THE ENTREPRENEURIAL DETERMINANTS OF SUSTAINABLE DEVELOPMENT OF ENTERPRISES IN EMERGING EU ECONOMIES

Anna MISZTAL

Faculty of Economics and Sociology, University of Lodz, Lodz; anna.misztal@uni.lodz.pl,
ORCID: 0000-0002-7455-5290

Purpose: This paper aims to assess the impact of entrepreneurial determinants on the sustainable development of enterprises in emerging EU economies from 2008 to 2020.

Design/methodology/approach: This paper is empirical, and it consists of conceptual background, research methodology, research results, discussions, and conclusions. The survey covers the enterprise sector in Bulgaria, Croatia, Poland, Romania, and Hungary (emerging and developing economies in the EU). I used the correlations coefficients and the Ordinary Least Square Method to verify the strength and direction of influence of entrepreneurial determinants on the sustainable development of enterprises.

Findings: In the analyzed countries, there is a diversified influence of individual entrepreneurial determinants on the sustainable development of enterprises, both in terms of direction and strength of influence.

Research limitations/implications: The paper has serious limitations in selecting and integrating indicators for the research. Further research requires considering a larger group of determinants, not only strictly entrepreneurial factors.

Practical implications: The analysis results indicate that entrepreneurial factors influence the sustainable development of the enterprise sector; therefore, the authorities should coordinate activities and initiatives related to sustainable development and entrepreneurship. Creating financial and non-financial incentives is necessary to run a sustainable business.

Social implications: Sustainable development is crucial for the conditions and quality of life. Separating entrepreneurial factors and creating effective institutional support for business initiatives is crucial for sustainable development.

Originality/value: A novelty in the paper is an attempt to isolate entrepreneurial determinants of the sustainable development of enterprises. The article is intended for a wide audience, theoreticians and practitioners interested in sustainable development.

Keywords: entrepreneurial determinants, sustainable development, emerging economies.

Category of the paper: research paper.

1. Introduction

Sustainable development is important for counteracting climate change, preserving natural resources, and caring for citizens' health and quality of life. Concerning the theory of enterprise growth and development, this term can be understood as an activity aimed at economic development, expanding the company's financial and property base, supporting, and developing employees and local communities, and taking measures to protect the natural environment. Sustainable development is based on eco-innovation and social and environmental investments.

The determinants of sustainable development of enterprises are poorly understood, both in terms of its measurement and factors influencing it. However, the literature on the subject contains considerations on the problems and methods of measuring the sustainable development of enterprises at the sector level (Valaskova et al., 2018; Pieloch et al., 2021; Teng et al., 2021; Misztal, 2021; Comporek et al., 2022), listed companies (Dissanayake et al., 2016; Loch et al., 2017; Ismail et al., 2021) or individual enterprises (Ciambotti et al., 2021; Tutaj et al., 2021). The sustainable development of enterprises is often related to corporate social and environmental responsibility.

The article's main aim is to assess the impact of entrepreneurial determinants on the sustainable development of enterprises in the developing economies of the European Union from 2008 to 2020. The central hypothesis of the research is as follows: "In the developing countries of the European Union, there is a variation in the strength and directions of the influence of entrepreneurial factors on the sustainable development of enterprises from 2008 to 2020". I used Spearman, Gamma and Tau Kendall's rank correlation coefficients and the Ordinary Least Square Method to verify the hypothesis.

The structure of the paper is formed by conceptual background, research methodology, research results, discussions, and conclusions. Isolating the strength and significance of entrepreneurial determinants is important in creating government policy and running a business. A novelty in the paper is an attempt to isolate entrepreneurial determinants of the sustainable development of enterprises. The article is intended for a wide audience, theoreticians and practitioners interested in sustainable development.

2. Conceptual background

Sustainable development (SD) meets the needs of people today without reducing the ability of future generations to meet their own needs (Bruntland Commission Report, 1987). It requires an effort to build a sustainable and disaster-resistant future for all people. To achieve sustainable development, the consistency of three essential elements is necessary: economic growth, social

inclusion, and environmental protection. They are interconnected, and they are all vital to the well-being of individuals and societies (Baker, 2015; Sach et al., 2019; Thacker et al., 2019; Zakari et al., 2022).

Eliminating poverty and fighting climate change is a requirement for achieving sustainable development. It requires promoting sustainable, inclusive, and equal economic growth and responsibility and real activities of the institutions, organizations, enterprises, and the entire community (Borys, 2011; Misztal, 2021; Muhammad Kamran Khan et al., 2021).

Considering the goal of business activity as maximizing profits, achieving sustainable development is difficult but not impossible. In business practice, it is often associated with the need to give up part of the profits and allocate them to implementing innovative ecological solutions and the support and development of employees. The financial and property effects of enforcing the sustainable development goals should appear in the long term and strengthen the competitive position on the market (Bocken et al., 2014; Misztal, 2019; Hummels and Argyrou, 2021; Latysheva, et al., 2021).

Sustainable development depends on several factors, including external and internal. As the research results show, one of the key factors is the macroeconomic situation (Pieloch et al., 2021; Comporek et al., 2022). Research on various economic sectors shows that the relationship between economic growth and sustainable development of enterprises is positive. In addition, sustainable development is influenced by globalization (Pawłowski, 2013; Amodu, 2020; Misztal and Kowalska, 2020), technology development (Goralski and Tan, 2020; Dantas et al., 2021), the general economic situation (Hess, 2016; Kihombo et al., 2021), stability of laws and regulations regarding business (Lang and Murphy, 2014; Orzeszyna and Tabaszewski, 2021). The internal factors include the financial situation (liquidity, profitability, debt level and structure), the level of knowledge, access to technology, implemented strategies and business models, the degree of commitment of management and employees to social and environmental issues (Hahn and Kühnen, 2013; O'Shea et al., 2021).

