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SUSTAINABLE BUSINESS MODELS AMONG SMALL AND MEDIUM ENTERPRISES – RESOURCE-BASED VIEW

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ABSTRACT: The purpose of the article is to identify the relationship between operating in accordance with sustainability goals (SG) and resource-oriented elements of sustainable business model (SBM), belonging to the business, environmental and social layer. The analysed data comes from a survey conducted in 2022 on a sample of 303 enterprises belonging to SMES. The survey used the authors' questionnaire developed using the Triple Layer Business Model. The results were statistically analysed, and a logit model was developed to verify the significance of the relationship between the variables. The conducted research confirmed that acting in accordance with SGS is strongly related to resource-oriented elements of the SBM belonging to the business and social layers. Organisational culture and flexible work teams were identified as the most important resources used to create value propositions. Among the activities contributing to the success of the enterprise, the most important were those oriented to the environment. When choosing a partner for cooperation, the level of its commitment to social issues and its impact on the environment were most important. Organisational culture that promotes ethical actions and additional benefits was identified as the most important elements that create value for employees. On the other hand, when analysing the social impact of the company, the most important element here was the local community.

KEYWORDS: sustainable business model (SBM), triple layered business model (TLBM), small and medium enterprise (SME), resources-based view (RBV), logit model

Introduction

The growing cumulative effects of global issues such as climate change, global warming and over-consumption are bringing about changes in business activities. A transformation is needed from the traditional business model to a sustainable business model (SBM). The SBM is such a business model (BM) that provides benefits also to other stakeholders, including consumers and the local community (Freeman, 2010), as well as supports the development of a circular economy (Manninen et al., 2018) and a sharing economy (Curtis & Mont, 2020). An indispensable element of this concept is cooperation between different stakeholders, which contributes to improving the company's competitiveness and resource efficiency.

The transformation toward SBM is taking place among large enterprises, which is widely observed. However, the question is whether it is also visible among small and medium-sized enterprises (SME), which are the most numerous groups of enterprises. For this reason, they have a significant impact on the environment, often through resource use or external effects such as gas emissions or garbage and wastewater production, but sometimes business model innovation might generate negative social and environmental impacts, such as overconsumption, fast obsolesce/replacement (Pieroni et al., 2019).

Due to the critical importance of resources (Upward & Jones, 2016), which need to be skilfully used, as they are limited and their availability is a barrier to SME development, this article focuses on the issue of the organisation's resources. They are the main concern of numerous contemporary theories that describe the increasingly complex processes taking place inside and around the company. One of these is a theory, based on Schumpeter's approach and the work of Penrose, known in the literature as the Resource-Based View of the Firm (RBV). The resource-based approach shifted the focus to the inside of the company and brought back interest in resources and competencies. It depicts the company as a unique bundle of tangible and intangible resources and skills that provide a source of competitive advantage (Kunasz, 2006).

In the context of the above observations, an interesting research question was formulated: *How do sustainable development goals impact the business models of small and medium enterprises?* This is a very broad question because it encompasses many elements of a sustainable business model, so this article focuses on looking at a sustainable business model only through the RBV. It should be mentioned that in previous research, Zimmer et al. (2024) analysed the customer-oriented elements of sustainable business models. The approach used to describe a SBM is based on the Triple Layer Business Model (TLBM) Canvas (Joyce & Paquin, 2016), which extends the original business model with an environmental layer based on a life cycle perspective and a social layer based on a stakeholder perspective. In order to assess whether SMEs use SBM, the survey questionnaire, based on the TLBM, addressed the question of whether enterprises operate in accordance with sustainable development goals (SDGs).

The assumption is that if a company operates in accordance with the SDGs, then its business model should reflect this, and therefore it should have a lot of elements proving sustainability, which are present in the business layer but especially in the environmental and social layers. Therefore, **the purpose of the article is to identify the relationship between operating in accordance with sustainability goals and resource-oriented elements of SBM**, such as: in the business layer – resources, activities, partners and costs; in the environmental layer – materials, production, suppliers and outsourcing, environmental impact; in the social layer – employees, corporate governance, local community, social impact.

