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CORPORATE RESILIENCE IN THE ESG DIMENSION: SYNERGY OF FINANCIAL, SECURITY AND MARKETING DETERMINANTS

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Abstract. This article develops an integrated model of corporate resilience in the ESG dimension, combining financial, security, and marketing determinants under conditions of growing uncertainty and systemic risks. The study addresses the limitations of traditional resilience assessment approaches that overlook the interdisciplinary nature of ESG-related factors.

The aim is to substantiate and empirically verify the impact of ESG performance on corporate resilience, considering the mediating role of financial stability and the moderating role of sustainable marketing. The research applies a systemic and interdisciplinary approach, supported by content analysis, expert evaluation, economic–mathematical modelling, panel regression with fixed effects.

The findings confirm a statistically significant positive relationship between ESG performance and corporate resilience. Governance demonstrates the strongest direct effect, while financial stability serves as the main mediator of ESG influence. Sustainable marketing strengthens the transformation of ESG initiatives into financial and reputational outcomes. Corporate resilience is therefore interpreted as a multidimensional capability integrating financial, operational, and market stability.

The novelty of the study lies in proposing a comprehensive analytical framework that combines ESG principles, financial stability, security management, and sustainable marketing. The model can support strategic management, ESG integration, risk management, investment assessment, and the development of long-term corporate sustainability policies.

Keywords: sustainable development, socio-economic systems, quality assessment, corporate governance, risk management, corporate security.

JEL Classification: G32, G34, M14, M31, Q56, D81.

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1. Introduction

Climate change, geopolitical instability, pandemic shocks, digitalization and the growth of social expectations as global transformation processes of the beginning of the 21st century have significantly complicated the conditions for the functioning of business systems. Under such circumstances, traditional approaches to ensuring the financial stability of enterprises are insufficient, since they do not take into account the complex nature of modern risks and threats. In response, the focus of scientific research is increasingly on corporate resilience as the ability of an enterprise not only to withstand external and internal shocks, but also to adapt, transform and ensure long-term viability in the context of sustainable development (World Commission on Environment and Development, 1987).

The concept of resilience has acquired an interdisciplinary character and is actively developing at the intersection of economics, management, finance and security research. In modern conditions, it is increasingly closely associated with the sustainable development paradigm, which involves a balance of economic, social and environmental goals. In this context, the ESG approach (Environmental, Social, Governance) is gaining particular relevance, as it acts as an institutionalized form of integrating sustainable development principles into corporate governance and business practices. ESG is no longer considered exclusively as a tool for non-financial reporting, but is increasingly positioned as a factor of strategic sustainability, investment attractiveness and long-term competitiveness of enterprises.

At the same time, the scientific literature is fragmented in its studies on the relationship between ESG and corporate resilience. Most empirical work focuses either on the financial effects of ESG (impact on profitability, cost of capital, risk), or on individual aspects of social or environmental responsibility of business. Much less has been revealed about the synergistic interaction of financial, security and marketing determinants in shaping the resilience of enterprises in the ESG dimension. This situation creates a scientific gap, especially given the growing role of intangible assets, reputational capital, stakeholder trust and corporate security in the context of systemic crises.

The financial determinants of corporate resilience are traditionally associated with the stability of cash flows, the effectiveness of capital management, liquidity and the ability of the enterprise to absorb financial shocks. However, in the context of sustainable development, financial resilience is increasingly formed not in isolation, but in interaction with environmental and social practices that affect access to financial resources, the cost of capital raised and investment decisions. At the same time, the security dimension of resilience, which encompasses risk management, corporate, information and reputational security, is becoming a critically important element of the ESG architecture, especially in the context of growing geo-economic and cyber threats.

Special attention deserves the marketing dimension of corporate resilience, which within the framework of ESG is manifested through the communication of sustainable development, brand management, and the formation of trust among consumers and other stakeholders. Sustainable marketing is increasingly acting not only as a tool for promotion, but also as a mechanism for reducing non-financial risks, maintaining customer loyalty, and stabilizing income in crisis conditions. Therefore, marketing determinants can enhance or, conversely, neutralize the positive impact of ESG practices on corporate resilience, which requires in-depth scientific analysis (Carroll, 1999).

