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## HOW SUSTAINABLE IS YOUR BUSINESS MODEL? A MULTIDIMENSIONAL FRAMEWORK AND EMPIRICALLY VALIDATED MEASUREMENT SCALE

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**ABSTRACT:** The study develops a multi-dimensional framework for sustainable business models (SBM) and develops an empirically validated measurement scale. A systematic literature review revealed the lack of a universally accepted SBM concept, with fundamental theoretical differences between existing conceptualisations and limited empirical verification. Most studies identify SBM types, whereas we propose that sustainability is an inherent, gradable attribute of every business model. The SBM conceptualisation, based on an extensive literature review, led to a hypothetical model, verified through empirical research involving 694 companies from Poland and Denmark via confirmatory factor analysis. Despite differences in sustainability approaches in these countries, SBM consistently encompasses three dimensions: sustainable value proposition, creation and delivery; sustainable value capture, and governance for sustainability. The paper advances the state of the art by reframing sustainability as a continuous maturity attribute embedded in any business model, thereby moving beyond the prevailing typology-based approaches in current research. It also provides a validated measurement scale that offers a robust foundation for future SBM research, while enabling companies to assess the sustainability maturity of their business model, benchmark within their industry, and design more effective development strategies.

**KEYWORDS:** business model, sustainable business model, measurement scale, empirical research, confirmation factor analysis

## Introduction

Business models (BMs), which are mainly used by firms to generate competitive advantage (Ferrer-Lorenzo et al., 2019), seem to be a potentially promising area of exploration into opportunities for sustainable practices (Ferlito & Faraci, 2022). Primarily because a business model is a holistic conceptual tool expressing business logic, representing the essence of business activities that propose, create, deliver, and capture value (Zott & Amit, 2010; Bocken et al., 2014; Osterwalder & Pigneur, 2010). Lüdeke-Freund and Dembek (2017) argue that business models can illuminate how organisations perform in terms of sustainability, yet conventional BM frameworks are inadequate for this purpose (Yang et al., 2014). Their limitations stem from a narrow, economically bounded perception of value, an exclusion of non-human ecosystem actors, and a short-term understanding of organisational performance (Boons & Lüdeke-Freund, 2013; Lozano, 2018; Mignon & Bankel, 2023).

The concept of a sustainable business model (SBM) is currently being developed by researchers and practitioners (Bocken et al., 2014; Breuer et al., 2018; Foss & Saebi, 2017; Ferlito & Faraci, 2022). However, a systematic literature review revealed a lack of a single, universally accepted concept of SBM (Ferlito & Faraci, 2022; Lüdeke-Freund et al., 2018; Mignon & Bankel, 2023; Caravelli-Svärd, 2025). There are fundamental differences between SBM conceptualisations developed to date. Partly these differences stem from different understandings of the business model concept (Foss & Saebi, 2017; Spieth et al., 2014; Zott et al., 2011), and due to the adoption of different, to some extent, contradictory approaches to business sustainability – from instrumental and win-win perspectives to holistic, systems-oriented approaches (Kubiński et al., 2023; Upward & Jones, 2016). Much of the literature continues to treat SBMs merely as modified versions of conventional business models, with sustainability-related features externally added (Caravelli-Svärd, 2025). Moreover, the dominant stream of research still relies on typology- and archetype-based classifications (e.g., Bocken et al., 2014; Caravelli-Svärd, 2025; Mignon & Bankel, 2023). These archetypes typically represent idealised solutions or mechanisms and often remain limited to shallow system leverage points, offering only incremental improvements rather than transformational change (Caravelli-Svärd, 2025; Schlüter et al., 2023).

In response to these limitations, several recent studies explicitly call for reconceptualising sustainability as a dynamic and evolving maturity attribute rather than a static categorical type (Neesham et al., 2023; Schlüter et al., 2023). Yet empirical verification of such conceptualisations remains very limited, and we argue that this lack of consistency across empirical studies is primarily due to the unclear theoretical foundation of the SBM concept, which in turn results in the absence of an accepted measurement scale for assessing the sustainability maturity of business models.

Consequently, what is still missing is a theoretically grounded and diagnostically useful conceptualisation of SBM that treats sustainability as an inherent, gradual structural property of any business model – one that can be systematically assessed and compared across diverse contexts. This gap hinders cumulative knowledge-building and restricts the development of robust tools for international research and practice.

Addressing this gap, the present study develops a multi-dimensional conceptualisation of SBM and proposes an empirically validated measurement scale designed to assess the sustainability of business models. Accordingly, this study seeks to answer the following research questions:

- RQ1. How can sustainability be conceptualised as a gradual and inherent attribute of any business model?
- RQ2. What theoretically grounded dimensions constitute a comprehensive and multidimensional structure of the sustainable business model (SBM)?
- RQ3. Can this multidimensional SBM structure be empirically validated across culturally distinct contexts, thereby supporting its applicability as a robust measurement scale?

