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ENVIRONMENTAL, SOCIAL AND GOVERNANCE FACTORS IN COMPANIES' BUSINESS MODELS AND THE MOTIVES TO INCORPORATE THEM IN THE CORE BUSINESS

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Abstract. The aim of the article is to study ESG factors and the motives of including the ESG perspective by companies in their business models (BM). The 2-stage research procedure was used to analyse the problem: bibliographic research was carried out with the use of VOSviewer software. In the paper, 99 from 3000 publications were selected for in-depth analyses, and various types of correlation measures were selected, examining the strength and direction of the relationship between the variables included in two-way and multi-way frequency tables. Fourteen binary variables were constructed with two categories, "yes" and "no", which were assigned ranks 1 and 0, respectively. It turned out that there is a moderate (0.379) significant correlation between ESG factors and companies' business models. The environmental factor is most often emphasized in these models (0.308). In the SME sector, CSR (1.000 – full correlation) and ESG factors (0.471) are taken into account, with the strongest relationships between this sector and Government (0.615) and Social (0.549). The role of the financial market in supporting sustainability in companies' business models is growing and taking on importance.

Keywords: companies, sustainable business model, ESG factors, non-financial factors, relationships, corporate social responsibility.

JEL Classification: C1, L2, Q01, Q56, O16, O32.

Introduction

Sustainable business models are a response to the need to adapt enterprises to the challenges of sustainability. These models consider the role of non-financial factors (environmental, social, and governance factors; ESG) in building sustainable value. Although the relationships between non-financial factors and the financial condition of enterprises have been

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recognized, there is a research gap regarding the relationship between ESG and companies' BM. The recognition of the impact of non-financial factors on business models is crucial as it allows better recognition and management of ESG risk. The criteria for evaluating the risk of transactions are changing due to changes in the economy, which is especially visible in the conditions of "greening" the economy and social inclusion. These two factors – referring to the both pillars (economic and social) of sustainable development (SD) – strongly indicate the need to extend the risk evaluation criteria.

Knowledge about the type of risk and the scale of exposure provides a basis for taking actions in the field of product design, participation in "green" public procurement, recycling, choosing friendly distribution channels, avoiding the implementation of orders that are socially and environmentally harmful, using innovations that have a positive impact on the environment, limiting the share of water in the production process, or selecting suppliers from the CSR (corporate social responsibility) group. Furthermore, the reasons why companies decide to build sustainable business models are also of interest. These may be financial or non-financial factors, e.g., image-related or resulting from the need to adjust to the expectations of business partners, including financial institutions. The archetype on which the sustainable business model is based is also connected with the motive of action. The influence of ESG factors on BM is geographically determined and depends on the location of the business. Sustainable business models differ among countries because the ESG risk differs and is determined by extraordinary events related to climate change, as in the case of Australia, Vietnam, and Mongolia. Extreme climate phenomena and their predicted intensity in the coming years, determined by environmental (climate) risk, will determine the changes in demand for sustainable products and services, which will result in a change in the structure of these products towards the increasing role of CSR and sustainability. The aim of this article, then, is to study ESG factors and the motives for including the ESG perspective by companies in their business models.

The main research question is what the relationship between ESG factors and the business models of enterprises is? The intermediary questions are as follows:

- What do we know so far about the influence of ESG factors on the sustainability in companies' business models?
- What ESG factors do companies take into consideration in their business models?
- Does the impact of ESG factors on companies' business models differ between countries?

The paper is organized as follows: the theoretical aspects of sustainable business models are presented in Section 1. Section 2 includes the methodological approach, data collection procedure, and the description of the methods. Section 3 presents the results, and the last Section is the conclusion.

1. Literature review

The concept of a business model appeared in the literature at the turn of the 1950s and 1960s (Bellman et al., 1957; Jones, 1960), but it gained importance in the late 1990s (Osterwalder et al., 2005). There were various approaches to the definition of business model in the literature. Osterwalder et al. (2005), Chesbrough (2006), and Magretta (2002) describe a business

model as the way of running a business by a company. Timmers (1998), Chesbrough and Rosenbloom (2002) pay attention to the relationship between business model and financial performance. Timmers (1998) defines a business model as a "description of the sources of revenues" and Chesbrough and Rosenbloom (2002) as "the realization of economic value". The business model is also defined in terms of the company's strategy. Casadesus-Masanell and Ricart (2010) claim that "strategy refers to the choice of business model through which the firm will compete in the marketplace." The business model framework helps to think strategically about the detailed way the firm does business (Richardson, 2008). Zott and Amit (2010) and Geissdoerfer et al. (2018) emphasize the importance of the business model in creating, delivering, capturing, and exchanging value. Demil et al. (2015) highlight that the business model brings a new and holistic understanding of the strategic sources of a company's performance.