In view of the above, there is a pressing need for a systematic study of corporate resilience in the ESG dimension, which would integrate financial, security and marketing determinants into a single analytical model. Such an approach corresponds to interdisciplinary scientific logic and contributes to a deeper understanding of the mechanisms for ensuring sustainable business development in conditions of growing uncertainty.

The aim of this article is to theoretically substantiate and empirically assess the synergistic influence of financial, security, and marketing determinants on corporate resilience within the ESG framework by clarifying the conceptual foundations of corporate resilience in the sustainable development paradigm, identifying the key ESG factors affecting corporate financial and non-financial sustainability, developing an analytical model of the relationship between ESG indicators and corporate resilience, and evaluating the contribution of marketing and security factors to strengthening this relationship.

The structure of the paper is stated as follows: Section 1 presents the state of art of the problem investigated. Section 2 presents a thorough literature analysis. Section 3 is devoted to the brief analysis of the methodological basis. While in the following Section 4 is presented methodological framework of the research. In the main Section 5 – Results – the main ideas, insights and findings are presented. The principal findings are summarized in the final Section 6.

2. Literature review

In the scientific literature, corporate resilience is interpreted as a multidimensional characteristic of an enterprise, reflecting its ability to withstand external and internal shocks, adapt to a changing environment and ensure business continuity in the long term (Duchek, 2020; Saebi et al., 2017). The conceptual origins of resilience are associated with environmental and socio-economic research, within which resilience was considered as the ability of a system to maintain functional integrity under conditions of destabilization (Holling, 1973). Further adaptation of this approach to the corporate level led to the formation of a strategic and managerial understanding of resilience as a dynamic organizational capability.

In the sustainability paradigm, corporate resilience is increasingly interpreted not as a reactive response to a crisis, but as a proactive systemic property that is formed through the integration of economic, social and environmental goals into corporate governance (Bansal et al., 2021; Cherniak et al., 2020, 2024; Eccles et al., 2014). Researchers emphasize that resilient enterprises are able not only to minimize the negative consequences of crisis events, but also to transform business models, accumulating organizational learning and innovative potential (Hovorov et al., 2025; Lengnick-Hall et al., 2011).

At the same time, a significant part of the research is characterized by conceptual fragmentation: corporate resilience is often described declaratively, without clear operationalization and quantitative assessment criteria (Hillmann & Guenther, 2021). This necessitates the further development of methodological approaches to measuring resilience through the integration of financial, security, and non-financial indicators (Likhonosova et al., 2025).

The ESG paradigm in modern research is considered as a key institutional mechanism for implementing sustainable development principles at the enterprise level (Friede et al., 2015; Porter & Kramer, 2011). The vast majority of empirical work focuses on analyzing the impact of ESG indicators on companies' financial results, cost of capital, risk management, and investment attractiveness (Eccles et al., 2014; Broadstock et al., 2021). The generalized results indicate a positive or neutral impact of ESG on financial performance in the long term. A separate scientific direction is associated with the study of ESG as a factor in reducing systemic and idiosyncratic risks. In this context, ESG is viewed not only as a reputational asset, but as a tool to increase business adaptability and stability in times of uncertainty (Pankratz & Zehntbauer, 2021). However, most research analyzes ESG components in isolation, without considering their interaction with each other and with other determinants of corporate resilience.

The financial aspects of corporate resilience have traditionally been analyzed through measures of liquidity, capital structure, cash flow stability, and the probability of financial insolvency (Altman, 1968; Wernerfelt, 1984). Emerging research is increasingly focusing on the relationship between ESG indicators and corporate financial stability, particularly through lower cost of capital, improved access to finance, and enhanced investor confidence (Friede et al., 2015; Broadstock et al., 2021). Empirical research shows that companies with higher ESG ratings demonstrate better financial resilience during times of crisis, including the global financial crisis and the COVID-19 pandemic (Pankratz & Zehntbauer, 2021; Albuquerque et al., 2020). However, there is a lack of literature that integrates financial metrics with non-financial and security aspects of resilience within a single analytical model.