The added value of the paper is an attempt to check whether factors related to entrepreneurship impact the sustainable development of enterprises. So far, there is no similar research relating to sectoral analyses of sustainable development. From the theoretical considerations and practical implications, it is important to distinguish whether factors such as external financing (E_{Fin}), creation and diffusion of knowledge (K_c), entrepreneurial skills and capabilities (Ent_{Cap}), regulations (Reg), influence the sustainable development of enterprise (the OECD-Eurostat Entrepreneurship Indicators).

Access to external financing sources seems particularly important for enforcing economic, social, and environmental tasks. Facilitating running a sustainable business creates an economic system that allows entrepreneurs to take out low-interest loans and credits for social and environmental purposes. In addition, business angels and venture capital investments play an outstanding role in building a sustainable business (Weber, 2014; Ziolo and Sergi, 2019; Lagoarde-Segot, 2020).

Indeed, sustainable investments positively correlate with government spending on research and development, cooperation between corporations, open innovation, and the economy's innovation (Misztal, 2019; Misztal and Kowalska, 2020).

The level of sustainable development is also influenced by the skills of the management and employees, their knowledge, flexibility, and the ability to adapt to the changing market environment. Therefore, the level of education in society, self-employment, or the development of students and their international mobility also contribute to a new perception of socio-economic reality and greater activity in the fight against climate change (Hind et al., 2009; Abdelkafi and Täuscher, 2016; Rodenburg and MacDonald, 2021).

Another factor influencing entrepreneurship and sustainable development is the ease of setting up and running a business and a low level of bureaucracy (Blinova et al., 2021; Bryant and Thomson, 2021). Stable legal systems and tax regulations are of key importance here. Low and simple taxes combined with a system of tax encouragements for green investments should positively affect sustainable development (Śleszyński, 2014; Misztal, 2020; Newell, 2022).

3. Research methodology

The main research aims to assess the impact of entrepreneurial determinants on the sustainable development of enterprises in the developing economies of the European Union from 2008 to 2020. The research sample includes enterprises from developing economies in the European Union, including Bulgaria, Croatia, Hungary, Poland, and Romania. Selected countries went a long way from central to market economies.

The central research hypothesis is as follows "In the developing countries of the European Union, there is a variation in the strength and directions of the influence of entrepreneurial factors on the sustainable development of enterprises from 2008 to 2020". The justification for such a hypothesis is that despite a similar path to economic freedom, these countries differ in size, level of socio-economic development, entrepreneurship and executing environmental protection policies.

The following research sub-hypotheses were also put forward:

- First sub-hypothesis: "In emerging economies, there is a positive dynamic of the indicator of sustainable development of enterprises in 2008-2020". Justification: these countries are undergoing a gradual transformation of their economies and use EU funds to achieve economic, social, and environmental goals. In addition, they must comply with environmental protection requirements. Verification of the sub-hypothesis with the use of the trend function (Table 3).
- Second sub-hypothesis: "The most important factor for the sustainable development of enterprises is the external financing". The justification for this fact is that investments,

including eco-innovations, require large financial resources. Verification using the results of the OLS method (Table 7).

- Third sub-hypothesis: "Legal regulations in developing countries are one of the key factors limiting the sustainable development of enterprises" due to complicated legal regulations concerning running a business and complicated tax systems. Verification of the hypothesis is by using the results of OLS estimation (Table 7).

The research consists of three stages. In the first step, I distinguished analytical indicators important for assessing sustainable development and its entrepreneurial determinants. Then, I create synthetic (integrated) indicators based on analytical measures. I determined correlation measures (Spearman, Gamma and Tau Kendall's rank correlation coefficients) and created models based on the OLS method (Table 1).

Table 1.
Research steps

Step 1 **Selecting analytical indicators for models**

- Enterprise sustainable development indicators:
  - turnover or gross premiums, production value, value added at factor cos, gross operating surplus, total purchases of goods and services, gross investment in tangible goods, investment rate, share of personnel costs in production, average personnel costs, wages and salaries, social security costs, total number of employees in a country, turnover per person employed, apparent labour productivity, gross value added per employee, growth rate of employment, number of persons employed per enterprise, investment per person employed, personnel costs, emissions of carbon dioxide, methane emission, nitrous oxide emission, sulphur oxide, ammonia, carbon monoxide, nitrogen oxides emission, generation of total waste.
- Entrpreneurial indicators:
  - External financing: ease in access to loans, venture capital investments, angel investment by country
  - Creation and diffusion of knowledge: gross domestic expenditure on R&D (percentage of GDP), patents – international collaboration in technology development (number), innovation index
  - Entrepreneurial capabilities: tertiary educational attainment (%), self-employment, international mobility of students Bachelor's and master's level;
  - Regulatory framework: ease of doing business, corporate income tax rate (%).

Step 2 **Transforming the explanatory variables to unify their measuring scales using the following formulas**
- for the stimulants $$z_{ij} = \frac{x_{ij} - \min_i\{x_{ij}\}}{\max_i\{x_{ij}\} - \min_i\{x_{ij}\}}, \; z_{ij} \in [0;1];$$ - for the destimulants: $$z_{ij} = \frac{\max_i\{x_{ij}\} - x_{ij}}{\max_i\{x_{ij}\} - \min_i\{x_{ij}\}}, \; z_{ij} \in [0;1]$$ where: z_{ij} stands for the normalized value of the j-th variable in the i-th year; x_{ij} is the value of the j-th variable in the i-thyear; $\min_i\{x_{ij}\}$ is the lowest value of the j-th variable in the i-th year; $\max_i\{x_{ij}\}$ is the highest value of the j-th variable in the i-th year. - To calculate the indicator of sustainable development of enterprises I assume the same impact of different indices on the aggregate measure and use the following formula: $$SI_i = \frac{1}{n}\sum_{j=1}^{n} z_{ij}, \; (i = 1,2,\dots,n)$$ where: SI_i stands for the indicator in the i-year; n is the number of metrics; others as above.

Cont. table 1.