Based on the literature review, Geissdoerfer et al. (2018) revealed that SBM is most frequently understood as a modified traditional BM, consisting of adding specific characteristics and goals and integrating sustainability into a value proposition, creation and delivery activities, and/or value capture mechanisms of the company. Successful transformation to SBM is a key to meet the demands of changing environment and society (Neumeyer & Santos, 2018). A different perspective on SBM presented Lozano (2018), leaving the value proposition, creation, and delivery approach to one in which efficiently used inputs and resources provide added value resulting in products and services better contributing to more sustainable societies. One of the challenges in building an SBM is use methods that lets the company acquire economic value for itself by providing benefits to society and the environment (Schaltegger et al., 2012).

In recent years research proposed several frameworks and archetypes of sustainable business models that can help companies design one. A group of such archetypes was described by Bocken et al. (2014), i.e., maximising material and energy efficiency, creating value from "waste", substitution with renewables and natural processes, delivering functionality, rather than ownership, adopting a stewardship role, encouraging sufficiency, re-purposing the business for society/environment, developing scale-up solutions. Ritala et al. (2018) updated these archetypes, so finally they contain: maximizing material and energy efficiency; closing resource loops; substitution with renewables and natural processes; delivering functionality rather than ownership; the adoption of a stewardship role; encouraging sufficiency; re-purposing for society or the environment; inclusive value creation; and developing sustainable scale-up solutions. Being aware of the multitude and diversity of definitions of a sustainable business model, we adopt the one that describes an SBM as a model that considers the concept of sustainability, of which ESG factors are elements, but SBM is a broader concept. In an SBM, sustainability is at the heart of the decision-making process (Stubbs & Cocklin, 2008). The adoption of SBM is intended to help the company achieve sustainable development. The inclusion of ESG factors in the traditional model is a step towards sustainability, but companies can take ESG factors into account in various combinations and intensities. The change of BM to an SBM is possible by including the concept of sustainability in the BM, which can be done by incorporating sustainability into the actions for value proposition, creation and delivery, and/or value capture methods of the company (Geissdoerfer et al., 2018).

Integration of ESG into the business model affects company's financial performance. The positive impact of ESG on business performance has been confirmed in research of Abdi et al. (2021), Chouaibi et al. (2021), Ahmad et al. (2021), and Kim and Li (2021). The opposite results were obtained by Saygili et al. (2021), who found out, that environmental disclosures have negative impact on financial performance of corporations. Including ESG into business model can manifest in better stock performance, as ESG factors lower volatility and, therefore a risk, and consequently bring higher risk-adjusted returns (Ashwin Kumar et al., 2016) or by lower cost of debt for firms with good ESG performance (Eliwa et al., 2021). The association between ESG performance and investment decision-making of stock investors was studied and confirmed by Ng and Rezaee (2020). They revealed a positive relationship between non-financial environmental, social, and governance (ESG) sustainability performance factors and idiosyncratic volatility after controlling financial-economic performance. Park and Jang (2021) revealed that for institutional investors, environmental and management factors are more important than social ones. The greatest impact on investors decisions have pollution and waste, greenhouse gas emissions, shareholder rights and risk management.

Besides frameworks and propositions, financial institutions also play an essential role in changing companies' business models toward sustainability. Cooperation with such institutions can help firms with a business model to implement the ESG risk reduction (Zioło et al., 2020).

2. Research methodology

2.1. Stages of the applied research procedure

In this paper, a 2-stage research procedure was used to study the impact of financial factors on creating a sustainable business model: 1. The preparation of data for analysis; 2. The analysis of relationships between variables constructed based on the collected publications. The methodological aspects of the presented stages are briefly described below. The graphical presentation of the analytical framework is presented in Figure 1.

As a part of the first stage, bibliographic research was conducted to identify publications including the following keywords: business model, financial market (or finance), and corporate social responsibility (or CSR) in the title, abstracts, or keywords. The bibliographic research was carried out with the use of VOSviewer software, version 1.6.14. The conducted research also identified clusters containing selected keywords and their reference networks (Waltman et al., 2010; van Eck & Waltman, 2010; Perianes-Rodriguez & Waltman, 2016). In the first step of this stage, we created a database containing the results of research obtained based on various combinations of keywords. There were 3,000 publications in this database. Then we removed duplicate works from this database. Finally, 236 publications indexed in the Web of Science (WoS) published from 2001 to 2020 containing the indicated terms in the title, abstracts, and keywords were collected.

Table 1 shows the number of publications finally identified in the Web of Science database (236 publications), taking into account different combinations of selected keywords.

The evolution of the number of publications and citations of these papers in the analyzed period was presented in Figure 2.