The study was conducted through an extensive literature review to define the concept of SBMs and to formulate a hypothetical multi-dimensional model of SBMs. Moreover, extensive cross-country empirical research was conducted to verify the suggested theoretical model (694 businesses were examined from Poland and Denmark). CAWI method was used to collect data, and the Confirmatory Factor Analysis (CFA) were used to identify the SBM dimension structure and to test the measurement scales of all constructs and the final model.

## Theoretical Background

### Business model

There is no consensus on the definition of a business model (BM) (Foss & Saebi, 2017). Zott and Amit (2010) emphasise its role in explaining strategic issues such as value creation and competitive advantage, while Massa and Tucci (2013) extend the concept to include the broader network of suppliers, partners, and channels. Teece (2010), in turn, frames the BM as the firm's organisational and financial architecture that both creates and captures value.

Despite definitional ambiguity, scholars generally agree that a BM: (a) is distinct from the product, company, or industry; (b) represents the systemic logic of how a business operates; (c) must be understood in relation to its key stakeholders; and (d) primarily explains how value is created rather than merely captured (Zott et al., 2011). Furthermore, BMs are widely viewed as dynamic processes of continuous adaptation to customers, institutions, and competitors (Provance et al., 2011), with innovation both shaping and emerging from BM evolution.

In this paper, we adopt the view of the BM as a holistic construct expressing the business logic that proposes, creates, delivers, and captures value (Zott & Amit, 2010; Teece, 2010).

### Business sustainability

Business sustainability can be understood as the ability to coordinate economic, social and environmental practices to ensure organisational growth and survival (Sun et al., 2018; Al-Shaikh & Hanaysha, 2023). It is a complex, multi-faceted phenomenon rooted in different sustainability paradigms and often combining contradictory elements (Zgrzywa-Ziemak & Walecka-Jankowska, 2021). Importantly, these paradigms imply fundamentally different expectations toward the role of business in society, which makes the conceptual landscape of BS fragmented and often internally inconsistent.

In the conventional paradigm (Gibbons, 2020), BS is primarily aimed at creating long-term shareholder value, with social and environmental concerns treated as critical factors in assessing risks, costs and opportunities. From a broader perspective that views the firm as "a mesoscale social artefact" (Parrish, 2007), the regenerative paradigm holds that a sustainable business should actively generate positive impact for society and the planet (Dyllick & Muff, 2016; Gibbons, 2020). Between these extremes lies the widely adopted win-win approach, which seeks simultaneous economic, social and environmental gains (Sekerka & Stimela, 2011), aligned with Gibbons's contemporary paradigm.

In this paper, we adopt the regenerative paradigm and define BS as a business's commitment and actions aimed at contributing to sustainable development (Zgrzywa-Ziemak & Walecka-Jankowska, 2021).

### Sustainable business model

SBM results from the proposal to pursue an economic value together with ecological and social value (Boons & Lüdeke-Freund, 2013) through a progression of continuous practices. However, the more detailed analysis of articles, books, and conference proceedings does not result in one single, unambiguous definition of the SBM term. There are plenty of definitions of SBM (e.g., Abdelkafi & Täuscher, 2016; Bocken et al., 2014; Evans et al., 2017; Geissdoerfer et al., 2018; Schaltegger et al., 2016; Stubbs & Cocklin, 2008; Upward & James, 2016; Caravelli-Svärd, 2025). The authors use different theoretical frameworks of BM (Foss & Saebi, 2017; Spieth et al., 2014; Zott et al., 2011) and approaches to BS (Zgrzywa-Ziemak & Walecka-Jankowska, 2021). Furthermore, the notion of SBM is often used inconsistently, confusing "sustainable" as financially viable and "sustainable" as a form of triple-bottom-line contribution to the sustainable development of the natural environment and society (Lüdeke-Freund & Dembek, 2017).

Johnson et al. (2008) include sustainability in BMs through customer value proposition, choice of critical resources and processes. However, the company is still aiming to achieve profits and, in such a way, realizes its financial as well as social and environmental objectives. Stubbs and Cocklin (2008) proposed a system-wide and enterprise-level perspective aligning all stakeholder groups and explicitly considering the environment and society as critical players. The wide range of literature addresses

SBM to the concept of circular economy, uses new designs to contribute to the innovation of BMs and finds collaboration or sharing as a central aspect of developing SBMs (Kozłowski et al., 2018). All the above examples show that the concept of the sustainable business model (less commonly ‘business model for sustainability’, ‘sustainability-oriented business model’ or ‘sustainability business models’) is currently being developed (Bocken et al., 2014; Evans et al., 2017; Ferlito & Faraci, 2022; Neesham et al., 2023).

In this paper, we understand SBM as BM “that incorporates proactive multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders, and holds the long-term perspective” (Geissdoerfer et al., 2018). Within this definition, four dimensions of the SBM concept can be distinguished: sustainable value proposition, sustainable value delivery and capture, sustainable value creation, and governance as the critical requirement that enables the organisational culture to change and guide sustainable behaviour (Bolboli & Reiche, 2013; Evans et al., 2017).