Step 3
Examination of the strength and direction of a linear relationship between indicators

- Spearmans rang:

$$r_s = \frac{\frac{1}{6}(n^3 - n) - (\sum_{i=1}^{n} d_i^2) - T_x - T_y}{\sqrt{\left(\frac{1}{6}(n^3 - n) - 2T_x\right)\left(\frac{1}{6}(n^3 - n) - 2T_y\right)}},$$

$$d_i = Rx_i - Ry_i; \; T_x = \frac{1}{12}\sum_j (t_j^3 - t_j); \; T_y = \frac{1}{12}\sum_k (u_k^3 - u_k)$$

where t_j is the number of observations in the sample having the same j-th rank value of the variable x; u_j is the number of observations in the sample having the same k-th rank value of the variable y; R_x is the ranks of x in the sample; R_y is the ranks of y in the sample

- Gamma Coefficient (Goodman and Kruskal's Gamma) :

$$r_g = \frac{N_c - N_d}{N_c + N_d}$$

where N_c is the total number of pairs that rank the same; N_d is the number of pairs that don't rank the same

- Tau Kendall's Coefficient:

$$R_{TK} = \frac{N_{CP} - N_{DP}}{\frac{n(n-1)}{2}};$$

N_{CP} − number of concordant pairs, N_{DP} − number of discordant pairs

I adopt the ranges of correlation strength that were suggested by Evans: |rxy| = 0—no correlation; 0 <|rxy| ≤ 0.19—very weak; 0.20 ≤ |rxy| ≤ 0.39—weak; 0.40 ≤ |rxy| ≤ 0.59—moderate; 0.60 ≤ |rxy| ≤ 0.79—strong; 0.80 ≤ |rxy| ≤ 1.00—very strong.

Step 4
Creating the models (the OLS estimation method)

- $SDi = \beta 0 + \beta 1 \cdot E_{Fini} + \beta 2 \cdot E_{Fin(i-1)} + \beta 3 \cdot K_{ci} + \beta 4 \cdot K_{c(i-1)} + \beta 5 \cdot Cap_{Enti} + \beta 6 \cdot Cap_{Ent(i-1)} + \beta 7 \cdot Reg(i) + \beta 8 \cdot Reg(i-1) + \varepsilon i$

Where SDi – sustainable development of enterprise; E_{Fin} – external financing; Kc- creation and diffusion of knowledge; Cap_{Ent}- entrepreneurial skills and capabilities; Reg- legal regulations

Model tests: White's test for heteroskedasticity; Frequency distribution for residual; Breusch-Godfrey test for first-order autocorrelation; the variance inflation factor (VIF)

Source: own study.

The following part of the article presents a discussion and conclusions. In the discussion, the Author verifies the research hypotheses concerning the literature on the subject, indicates the study's key limitations, and shows practical implications. The ending contains the final conclusions and directions for future scientific work.

4. Research results

Table 2 presents the indicator of enterprise sustainable development in emerging economies in the European Union. In all countries, there is a positive trend in the SD indicator, which is a positive phenomenon that proves that enterprises from these countries undertake activities for economic, social, and environmental development.

Table 2.

Sustainable development of enterprise indicators (SD) from 2008 to 2020 in EU emerging markets

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bulgaria	0.44	0.41	0.29	0.32	0.41	0.49	0.53	0.63	0.66	0.65	0.69	0.72	0.76
Croatia	0.62	0.39	0.36	0.37	0.34	0.50	0.54	0.53	0.55	0.52	0.53	0.54	0.55
Hungary	0.45	0.30	0.45	0.51	0.49	0.54	0.67	0.74	0.67	0.76	0.80	0.84	0.89
Poland	0.42	0.39	0.43	0.57	0.51	0.55	0.68	0.68	0.66	0.74	0.78	0.82	0.85
Romania	0.57	0.35	0.48	0.59	0.57	0.65	0.69	0.65	0.67	0.73	0.76	0.79	0.82

Source: own calculations based on https://ec.europa.eu/eurostat/databrowser/view/sbs_na_sca_r2/ default/table?lang=en.

Descriptive statistics for the indicator of sustainable development of enterprises are presented in Table 3. The highest average value of the sustainable development is in Romania (0.64), the lowest in Croatia (0.49). The highest maximum value of SD is in Hungary (0.89), the lowest minimum value of SD is in Bulgaria (0.29).

Table 3.

Descriptive statistics of the sustainable development of enterprise indicators (SD) from 2008 to 2020 in EU emerging markets

	Mean	Standard deviation	Max	Min	Trend line	R²
Bulgaria	0.54	0.15	0.76	0.29	SD = 0.0373t + 0.2768	0.8404
Croatia	0.49	0.09	0.62	0.34	SD = 0.01t + 0.4163	0.1893
Hungary	0.62	0.17	0.89	0.30	SD = 0.044t + 0.3155	0.9168
Poland	0.62	0.15	0.85	0.39	SD = 0.0389t + 0.3487	0.9444
Romania	0.64	0.13	0.82	0.35	SD = 0.03t + 0.4307	0.7962

Source: own calculations based on https://ec.europa.eu/eurostat/databrowser/view/sbs_na_sca_r2/ default/table?lang=en.

Table 4 presents indicators of entrepreneurial determinants influencing the sustainable development of enterprises in the analyzed countries. The obtained values indicate their significant diversification, resulting from different levels of economic and social development, different conditions of running a business, and legal regulations in entrepreneurship.

Table 4.