Thus, the main research hypothesis was formulated as follows: H0: The resources-oriented elements of the business model are associated with operating in accordance with the SDGs. It has been decomposed into sub-hypotheses, each of which examined the relationship between one element of the business model and the company's activity in line with sustainability goals: H1.1 – resources, H1.2 – activities, H1.3 – partners, H1.4 – costs, H2.1 – materials, H2.2 – production, H2.3 – suppliers and outsourcing, H2.4 – environmental impact, H3.1 – employees, H3.2 – corporate governance, H3.3 – local community, H3.4 – social impact.

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An overview of the literature

Sustainable Business Model

Sustainable development refers to the use of practices and activities that are economically profitable, but also socially and environmentally responsible (Anand & Sen, 2000). When the concept was first developed, its main goal was to integrate sustainability into the organization's goals and to involve companies in the transformation of the economy towards a more sustainable one (Stubbs & Cocklin, 2008). Sustainable business models are seen as a modification of a conventional business model concept, complete with certain features and additional objectives (Geissdoerfer et al., 2018). Two approaches can be distinguished: (1) the concepts, principles and goals of the company are in line with the goals of sustainability; (2) companies integrate sustainability into their value proposition, activities related to the creation and delivery of customer value, with cooperation with partners. The term "sustainable business model" (SBM) has been associated with closed-loop BMs (Wells & Seitz, 2005), social enterprises (Upward & Jones, 2016), new product-service systems (Mont, 2002; Tukker & Tischner, 2006), circular economy (Holzer et al., 2021; Prieto-Sandoval et al., 2018) and sharing economy (Curtis & Mont, 2020; Gyódi, 2019).

Three specific features that SBM is characterised by are: (1) value proposition is created for different stakeholders such as: customers, society, employees, suppliers and the environment (Abdelkafi & Täuscher, 2016); (2) SMB's main goal is not to maximise profits for stakeholders but social, environmental and economic sustainability or social corporate responsibility (Bocken et al., 2014); (3) SBMs focus on long-term perspective (Geissdoerfer et al., 2018) and on the satisfaction of all stakeholders and social welfare (Guinot, 2020).

Sustainable development goals AND small and medium enterprises

Exploring the answer to the research question „How do sustainable development goals impact the business models of small and medium enterprises?" a bibliometric analysis was performed based on the Scopus database. The search was conducted by title, keywords and abstract using the phrases: "sustainable development goals" AND "small and medium enterprises". The search result produced 122 papers from 2017 to 2024. The papers were most frequently assigned to the following subject area: 21.1% Business, Management and Accounting, 17.9% Social Sciences, 15.4% Environmental Sciences and 14.3% Economics, Econometrics and Finance.

A significant amount of papers concern the factors influencing the development of business model towards SBM in the context of circular economy (Stubbs et al., 2024; Troise et al., 2024) and there is a growing body of research on the drivers of environmental practices of SME and the barriers that prevent them from doing so (Fellnhofer, 2017), less in known about the successful factors that lead SMEs to adopt environmentally sustainable practices (Tereshchenko et al., 2023). The papers have been grouped by five thematic categories such as: technologies (Brown et al., 2019; Costa Melo et al., 2023; Smith et al., 2022), performance tools and indicators (Kovalov, 2024; Macqueen et al., 2020), challenges and barriers (Awan & Sroufe, 2022; Cantele & Zardini, 2020; Hassan et al., 2017; Holzer et al., 2021; Pizzi et al., 2021), business models (Arnold, 2018; Chiappetta Jabbour et al., 2020; Hagawe et al., 2023) and strategies (Nogueira et al., 2023), and best practices (Macchion et al., 2023; Tereshchenko et al., 2023; Liszczyk & Chomiak-Orsa, 2024). The search by title, keywords and abstract was narrowed by adding an additional phrase: 'business model', which ultimately yielded only seven articles, which will be discussed below.