*Sustainable value proposition as a SBM dimension.* The value proposition in a classical BM is concerned with the product and service offerings in generating economic return. A sustainable value proposition is at the core of any SBM (Laukkanen & Tura, 2020). In a sustainable business, the value proposition provides measurable ecological and social value together with economic performance, which aligns with recent eco-innovation studies emphasising integration of sustainability benefits into market offerings (Boons & Lüdeke-Freund, 2013; Barbieri & Santos, 2020). Furthermore, SBM literature defines the value proposition as “the degree to which a BM maximises benefits while reducing damages in economic, social, and environmental terms” (Méndez-León et al., 2022, p. 26). Thus, value extends beyond customers and the firm itself to multiple stakeholder groups, with the environment recognised as a parallel stakeholder alongside customers, suppliers, and employees (Neesham et al., 2023). A sustainable value proposition conveys an integrated promise of economic, environmental, and social benefits delivered to customers and society, balancing short-term profitability with long-term sustainability (Bocken et al., 2015; Laukkanen & Tura, 2020). When a company offers less energy-intensive, less environmentally harmful, and socially positive products or services, it strengthens both long-term sustainability effects and economic outcomes, thus reinforcing the overall sustainability of its BM. This corresponds with Matos and Silvestre (2013), who note that organisations creating sustainability values aligned with multiple stakeholder objectives are more likely to achieve a truly sustainable business model. Based on these arguments, the following main hypothesis is proposed: **H1:** *A more sustainable value proposition is positively related to a more sustainable business model.* The specific hypotheses were developed to frame the sustainable value proposition notion:

**H1-1:** *Stronger business commitment to long-term social and environmental value is positively related to a more sustainable value proposition.*

**H1-2:** *Greater contribution of the value proposition to customers’ well-being is positively related to a more sustainable value proposition.*

**H1-3:** *The stronger the contribution of the value proposition to maintaining a sustainable biosphere, the more sustainable the value proposition is.*

*Sustainable value creation & delivery as an SBM dimension.* Value creation and delivery refer to how firms generate and realise value through new opportunities, markets, and revenue streams (Teece, 2010; Beltramello et al., 2013). Within the BM components, companies determine key activities, partners, resources, and distribution channels (Wells, 2013). Oskam et al. (2018) identify four stages of value creation: exploration through networks, development via customer engagement, reframing through feedback, and redirection toward new client groups. SBM integrates sustainability not only into the value proposition but also into the logic of value creation, emphasising shared and systemic value co-creation with stakeholders (Abdelkafi & Täuscher, 2016; Evans et al., 2017). It captures both value co-creation and potential value destruction through stakeholder interactions and system interdependencies (Evans et al., 2017; Upward & Jones, 2016). Sustainable value creation and delivery require aligning resources, activities, and partnerships to realise the sustainable value proposition and to ensure verifiable sustainability outcomes (Goffetti et al., 2022). SBMs operate through networks of sustainable value flows among multiple stakeholders, including the natural environment

and society as key participants in shared value creation (Evans et al., 2017). Organisations function as parts of interdependent stakeholder networks, where long-term collaborative relationships constitute the process of shared value creation (Geissdoerfer et al., 2018; Lewandowska & Cherniaiev, 2022). Manda et al. (2016) define sustainable value creation as “the identification of strategies and practices that contribute to a more sustainable world by viewing global challenges through the appropriate business perspective.” Based on the above considerations, the following main hypothesis is proposed: **H2: The more business activities for the benefit of generating sustainable value, the more sustainable the business model is.** The specific hypotheses are:

**H2-1: The more business–stakeholder relationships enhance stakeholders’ quality of life, the more sustainable the business activities are.**

**H2-2: The stronger the joint commitment with the stakeholders for the benefit of sustainable development, the more sustainable business activities are.**

**H2-3: The greater the extent to which business activities support a sustainable biosphere, the more sustainable business activities are.**

*Sustainable value capture as a SBM dimension.* Value capture relates to how a business generates revenues from the provision of products, services, or data (Teece, 2010). Biloslavo et al. (2018) propose a value triangle in which economic value is captured within a circular value system co-created with stakeholders, including future generations. Sustainable value capture offers new ways of creating and delivering value by promoting business model innovation (Yang et al., 2014). As recent literature increasingly stresses, measurable and transparent value capture mechanisms are essential to avoid merely superficial sustainability claims and ensure evidence-based accountability in business model design (Goffetti et al., 2022). In this context, value capture in SBMs requires defining and assessing tri-profit through economically, socially, and environmentally relevant units of flourishing, acknowledging that stakeholders evaluate success in non-monetary as well as monetary terms (Upward & Jones, 2016). Based on this understanding, the following main hypothesis is proposed: **H3: The more integrated the economic, social & environmental benefits are, the more sustainable the business model is.** The specific hypotheses relate to the contribution of each type of benefit to sustainable value capture:

**H3-1: The higher the economic benefits, the more sustainable value capture.**

**H3-2: The higher the social benefits, the more sustainable value capture.**

**H3-3: The higher the environmental benefits, the more sustainable value capture.**

*Governance as a SBM dimension.* SBM implies a shift from a money-earning logic toward a purpose-driven logic of organisational existence (Sternad et al., 2017) that goes beyond purely financial outcomes (Osterwalder & Pigneur, 2010). Viewing the firm as a social system embedded in economic, societal, and natural systems exposes dynamic interdependencies, tensions, and trade-offs across short-, long-term, and intergenerational horizons (Espinosa & Porter, 2011; Senge et al., 2010; Upward & Jones, 2016; Hahn et al., 2015). In such contexts, SBMs require “a value network with a new purpose, design and governance” that integrates the interests and responsibilities of multiple stakeholders, including the natural environment (Evans et al., 2017). Accordingly, governance should embed sustainability commitments into strategy and day-to-day management through coherent mechanisms of vision-setting, strategic alignment, planning, coordination, monitoring, and transparent reporting of the firm’s contribution to sustainable development (Broman & Robèrt, 2017; Hahn et al., 2015; Epstein & Buhovac, 2017; Evans et al., 2017). To reduce unintended consequences and better manage system-level feedback during SBM development and implementation, recent work stresses the role of systems thinking and early-stage assessment principles (Schlüter et al., 2023). Based on these arguments, the following hypothesis is proposed: **H4: The more sustainable value-oriented the business management process, the more sustainable the business model.** Along with three specific hypotheses:

**H4-1: The more the planning process supports the orientation and integration of the commitments and activities for the benefit of sustainable development, the more sustainable value-oriented the business management process.**

**H4-2:** *The more decision-making processes support the orientation and integration of commitments and activities for the benefit of sustainable development, the more sustainable value-oriented the business management process.*

**H4-3:** *The more the reporting process supports the orientation and integration of the commitments and activities for the benefit of sustainable development, the more sustainable value-oriented the business management process.*

Figure 1 presents the final hypothetical SBM phenomenon model.

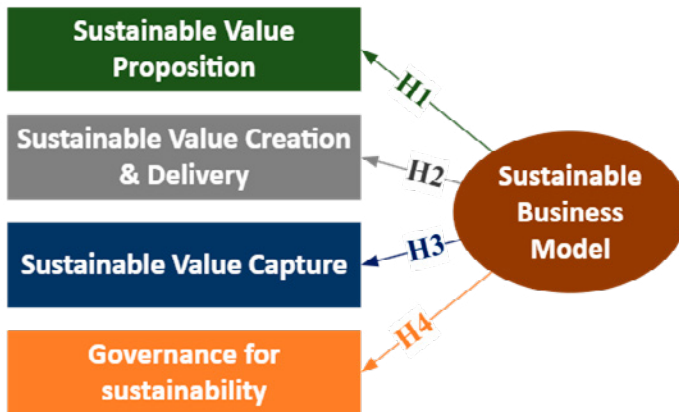


Figure 1. The hypothetical model of SBM

## Research methods

To ensure the general construct validity, content validity and reliability, to the sample were selected the countries that differ in their commitment to sustainability – Poland and Denmark. The research was carried out in 694 businesses: 391 operating in Poland and 303 in Denmark. The respondents were only higher-level managers or other people who have a broad view of the entire enterprise in the business organisations employing at least 10 people. Because of the study's purpose, the sample was not representative; the goal was to create numerically similar groups concerning organisational size and ensure substantial diversity in their activity types. To collect the data, the CAWI method was used, and the survey was composed of questions measuring each of the SBM dimensions (71 items) and enterprise characteristics (the type of business activity, employment size, and the form of ownership).

Confirmatory factor analysis (CFA) was used to verify the dimensions of the SBM and its overall hypothesised structure. Exploratory factor analysis (EFA), a data-driven method suited for initial scale development, informed the model by indicating potential dimensionality (Kenaszchuk et al., 2010). While EFA is recommended at early stages to avoid incorrect assumptions and ensure item quality (Carpenter, 2018), CFA remains essential for final structural validation against theory (Henson & Roberts, 2006). Following established analytical guidelines (Schreiber et al., 2006), the model was revised based on preliminary results and re-evaluated using CFA. Data analysis was performed using IBM SPSS and AMOS.