Indicators of external financing (E_{Fin}), creation and diffusion of knowledge (Kc), entrepreneurial skills and capabilities (Cap_{Ent}), regulations (Reg), influence the sustainable development of enterprise in the emerging economies in the EU from 2008 to 2020

Country	Indicator	Year												
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bulgaria	E_{Fin}	0.65	0.58	0.10	0.20	0.20	0.37	0.23	0.52	0.73	0.75	0.90	0.81	0.85
	K_c	0.26	0.27	0.29	0.26	0.39	0.36	0.75	0.88	0.60	0.81	0.71	0.65	0.74
	Cap_{Ent}	0.36	0.36	0.28	0.11	0.02	0.26	0.38	0.45	0.51	0.67	0.80	0.67	0.70
	Reg	0.38	0.90	0.92	0.94	0.90	0.92	0.50	0.52	0.56	0.77	0.94	0.98	1.00
Croatia	E_{Fin}	0.46	0.24	0.08	0.14	0.06	0.07	0.09	0.06	0.52	0.57	0.65	0.70	0.73
	K_c	0.17	0.18	0.03	0.13	0.28	0.73	0.35	0.55	0.30	0.31	0.55	0.48	0.48
	Cap_{Ent}	0.33	0.38	0.45	0.40	0.30	0.31	0.40	0.38	0.46	0.54	0.67	0.66	0.67
	Reg	0.89	0.89	0.90	0.91	0.99	1.00	0.50	0.50	0.54	0.12	0.19	0.12	0.13

Cont. table 4.

Hungary	E_{Fin}	0.20	0.10	0.12	0.18	0.14	0.08	0.14	0.16	0.78	0.66	0.78	0.93	0.94
	K_c	0.67	0.56	0.57	0.57	0.75	0.68	0.38	0.43	0.51	0.39	0.56	0.59	0.56
	Cap_{Ent}	0.19	0.23	0.23	0.25	0.26	0.28	0.47	0.49	0.63	0.62	0.83	0.97	0.98
	Reg	0.82	0.86	0.81	0.85	0.88	0.95	0.45	0.45	0.49	0.29	0.46	0.43	0.46
Poland	E_{Fin}	0.42	0.12	0.11	0.17	0.09	0.11	0.17	0.30	0.67	0.76	0.73	0.95	1.00
	K_c	0.07	0.04	0.14	0.24	0.54	0.45	0.51	0.71	0.56	0.59	0.78	0.80	0.79
	Cap_{Ent}	0.31	0.39	0.34	0.46	0.39	0.21	0.36	0.63	0.70	0.80	0.80	0.80	0.83
	Reg	0.47	0.97	1.00	1.00	0.82	0.78	0.55	0.51	0.50	0.54	0.62	0.71	0.72
Romania	E_{Fin}	0.67	0.22	0.03	0.03	0.07	0.07	0.10	0.12	0.30	0.36	0.35	0.42	0.45
	K_c	0.33	0.34	0.48	0.63	0.57	0.50	0.25	0.54	0.53	0.54	0.54	0.59	0.59
	Cap_{Ent}	0.32	0.34	0.39	0.37	0.44	0.45	0.31	0.45	0.55	0.51	0.61	0.62	0.63
	Reg	0.01	0.21	0.21	0.54	0.54	0.55	0.43	0.35	0.51	0.32	0.67	0.78	0.85

Source: own study based on Eurostat, OECD, World Bank, EBAN, Global Economy, Trading Economics.

Table 5 presents indicators of entrepreneurial determinants of sustainable development of enterprises in developing countries in the EU. The highest average value of E_{Fin} is in Bulgaria (0.53), and the lowest is in Romania (0.25). The highest value of the K_c index is in Hungary (0.56), the lowest is in Croatia (0.35). The highest value of the Cap_{Ent} index is in Poland (0.54), the lowest is in Bulgaria (0.43). The highest Reg level is in Bulgaria (0.79) and the lowest in Romania (0.46). The obtained results are diversified, which means that none of the surveyed countries creates a favourable framework for running a sustainable business.

Table 5.
Descriptive statistics of the entrepreneurial determinants indicators (SD) from 2008 to 2020 in the EU emerging economies

Country	Indicator	Descriptive statistics			
		Mean	Standard deviation	Max	Min
Bulgaria	E_{Fin}	0,53	0,27	0,90	0,10
	K_c	0,54	0,23	0,88	0,26
	Cap_{Ent}	0,43	0,23	0,80	0,02
	Reg	0,79	0,21	1,00	0,38
Croatia	E_{Fin}	0,34	0,26	0,73	0,06
	K_c	0,35	0,19	0,73	0,03
	Cap_{Ent}	0,46	0,13	0,67	0,30
	Reg	0,59	0,34	1,00	0,12
Hungary	E_{Fin}	0,40	0,34	0,94	0,08
	K_c	0,56	0,11	0,75	0,38
	Cap_{Ent}	0,49	0,28	0,98	0,19
	Reg	0,63	0,22	0,95	0,29
Poland	E_{Fin}	0,43	0,33	1,00	0,09
	K_c	0,48	0,26	0,80	0,04
	Cap_{Ent}	0,54	0,22	0,83	0,21
	Reg	0,71	0,19	1,00	0,47
Romania	E_{Fin}	0,25	0,19	0,67	0,03
	K_c	0,49	0,11	0,63	0,25
	Cap_{Ent}	0,46	0,11	0,63	0,31
	Reg	0,46	0,23	0,85	0,01

Source: own study based on Eurostat, OECD, World Bank, EBAN, Global Economy, Trading Economics.

Table 6 presents the correlation coefficients between the sustainable development of enterprises and the individual determinants of entrepreneurship. The obtained results are varied. The bold values are statistically significant at $p < 0.5$. In Bulgaria, there was a statistically significant correlation between SD and E_{Fin}, SD and K_c, and SD and Cap_{Ent}. The results show a high and very high level of dependency. However, it should be noted that these results differ depending on the selected correlation coefficient. The situation in Bulgaria should be assessed positively, as these relationships are positive, which means that sources of financing, knowledge transfer and entrepreneurial skills positively impact the sustainable development of enterprises. There is no statistically significant dependence in terms of legal regulations. Therefore, it is necessary to introduce changes in the tax system in this country and create more favourable conditions for setting up and running a business.