The article (Awan & Sroufe, 2022) focused on identifying the key success factors and obstacles to implementing a circular economy business model integrated with sustainability, using the example of a material reuse company. The outcome of the research was the development of a conceptual model showing the factors that enable the transition to a circular economy business model. Whereas Arnold (2018) explored how the private sector, through frugal innovations, contributes to the SDGs and value creation. The analysis of 50 innovations showed that SMEs and NGOs play the main role in creating social value, while multinational corporations develop new business models in response to institutional gaps. In contrast, Macqueen et al. (2020) focused on locally controlled forest enterprises whose business models incorporate organisational innovations introduced at different levels. Two more articles (Hagawe et al., 2023; Manurung et al., 2024) address the business models of financial

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institutions that offer alternative forms of financing to support the development of SMEs. Both proposed solutions contribute to the achievement of the SDGs on a global scale. A slightly different approach is presented in the papers (Mondal et al., 2024; Rahman et al., 2024) where the importance of technology development and other factors that influence the sustainable development of SMEs in India and Pakistan are highlighted. Among these factors were mentioned: sustainable business models, crowdfunding, Industry 4.0 technologies, stakeholder pressures, the green manufacturing, operation capability development, green business process management. Analysis of the articles shows that this area is still poorly explored.

Application of Triple Layer Business Model

I conducted search queries in the Scopus database by title, keywords and abstract using triple AND layer AND business AND model. The search result produced 24 papers from 2016 to 2024. The year of publication of the model by Joyce and Paquin (2016) was used as the cut-off year. Among these articles, only 8 of them used the Triple-layer business model (TLBM) canvas (Joyce & Paquin, 2016) to describe sustainable business models.

Most of the articles recognise that the transition to a sustainable business model requires significant changes in many aspects of a company's operations. The first ideas for a three-layer approach based on life-cycle thinking emerged in paper (Wiedmann et al., 2009) where the authors proposed that economic input-output analysis extended with data from all three dimensions of sustainability. They introduced a triple-bottom-line accounting framework and applied it in a case study of a small company.

Peppou (2018) was the first to use the TLBM canvas as the categorisation matrix to identify five sustainable business model archetypes for biotechnology firms. Gunarta and Hanggara (2018) created a new business model using the TLBM canvas approach for businesses in the tourism sector, while Petrovic (2023) developed a framework based on TLBM to understand the business models of social media, including their social and environmental impact. By contrast, Mili and Loukil (2023) explored the TLBM approach for the transition toward more sustainable BMs in the fruit and vegetable industry.

TLBM approach has been used to help to understand how enterprise creates different types of values (economic, social and environmental) using social enterprises (Panza et al., 2019) and One-Stop-Shop business model for energy renovation of detached houses (Pardalis et al., 2020) and start-ups providing energy-efficient services (Wit et al., 2021) as examples. TLBM has been used to describe or design SBM of different types of enterprises, with a particular focus on sustainability-oriented start-ups (Bergmann & Utikal, 2021; Wit et al., 2021).

Resource-Based View of the firm

In economic thought, a reorientation of interest towards new sources of competitive advantage for the modern economic entity is observable – intellectual capital and intangible assets (Hall, 1992). A broad way of defining resources allows you to look at the company more holistically at each stage of building a competitive advantage. The Resource-Based View (RBV) theory is grounded in two assumptions. First, a company can gain a sustainable competitive advantage through the use of specific, unique resources and skills. Second, companies differ in their resources and skills, which translates into differences in performance (Barney, 1991; Peteraf, 1993). According to the RBV model, companies build competitive advantages mainly on intangible resources (Ferreira & Ferreira, 2024), i.e. brand reputation, organisational culture, and knowledge capital (knowledge, skills and experience) that allow them to provide customers with a unique value proposition, which is created collectively by the products offered and accompanying services. Resources and skills are the raw material for building core competencies or distinctive capabilities. A company's resources, together with the core competencies or distinctive capabilities built on them, build a competitive advantage in the market.

This theory finds widespread application across various research fields, particularly in entrepreneurship studies. Adopting environmentally friendly practices and technology may provide SMEs with specific resources and capabilities to build a long-term competitive advantage (Mondal et al., 2024). This theory helps to identify resources (i.e. valuable and distinctive) that help SMEs identify

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key resources and a dynamic ability to get sustainable competitive advantages (Cooper et al., 2023; Dubey et al., 2024). Here, the RBV framework assists in uncovering unique green resources, developing sustainable advantages, and attaining economic success while supporting environmental sustainability.

The natural RBV perspective emphasises that companies can gain a competitive advantage by effectively utilising and accessing natural resources (Fraj et al., 2013; Makhloufi et al., 2022). The approach is particularly beneficial for manufacturing SMEs as it enables them to identify and understand the availability of key resources like raw materials, energy, and waste (Fraj et al., 2013). Natural RBV improves resource efficiency, environmental impact, market competitiveness, and sustainability in manufacturing SMEs, meeting the growing demand for green products and services and promoting a sustainable future (Makhloufi et al., 2022).