## Results of the research

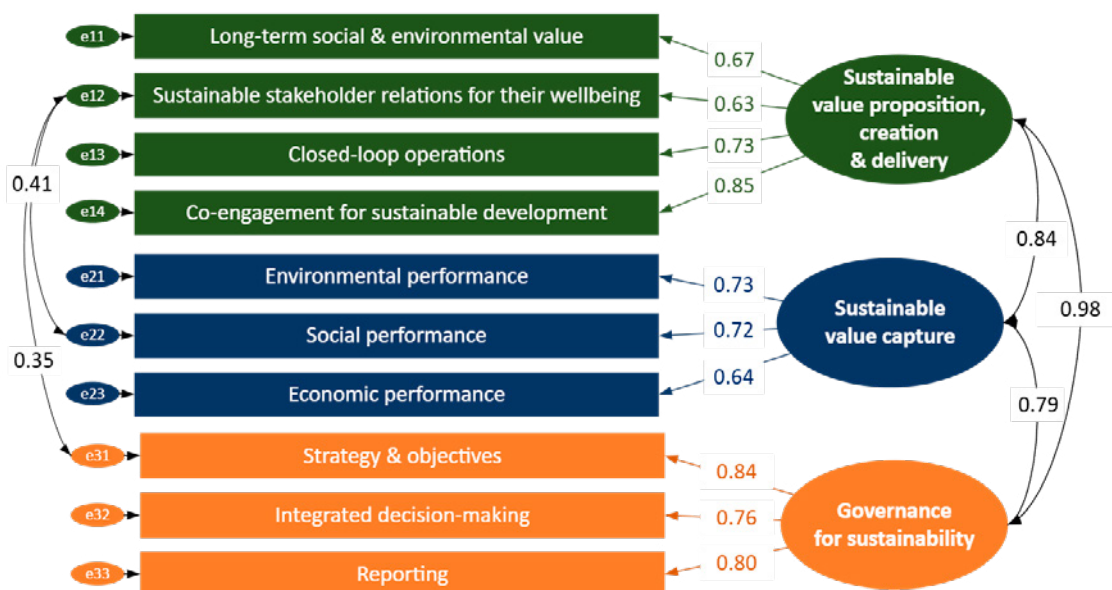
In the first step, the hypothetical structures of the individual dimensions of the SBM were verified. Secondly, the hypothetical dimension structure of the total SBM concept was verified. CFA was conducted separately for each of the four proposed SBM dimensions. In all cases, the models demonstrated satisfactory global fit and internal consistency, providing support for hypotheses H1-1 – H1-3, H2-1 – H2-3, H3-1 – H3-3 and H4-1 – H4-3. The detailed results are summarised in Table 1.

**Table 1.** Model 1: verification results of SBM dimensions

Dimensions & variables	Items	$\alpha$	CR	AVE	CFA fit indices	Hypotheses	CFA result
Sustainable value proposition	3	0.63	0.75	0.52	$\chi^2(74)=308.045$ ; $\chi^2/df=4.163$ ; GFI=0.935; RMSEA=0.068	H1-1 – H1-3	Accepted
long-term social & environmental value	4	0.77	0.85	0.50			
closed-loop value proposition	5	0.83	0.86	0.54			
sustainable relations with customers	6	0.80	0.81	0.52			
Sustainable value creation and delivery	5	0.71	0.68	0.43	$\chi^2(203)=487.553$ ; $\chi^2/df=2.402$ ; GFI=0.937; RMSEA=0.045	H2-1 – H2-3	Accepted
sustainable stakeholder relations: employees	7	0.85	0.84	0.44			
sustainable stakeholder relations: business partners	3	0.74	0.74	0.42			
sustainable stakeholder relations: other stakeholders	4	0.72	0.77	0.46			
reduction of environmental impacts	4	0.80	0.85	0.60			
co-engagement for sustainable development	4	0.88	0.88	0.66			
Sustainable value capture	3	0.76	0.85	0.65	$\chi^2(87)=301.02$ ; $\chi^2/df=3.46$ ; GFI=0.945; RMSEA=0.06	H3-1 – H3-3	Accepted
economic performance	4	0.73	0.78	0.47			
environmental performance	5	0.80	0.83	0.50			
social performance	6	0.81	0.83	0.45			
Governance for sustainability	3	0.83	0.92	0.80	$\chi^2(87)=334.669$ ; $\chi^2/df=3.847$ ; GFI=0.938; RMSEA=0.064	H4-1 – H4-3	Accepted
strategy & objectives	6	0.88	0.85	0.49			
integrated decision-making	4	0.78	0.80	0.50			
Reporting	5	0.88	0.87	0.57			

In line with the hypothetical model of the SBM (see Figure 1) Model 1 was developed and tested using CFA. Testing the validity of the Model 1, it is observed that two factor loadings (for *sustainable value proposition* and *sustainable value creation and delivery*) were greater than 1, indicating multicollinearity between factors and implying that the model is a mis specified. Thus, the SBM structure is not confirmed, and Model 1 is rejected. As a result, the hypotheses H1 – 4 are rejected.

EFA supported changes in Model 1, and finally, Model 2 was developed. SBM (Model 2) consists of 3 dimensions (see Figure 2). Table 2 contains reliability coefficients, average variance extracted and descriptive statistics all variables building the SBM scale.