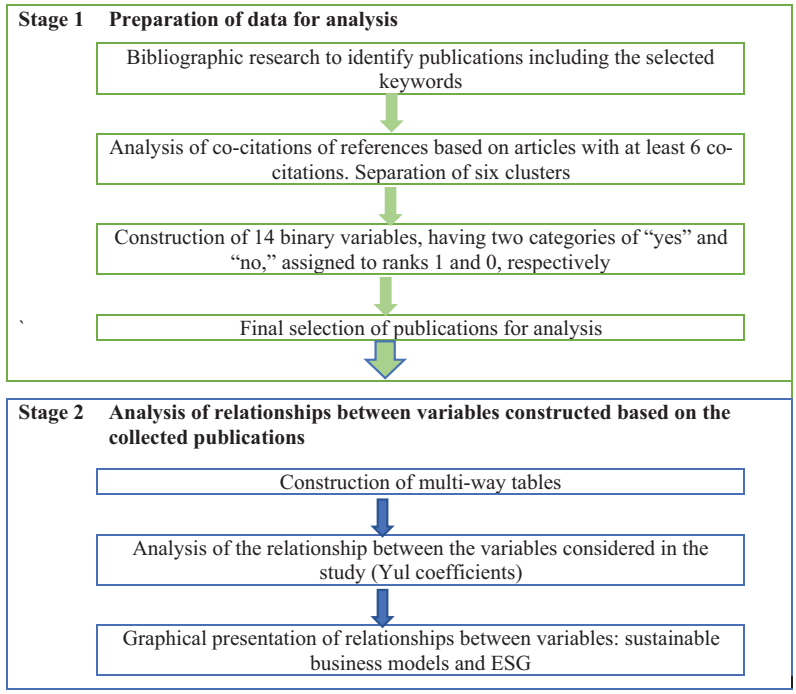

Figure 1. The graphical presentation of the analytical framework used in the research (source: own elaboration)

Table 1. Number of papers identified in the WoS according to the selected keywords (source: own elaboration based on WoS database)

The combinations of topics	Number of publications
model AND finance AND "corporate social responsibility" OR model AND finance AND CSR	904
"business model*" AND "corporate social responsibility" OR "business model*" AND CSR	533
"business model*" AND "corporate social responsibility"	477
"business model*" AND CSR	304
"financial market*" AND "corporate social responsibility" OR "financial market*" AND CSR	233
"financial market*" AND "corporate social responsibility"	206
"financial market*" AND CSR	129
"business model*" AND "financial market*."	109
model* AND "financial market*" AND "corporate social responsibility" OR model* AND "financial market*" AND "corporate social responsibility" CSR	58
"business model*" AND finance* AND "corporate social responsibility" OR "business model*" AND finance* AND "corporate social responsibility" CSR	44
"business model*" AND "financial market*" AND "corporate social responsibility" OR "business model*" AND "financial market*" AND "corporate social responsibility" CSR	3

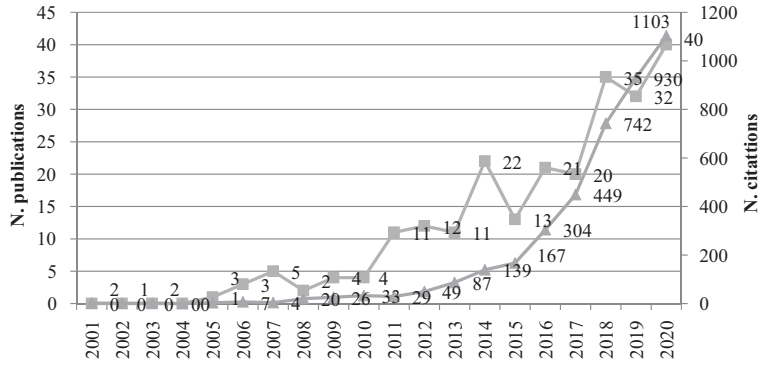

Figure 2. Total publications and citations by year – final database of 236 papers (source: own elaboration based on WoS database)

The information presented in the chart confirms the increase in interest in research areas described by the indicated keywords, also observed in other publication databases (Scopus, Google Scholar). The first article in this field appeared in the WoS database in 1998; until 2011, only a few articles (maximum 5 in 2007) were published in the publications indexed in the database. The number of publications reached its highest point in 2020 with 40 publications. Since 2012, a systematic increase in citations of publications has also been observed, the largest in the last few years, reaching the highest level in 2020 (1103 citations). Despite the growing number of publications and their citations, the created base is not impressive, which may confirm little exploration of issues from the indicated research areas considered as one set, which includes publications referring to analyzes in the field, in particular, of the business model, financial market and corporate social responsibility. In the WoS database, there are over 8,000 articles that refer to the first two keywords in the title, abstract, or keywords: business model or financial market, but only 236 of them also include references to corporate social responsibility. Articles published in the WoS database are mainly publications in the field of business (87 publications), management (84), green sustainable science technology (48), environmental sciences (44), and environmental studies (43). Articles in this field were published, among others, in such journals as Sustainability, Journal of Cleaner Production, Social Responsibility Journal, and Journal of Business Ethics. The authors of the identified studies come mainly from England (21 papers), Italy (29), the USA (22), Germany and Spain (17 papers each), and Poland (15). Table 2 presents information on the most frequently cited publications in this field.