Research methods

This article presents only a part of a larger study on sustainable business models of enterprises, which focuses on resource-oriented elements of SBM. The study was conducted in December 2022 by the research team from WUST. The research sample included 303 enterprises belonging to SMEs operating in Poland. It should be emphasised that the questionnaire was filled out by people in managerial positions or by owners. Enterprises were randomly selected from a nationwide Ariadna research panel. The sample is representative, its structure according to main business activities is as follows (Węglarz et al., 2024): research and development – 6.6%, service – 58.1%, commers – 22.8%, manufacturing – 24.1%, and others – 1.3%. It was a multiple-choice question. Most of SMEs are private (81.2%) against public (8.3%), their scope of activity is in 17.5% international, in 42.6% national and in 39.9% local or regional. The largest number of SME have less than 10 employees (43.9%), while 27.4% have between 10 and 49 employees, 19.8% have between 50 and 149 employees, and 8.9% have between 150 and 249 employees.

The survey used the authors' questionnaire developed using the TLBM Canvas. The key question from the point of view of this research was: "Does your enterprise take into consideration the sustainable development goals in its activities?" In this question, the respondents could choose one answer: "yes", "no" or "I don't know". Since the respondents were decision-makers in enterprises (managers, owners), therefore it was assumed that the answer "I don't know" in the mouth of a manager indicates the absence of such activity. It should be added that the sustainable development policy was defined. In the survey sample, 58% of respondents confirmed that they were acting in accordance with SDGs, as against 42%.

In order to confirm the hypothesis H0 that there is a relationship between the binary variable that states acting in accordance with the SDGs and the individual variables associated with the resources-oriented elements of the business model, it was decomposed into 12 sub-hypotheses. The sub-hypotheses were designed according to the TLBM methodology presented in (Joyce & Paquin, 2016), where the business layer corresponds to particular elements in the environmental and social layers, as shown in Table 1. Each of sub-hypothesis examined the relationship between one element of the SBM (see Table 1), represented by several variables and the company's activity in line with sustainability goals (binary variables).

Table 1. The resources-oriented elements of the triple layer business model

	Layer	Resources-oriented elements			
H1	Business	Resources	Activities	Partners	Costs
H2	Environmental	Materials	Production	Suppliers and outsourcing	Environmental impact
H3	Social	Employees	Corporate governance	Local community	Social impact

Source: author's work based on Joyce and Paquin (2016).

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The data was analysed to find the relationship between endogenous variable and exogenous variables (see Table 1) firstly by using Spearman correlation test. Then a logit model (LM) was used to confirm the relationships and to identify which exogenous variables have a significant impact on the endogenous variable. The significance level is assumed to be 0.05. The results were statistically analysed using the SPSS software and a logit model was developed to verify the significance of the relationship between the variables using the Gretl program.

Results of the research

Correlation analysis

As exogenous variables were selected resource-oriented elements of SBM which were grouped according to three layers into 12 categories of variables, as showed in Table 1. Each category consists of several or more items, as shown in Table 2. Each of sub-hypothesis examined the relationship between the endogenous variable and the variables belonging to a particular category, e.g., for sub-hypothesis H1.1 it is variable B8-resources, which consists of 17 items.

The total number of variables is 129, of which 57 belong to the business layer, 38 belong to the environmental layer and 34 variables belong to the social layer. The structure of exogenous variables was presented in Table 2.

Table 2. The structure of exogenous variables

No of sub-hypothesis	Name of variable	Description	Number of items
Business layer			
H1.1	B8	Resources	17
H1.2	B9	Activities	10
H1.3	B10	Partners	21
H1.4	B11	Costs	9
Environmental layer			
H2.1	C6	Materials	11
H2.2	C7	Production	6
H2.3	C8	Suppliers and outsourcing	12
H2.4	C9	Environmental impact	9
Social layer			
H3.1	D6	Employees	12
H3.2	D7	Corporate governance	6
H3.3	D8	Local community	10
H3.4	D9	Social impact	6

Explanatory variables were related to the impact of specific elements of the business model on various activities or opportunities occurring in companies, e.g., respondents assessed how selected elements of the business model affect the success of the company, cooperation with a partner, the environment, society, creating value for employees, building relationships with society. Respondents made evaluations on a 5-point Likert scale, where 1 means not at all, 2 – rather not, 3 – hard to say, 4 – almost yes, 5 – fully. Therefore, the explanatory variables are ordinal variables, described on a scale of 1-5.