**Figure 2.** Model 2: a structural model of SBM (Poland n = 391; Denmark n =303)

**Table 2.** Model 2: SBM dimensions and variables (n=694)

Dimensions & variables	Items	$\alpha$	CR	AVE	M	SD
Sustainable value proposition, creation & delivery	4	0.78	0.87	0.62	3.34	0.66
long-term social & environmental value	4	0.77	0.79	0.49	3.17	0.93
closed-loop operations	2	0.60	0.68	0.53	3.18	0.90
closed-loop value proposition	5	0.86	0.82	0.48	3.12	0.87
reduction of environmental impacts	4	0.80	0.79	0.50	3.24	1.22
Sustainable stakeholder relations	4	0.83	0.81	0.52	3.85	0.61
sustainable relations with customers	4	0.75	0.79	0.49	4.03	0.73
sustainable relations with employees	7	0.85	0.84	0.44	3.70	0.77
sustainable relations with business partners	4	0.69	0.72	0.39	3.62	0.76
sustainable relations with other stakeholders	4	0.72	0.76	0.44	4.05	0.74
co-engagement for sustainable development	4	0.88	0.84	0.57	3.15	0.96
Sustainable value capture	3	0.76	0.88	0.71	3.51	0.52
environmental performance	5	0.80	0.82	0.48	3.46	0.61
social performance	6	0.81	0.82	0.44	3.58	0.64
economic performance	4	0.81	0.82	0.44	3.49	0.64
Governance	4	0.73	0.71	0.38	3.39	0.73
strategy & objectives	6	0.85	0.89	0.58	3.46	0.82
integrated decision-making	4	0.80	0.78	0.47	3.47	0.76
Reporting	5	0.87	0.88	0.61	3.23	0.94

$\alpha$  – Cronbach's alpha, CR – composite reliability, AVE – average variance extracted  
M – mean; SD – standard deviation

Two of the four original dimensions of Model 1 are the same as assumed (sustainable value capture and governance for sustainability). The other two dimensions building Model 1 (sustainable value proposition and sustainable value creation delivery) were rebuilt to one new dimension consisting of 4 variables (named Sustainable value proposition, creation & delivery):

- sustainable stakeholder relations are built on one variable from the SVP dimension (variable: customer wellbeing) and 3 variables from the SVCD dimension (building variable: sustainable stakeholder relations); a new common variable integrates all issues concerning the relations with stakeholders and their wellbeing in the long term;
- *closed-loop operations*, integrating two variables from Model 1: one from the SVP dimension (variable: *closed-loop value proposition*) and one from the SVCD dimension (variable: *reduction of environmental impacts*), thus all the environmental aspects of value proposition, creation & delivery reviled to build a coherent variable;
- long-term social & environmental value – a variable of SVP dimension from Model 1 has been accepted without changes;
- co-engagement for sustainable development – a variable of the SVCD dimension from Model 1 has been extracted without changes.

In order to verify the SBM scale, CFA was conducted to test Model 2 (the asymptotically distribution-free estimation method was used). The measures of overall fit indicate the fit of the structural model:  $X^2(113) = 434.597$ ,  $p < 0.001$ ,  $X^2/df = 3.846$ , GFI = 0.910, AGFI = 0.868, RMSEA = 0.045, RMR = 0.064. All estimated parameters are significant ( $p < 0.001$ ).

The research results prove the strong interdependence of all three factors: sustainable value proposition, creation & delivery, sustainable value capture and governance for sustainability. Supplementary material contains all items in the SBM measurement scale.

Multi-group analysis was conducted to verify metric invariance between subgroups of organisations from different countries, Poland and Denmark. There are no significant differences in the estimates of most parameters; however, two parameters differ significantly: sustainable stakeholder relations (in sustainable value proposition, creation & delivery factor) and environmental performance (in sustainable value capture factor). With regard to the sustainability of the business model, environmental results are considered of greater importance in companies operating in Denmark compared to Poland, and for companies in Poland compared to companies in Denmark in the SBM conceptualisation, the development of sustainable relationships with customers and other stakeholders is more important. Still, for both countries, SBM consistently encompasses an identified three-dimensional structure.

These results provide the empirical basis for the discussion of theoretical and practical implications presented in the next section.

## Discussion

An in-depth analysis of the literature defining the concept of the sustainable business model (SBM) confirmed that it remains a multidimensional and evolving construct, integrating multiple, sometimes contradictory perspectives. This study adopted a holistic approach that positions business as an active participant in sustainable development, following key conceptual contributions by Evans et al. (2017), Geissdoerfer et al. (2018), and Upward and Jones (2016). Based on these premises, the research moved beyond typologies and archetypes of SBMs to conceptualise sustainability as a graded attribute inherent in every business model. This assumption – tested through extensive empirical research – allowed for identifying the underlying structure and measurable dimensions of SBM maturity rather than its types.

Building on general BM theory (Zott & Amit, 2010) and SBM ontologies (Upward & Jones, 2016), the study proposed and empirically validated a multidimensional SBM structure. The final three-dimensional model reflects the significance of the dimensions: *sustainable value proposition, creation & delivery, sustainable value capture* and *governance for sustainability*. The resulting model provides a conceptual and empirical bridge between theoretical SBM frameworks and evidence-based managerial applications, addressing an indicated gap in the literature that has so far lacked standardised and validated SBM measurement instruments (Goffetti et al., 2022; Schlüter et al., 2023; Caravelli-Svärd, 2025).