Table 2. The most frequently cited publications in the WoS database (source: own elaboration based on WoS database)

Paper	Author/year	Journal	Total citations
A literature and practice review to develop sustainable business model archetypes	N. M. P. Bocken, S. W. Short, P. Rana, S. Evans, 2014	*Journal of Cleaner Production*, *65*, 42–56	880

End of Table 2

Paper	Author/year	Journal	Total citations
Business cases for sustainability: the role of business model innovation for corporate sustainability	S. Schaltegger, F. Luedeke-Freund, E. G. Hansen, 2012	*International Journal of Innovation and Sustainable Development*, *6*(2), 95–119	357
Is there a market for virtue? The business case for corporate social responsibility	D. J. Vogel, 2005	*California Management Review*, *47*(4), 19–27	199
An Ontology for Strongly Sustainable Business Models: Defining an Enterprise Framework Compatible With Natural and Social Science	A. Upward, P. Jones, 2016	*Organization & Environment*, *29*(1), 97–123	139
Development on whose terms?: CSR discourse and social realities in Papua New Guinea's extractive industries sector	E. Gilberthorpe, G. Banks, 2012	*Resources Policy*, *37*(2), 185–193	123
Ecopreneurship – a new approach to managing the triple bottom line	S. E. A. Dixon, A. Clifford, 2007	*Journal of Organizational Change Management*, *20*(3), 326–345	119
Mission impossible?: Adopting a CSR-based business model for extractive industries in developing countries	K. Slack, 2012	*Resources Policy, 37*(2), 179–184	98
Responsible Innovation Toward Sustainable Development in Small and Medium-Sized Enterprises: a Resource Perspective	M. Halme, M. Korpela, 2014	*Business Strategy and the Environment*, *23*(8), 547–566	91
Beyond What and Why: Understanding Organizational Evolution Towards Sustainable Enterprise Models	M. Zollo, C. Cennamo, K. Neumann, 2013	*Organization & Environment*, *26*(3), 241–259	89
Exploring the Relationship Between Business Model Innovation, Corporate Sustainability, and Organisational Values within the Fashion Industry	E. R. G. Pedersen, W. Gwozdz, K. K. Hvass, 2018	*Journal of Business Ethics*, *149*(2), 267–284	70

In the second step of the first stage, to identify the tendencies in the literature, especially to answer the question of how research on this topic is divided into clusters, the analysis of co-citations of references was carried out based on articles with at least 6 co-citations, which resulted in five clusters (see Figure 3).

The clusters are (1) business, business model innovation, corporate social responsibility (CSR), competitive advantage, entrepreneurship, environmental performance or firm performance, governance, SMEs (small and medium enterprise); finance, and financial market; (2) business ethics, business model, corporate social responsibility, ethics, integrated reporting, shared value, social responsibility, finance and sustainable development; (3) corporate responsibility, environmental-management, framework, green, performance, social-responsibility,

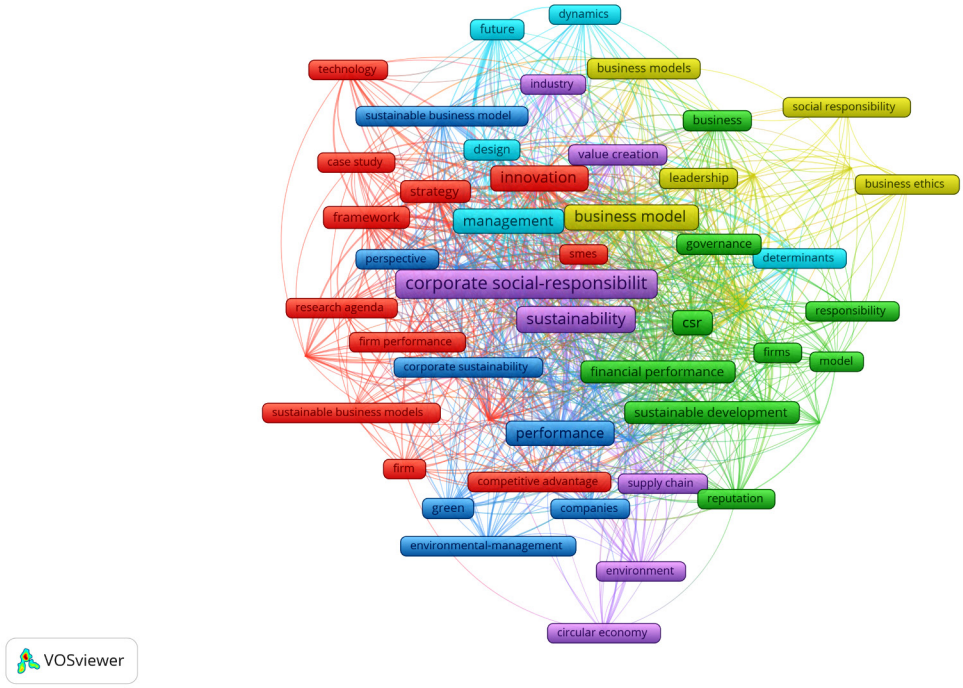

Figure 3. Clusters network (source: own elaboration in VOSviewer software)

strategies, and sustainable business model; (4) business models, corporate social responsibility, innovation, resource-based view, strategy, value creation; (5) circular economy, corporate social responsibility, environment, environmental sustainability, sustainability, sustainable business model; (6) design, determinants, future, management, social entrepreneurship.