The security component of corporate resilience encompasses risk management, corporate, information and reputational security, and the ability of enterprises to counter systemic threats (Lengnick-Hall et al., 2011). Within the ESG approach, this dimension is most closely related to the governance component, which determines the quality of strategic decisions, the level of transparency and accountability of corporate management (Aguilera et al., 2019; Ushenko et al., 2023).

At the same time, qualimetric approaches provide a robust methodological basis for formalizing and assessing quality-related risks (Trishch et al., 2025). In particular, Trishch et al. (2025) propose component-oriented and functionally dependent models that allow identifying the contribution of individual elements to overall system quality. Despite their significant analytical potential, the integration of qualimetric methods into ESG-oriented research remains limited. In particular, existing studies rarely combine formalized quality assessment tools with ESG indicators in the context of corporate resilience. This creates a methodological gap related to the lack of unified approaches that simultaneously capture financial, non-financial, and quality-related determinants of resilience.

The marketing dimension of corporate resilience in the ESG context is related to brand building, reputation management, sustainability communication, and stakeholder trust (Kotler & Kartajaya, 2019; Pomering & Dolnicar, 2009). Despite the growing number of publications on sustainable marketing, its role in shaping corporate resilience remains under- formalized in empirical models. Studies that analyze marketing factors as mediators or moderators of the impact of ESG practices on the financial and security sustainability of businesses are particularly limited (Torelli et al., 2020).

The conducted analysis of the literature indicates the lack of comprehensive studies that would simultaneously integrate financial, security and marketing determinants of corporate resilience in the ESG dimension. The existing works are mainly characterized by fragmentation or narrow specialization, which does not correspond to the systemic logic of sustainable development. It is precisely overcoming this scientific gap by building an integrated analytical model that constitutes the conceptual basis of this article.

3. Methods

The methodological basis of the study was a combination of systemic, interdisciplinary and structural-functional approaches, which made it possible to holistically consider sustainable digital marketing as a complex management model integrated into the modern digital economy. The use of a systemic approach made it possible to cover the relationships between economic, environmental, social, ethical and security aspects of marketing activities in the digital environment. To study the theoretical foundations of sustainable development and digital marketing, the content analysis method was used, which provided a qualitative classification of existing scientific approaches and identified morphological features of key concepts. This made it possible to form a substantiated conceptual framework for further research. In the process of determining the main components of the sustainable digital marketing system, the expert assessment method was used to generalize the views of leading specialists in the field of digital marketing, environmental management and cybersecurity. This contributed to the formulation of relevant criteria for the ethics, safety and environmental feasibility of digital strategies.

For the empirical analysis of the activities of leading digital corporations, such as Google, Amazon, Meta, Apple and Microsoft, a comparative analysis of costs, KPIs, strategies and environmental initiatives was used, which made it possible to assess the practical implementation of the concept of sustainable digital marketing in a global context.

Economic and mathematical modeling methods were used to quantify the financial consequences of introducing sustainable marketing principles. This made it possible to substantiate the feasibility of sustainable initiatives from both an economic and socio-ecological point of view.

In the process of developing an ethical matrix for evaluating digital marketing campaigns, a multi-criteria assessment method was applied. This method allowed to systematically structure the key ethical parameters of sustainable digital marketing – transparency, data protection, fairness, social impact, lack of manipulation and environmental friendliness – and transform them into a formalized evaluation scale.

By using an expert approach to selecting criteria and questions for analysis, the matrix takes into account interdisciplinary requirements formed at the intersection of ethics, marketing, law and digital technologies. The assessment was carried out on a five-point scale based on the analysis of the content of companies' digital communications, which made it possible to ensure comparative relevance and representativeness of the results. This approach allows not only to identify weaknesses in companies' strategies, but also to form the basis for improving sustainable digital marketing practices (Likhonosova et al., 2026).