Since the quantitative variables do not have a normal distribution but have ordered categories, Spearman's rho correlation coefficient, a measure of the relationship between ranks, was chosen to examine the relationship between the variables. The Spearman correlation test was conducted for all variables, but for most variables, the correlation was below 0.25. It was assumed that Spearman's rho correlation coefficient, with a value of less than 0.25 means that there is no correlation, while a coef-

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ficient in the range (0.25-0.4) means that the correlation exists but is low. Due to the large number of variables and in order to keep the message readable, Table 3 excerpts only those variables for which the correlation value was greater than 0.25.

Table 3. The Spearman correlation test results

Variables		Description (Items)	Correlation index	Significance
B8 – Resources	B8_r5	Localization	0.323	<0.001
	B8_r10	Corporate culture	0.394	<0.001
	B8_r12	Employee loyalty	0.274	<0.001
	B8_r14	Flexible work teams (e.g., project teams)	0.338	<0.001
	B8_r15	Leadership (strong leaders)	0.289	<0.001
B9 – Activities	B9_r3	Problem-solving activities – consultations	0.285	<0.001
	B9_r4	Platform or networking activities	0.317	<0.001
	B9_r5	Innovation implementation activities	0.291	<0.001
	B9_r6	Environmentally oriented activities	0.423	<0.001
	B9_r7	Increasing knowledge in customers	0.319	<0.001
B10 – Partners	B10_r7	Cultural similarities	0.268	<0.001
	B10_r17	Partner's impact on the environment	0.413	<0.001
	B10_r18	Partner's values	0.349	<0.001
	B10_r19	Opinion of the partner among the local community and social media	0.267	<0.001
	B10_r21	Partner's level of commitment to social issues	0.428	<0.001
B11 – Costs	B11_r7	Marketing	0.292	<0.001
C8 – Supplies and outsourcing	C8_r7	Ability to participate in green supply chain	0.293	<0.001
D6 – Employees	D6_r2	Development of employees	0.256	<0.001
	D6_r7	Participation in decision-making	0.252	<0.001
	D6_r10	Additional benefits (e.g., health insurance, sports card)	0.251	<0.001
	D6_r11	Involvement in community/social activities	0.295	<0.001
D8 – Local communities	D8_r1	Caring for local material resources	0.311	<0.001
	D8_r3	Caring for local intangible resources	0.327	<0.001
	D8_r4	Improve access to knowledge and technology by sharing these resources with the local community	0.300	<0.001
	D8_r5	Taking care to integrate migrant workers into the local community	0.322	<0.001
	D8_r6	Caring for the cultural heritage of the local community	0.304	<0.001
	D8_r7	Environmental risk management	0.351	<0.001
	D8_r8	Include stakeholders in an action strategy affecting the local environment, health or well-being of the local community	0.345	<0.001
	D8_r9	Engaging, including financially, in community initiatives	0.357	<0.001
	D8_r10	Caring for local employment	0,276	<0.001

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Variables		Description (Items)	Correlation index	Significance
D9 – Social impacts	D9_r1	Employees	0.265	<0.001
	D9_r2	Local community (e.g., preservation of cultural heritage, engagement of local communities)	0.376	<0.001
	D9_r3	Participants in the supply chain, in excess of consumers	0.292	<0.001
	D9_r4	Consumers	0.276	<0.001
	D9_r5	Society	0.341	<0.001
	D9_r6	Children	0.336	<0.001

In fact, 36 of the 129 explanatory variables showed statistical correlation. For variables in the category C6 – Materials, C7 – Production, C9 – Environmental impact and D7 – Corporate governance, the test showed no statistical correlation between all items included in them and operation according to the SDGs. For variables in the category B11 – Costs and C8 – Suppliers and outsourcing the test showed a statistical correlation between 1 item included in them and operation according to the SDGs. Other variables (B8, B9, B10, D6, D8, D9) displayed statistical dependence with operation according to the SDGs for several variables, ranging from four for variable D6 to nine for variable D8 (see Table 3).

