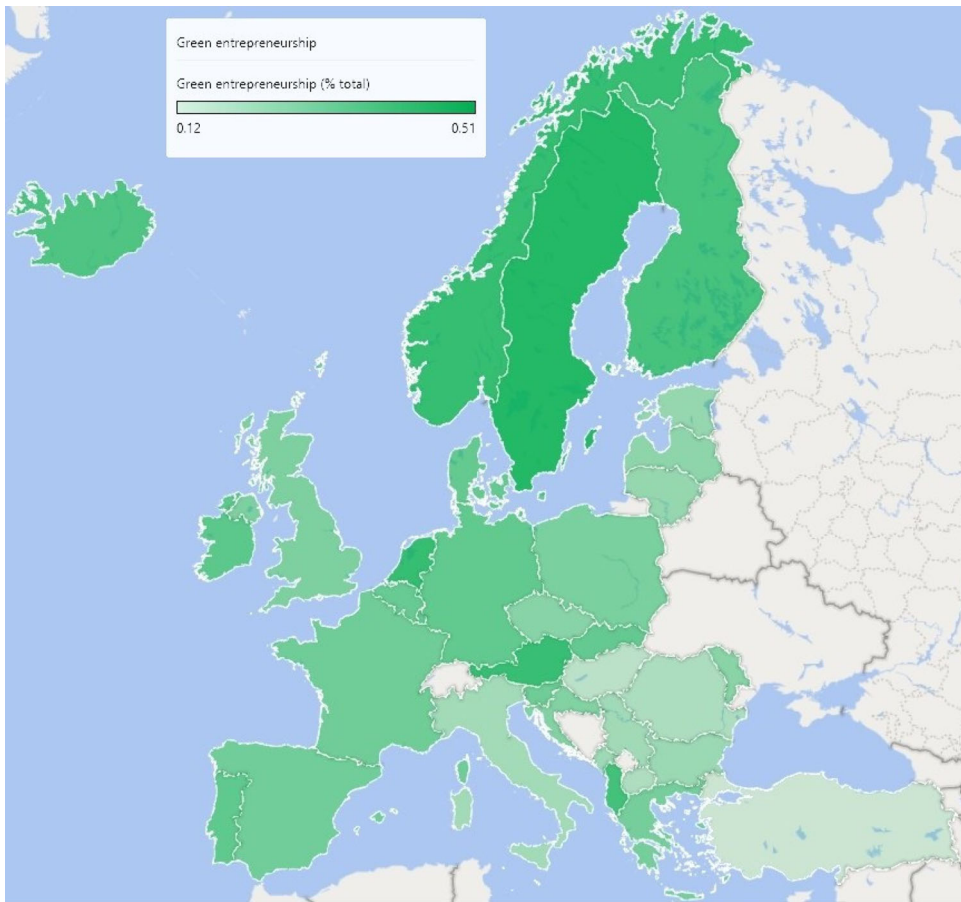


Figure 2. The intensity of green entrepreneurship in Europe (% of total companies).

Source: Authors' analyse in Excel 2016, using data from Flash Eurobarometer 456

environment. Even during the Covid-19 pandemic, Sweden did not set aside environmental policies, with the Sweden Green Recovery plan specifying precise targets and exact measures, including financial support for the transition to fossil-free business activities, or a set of measures to encourage green employment for reducing unemployment caused by the pandemic (Platform2020Redesign, 2020).

Large shares (over 40%) of companies offering green products and services were also registered in the Netherlands, Norway, Austria, Albania, Finland, and Iceland. As expected, most countries in this group are developed countries. The surprise comes from Albania, the only less developed country with such an important share of green entrepreneurship. The success of Albanian companies is to be appreciated, this result also being due to the numerous international organizations that have supported and financed green programs, including EBRD (Green Economy Financing Facility), or the Green Climate Fund.

At the opposite end of the hierarchy, we find Turkey and Hungary, with a very low intensity of green entrepreneurship: only 12% of Turkish companies offer green products or services, and only 12.5% of companies in Hungary decided to go green.

The results of the econometric estimation are presented in [Table 1](#). One of the first aspects that stand out is that, among the explanatory factors considered, only the number of employees is not statistically significant, indicating that the number of employees does not influence the decision to go green, whereas all other variables have an impact on green entrepreneurship.

Regarding the company's seniority on the market, the results indicated that young companies, less than 10 years old, are the ones most likely to decide to go green. By comparison, companies aged between 10 and 19 years are 13% less likely to offer green products or services. The companies with an age between 20 and 29 years are 1.2 times less likely to choose green entrepreneurship compared to young companies, as well as the companies established more than 30 years before data collection. Thus, the first research hypothesis was validated: the age of the companies is a decisive factor in the decision to choose green entrepreneurship. Newer companies are more aware of current challenges and strive to implement sustainable business models with little impact on the environment.