When analyzing terms in individual clusters, we can notice that all selected keywords were identified only in the first cluster. In the second to fifth clusters, keywords related to business models and corporate social responsibility are represented the most. Among the keywords describing the sixth cluster, there are none of the keywords selected for the study. It is also worth noting that among the terms describing the second cluster, there is the notion: shared value, which in the literature on the subject is described as an alternative solution to corporate social responsibility. Interesting is also the emerging terms related to the environment (environment sustainability), which indicate one of the research directions being the subject of the analyzed articles.

In the second stage, 99 publications were selected for in-depth analyses, representing mainly the first 5 clusters, in which the results of the analyses were a business model taking into account both financial factors and references to the CSR concept. Analyzes, at this stage, aimed to identify the relationships connecting various variables describing these models identified during the research using selected statistical methods. For this purpose, various types of correlation measures were selected, examining the strength and direction of the relationship between the variables included in two-way and multi-way frequency tables.

2.2. Statistical material and methods

From the database, 99 articles were extracted that contained the required keywords. Careful analysis of the collected publications made it possible to construct variables that indicate which issues were studied in the accepted publications for the study. In this way, 14 binary variables were created, having two categories, "yes" (when the issue was studied in the publication) and "no" (the issue was not studied), which were assigned ranks of 1 and 0, respectively:

- X_1 – sustainable business model, SBM (1, if an SBM was deployed base on analyzed data or if an SBM was used to test the thesis; 0, in other cases);
- X_2 – publication year (1, if the paper was published later than 2018; 0, in other cases);
- X_3 – SME sector (1, if companies from SME sectors were analyzed; 0, in other cases);
- X_4 – environmental (1, if environmental factors were analyzed or used in the SBM; 0, in other cases);
- X_5 – governance (1, if corporate governance factors were analyzed or used in the SBM; 0, in other cases);
- X_6 – social (1, if social factors were analyzed or used in the SBM; 0, in other cases);
- X_7 – CSR (1, if Corporate Social Responsibility was analyzed or used in the SBM; 0, in other cases);
- X_8 – ESG (1, if ESG was analyzed or used in the SBM; 0, in other cases);
- X_9 – Europe (1, if European companies were analyzed; 0, in other cases);
- X_{10} – Asia (1, if Asian companies were analyzed; 0, in other cases);
- X_{11} – North America (1, if North American companies were analyzed; 0, in other cases);
- X_{12} – South America (1, if South American companies were analyzed; 0, in other cases);
- X_{13} – Africa (1, if African companies were analyzed; 0, in other cases);
- X_{14} – emerging economies only (1, if only emerging economies were analyzed; 0, in other cases).

On the basis of such constructed variables, multi-way tables can be constructed, which are the basis for calculating statistics determining the relationship's strength. The multi-way table shows the distribution of observations due to several features simultaneously. For two variables, it shows the combined distribution of both features. The last row and column sums are called the marginal frequencies for feature Y and feature X, respectively.

In qualitative variables, in particular ordinal scales, the following coefficients are most often used: r Spearman, Kendall τ, and gamma. The gamma coefficient (the gamma of Goodman and Kruskal) has a similar structure and interpretation as the r coefficient of Spearman or Kendall τ (Stanisz, 2006, p. 314). It also requires similar assumptions. It is used when the data contain many related observations, i.e., those representing the same variant of a feature. Gamma is also based on probability, as it is counted as the difference between the probability that the order of two variables agrees and the probability that it does not agree, divided by 1 minus the probability of the related observations. It can be calculated for ordinal (ordered) variables that are continuous (such as height or weight) or discrete (such as "hot," "hotter," and "hottest"). While other coefficients can calculate relationships for this type of variables, such as, e.g., τ Kendall or r Spearman, Goodman, and Kruskal gamma is generally preferred

when there are many linked observations. The gamma coefficient is also advantageous when the data contain outliers because they do not affect the results excessively. It can also be the preferred method for all ordinal data arranged in a two-dimensional table. A particular case of the gamma coefficient is the *Q*-Yule contingency (association) coefficient. It is a measure of assessing the relationship between two qualitative (non-measurable) features X and Y when the data is presented in the form of a contingency table and is used only for tables with dimensions of 2×2 (Zysno, 1997; Mider & Marcinkowska, 2013; Albatineh et al., 2006). The value of the coefficient belongs to the range [–1, 1], and its sign does not indicate the direction of the relationship. In order to calculate this ratio, group the sample observations into all possible pairs, and then divide these pairs into three possible categories:

- **concordant pairs** – the compared variables within the two observations drift in the same direction, i.e., either in the first observation, they are both bigger than in the second one, or both are smaller. The number of such pairs in the sample will from now on be denoted as *P*.
- **dis-concordant pairs** – variables change in the opposite direction; that is, one of them is bigger for that observation in the pair for which the other is smaller. The number of such pairs in the sample will be denoted by *Q*.
- **tied pairs** – one of the variables has equal values in both observations.