Logit model

These results required verification, which was done using a logit model. The logit model was appropriate for this analysis because the endogenous variable is dichotomous (binary) and allows identification of variables which have a significant impact on the endogenous variable. Which, in the case under analysis, means identifying variables that have a significant impact on the decision-making process of SMEs to act in accordance with the SDGs. The endogenous variable is defined as:

- $y_1 = 0$, when the company does not act in accordance with the SDGs or does not know if it is following them,
- $y_1 = 1$, when the company is operating in accordance with the SDGs.

As explanatory variables, implemented in logit models, all variables grouped into twelve category variables (see Table 2) were adopted. For each sub-hypothesis, separate regression equations of the logit model were constructed. Hence, twelve models were obtained. When constructing the regression equation, all explanatory variables from a particular category were included, e.g., for D8 – Local communities in the logit model ten explanatory variables were adopted. Non-significant variables were not removed from the model because the goal was not to fit the model but to determine which variables have a greater impact on decision-making to act in accordance with the SDGs. The calculations were made using the Gretl program. The level of significance was 5%.

Table 4. The results of estimation of logit model for business layer

Variable	Coefficient β	p-value	Significance level	Odds ratio
B8_r5_resurces_location	0.33931	0.0295	**	1.40397
B8_r10_resurces_corporate culture	0.74501	0.0004	***	2.10647
B8_r14_resurces_flexible work teams	0.47005	0.0025	***	1.60007
B9_r6_activities_environmentally oriented	0.75617	<0.001	***	2.13011
B10_r17_partner's impact on environment	0.58274	0.0011	***	1.79094
B10_r18_partner's values	0.52169	0.0150	**	1.68487
B10_r21_partner's commitment to social issues	0.66646	0.0012	***	1.94733
B11_r7_costs_marketing	0.40752	0.0067	***	1.50309

Note: p –significance level, *** $p < 0.01$, ** $p < 0.05$.

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The sign of estimating the coefficient βi standing next to the exogenous variable determines the direction of changes in the endogenous variable (Gruszczyński, 2010), i.e. if the coefficient βi is:

- greater than zero, it should be interpreted that the chance of acting in accordance with the SDGs by a given subgroup is higher than in the reference group. However, to determine how many times it is greater, one should calculate the value of odds ratio ,
- below zero, it should be interpreted that the chance of acting in accordance with the SDGs is lower than in the reference group.

The results of the estimation of logit model parameters for variables: B8 – Resources, B9 – Activities, B10 – Partners, B11 – Costs, are shown in Table 4.

The logit model confirmed the existence of a relationship between variables from all categories for the business layer, with a significant relationship for categories B9 – Activities and B11 – Costs for only one variable. The chance of making a decision about acting in accordance with the SDGs is:

- on average 40% higher the greater the importance of the localisation resource for value creation,
- on average 2.1 times higher the greater the importance of the corporate culture resource for value creation,
- on average 60% higher the greater the importance of the flexible work teams' resource for value creation,
- on average 2.13 times higher the greater the importance of environmentally oriented activities in the success of the enterprise,
- on average 79% higher the greater the importance of partner's impact on the environment in the selection of a cooperation partner,
- on average 68% higher the greater the importance of partner's values in the selection of a cooperation partner,
- on average 95% higher the greater the importance of partner's commitment to social issues in the selection of a cooperation partner,
- on average 50% higher the greater the importance of marketing costs in the product offered.

The results of estimation of logit model parameters for variables: C6 – Materials, C7 – Production, C8 – Supplies and outsourcing, C9 – Environmental impact, are shown in Table 5.

Table 5. The results of estimation of logit model for environmental layer

Variable	Coefficient β	p-value	Significance level	Odds ratio
C9_r6_environ_nonindustrial wastewater	-0.38205	0.0117	**	0.68246

Note: p –significance level, ** p < 0.05.

The logit model confirmed that there was no relationship between the variables in the categories C6 – Materials, C7 – Production and C8 – Supplies and outsourcing, while for category C9 – Environmental impact only one variable showed a significant relationship. The greater the environmental impact of an enterprise in the area of non-industrial wastewater production, the lower the chance of deciding to act in accordance with the SDGs by an average of 32%.