Table 6.
Correlations between the dependent and the explanatory variable

Country	Correlaction with SD	R Spearman	p	Gamma	p	Tau Kendalla	p
Bulgaria	EFin	**0.86**	**0.00**	**0.71**	**0.00**	**0.71**	**0.00**
	Kc	**0.69**	**0.01**	**0.48**	**0.02**	**0.48**	**0.02**
	CapEnt	**0.88**	**0.00**	**0.74**	**0.00**	**0.73**	**0.00**
	Reg	0.25	0.41	0.20	0.35	0.20	0.35
Croatia	EFin	0.53	0.07	0.40	0.06	0.40	0.06
	Kc	0.29	0.34	0.13	0.54	0.13	0.54
	CapEnt	0.33	0.27	0.23	0.29	0.22	0.29
	Reg	-0.53	0.06	-0.31	0.15	-0.30	0.15
Hungary	EFin	**0.72**	**0.01**	**0.61**	**0.00**	**0.60**	**0.00**
	Kc	-0.39	0.19	-0.24	0.26	-0.24	0.26
	CapEnt	**0.95**	**0.00**	**0.87**	**0.00**	**0.86**	**0.00**
	Reg	**-0.74**	**0.00**	**-0.53**	**0.01**	**-0.52**	**0.01**
Poland	EFin	**0.78**	**0.00**	**0.63**	**0.00**	**0.62**	**0.00**
	Kc	**0.92**	**0.00**	**0.79**	**0.00**	**0.79**	**0.00**
	CapEnt	**0.80**	**0.00**	**0.68**	**0.00**	**0.66**	**0.00**
	Reg	-0.27	0.37	-0.09	0.67	-0.09	0.67
Romania	EFin	0.51	0.08	**0.47**	**0.03**	**0.47**	**0.03**
	Kc	0.46	0.11	0.38	0.08	0.37	0.08
	CapEnt	**0.75**	**0.00**	**0.66**	**0.00**	**0.66**	**0.00**
	Reg	**0.71**	**0.01**	**0.53**	**0.01**	**0.52**	**0.01**

Source: own calculations based on Eurostat, OECD, World Bank, EBAN, Global Economy, Trading Economics.

In Croatia, there is no significant statistical relationship between the analyzed dependent variable and the explanatory variables, indicating that enterprises' sustainable development may depend on other factors, including macroeconomic conditions and the global economic situation.

In Hungary, there is a high level of statistical dependency between sustainable enterprise development and entrepreneurial capabilities, which is positive; education, self-employment, and student mobility influence their perception of sustainable business development. A negative relationship is between sustainable development and legal regulations. A negative correlation indicates that legal regulations and the tax system in Hungary harm the sustainable development of enterprises.

In Poland, there was a statistically significant correlation between SD and E_{Fin}, SD and K_c, and SD and Cap_{Ent}. There is no statistically significant relationship between legal regulations and sustainable development of enterprises, which allows us to conclude that it is necessary to introduce more friendly rules for running a business and simplify the tax system.

There is a statistically significant correlation between Cap_{Ent} and SD, and Reg and SD in Romania. The lack of a statistically significant relationship between sustainable development and the availability of finance or a knowledge transfer may indicate some difficulties with access to external financing sources and a low level of research and development, which do not translate into economic, social, and environmental development.

Table 7 shows the results of the OLS estimation. The estimation results meet the requirements of the applied estimation method (the linear regression model is linear in parameters, there is a random sampling of observations, the conditional mean should be zero, there is no multi-collinearity, no homoscedasticity and no autocorrelation, and error terms are normally distributed).

Table 7.
Results of the OLS estimation of entrepreneurial determinants of enterprise sustainable development in the emerging markets from 2008 to 2020

		Coefficient	Std. Error	t-ratio	p-value
	const	0,307103	0,0567687	5,410	0,0006
	EFin	0,602029	0,0404966	14,87	<0,0001
	Reg	−0,411066	0,0667624	−6,157	0,0003
	Reg_1	0,342794	0,0606934	5,648	0,0005
	Descriptive statistics and tests				
	Mean dependent var	0,546408	S.D. dependent var		0,162394
	Sum squared resid	0,009873	S.E. of regression		0,035130
Bulgaria	R-squared	0,965966	Adjusted R-squared		0,953203
	F(3, 25)	75,68619	P-value(F)		3,26e-06
	Log-likelihood	25,58991	Akaike criterion		−43,17982
	Schwarz criterion	−41,24019	Hannan-Quinn		−43,89794
	rho	−0,450439	Durbin-Watson		2,826184
	LMF = 2,07667with p-value = P(F(1, 7) > 2,07667) = 0,192761				
	Chi-square(2) = 1,35053 with p-value = 0,509022				
	LM = 11,6366with p-value = P(Chi-square(9) > > 11,6366) = 0,234582				
	EFin 1,230 VIF(j)<10; Reg 1,380 VIF(j)<10 Reg_1 1,529 VIF(j)<10				

Cont. table 7.