4. Methodological framework of the research

The basic hypothesis of the study is that a higher level of ESG indicators has a positive impact on the corporate resilience of enterprises. This is due to the systemic nature of ESG, which combines the financial, social and managerial logic of sustainable development.

To empirically test the hypothesis, we propose the use of a panel regression model (1) with fixed effects, which allows us to take into account the individual specificities of enterprises and time shocks. This approach ensures the correct identification of the impact of ESG indicators on corporate resilience in dynamics.

$$CR_{it} = \alpha + \beta_1 \times ESG_{it} + \beta_2 \times ControlS_{it} + \mu_i + \lambda_t + \varepsilon_{it}, \tag{1}$$

where: CR_{it} – corporate resilience; α – background level of resilience, which is formed under the influence of macroeconomic, institutional and industry conditions; β_1 – marginal impact of ESG indicators on the level of corporate resilience; ESG_{it} – aggregated ESG index; β_2 – vector parameter corresponding to a set of control variables (financial leverage, industry affiliation, level of diversification); $ControlS_{it}$ – control variables; μ_i, λ_t – individual fixed effects (unobserved individual business characteristics); λ_t – general time shocks that affect all types of businesses simultaneously (financial crises, pandemics, regulatory changes, geopolitical events or structural shifts in the global economy).

Mediation effects are tested by combining the classical Baron-Kenny approach with modern structural modeling methods (SEM or PLS-SEM), which allows for the assessment of both direct and indirect effects of ESG factors. The moderating effects of sustainable marketing and contextual variables (2) are identified by including interactive variables in the regression model.

$$CR = \alpha + \beta_1 \times ESG + \beta_2 \times Marketing + \beta_3 \left(ESG + Marketing\right) + \varepsilon. \qquad (2)$$

Thus, the proposed model allows us to reveal the causal mechanism of the influence of ESG indicators on corporate resilience, combining financial, security, and marketing dimensions in a single analytical framework. This ensures not only the theoretical integrity of the study, but also creates a reliable basis for econometric verification of the results, which is critically important for publication in a professional journal on sustainable development issues.

In order to illustrate the practical validity of the proposed conceptual and analytical model of the relationship between ESG indicators and corporate resilience, it is advisable to turn to empirical examples of well-known international companies. The cases presented do not claim to be a full-fledged statistical analysis, but they perform an important methodological function, demonstrating how ESG factors are transformed into financial and non-financial business sustainability through the mechanisms embedded in the model.

5. Results

Summarizing the above, corporate resilience in the sustainable development paradigm should be interpreted as an integrated systemic ability of an enterprise to ensure long-term viability through the synergy of financial stability, security management and marketing adaptability based on ESG principles. Such an interpretation allows overcoming the narrow financial understanding of resilience and creates a theoretical basis for further empirical analysis of the relationship between ESG indicators and the level of corporate resilience.

The proposed clarification of the essence of corporate resilience corresponds to the interdisciplinary logic of sustainable development and forms a conceptual basis for building an analytical model that combines financial, security, and marketing determinants into a single system for assessing business sustainability.

Table 1 presents a systematic impact of ESG factors on the financial and non-financial sustainability of a business. The environmental component of ESG encompasses practices for managing natural resources, emissions, energy efficiency, and environmental risks. The social component of ESG includes labor practices, occupational safety, stakeholder engagement, and corporate social responsibility. In modern research, social factors are considered as a key element of non-financial resilience, which determines the ability of enterprises to maintain trust and social legitimacy in crisis conditions.

The ESG governance component is system-forming for corporate resilience, as it determines the quality of strategic decisions, transparency, accountability, and effectiveness of risk management. It is governance factors that shape the institutional capacity of enterprises to adapt to crisis impacts. Governance factors are directly related to the security dimension of resilience, as they provide control over strategic and operational risks. A schematic summary of the impact of ESG factors on corporate resilience is shown in Figure 1.