The results of the estimation of logit model parameters for variables: D6 – Employees, D7 – Corporate governance, D8 – Local communities, D9 – Social impact, are shown in Table 6.

Table 6. The results of estimation of logit model for social layer

Variable	Coefficient β	p-value	Significance level	Odds ratio
D6_r1_employees_organizational culture	0.51125	0.0234	**	1.66755
D6_r10_employees_additional benefits	0.27463	0.0385	**	1.31604
D9_r2_impact_local_communities_	0.40547	0.0448	**	1.50001

Note: p –significance level, ** p < 0.05.

The logit model confirmed that there was no relationship between the variables in the categories D7 – Corporate governance and D8 – Local communities, while for category D9 – Social impact only

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one variable showed a significant relationship. The chance of making a decision about acting in accordance with the SDGs is:

- on average 66% higher the greater the importance of the organisational culture that promotes ethical actions for creating value for employees,
- on average 31% higher the greater the importance of the additional benefits (e.g., health insurance, sports card) for creating value for employees,
- on average 50% higher the greater the importance of the local communities in the activities of the enterprise, for example, through access to material resources or engagement of local communities.

Limitation and future research

No confirmation of the relationship between acting in accordance with the SDGs and resources-oriented elements of BM belonging to environmental and social layers may be due to the fact that the research sample includes SMEs from different sectors. And previous research (Węglarz et al., 2024) has shown that there is a relationship between the industry in which a company operates and acting in accordance with SDGs. The article identifies the following industries: real estate activities, transportation, finance and insurance, construction, manufacturing, wholesale and retail trade, agriculture, vehicle repair, healthcare and social assistance. Which means that more and more environmentally and socially conscious actions can be observed in these sectors. Further research should focus on companies belonging to one of the mentioned industries.

A high correlation was observed between the explanatory variables in each model. On the other hand, the results from the collinearity test among exogenous variables performed using the variance inflation factor (VIF) were obtained of 1.416 to 4.891, with values above 4 obtained for only six variables.

Survey questions were answered only by owners or managers, which had the effect of incorrectly interpreting the exogenous variable D6 – Employees belonging to the social layer. The survey question was about assessing the elements that create value for employees. In order to properly assess this, it is the employees who should provide the answers, which was not possible during this survey.

The results obtained for the environmental and social layers showed that either entrepreneurs do not understand the idea of sustainable business models or elements of sustainable business models are not yet present in the models of small and medium-sized enterprises. Therefore, there is a need for further research in this area, using other methods, such as the method of individual in-depth interviews.

Conclusions

This paper includes a verification of twelve sub-hypotheses about the correlation between the resources-oriented elements of the business model and the decision of SMEs to act in accordance with the SDGs. These resource-oriented elements are as follows:

- for business layer: Resources (H1.1), Activities (H1.2), Partners (H1.3), Costs (H1.4),
- for environmental layer: Materials (H2.1), Production (H2.2), Suppliers and outsourcing (H2.3), Environmental impact (H2.4),
- for social layer: Employees (H3.1), Corporate governance (H3.2), Local community (H3.3), Social impact (H3.4).

The Spearman correlation test was used to verify these hypotheses, and the logit model was used to confirm the observed relationship between the variables. The statistical analysis confirmed hypotheses H1.1, H1.2, H1.3, H3.1, H3.3, H3.4. The logit model confirmed sub-hypotheses: H1.1, H1.2, H1.3, H3.1, H3.4. Table 7 shows the number of variables that showed a statistically significant relationship with the endogenous variable in the Spearman correlation test and the logit model. This means that there are relationships between resource-oriented elements of BM from the business layer and weak relationships between resource-oriented of BM elements from the social layer, and no relationships between resource-oriented elements of BM from the environmental layer. This situa-

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tion may be due to the fact that this model is not well understood among SMEs, as is the classic business model. Entrepreneurs do not understand the assumptions of these models, they see the need for pro-environmental and pro-social activities but only through the prism of financial benefits.