The following formula calculates the *Q*-Yule's contingency coefficient:

$$Q = \frac{P - Q}{P + Q}.$$

The closer the absolute value is to unity, the stronger the relationship between the features. Where:

Q is 0: no relationship between the variables;

Q = 0 to ± 0.29: very small association;

Q = –0.30 to –0.49 or 0.30 to 0.49: moderate relationship between variables;

Q = 0.50 and 0.69 or –0.50 and –0.69: significant relationship between the variables;

Q > 0.70 or <–0.70: a very strong relationship.

The next stage of the statistical analysis of the data collected in this way attempts to verify the hypothesis that the two qualitative features in the population are independent. The most frequently used "tool" is the test χ^2. It compares the observed frequencies with the expected frequencies assuming the null hypothesis (that there is no relationship between these two variables).

We are interested in verifying the null hypothesis: H0: *X* and *Y* features are independent. Concerning the alternative hypothesis: H1: *X* and *Y* features are interdependent.

To verify the hypothesis, we use the statistic (Bąk et al., 2019):

$$\chi^2 = \sum_{i=1}^{k}\sum_{j=1}^{r}\frac{\left(n_{ij} - \hat{n}_{ij}\right)^2}{\hat{n}_{ij}},$$

where: χ^2 – chi-square statistic with $(k-1) \times (r-1)$ degrees of freedom; n_{ij} – empirical partial counts, i.e., the number of units with an *i*-th variant of the variable *X* and *j*-th variant of the variable *Y*; $\hat{n}_{ij}$ – theoretical partial numbers calculated according to the formula:

$\hat{n}_{ij} = \frac{n_{i.} \times n_{.j}}{n}$; $n_{i.}$ – the number of units having an *i*-th variant of the variable *X;* $n_{.j}$ – the number of units with *a j*-th variant of the variable Y; *k* – the number of variants of variable *X;* r – the number of variants of variable *Y; n* – sample size.

A verification decision can be made based on a test probability obtained from a calculation in *Statistica*:

– if $p \leq \alpha$, reject the null hypothesis and adopt an alternative hypothesis;
– if $> \alpha$, there is no reason to reject the null hypothesis.

3. Results

3.1. Sustainable business models and their relationships with selected variables – multi-way tables analysis

The review of 99 articles selected for more in-depth analyses made it possible to identify 51 publications emphasizing sustainable business models' importance in enterprises. According to the authors of these publications, managers can make more deliberate decisions by identifying risk in sustainable business models. In their opinion, companies worldwide attach increasing importance to factors related to environmental protection, social responsibility, and corporate governance (ESG), striving to balance the organization's goals with the expectations of the entities participating in their activities in increasingly complex conditions. However, this is not always reflected in scientific research. As shown in Table 3, more than 50% of articles deal with ESG factors, but at the same time, only 17 deal with issues related to sustainable business models. The situation is similar to the relationship between the sustainable business model and corporate social responsibility (CSR), which focuses mainly on building relationships supporting all stakeholders participating in business ventures. Among enterprises belonging to the SME sector, this problem was presented less frequently in the analyzed publications. The inclusion of ESG factors in financial risk assessments is gaining popularity, as evidenced by, for example, the increase in publications on this subject. The issues related to the enterprise's strategic interest and profit generation as part of implementing the CSR idea were highlighted in almost every fourth publication. It is worth emphasizing that the publications emphasize the importance of sustainable business models, but they function primarily in large enterprises, and research is conducted on their basis.

Table 3. Cross-way table for variables: Sustainable business model (SBM; X_1) and CSR (X_7) and ESG (X_8) and SME (X_3) (source: own calculations)

SBM	ESG		Summary	CSR		Summary	SME		Summary
	No	Yes		No	Yes		No	Yes	
No	23	31	54	41	13	54	45	9	54
Yes	28	17	45	37	8	45	40	5	45
Summary	51	48	99	78	21	99	85	14	99

Almost 70% of them were created in 2018 or later. The results of the studies presented therein show that the inclusion of non-financial factors in enterprises in business models can improve financial results, which is of great importance for the company's management, decision-makers, and potential investors. ESG factors in business models are considered more often in publications for European Union countries, while less often for Asian countries (Table 4).

Table 4. Cross-way table for variables: Sustainable business model (SBM; X_1) and the publication year (X_2) and Europe (X_9) (source: own calculations)

SBM	Year		Summary	Europe		Summary
	No	Yes		No	YES	
No	18	36	54	27	27	54
Yes	12	33	45	27	18	45
Summary	30	69	99	54	45	99

3.2. Sustainable business models and their relationships with selected variables – correlation analysis

By analyzing the relationships between the variables considered in the study, multi-way tables were constructed based on which Yule's coefficients were determined, and their statistical significance was examined at the significance level of 0.05. Significant values of the coefficients are shown in bold (Table 5).