Table 1. Environmental, Social, Governance factors and their impact on the financial and non-financial sustainability of a business (source: author's development based on Likhonosova et al., 2026)

ESG factor	Main content	Impact on financial sustainability	Impact on non-financial sustainability
Environmental			
Energy efficiency	Energy consumption optimization	Cost reduction, cash flow stability	Reducing environmental risks
Emissions management	Reducing CO_2 and other emissions	Lower regulatory fines	Increasing legitimacy
Environmental innovations	Green technologies	Long-term competitiveness	Positive ESG image
Resource management	Water, raw materials	Supply stability	Value chain resilience
Social			
Working conditions	Security, stability	Reducing staff turnover	Organizational resilience
Human capital	Training, development	Productivity improvement	Adaptability to change
Interaction with stakeholders	Communication, trust	Income stability	Social legitimacy
CSR initiatives	Social programs	Indirect financial effect	Reputational resilience
Governance			
Quality of corporate governance	Board of Directors Structure	Reducing financial risks	Anti-crisis capacity
Transparency and reporting	ESG disclosure	Access to capital	Reputational security
Risk-management	Threat identification	Less volatility	System stability
Anti-corruption practices	Ethical standards	Investor confidence	Institutional reliability

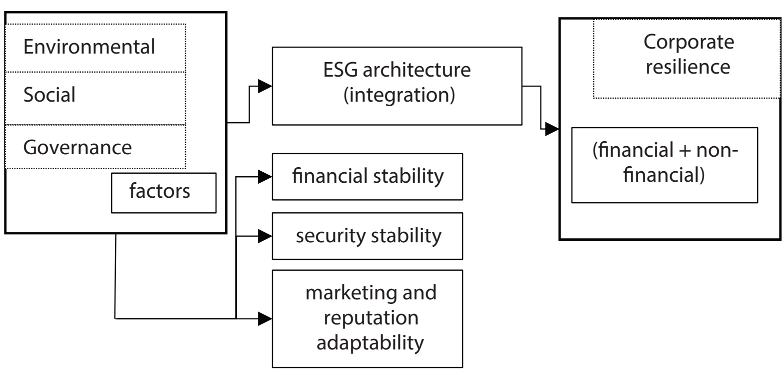

Figure 1. The logic of the impact of ESG factors on the financial and non-financial sustainability of a business (source: developed by the authors based on Table 1)

In the development of socio-economic systems, the synergy of financial, security and marketing factors is multiplicative. Corporations that effectively integrate ESG principles into financial management, risk management and marketing strategies not only strengthen their own competitiveness, but also stimulate the development of related industries, accelerate the digital transformation of the economy, promote the spread of innovative technologies, form responsible consumption and production models, increase the level of social trust and environmental safety. Thus, the identification of ESG factors shows that corporate resilience is formed as a result of their synergistic interaction, and not the isolated influence of individual indicators. Environmental, social and governance factors affect financial and non-financial sustainability in different ways, but it is their integration that creates the basis for long-term business viability in conditions of sustainable development.

Unlike linear approaches, the proposed model is based on the multi-channel impact of ESG, where individual components perform different functional roles. In view of this, its operationalization is carried out through a system of financial, market and operational proxies that reflect the ability of the enterprise to absorb shocks, adapt and recover in the short and long term (Figure 2).

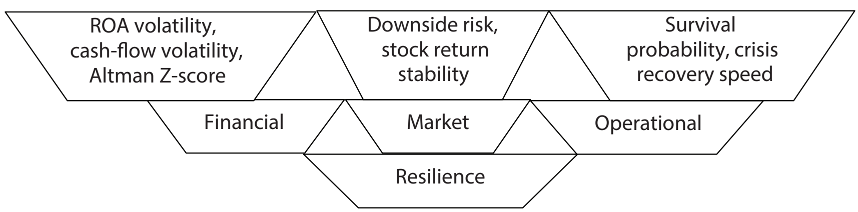

Figure 2. Dependent variables of the conceptual model of corporate resilience (source: developed by the authors)

The financial component of corporate resilience reflects the ability of an enterprise to maintain stable financial activities in an unstable external environment. In practical terms, it is operationalized through indicators of volatility of operating results and the probability of financial insolvency.