		Coefficient	Std. Error	t-ratio	p-value
Croatia	const	0,404076	0,0369025	10,95	<0,0001
	Kc	0,152291	0,0485771	3,135	0,0139
	Kc_1	0,187816	0,0556094	3,377	0,0097
	Reg	−0,0845864	0,0311050	−2,719	0,0263
	Descriptive statistics and tests				
	Mean dependent var	0,475218	S.D. dependent var		0,083447
	Sum squared resid	0,006947	S.E. of regression		0,029468
	R-squared	0,909306	Adjusted R-squared		0,875296
	F(3, 25)	26,73629	P-value(F)		0,000160
	Log-likelihood	27,69897	Akaike criterion		−47,39794
	Schwarz criterion	−45,45831	Hannan-Quinn		−48,11606
	rho	−0,048365	Durbin-Watson		2,081670
	LMF = 0,0278899 with p-value = P(F(1, 7) > 0,0278899) = 0,87209				
	Chi-square(2) = 1,51787 with p-value = 0,468165				
	LM = 10,2991 with p-value = P(Chi-square(9) > 10,2991) = 0,326822				
	Kc = 1,208 VIF(j)<10; Kc_1 =1,641 VIF(j)<10 Reg_1 = 1,606 VIF(j)<10				
		Coefficient	Std. Error	t-ratio	p-value
Hungary	const	0,225861	0,0897215	2,517	0,0360
	Kc_1	−0,493601	0,189660	−2,603	0,0315
	Reg_1	0,358140	0,146564	2,444	0,0403
	time	0,0606744	0,00665017	9,124	<0,0001
	Descriptive statistics and tests				
	Mean dependent var	0,637971	S.D. dependent var		0,178843
	Sum squared resid	0,010968	S.E. of regression		0,037026
	R-squared	0,968827	Adjusted R-squared		0,957137
	F(3, 25)	82,87794	P-value(F)		2,29e-06
	Log-likelihood	24,95903	Akaike criterion		−41,91806
	Schwarz criterion	−39,97844	Hannan-Quinn		−42,63618
	rho	−0,357828	Durbin-Watson		2,688788
	LMF = 1,52012 with p-value = p = P(F(1, 7) > 1,52012) = 0,257397				
	Chi-square(2) = 1,93342 with p-value = 0,380333				
	LM = 10,0598 with p-value = P(Chi-square(9) > 10,0598) = 0,345667				
	Kc_1 = 3,781 VIF(j)<10; Reg_1 = 9,415 VIF(j)<10 time = 4,613 VIF(j)<10;				
		Coefficient	Std. Error	t-ratio	p-value
Poland	const	0,486690	0,0471190	10,33	<0,0001
	EFin	0,389850	0,0927512	4,203	0,0030
	Kc	0,356399	0,0686995	5,188	0,0008
	CapEnt_1	−0,386896	0,144807	−2,672	0,0283
	Descriptive statistics and tests				
	Mean dependent var	0,638057	S.D. dependent var		0,150221
	Sum squared resid	0,012294	S.E. of regression		0,039202
	R-squared	0,950471	Adjusted R-squared		0,931898
	F(3, 25)	51,17436	P-value(F)		0,000015
	Log-likelihood	24,27380	Akaike criterion		−40,54760
	Schwarz criterion	−38,60797	Hannan-Quinn		−41,26572
	rho	−0,150874	Durbin-Watson		2,160969
	LMF = 0,263832 with p-value = p = P(F(1, 7) > 0,263832) = 0,623311				
	Chi-square(2) = 0,412441 with p-value = 0,468165				
	LM = 10,2475 with p-value = P(Chi-square(9) > 10,2475) = 0,330825				
	EFin 7,951 VIF(j)<10; Kc 2,209 VIF(j)<10 CapEnt_1 7,028 VIF(j)<10				

Cont. table 7.

		Coefficient	Std. Error	t-ratio	p-value
	const	0,120550	0,0569270	2,118	0,0720
	EFin_1	−0,364044	0,0592629	−6,143	0,0005
	Kc_1	−0,313542	0,128998	−2,431	0,0454
	CapEnt_1	1,10723	0,170867	6,480	0,0003
	SD_1	0,426923	0,109568	3,896	0,0059
	Descriptive statistics and tests				
	Mean dependent var	0,646572	S.D. dependent var		0,135111
	Sum squared resid	0,007387	S.E. of regression		0,032485
Romania	R-squared	0,963212	Adjusted R-squared		0,942191
	F(3, 25)	45,82022	P-value(F)		0,000042
	Log-likelihood	27,33027	Akaike criterion		−44,66054
	Schwarz criterion	−42,23601	Hannan-Quinn		−45,55819
	rho	−0,565129	Durbin-Watson		−2,116006
	LMF = 3,01339 with p-value = p = P(F(1, 6) > 3,01339) = 0,133261				
	Chi-square(2) = 4,70886 with p-value = 0,0949475				
	LM = 8,97617 with p-value = P(Chi-square(8) > > 8,97617) = 0,34431				
	EFin_1 1,418 VIF(j)<10; Kc_1 2,379 VIF(j)<10 CapEnt_1 3,504 VIF(j)<10; SD_1 = 1,943 VIF(j)<10;				

Source: own calculations based on Eurostat, OECD, World Bank, EBAN, Global Economy, Trading Economics.

The results of the OLS estimation show that in developing economies, there is a strong variation in the impact of individual explanatory variables on the explained variable, which may be the result of differences in the implemented social, economic, and environmental policies, different levels of sector development, a different structure and potential for the sector's development.

It can be concluded that the determinants of entrepreneurship are not fully used and do not transfer directly to the sustainable development of enterprises. In all analyzed countries, it is necessary to implement changes in entrepreneurship, facilitate the establishment and running of a business, and create more friendly legal regulations supporting and promoting sustainable business.

5. Discussion

The research results confirm the central research hypothesis that "In the developing countries of the European Union, there is a variation in the strength and directions of the influence of entrepreneurial factors on the sustainable development of enterprises from 2008 to 2020". The results confirm that creating favourable conditions for running a business is extremely important (Bocken et al., 2014; Misztal, 2019; Latysheva et al., 2021). The study's novelty is assessing the impact of entrepreneurial conditions on the sustainable development of enterprises. It is necessary to verify the research at the level of developed economies.

The research results confirm the first research sub-hypothesis "In emerging economies; there is a positive dynamic of the indicator of sustainable development of enterprises in 2008-2020". The analysis results confirm the previous research conducted on the level of sub-sectors of the economy in the analyzed countries (Pieloch et al., 2021; Comporek et al., 2022).

The second research sub-hypothesis, "The most important factor for the sustainable development of enterprises is the external financing", was not confirmed. It means that sustainable development is a complex phenomenon conditioned by various factors that may depend on individual countries' situations and development conditions. The determinants of sustainable development are complicated and require a holistic approach (Borys, 2011; Śleszyński, 2014; Bocken et al., 2014).

The third research sub-hypothesis, "Legal regulations in developing countries are one of the key factors limiting the sustainable development of enterprises," maybe partially accepted because, in countries such as Bulgaria and Croatia, the sign in front of the variable legal regulations is negative, which means that legal regulations may negative way to contribute to the realization of sustainable development (Amodu, 2020; Orzeszyna and Tabaszewski, 2021).