Another significant factor is the company's sector of activity. To simplify the analysis, we grouped the sectors of activity into 4 main areas: i) Industry, which includes Mining and quarrying; Electricity, gas, steam and air conditioning supply; Water supply, sewerage, waste management and remediation activities; and Construction; ii) Manufacturing; iii) Retail; and iv) Services, that includes Transportation and storage; Accommodation and food service activities; Information and communication; Financial and insurance activities; Real estate activities; and Professional, scientific and technical activities. The econometric results indicated significant differences between Industry and Retail, respectively, Services. More precisely, the companies in the Retail sector have 18% higher chances than those in the Industry to offer green products or services. On the contrary, companies in the Services sector are 1.23 times less likely to opt for green entrepreneurship, compared to companies in the Industry. The regression coefficient for Manufacturing was not statistically significant.

The analysis of turnover's impact on the decision to go green indicated that as the turnover of a company is higher, the chances of that company to offer green products or services increase. The reference value of the annual turnover was set at the lowest interval in the questionnaire, 100,000 euros or less. The next threshold, between 100,000 euros and 500,000 euros, was not statistically significant, i.e., there are no notable differences between companies in these two categories. Next, as the values for turnover increase, the coefficients are higher and higher. Companies with an annual turnover of more than 500,000 and up to 2 million euros are 26% more likely to offer green products or services, compared to companies with low turnover (less than 100,000 euros). Furthermore, companies with an annual turnover of more than 2 and up to 10 million euros are 1.3 times more likely to choose green entrepreneurship, those with a turnover of 10 to 50 million euros have a 1.66 higher probability, and companies with a turnover of over 50 million euro register 105% higher chances to go green than companies with low turnover.

Another variable related to the economic performance of the analysed companies was the evolution of the turnover. The results showed that companies that registered increases in turnover in the last two years are 21% more likely to offer green products or services, compared to companies that had a decrease or stagnation in turnover.

Considering the country of origin, the analysis indicated that companies located in relatively more developed countries are 51% more likely to develop green products and services, compared to companies in less developed countries.

These last three variables allowed the validation of the second research hypothesis: going green is expensive. We have noticed that the chances of a company to offer green products or services increase as turnover increases, a positive evolution of turnover implies a higher probability of green entrepreneurship, and companies in developed countries are more likely to go green.

The next factor included in the analysis refers to the companies' behaviour in relation to environmental protection. The purpose of this analysis was to see the connection between the actions undertaken by a company to be more resource efficient and the decision to offer green products and services. In other words, we wanted to test the involvement of companies in aspects related to sustainable development, not just the option to choose green entrepreneurship for profit, for the desire to be on trend or for marketing reasons. The results exceeded expectations. Companies that take few actions to be more resource efficient are 49% more likely to offer green products or services compared to companies that do not take any action in this regard. For those who take some actions, the probability increases to 90%, and companies that take many actions are 2.7 times more likely to choose green entrepreneurship than those that do not act at all. This is the highest coefficient obtained in the regression model, indicating the strong link between the involvement of companies in resource efficiency and the decision to offer green products or services. It is clearly a pattern of business behaviour, in which sustainable development and care for the environment play a central role.

We also included in the analysis the relationship of companies with their main customers and how they can influence green entrepreneurship decisions. The results indicated that companies whose main customers are individual consumers are 48% more likely to offer green products and services. For companies that largely address to other companies the coefficient was not statistically significant. The pleasant surprise came from the companies that have as main clients the public administration, these having 20% higher chances to offer green products and services. It is a signal that public institutions are beginning to pay attention to sustainable development and encourage green entrepreneurship.

Regarding the support measures for the launch of green products or services or for their development, the results indicate that they are viewed with great optimism by the companies. The best support measure is to offer financial incentives for developing products, services or new production processes, the companies that share this opinion having 97.4% higher chances to offer green products or services. Also, benefiting from consultancy services for marketing or distribution increases the chances of a company by 96.8% to choose green entrepreneurship. Companies believing that assistance with identifying potential markets or customers would help them are 1.8 times more likely to offer green products and services, and technical support and consultancy for the development of products increases by 54% the chances of a company to go green. Thus, the third research hypothesis was validated: the support measures facilitate green entrepreneurship, significantly increasing the likelihood of a company to decide to launch or expand their range of green products or services.