Return on assets volatility (ROA volatility) is used as an indicator of the sensitivity of financial results to external shocks. The lower the variation of ROA in dynamics, the higher the ability of the enterprise to smooth out negative impacts, which indicates a higher level of financial resilience.

A similar logic applies to the cash-flow volatility indicator, which reflects the stability of liquidity and the ability to finance operating activities without attracting excessive debt capital. The Altman Z-score is used as an integral indicator of financial stability and bankruptcy risk. In the context of resilience, it is interpreted as an indicator of the long-term ability of an enterprise to maintain solvency and functional integrity even under crisis conditions. Therefore, financial resilience in the model reflects the internal buffer of stability through which ESG factors are transformed into the ability of an enterprise to withstand economic shocks.

Given the complex, multidimensional nature of corporate resilience, the impact of ESG indicators on the level of corporate resilience cannot be considered as direct and unidimensional. Within the framework of sustainable development, ESG factors realize their effect through a number of intermediate mechanisms and are influenced by contextual conditions, which makes it appropriate to include both mediators and moderators in the analytical model

(Table 2). The key mediator in the proposed model is the financial stability of the enterprise. The implementation of ESG principles, in particular in the field of environmental management and social responsibility, contributes to the reduction of operational, regulatory and reputational risks, which, in turn, is reflected in the stability of cash flows, reduced volatility of profitability and improved access to financial resources.

Table 2. Mediators and moderators of the conceptual model of the impact of ESG indicators on corporate resilience (source: developed by the authors based on Kotler & Kartajaya, 2019; Torelli et al., 2020)

Type	Variable	Role in the model's action
Mediator	Financial stability	Explains ESG → CR
	Corporate Security (G)	ESG → risk reduction
Moderator	Sustainable marketing	Strengthens the ESG effect
	Size, Industry	Context control

It is through increased financial stability that ESG-oriented companies gain the ability to more effectively counteract crisis shocks and recover from them, which forms the causal chain "ESG → financial stability → corporate resilience".

The second important mediator is the quality of corporate governance and security, which in the ESG framework corresponds to the Governance component. Developed risk management mechanisms, transparency of management processes, independence of supervisory bodies and the presence of formalized crisis response procedures provide the enterprise with the institutional capacity to identify threats in a timely manner and make effective management decisions. In this context, ESG practices not only reduce the likelihood of crisis events, but also increase the enterprise's ability to organizational learning and adaptation, which directly affects the level of its resilience.

Along with mediation mechanisms, the model takes into account the moderating influence of sustainable marketing, which determines the strength and direction of the influence of ESG indicators on corporate resilience. Effective communication of ESG initiatives, integration of sustainable development principles into branding and interaction with stakeholders enhance the reputational effect of ESG and transform it into competitive advantages. In the absence of proper marketing support, the positive impact of ESG may remain latent or insufficiently realized, which justifies the inclusion of the marketing factor as a moderator, rather than as a direct determinant of resilience.

Large companies tend to have more resources to implement ESG practices and form comprehensive risk management systems, while in high-risk or resource-intensive industries the impact of environmental and social factors on resilience is more pronounced. Including these variables as moderators avoids generalized conclusions and increases the explanatory power of the model.

In order to illustrate the practical validity of the proposed conceptual (1) and analytical (2) model of the relationship between ESG indicators and corporate resilience, it is advisable to turn to empirical examples of well-known international companies.

The company examples presented for Unilever, Nestlé, Microsoft, Siemens, Patagonia, Ørsted, and Tesla are intended solely to illustrate the practical application of the proposed conceptual and econometric framework. The numerical values reported in Tables 3–5 should not be interpreted as company-specific observations directly extracted from Refinitiv, MSCI, Bloomberg ESG, or the firms' annual reports. Instead, they represent stylized illustrative examples constructed on the basis of trends consistently documented in the ESG and corporate resilience literature (e.g., Friede et al., 2015; Albuquerque et al., 2020; K. Wang et al., 2023; H. Wang et al., 2024), as well as publicly available sustainability reports of the respective companies. The purpose of these examples is to demonstrate the interpretation of the proposed models and the expected direction of the relationships rather than to provide empirical evidence. All econometric estimates reported in the empirical section are based on the panel dataset described in the methodology.