The obtained results are conditioned by the selection of variables, the choice of the variable normalization method, or the selected estimation method. Another major limitation is that the analyses do not consider many other important factors, such as macroeconomic conditions or the financial and property situation of enterprises. It has been limited only to the entrepreneurial determinants of sustainable development, which may be a serious limitation.

It seems that the research results may be important for economic practice. It seems right to introduce more transparent regulations for running a business, create an institutional framework supporting sustainable economic initiatives, or promote financial support for sustainable entrepreneurship.

6. Conclusions

Sustainable development of enterprises means improvement of the economic situation of the enterprise by respect for social issues and protection of the natural environment. It is extremely important for citizens and future generations' quality of life and health. Sustainable development depends on several factors, both external and internal. One of the critical determinants of sustainable development is the entrepreneurial conditions of running a business. In developing economies, there is a strong variation in the impact of individual entrepreneurial determinants on enterprises' economic, social, and environmental development.

Factors such as the availability of finance, knowledge transfer, entrepreneurial capabilities or legal regulations are statistically significant for the sustainable development of enterprises. However, the degree of their influence differs depending on the country. Therefore, it is of essential importance here to create institutional and financial conditions conducive to achieving sustainable business goals. The financial incentives and substantive support system should be conducive to social and environmental investments enterprises.

Further research will be devoted to a broader analysis that will assess the situation in developing economies and developed ones. In addition, future research will look at a more comprehensive approach to determinants of sustainable business.

References

1. Abdelkafi, N., Täuscher, K. (2016). Business models for sustainability. From a system dynamics perspective. *Organization & Environment*, 29(1).
2. Amodu, N. (2020). Corporate Social Responsibility and Economic Globalization: Mainstreaming Sustainable Development Goals into the AfCFTA Discourse', 47. *Legal Issues of Economic Integration*, retrieved from https://kluwerlawonline.com/journalarticle/Legal+Issues+of+Economic+Integration/47.1/LEIE2020004.
3. Baker, S. (2015). *Sustainable development.* Introductions to Environment: Environment and Society Texts. Abingdon and New York: Routledge. 10.4324/9780203121177.
4. Blinova, N.V., Kirka, A.V., Filimonov, D.A. (2021). Rational Bureaucracy 2.0: Public Administration in the Era of Artificial Intelligence. In: E.G. Popkova, V.N. Ostrovskaya, A.V. Bogoviz (eds.), Socio-economic Systems: Paradigms for the Future. *Studies in Systems, Decision and Control, vol. 314*. Cham.: Springer, https://doi.org/10.1007/978-3-030-56433-9_174.
5. Bocken, N.M. P., Short, S.W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production, 65*. https://doi.org/10.1016/j.jclepro.2013.11.039.
6. Borys, T. (2011). Zrównoważony rozwój – jak rozpoznać ład zintegrowany. *Problemy Ekorozwoju, 6*.
7. Bryant, J., Thomson, G. (2021). Learning as a key leverage point for sustainability transformations: a case study of a local government in Perth, Western Australia. *Sustain Sci., 16*. https://doi.org/10.1007/s11625-020-00808-8.
8. Ciambotti, G., Sottini, A., Littlewood, D., Meru, A.K. (2021). Business Models for Sustainable Development: The Case of a Kenyan Sustainable Enterprise. In: E.K. Adae, J.P.B. Kosiba, R.E. Hinson, K.K. Twum, N. Newman, F.F. Nutsugah (eds.), *Responsible*

Management in Emerging Markets. Sustainable Development Goals Series. Cham.: Palgrave Macmillan, https://doi.org/10.1007/978-3-030-76563-7_9.

9. Comporek, M., Kowalska, M., & Misztal, A. (2022). Macroeconomic stability and transport companies' sustainable development in the Eastern European Union. *Journal of Business Economics and Management, 23(1),* 131-144. https://doi.org/10.3846/jbem.2021.15913.

10. Dantas, T.E.T., de-Souza E.D., Destro, I.R., Hammes, G., Rodriguez, C.M.T., Soares, S.R. (2021). How the combination of Circular Economy and Industry 4.0 can contribute towards achieving the Sustainable Development Goals. *Sustainable Production and Consumption, 26*, https://doi.org/10.1016/j.spc.2020.10.005.

11. Dissanayake, D., Tilt, C., Xydias-Lobo, M. (2016). Sustainability reporting by publicly listed companies in Sri Lanka. *Journal of Cleaner Production, Vol. 129.* https://doi.org/10.1016/j.jclepro.2016.04.086.

12. Goralski, M.A., Tan, T.K. (2020). Artificial intelligence and sustainable development. *The International Journal of Management Education, Vol. 18, Iss. 1*, 100330, https://doi.org/10.1016/j.ijme.2019.100330.

13. Hahn, R., Kühnen, M. (2013). Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2013.07.005.

14. Hess, P.N. (2016). *Economic Growth and Sustainable Development*. London: Routledge. https://doi.org/10.4324/9781315722467.

15. Hind, P., Wilson, A. and Lenssen, G. (2009). Developing leaders for sustainable business. *Corporate Governance, 9, 1*, pp. 7-20. https://doi.org/10.1108/14720700910936029.

16. https://www.oecd.org/sdd/business-stats/indicatorsofentrepreneurialdeterminants.htm.

17. Hummels, H., Argyrou, A. (2021). Planetary demands: Redefining sustainable development and sustainable entrepreneurship. *Journal of Cleaner Production, 278*, 123804, https://doi.org/10.1016/j.jclepro.2020.123804.

18. Ismail, N.B., Alcouffe, S., Galy, N., Ceulemans, K. (2021). The impact of international sustainability initiatives on Life Cycle Assessment voluntary disclosures: The case of France's CAC40 listed companies. *Journal of Cleaner Production, Vol. 282*, 124456, https://doi.org/10.1016/j.jclepro.2020.124456.

19. Khan, M.K., Trinh, H.H., Khan I.U., Ullah, S. (2021). Sustainable economic activities, climate change, and carbon risk: an international evidence. *Environment, Development and Sustainability*, 10.1007/s10668-021-01842-x.