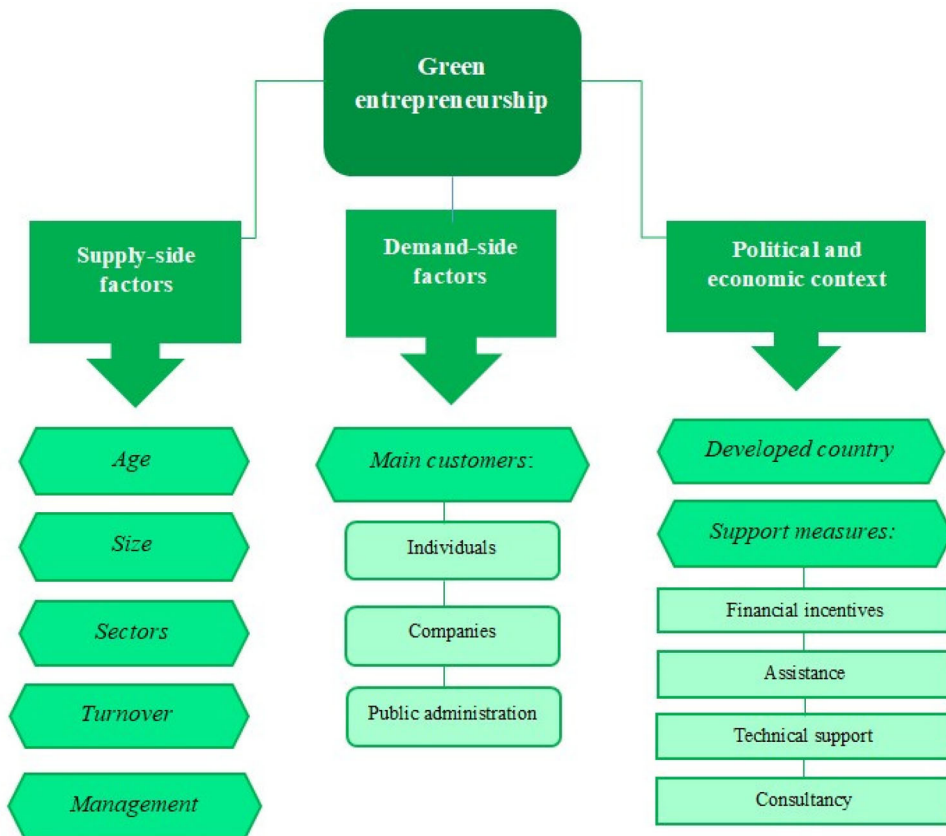


Figure 3. The influencing factors of green entrepreneurship.
Source: Authors' design

5. Discussion

Green entrepreneurs are fundamental pillars of the sustainable economic development. They support the green economy in at least four ways: providing green products and services, developing environmentally friendly production technologies, stimulating demand for green products and services, and creating green jobs (ILO 2020).

Given the tremendous role of the entrepreneurship with green products and services for better lives and better business and recognizing the need for a deeper understanding of how it can be stimulated, in this article, we tried to uncover the factors underlying the decision to provide green products and services. Among the factors highlighted in the literature, three categories stand out as the most important (Figure 3): supply-side factors, demand-side factors, and other external factors such as institutions and policies. In our article, we investigated the determining factors corresponding to these categories, focusing on the age of the company, the number of employees, the sector of activity in which the company operates, the turnover and its growth rate (as internal factors); types of customers; and economic and political environment (as external factors).

A first result of our research is that the number of employees is not among the drivers of entrepreneurship with green products and services. This fact can be correlated with the findings of the recent literature which shows that for the development of green entrepreneurship of great importance is rather eco-innovation (eco-product innovation, eco-process innovation and eco-organizational innovation), which does not depend on the number of employees, but rather on knowledge, expertise, proactive management, financial resources, and incentives (de Medeiros et al., 2018; Hojnik & Ruzzier, 2016).

In line with the latest green entrepreneurship literature outcomes, we showed that entrepreneurs' concern for more efficient use of resources, translated into specific actions to support sustainable development, is positively correlated with the likelihood to provide green products and services (Silajdzic et al., 2015; Hojnik & Ruzzier, 2016).

Our study supports the findings of other researchers related to the role of firms' age in becoming green by emphasizing the fact that the age of the company is a determining factor in the decision to offer green products and services (Demirel et al., 2019). The results of the logistic regression showed that young companies are more likely to be green entrepreneurs. However, this result must be interpreted in the context in which the market for green products and services is widely supported financially through numerous start-up stimulation programs.

Logistic regression results also have shown that the capacity to offer green products and services is positively correlated with turnover, and SMEs with high turnover growth rates are more likely to offer green products and services. This result confirms the findings of other studies that show that eco-innovation can be adopted by companies with high growth rates (Coad et al., 2016).