It turned out that there is a moderate (0.379) but significant relationship between ESG factors and sustainable business models functioning in enterprises. Most often, these models emphasize the environmental factor (0.308). In the SME sector, CSR (1.000 – full correlation) and ESG factors (0.471) are taken into account, with the strongest relationships between this sector and Government (0.615) and Social (0.549).

Table 5. The matrix of Yule's coefficients between the variables adopted for the study (source: own calculation)

	SBM	Year	SME	ESG	E	S	G	CSR
SBM	1.000	0.158	0.333	0.379	0.308	0.207	0.280	0.189
Year	0.158	1.000	0.460	0.241	0.464	0.606	0.133	0.053
SME	0.333	0.460	1.000	0.471	0.296	0.549	0.615	1.000
ESG	0.379	0.241	0.471	1.000	1.000	1.000	1.000	1.000
E	0.308	0.464	0.296	1.000	1.000	0.984	0.902	0.706
S	0.207	0.606	0.549	1.000	0.984	1.000	0.886	0.743
G	0.280	0.133	0.615	1.000	0.902	0.886	1.000	0.639
CSR	0.189	0.053	1.000	1.000	0.706	0.743	0.639	1.000

One can also try to interpret the analyzed problems graphically. For example, Figure 4 shows a radar chart of the correlation coefficients determined between the SBM variable (X1) and the other analysed variables shown in Table 5.

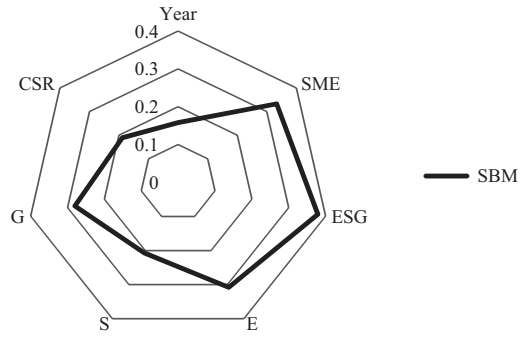

Figure 4. Radar chart for correlation coefficient between analysed variables (source: own elaboration based on Table 5)

It can be noted that the articles describing the application of sustainable business models in companies emphasize their relationship primarily with ESG factors, among which environmental factors are the most important. Less often, which is surprising, these models are presented together with the concept of corporate social responsibility. It may result from the fact that these terms are often used interchangeably. Meanwhile, ESG is more strongly measured and this is a fundamental difference from the CSR concept, although it is worth noting that CSR activities can incorporate elements of ESG within them and vice versa.

4. Discussion

The aim of the article is to study ESG factors and the reasons for including the ESG perspective by companies in their business models. We used the meta-analysis for this purpose. It turned out that there is a moderate (0.379) significant correlation between ESG factors and companies' business models. Due to the innovative nature of our research, it is difficult to find other studies with the results corresponding directly to ours. A similar method for their study on business models adopted Hajiheydari et al. (2019). They analyzed and mined the title, abstract, and keywords of 14,081 research papers related to the business model. The findings showed that studies on the business model could be divided into three main research areas: sustainable business model, electronic business model, and business model innovation. Each of them has some sub-areas, and their visibility in particular industries differs. Our study results can be compared to the findings of reasearch conducted by Hong and Jinho (2017) and Li et al. (2017). Hong and Jinho (2017) analyzed all business model studies extracted from the Scopus database. They indicated innovation, Internet, and electronic commerce as the subjects on which the research of the business model focuses and distinguished six main research areas in the business models literature, including sustainability, knowledge management, open model innovation, communication technology, globalization strategy, and the case of value network and innovation. Based on the analysis of 1498 records from the Web of Science database, Li et al. (2017) pointed out that the trending topics in the business model study are the business model innovation and value creation, while strategy and technology-oriented articles provide the main perspectives in this study.

A study carried out by Kluza et al. (2021) showed a positive impact of innovation on a sustainable business model. Researchers used a meta-analysis based on 72 articles from the Science Direct database and statistical methods to analyze the results. They also revealed that social capital positively affects a sustainable business model.

Marczewska and Kostrzewski (2020) also conducted a review of the available literature on sustainable business models. They analyzed the Web of Science and Scopus databases, revealing a constantly increasing number of sustainable business model publications that confirm the growing interest in this area. The authors also pointed out that among the most influential articles on SBM are those concerning sustainable business model innovations.

Using meta-analysis, Sinha et al. (2019) examined the effect of ESG factors on investments. The author analyzed 100 articles describing the relationship between ESG factors found in JSTOR, Google Scholar, SSRN, and ResearchGate databases and revealed the positive influence of these factors on financial performance.