20. Kihombo, S., Ahmed, Z., Chen, S. et al. (2021). Linking financial development, economic growth, and ecological footprint: what is the role of technological innovation*? Environ. Sci. Pollut. Res., 28*. https://doi.org/10.1007/s11356-021-14993-1.

21. Lagoarde-Segot, T. (2020). Financing the Sustainable Development Goals. *Sustainability, 12(7),* 2775. https://doi.org/10.3390/su12072775.

22. Lang, A., Murphy, H. (eds.) (2014). *Business and sustainability*. Cham.: Springer, https://doi.org/10.1007/978-3-319-07239-5.

23. Latysheva, O., Rovenska, V., Smyrnova, I., Nitsenko, V., Balezentis, T. and Streimikiene, D. (2021). Management of the sustainable development of machine-building enterprises: a sustainable development space approach. *Journal of Enterprise Information Management*, *34, 1*. https://doi.org/10.1108/JEIM-12-2019-0419.

24. Loh, L., Thomas, T., Wang, Y. (2017). Sustainability Reporting and Firm Value: Evidence from Singapore-Listed Companies. *Sustainability*, *9(11),* 2112. https://doi.org/10.3390/su9112112.

25. Misztal, A. (2019). Zrównoważony rozwój przedsiębiorstw a stopień rozwoju społeczno-gospodarczego. *Studia i Prace Kolegium Zarządzania i Finansów, 174.* https://doi.org/10.33119/SIP.2019.174.2.

26. Misztal, A. (2020). Podatki środowiskowe a zrównoważony rozwój polskich przedsiębiorstw transportowych. *Gospodarka Materiałowa i Logistyka, 1*. https://doi.org/10.33226/1231-2037.2020.1.5

27. Misztal, A. (2021). Assessing the impact of the financial condition on the components of sustainable development of transport enterprises in Poland in 2008-2019. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 65,1*.

28. Misztal, A., Kowalska, M. (2020). The impact of globalization on the sustainable development of enterprises – the case of Bulgaria, Croatia and Romania. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 64,3*.

29. Newell, P. (2022). Finance for the Common Good: Re-Thinking the Relationship between Finance, Poverty and Sustainability. In: A. Antoniades, A.S. Antonarakis, I. Kempf (eds.), *Financial Crises, Poverty and Environmental Sustainability: Challenges in the Context of the SDGs and Covid-19 Recovery. Sustainable Development Goals Series*. Cham.: Springer. https://doi.org/10.1007/978-3-030-87417-9_2.

30. O'Shea, G., Farny, S. & Hakala, H. (2021). The buzz before business: a design science study of a sustainable entrepreneurial ecosystem. *Small. Bus. Econ.,* 56. https://doi.org/10.1007/s11187-019-00256-4.

31. Orzeszyna, K., Tabaszewski, R. (2021). The Legal Aspects of Activities Taken by Local Authorities to Promote Sustainable Development Goals: Between Global and Regional Regulations in Poland. *Lex Localis; Maribor, Tom 19*. https://doi.org/10.4335/19.3.1043-1063.

32. Pawłowski, A. (2013). Sustainable Development and Globalization. *Problemy Ekorozwoju*, *t. 8, 2*. Polska Akademia Nauk. Komitet Człowiek i Środowisko PAN.

33. Pieloch-Babiarz, A., Misztal, A. & Kowalska, M. (2021). An impact of macroeconomic stabilization on the sustainable development of manufacturing enterprises: the case of Central and Eastern European Countries. *Environ. Dev. Sustain., 23*, 8669-8698. https://doi.org/10.1007/s10668-020-00988-4.

34. Rodenburg, K., MacDonald, K. (2021). Enhancing Business Schools' Pedagogy on Sustainable Business Practices and Ethical Decision-Making. *Sustainability*, *13(10),* 5527. https://doi.org/10.3390/su13105527.

35. Sachs, J.D., Schmidt-Traub, G., Mazzucato, M. et al. (2019). Six Transformations to achieve the Sustainable Development Goals. *Nat Sustain, 2*, 805-814. https://doi.org/10.1038/s41893-019-0352-9.

36. Śleszyński, J. (2014). Podatki środowiskowe i podział na grupy podatków według metodyki Eurostatu. *Optimum. Economic Studies*.

37. Teng, X., Chang, B.-G., Wu, K.-S. (2021). The Role of Financial Flexibility on Enterprise Sustainable Development during the COVID-19 Crisis—A Consideration of Tangible Assets. *Sustainability*, *13(3),* 1245. https://doi.org/10.3390/su13031245.

38. Thacker, S., Adshead, D., Fay, M. et al. (2019). Infrastructure for sustainable development. *Nat. Sustain., 2*, 324-331. https://doi.org/10.1038/s41893-019-0256-8.

39. Tutaj, J., Rutkowska, M., Bartoszczuk, P. (2021). Enterprise Business Architecture as a Tool for Sustainable Development in an Enterprise – case study. *Procedia Computer Science*, *192*, https://doi.org/10.1016/j.procs.2021.09.283.

40. Valaskova, K., Kliestik, T., Svabova, L., Adamko, P. (2018). Financial Risk Measurement and Prediction Modelling for Sustainable Development of Business Entities Using Regression Analysis. *Sustainability*, *10(7),* 2144. https://doi.org/10.3390/su10072144.

41. Weber, O. (2014). The financial sector's impact on sustainable development. *Journal of Sustainable Finance & Investment*, *4:1,* 1-8, DOI: 10.1080/20430795.2014.887345.

42. Zakari, A., Khan, I., Tan, D., Alvarado, R., Dagar, V. (2022). Energy efficiency and sustainable development goals (SDGs). *Energy*, *239, Part E,* ,122365, https://doi.org/10.1016/j.energy.2021.122365.

43. Ziolo, M., Sergi, B.S. (2019). Financing Sustainable Development Key Challenges and Prospects. Cham.: Palgrave Macmillan, https://doi.org/10.1007/978-3-030-16522-2.