Dimension **sustainable value proposition, creation & delivery** is defined as the scope of the company's commitments and actions for the economic, environmental and social benefits (while reducing harm) that the company provides to customers and society as a whole, taking into account both short-term profit and long-term sustainability. This dimension is built of four variables:

- *long-term social & environmental value*, understood as a degree to which business develops value proposition contributing to the development of healthy and friendly, current and future communities as well as healthy ecosystems. This is a direct reference to the concept of sustainable value by Hart and Milstein (2003); at the same time, however, the long-term perspective is rarely addressed in SBM concepts (e.g., Geissdoerfer et al., 2018);
- *sustainable stakeholder relations*, meaning a degree to which value proposition, creation and delivery (business products and activities) positively influence the quality of the stakeholders' life in the long term (customers, employees, business partners and others). This is social aspect fully rooted in stakeholder theory (Hörisch et al., 2014; Sulkowski et al., 2018);
- *closed-loop operations*, defined as the degree to which value proposition, creation and delivery are in a closed loop and protect the health of ecosystems in the long term; This is an environmental aspect embedded in the concept of a closed-loop economy (Ghisellini and Ulgiati, 2020), the concept of product lifecycle management (LCI, 2023) and integrated environmental management (Sommer & Brauweiler, 2013);
- *co-engagement for sustainable development*, understood as a degree to which the business is co-engaged with the stakeholders for the benefit of sustainable development. It is built on two theoretical foundations. It refers to the theory of complex adaptive systems and Beer's viable system theory, the enterprise is seen here as the result of a process of continuous coevolution of

the enterprise together with its environment (Espinosa and Porter, 2011). On the other hand, it directly embeds the concept of stakeholders shaking developed by Sulkowski et al. (2018). These dimensions are present in the SBM ontology (e.g., Upward and Jones, 2016; Evans et al., 2017), but they definitely go beyond the classic BM proposals.

The second dimension, **sustainable value capture**, represents the degree to which economic, social and environmental benefits are integrated and measured through transparent and verifiable indicators. It links to the concept of sustainable performance (Hansen & Schaltegger, 2016) and the emerging emphasis on evidence-based sustainability evaluation (Evans et al., 2017; Caravelli-Svärd, 2025).

The last dimension, **governance for sustainability**, concerns the orientation of management processes toward long-term sustainable value creation. It emphasises the role of strategy, coordination and reporting mechanisms that continuously integrate sustainability into business decisions (Hahn et al., 2015; Evans et al., 2017). This finding confirms that governance acts as a central capability enabling systemic alignment and adaptive learning within SBMs (Schlüter et al., 2023), which remains underrepresented in many earlier models (Stubbs & Cocklin, 2008).

The SBM structure does not specify how to increase the sustainability of BM, but it can be the basis for determining the areas, directions and scenarios of the changes or for formulating the methods and techniques of development – those general ones and those that are characteristic of particular types of businesses as well as of the contexts of their functioning. It also does not formulate the types of SBM, as we assumed that every BM is, to some extent, sustainable.

The scale of SBM as measurement gives the possibility to compare the internal situation of the company to the other entities in the branch or economic sector and build better strategies for the development.

The paper contributes to abandoning the understanding of the essence of BS as an engagement in selected environmental or social issues, providing the basis for coping with the complexity of the commitments and activities for the benefit of creating sustainable value. The model discloses the complexity of this phenomenon and the fact that it encompasses several dimensions, the change of which is a great challenge.

It also provides insights into the theory of BM itself. It shows the great importance of governance in building an effective BM. Following Osterwalder and Pigneur (2010), we claim that BM cannot be successful per se. BM can be more or less sound and coherent, but it must still be implemented. “Strong” BM can be poorly managed and fail, whereas the “weak” BM can succeed because of good management and implementation skills. Therefore, governance, besides the value proposition, creation, delivery and capture, should be recognised as a priority factor, which integrates all these elements of BM and is included in it.

The SBM concept, formulated due to the above-discussed research, provides a solid basis for further studies on this phenomenon. Above all, the knowledge of the structure and the preliminary verified measurement scale offers the possibility of developing diagnostic instruments for further research on BS as well as for the needs of the businesses. However, to validate the proposed SBM measurement scale, a CFA should be conducted on a separate sample to confirm the structure of the proposed scale resulting from an EFA (Carpenter, 2018; Kenaszchuk et al., 2010).

Together, these findings support the conceptual shift from static SBM typologies to a dynamic, maturity-based perspective.

An essential extension of the research results would be to examine the conditions of the differences in the level of sustainability of BMs depending on the contextual variables – the properties of the businesses themselves and their environment. Such knowledge can contribute to developing the instruments of business improvements and devising industry-related or regional solutions that foster businesses’ positive influence on sustainable development. The verified model can also be an essential basis for developing the curricula of managers’ education (and the education of other employees) in BS.