Our results provide a scientific basis for the public policies aiming at supporting the start-ups on medium and long-term, and not only through financial incentives, but also through access to knowledge, information, and cooperation. We found that entrepreneurs consider financial support a real incentive in the decision to develop and sell green products and services, but almost equally important were consulting, technical support, and assistance.

Another result of our research that deserves to be highlighted is the role of different categories of customers in stimulating green entrepreneurship. As demonstrated by the logistic regression, it is noteworthy that the public administration can significantly contribute to increasing the demand for green products and services. Also, the quantitative analysis showed that certain sectors of activity, such as retail, are more prone to offer green services and products.

In addition, both the descriptive analysis and the results of the logistic regression confirmed that the companies from developed countries are more likely to offer green products and services. The results of our research reinforce the concerns expressed at the international institutions level, which highlight that green entrepreneurship is much more difficult to be implemented in less developed countries. On the one hand, this result indicates that the activity of offering green products and services is expensive, and companies in less developed countries are not financially prepared to enter this market, and secondly, the main incentive to provide green products and

services, namely market demand, is not as high in developing countries compared to developed ones, given the lower purchasing power of potential customers.

There are several limitations to this study that need to be pointed out. A first limitation is determined by the small number of variables included in the database that served our purpose. The detailed characterization of green entrepreneurship involves the inclusion of a significant number of factors, because it is a complex process, with many facets, and its in-depth understanding requires a rich database. A second limitation refers to the reference period, respectively, the year 2017. This fact did not allow us to capture the opinion of entrepreneurs related to the recent challenge generated by the pandemic.

6. Conclusions

The current crisis caused by the COVID-19 pandemic overlaps with the great challenges that society already faces: global warming, scarcity of natural resources, poverty and inequality that generate vulnerable groups, the challenges of the digital era in terms of information security, digital skills, and labour market transformations. It is very difficult to find solutions that bring benefits on all levels, especially when there are so many serious and pressing problems. One aspect that offers a win-win situation is green entrepreneurship, combining favourable business outputs with environmental protection measures, offering a model of sustainable development that benefits each party involved: the consumer, the company, administrative structures, but also nature itself. Identifying the influencing factors and the conditions for stimulating green entrepreneurship is thus an important goal of the scientific community.

Our study focused on identifying what influences a company's decision to go green. We used a logistic regression model for analysing supply and demand factors, measures for resource efficiency and specific policies for green entrepreneurship.

We found that the company's age is a determinant factor, younger firms being more likely to adopt a green behaviour. In younger companies usually work younger people, more sensitive to societal problems, and more aware of the importance of environmental protection. At the same time, start-ups often focus on development niches, and green entrepreneurship is an opportunity for many creative and innovative companies. Older companies cherish tradition, or they simply have a business model that brings them profit and do not have the necessary motivation to change to green.

We also demonstrated that green entrepreneurship is expensive. Thus, the profile of a company that offers green products and services would be the following: high-income company, with growing turnover, founded in a developed country. Therefore, we can highlight a contribution of our article to the existing literature on green entrepreneurship, namely our analysis on the country's level of development. The results pointed out significant differences between the developed and less developed countries, the operating patterns of green entrepreneurship being distinct.

Another key aspect that generates added value is that we included in the analysis the main type of customers: individuals, companies, and public administration. The data showed that individual customers are the main beneficiaries of green products

and services, but we also demonstrated the important role of public administrations in stimulating green entrepreneurship. The contribution of public administration to the growth of green economy is twofold: it encourages entrepreneurship through the consumption of such products and services and stimulates its development through specific policies.

Our results also indicated that entrepreneurs need support measures for the development of their green products and services. Although financial incentives are very important, measures such as assistance with identifying potential customers, technical support and consultancy services have proven to be appreciated by green entrepreneurs. If we link this result to financial performance criteria, we better understand why companies in less developed countries might encounter difficulties in setting up green businesses. Financial resources are a decisive factor, but also the proper functioning of public policies and support programs matter. Facilitating the transfer of good practice, but necessarily accompanied by capital infusion, could be an integrated mechanism for stimulating green entrepreneurship in less developed countries.


Further developments of the current research can be made by including other dimensions to the analysis like environmental and ecosystem indicators, and elements such as national culture, organizational culture, and family traditions. The research can also be enriched by widening the time horizon, since a limitation of our analysis is related to the availability of recent data. Our study included an impressive number of companies from all EU Member States, but such surveys are not carried out very often. Thus, the compromise in this article was the preference for large coverage in terms of number of companies and countries, versus recent data. There is a need for further research, as green entrepreneurship is a topic of great interest, and reliable quantitative research will be needed in the near future, marked by a crisis which will impose new adaptation and development strategies and a fierce struggle for access to financial resources.

Disclosure statement

No conflict of interests has been declared by the authors.

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