Table 7. Number of variables that showed a statistically significant relationship with the endogenous variable

No of sub-hypothesis	Description	Number of items	Spearman correlation	Logit model
Business layer				
H1.1	Resources	17	5	3
H1.2	Activities	10	5	1
H1.3	Partners	21	5	3
H1.4	Costs	9	1	1
Environmental layer				
H2.1	Materials	11	0	0
H2.2	Production	6	0	0
H2.3	Suppliers and outsourcing	12	1	0
H2.4	Environmental impact	9	0	1
Social layer				
H3.1	Employees	12	4	2
H3.2	Corporate governance	6	0	0
H3.3	Local community	10	9	0
H3.4	Social impact	6	6	1

The research carried out showed which BM elements have a significant impact on the decision made by companies to act in accordance with the SDGs. Therefore, if we want to increase the number of companies operating in line with the SDGs, companies should be stimulated to increase the importance of the elements identified in the study in their BMs. The following are recommendations for entrepreneurs, showing which BM elements need to be developed if a company wants to move towards SBM.

Organisational culture and flexible work teams (e.g., project teams) were identified as the most important resources used to create value propositions by companies. A less important resource, however, in terms of value creation, was location. Among the activities contributing to the success of the enterprise, the most important were those oriented to the environment, which is a rather obvious conclusion. When choosing a partner for cooperation, the level of its commitment to social issues, its impact on the environment and its values were the most important for companies. Among all types of costs that are directly related to the offered product or service, the most significant were marketing costs, which seems justified in the context of conducted pro-environmental or pro-social campaigns.

Minimising the company's environmental impact in the area of non-industrial wastewater generation is the only factor in the environmental layer that was found to be important during the study. Other environmental impacts such as emissions, wastewater and waste, were found to be insignificant, as were other BM elements from the environmental layer.

Organisational culture that promotes ethical actions and additional benefits (e.g., health insurance, sports card) were identified as the most important elements that create value for employees. On the other hand, when analysing the social impact of the company, the most important element was the local community (e.g., access to material resources, preservation of cultural heritage, involvement of local communities). The study found no significant social impact on supply chain participants other than consumers (e.g., promotion of CSR or fair competition), which is at odds with the findings in the paper (Macchion et al., 2023).

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The contribution to the science of this study is twofold. First is the use of quantitative methods such as logit models to analyse internal SBM relationships, which is new among other studies. Second is the identification of relationships between SBM elements and enterprise performance according to SDGs.

The question of the role of sustainability in business models seems all the more important as more social and environmental challenges emerge. The transformation of models to a more sustainable one is very complicated, and many questions are still open and will define the directions for further discussion in both academic and practical fields.

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ZRÓWNOWAŻONE MODELE BIZNESU WŚRÓD MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW – PODEJŚCIE ZASOBOWE

STRESZCZENIE: Celem artykułu jest identyfikacja zależność pomiędzy działaniem zgodnie z celami zrównoważonego rozwoju a zorientowanymi na zasoby elementami zrównoważonego modelu biznesu (SBM). Analizowane dane pochodzą z badania przeprowadzonego w 2022 na próbie 303 przedsiębiorstw należących do MSP, w którym wykorzystano autorski kwestionariusz oparty na trójwarstwowym modelu biznesowym. Wyniki zostały poddane analizie statystycznej a następnie opracowano model logitowy w celu zweryfikowania istotności związku między badanymi zmiennymi. Przeprowadzone badania potwierdziły, że istnieje silna zależność pomiędzy działaniem zgodnie z celami zrównoważonego rozwoju a zorientowanymi na zasoby elementami SBM. Kultura organizacyjna i elastyczne zespoły robocze zostały zidentyfikowane jako najważniejsze zasoby wykorzystywane do tworzenia propozycji wartości. Wśród działań przyczyniających się do sukcesu przedsiębiorstwa najważniejsze były te zorientowane na środowisko. Przy wyborze partnera do współpracy najważniejszy był poziom jego zaangażowania w kwestie społeczne i jego wpływ na środowisko. Za najważniejsze elementy tworzące wartość dla pracowników uznano kulturę organizacyjną promującą etyczne działania oraz dodatkowe korzyści. Z kolei analizując wpływ społeczny firmy, najważniejszym elementem była tutaj społeczność lokalna.

SŁOWA KLUCZOWE: zrównoważony model biznesu (SBM), trójwarstwowy model biznesowy (TLBM), małe i średnie przedsiębiorstwa (MSP), podejście zasobowe, model logitowy

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