## Conclusions

This study set out to conceptualise sustainability as a gradual and inherent attribute of every business model, rather than a categorical condition, and to identify the systematically derived dimensions that constitute its structure. In response to RQ1, it was demonstrated that sustainability can be meaningfully treated as a continuum of maturity, embedded in the business model's logic and assessable irrespective of BM type, which marks a conceptual shift from typology-based classifications dominating previous research.

Addressing RQ2, we propose a theoretically grounded, multidimensional structure of the sustainable business model (SBM), consisting of: (1) sustainable value proposition, creation & delivery, (2) sustainable value capture, and (3) governance for sustainability. This structure results from the integration of business model theory with a holistic approach to business sustainability.

With regard to RQ3, the empirical results confirm that this structure is valid and statistically robust across two culturally distinct national contexts (Poland and Denmark). Despite differences in emphasis (e.g. greater importance of stakeholder relations in Polish firms vs. environmental performance in Danish firms), the core factor structure remained fully invariant, supporting the transferability and reliability of the model.

Importantly, the results also show that the validated structure can serve as a practical diagnostic instrument for assessing and comparing the sustainability maturity of business models, regardless of country, industry or firm size. This opens opportunities not only for academic use but also for managerial benchmarking and evidence-based strategic development.

## Limitations and future research directions

It is essential to underline that the research presented above has several limitations. First, the sample was not statistically representative, which was a conscious and justified design choice – aiming not at population generalizability, but at ensuring construct clarity and sufficient variation of sustainability maturity levels for model verification. We therefore ensured the balanced presence of firms differing in size and sectoral background across both countries. Second, Model 2 did not fully reproduce the theoretically assumed structure. Although the revised model is strongly theory-consistent and empirically well-fitted, further replication on new and independent samples is required to confirm its stability and advance toward cumulative validation. Finally, the proposed SBM scale consists of 66 items across three dimensions, which makes it a relatively complex diagnostic tool. Future studies could explore the possibility of reducing the instrument's length without compromising validity – especially if the scale is to be applied in longitudinal research or managerial practice, or used in predictive models linking SBM maturity to other strategic or performance-related phenomena. Finally, future studies should also examine the predictive validity of SBM (e.g., links to innovation, resilience, or performance).

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## The contribution of the authors

Conceptualisation, A.Z.-Z. and A.M.-K.; methodology, A.Z.-Z. and A.M.-K.; validation, A.Z.-Z. and A.M.-K.; formal analysis, A.Z.-Z., A.M.-K. and A.W.; writing original draft, A.Z.-Z. and A.M.-K.; writing – review & editing, A.Z.-Z. and A.W.; visualization, A.Z.-Z. and A.W.; funding acquisition, A.Z.-Z., A.M.-K. and A.W.

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## JAK BARDZO ZRÓWNOWAŻONY JEST TWÓJ MODEL BIZNESOWY? KU KOMPLEKSOWEJ SKALI POMIAROWEJ

**STRESZCZENIE:** Celem artykułu jest zidentyfikowanie wielowymiarowej struktury zrównoważonego modelu biznesu (SBM) oraz opracowanie empirycznie zweryfikowanej skali jego pomiaru. Systematyczny przegląd literatury ujawnił brak powszechnie akceptowanej definicji SBM, fundamentalne różnice teoretyczne między dotychczas opracowanymi koncepcjami oraz ograniczoną empiryczną ich weryfikację. Większość dotychczasowych prac koncentruje się na identyfikacji typów SBM, podczas gdy w niniejszym badaniu zaproponowano ujęcie, zgodnie z którym zrównoważenie stanowi nieodłączną, stopniowalną cechę każdego modelu biznesu. Konceptualizacji SBM dokonano na podstawie pogłębionego przeglądu literatury, czego efektem jest hipotetyczny model SBM. Weryfikację modelu oparto na wynikach badań empirycznych przeprowadzonych w 694 przedsiębiorstwach z Polski i Danii, wykorzystano confirmacyjną analizę czynnikową. Pomimo różnic w podejściu do zrównoważonego rozwoju w obu krajach, model dla obu obejmuje trzy wymiary: propozycję, tworzenie i dostarczanie wartości; odzyskiwanie zrównoważonej wartości; praktyki zarządcze wspierające zrównoważony rozwój. Artykuł wnosi wkład w rozwój badań nad SBM poprzez reinterpretację zrównoważenia jako ciągłego atrybutu dojrzałości, osadzonego w każdym modelu biznesu, tym samym wykraczając poza dominujące obecnie podejścia typologiczne. Dodatkowo przedstawiona, zweryfikowana empirycznie skala pomiarowa stanowi solidną podstawę dla dalszych badań nad SBM, umożliwiając jednocześnie przedsiębiorstwom ocenę poziomu dojrzałości zrównoważenia ich modelu biznesu, porównania branżowe oraz projektowanie skuteczniejszych strategii rozwoju.

**SŁOWA KLUCZOWE:** model biznesowy, zrównoważony model biznesowy, skala pomiaru, badania empiryczne, confirmacyjna analiza czynnikowa