Conclusions

European Union is currently working on the EU taxonomy for sustainable activities (The Taxonomy Regulation entered into force on 12 July 2020). The EU taxonomy could play an important role in supporting the EU to scale up a sustainable business and implement the sustainable business models of companies. Sustainable activities defined in the Taxonomy could be one of the examples of relevant business models in the arena of practice. This article aims to study ESG factors and the motives for including the ESG perspective by companies in their European Union is currently working on the EU taxonomy for sustainable activities (The Taxonomy Regulation entered into force on 12 July 2020). The EU taxonomy could play an essential role in supporting the EU to scale up a sustainable business and implement the sustainable business models of companies. Sustainable activities defined in the Taxonomy could be one of the examples of relevant business models in the arena of practice. The aim of this article is to study ESG factors and the motives for including the ESG perspective by companies in their sustainable business models. 99 articles were analyzed which referred to ESG, CSR, company firm value, and/or sustainable development to answer the indicated questions. Fifty-one articles pointed out that by identifying risk in SBM, managers make more effective decisions. In over 50% of the analyzed articles, the subject of non-financial factors was mentioned, but not in the context of their impact on SBM. In terms of the main research question resulting from this research, it was shown that there is a moderately (0.379) significant relationship between ESG factors and SBM of enterprises. Based on the literature review, 14 binary variables were distinguished, and multi-way tables were used to search for links between variables. As a result of this analysis, it was shown that the inclusion of non-financial factors in business models improves the companies' financial condition. The financial condition is, in turn, one of the elements taken into account by financial market institutions in risk assessment; therefore, SBM favor cooperation with financial institutions. The main factor that determines and is taken into account by companies in their BM is the environmental factor. The research results show a moderate (0.379) significant correlation between ESG factors and companies' sustainable business models. The environmental fac-

tor is most often taken into account in the business models of enterprises. The relationship between sustainable business models and the business location was also demonstrated. The study results confirm that the influence of ESG factors on companies' business models differs between countries. The impact is stronger for countries in Europe compared to Asia. Enterprises located in Europe implement sustainable business models more often than enterprises from Asia. The results of the research are related to the studies analyzed, not the actual practices of companies.

The main contribution of the study is an in-depth research on non-financial factors incorporated into business models of companies. A limitation of the study was the lack of papers referring to the direct relationship between the role of financial market institutions and companies' SBM. It was also challenging to ensure the comparability of the studied categories. The authors plan to direct future research into studying the relationships between sustainable business models of enterprises cooperating with banks in Europe, Asia, America, and Africa, which allows research into the in-depth relations between ESG factors, banks, and territorial differentiation SBM. 99 articles were analyzed which referred to ESG, CSR, company firm value, and/or sustainable development to answer the indicated questions. Fifty-one articles pointed out that by identifying risk in SBM, managers make more effective decisions. In over 50% of the analyzed articles, the subject of non-financial factors was mentioned, but not in the context of their impact on business models. In terms of the main research question, it was shown that there is a moderately (0.379) significant relationship between ESG factors and BM of enterprises. Based on the literature review, 14 binary variables were distinguished, and multi-way tables were used to search for links between variables. As a result of this analysis, it was shown that the inclusion of non-financial factors in business models improves the companies' financial condition. The financial condition is, in turn, one of the elements taken into account by financial market institutions in risk assessment; therefore, sustainable business models favor cooperation with financial institutions. The main factor that determines and is taken into account by companies in their business models is the environmental factor. The research results show that there is a moderately (0.379) significant correlation between ESG factors and companies' SBM. The environmental factor is most often taken into account in the business models of enterprises. The relationship between SBM and the business location was also demonstrated. The study results confirm that the influence of ESG factors on companies' business models differs between countries. The impact is stronger for countries in Europe compared to Asia. Enterprises located in Europe implement SBM more often than enterprises from Asia. The results of the research are related to the studies analyzed, not the actual practices of companies. The main contribution of the study is an in-depth research on non-financial factors incorporated into BM of companies. A limitation of the study was the lack of papers referring to the direct relationship between the role of financial market institutions and companies' sustainable business models. It was also challenging to ensure the comparability of the studied categories. The authors plan to direct future research into studying the relationships between SBM of enterprises cooperating with banks in Europe, Asia, America, and Africa, which allows research into the in-depth relations between ESG factors, banks, and territorial differentiation business.

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Author contributions

Conceptualization: M. Z.; methodology: I. B., K. Ch.; software: I. B., K. Ch.; validation: I. B., K. Ch.; formal analysis M. Z., I. B., K. Ch., A. S.; investigation: M. Z., I. B. K. Ch., A. S.; resources: M. Z., I. B., K. Ch., A. S.; data curation: I. B., K. Ch.; writing original draft preparation: M. Z., I. B., K. Ch., A. S.; writing review and editing: M. Z., I. B., K. Ch., A. S.; visualization: M. Z.; I. B., K. Ch., A. S.; supervision: M. Z.; project administration: M. Z.; funding acquisition: M. Z.

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