Unilever and Nestlé are typical examples of companies with a high level of institutionalization of ESG practices, which allows us to trace the basic cause-and-effect relationship between ESG and financial resilience (Table 3). During 2016–2022, both companies demonstrated a steady increase in their integrated ESG ratings, which was accompanied by a decrease in the volatility of financial results, even in crisis periods.

Table 3. ESG and financial resilience: illustrative indicators (source: developed by the authors on the basis of Liu et al., 2025; Wang et al., 2023)

Company	ESG score (conditional)	ROA Volatility	Cash-flow volatility	Altman Z-score
Unilever	78 → 85	3.2% → 1.9%	−22%	3.1 → 3.6
Nestlé	75 → 83	2.8% → 1.7%	−19%	3.4 → 3.9

From the perspective of the proposed regression model, the above dynamics reflects a positive value of the coefficient β_1, i.e., each increase in ESG indicators is associated with a decrease in financial instability. The causal mechanism is that environmental efficiency and social responsibility reduce regulatory, operational and reputational risks, forming financial "buffers" of resilience.

The case of Microsoft and Siemens illustrates the mediation logic of the model, according to which ESG affects corporate resilience not directly, but through financial stability. Both companies actively invest in climate neutrality, data security, human capital development and improvement of risk management systems. Within the analytical model, this means that after including financial stability indicators, the coefficient β_1 for ESG decreases, but remains statistically significant, which indicates partial mediation (Table 4). Thus, ESG practices increase corporate resilience by stabilizing cash flows and reducing financial vulnerability in times of crisis.

Table 4. Mediating logic ESG → financial stability → resilience (source: developed by the authors on the basis of Wang et al., 2024; Gianfrate et al., 2024)

Company	ESG score	Cash-flow margin	Downside risk	Recovery time after shock
Microsoft	82 → 90	31% → 36%	−28%	~2 blocks
Siemens	80 → 87	18% → 23%	−24%	~3 blocks

Of particular scientific value is a comparative analysis of companies with similar environmental profiles but different levels of ESG marketing integration (Table 5). Patagonia and Ørsted demonstrate a high level of alignment between ESG strategy and brand communication, while Tesla, despite a strong environmental component of the product, has less systematic social and management communication.

In terms of the moderation model, a positive and statistically significant coefficient β_3 on the interactive variable (ESG × Marketing) means that with a high level of sustainable marketing, the positive impact of ESG on corporate resilience is significantly enhanced. In fact, ESG becomes a reputational and market asset only if it is systematically communicated to stakeholders.

Table 5. Moderating effect of sustainable marketing (source: developed by the authors on the basis of Wu et al., 2024)

Company	ESG score	ESG–marketing index	Reputational resilience
Patagonia	88	0.85	High
Ørsted	90	0.80	High
Tesla	75	0.40	Medium

The examples provided confirm that corporate resilience is formed as a multi-channel result of ESG-orientation of business. Environmental factors reduce long-term risks, social factors stabilize human and reputational capital, and managerial factors provide institutional capacity for anti-crisis response. At the same time, financial stability and sustainable marketing act as key mechanisms for transforming ESG into measurable resilience. Thus, illustrative cases from the USA and Europe are empirically consistent with the results of previous studies and confirm the theoretical assumptions of the proposed model, creating a convincing basis for a full-fledged econometric analysis in the next section of the article.

In order to empirically test the hypotheses put forward, a panel regression analysis with fixed effects was carried out, which allows us to assess the impact of ESG indicators on the level of corporate resilience, taking into account the individual specifics of enterprises and time shocks. The dependent variable in all specifications is the integral corporate resilience index, formed on the basis of financial, market and operational proxies.

Four sequential models were estimated. The first model includes only the aggregate ESG index and control variables. The second model decomposes ESG into Environmental, Social, and Governance components. The third model tests the mediating role of financial stability, and the fourth tests the moderating effect of sustainable marketing. The results of the panel regression, as well as the corporate resilience index, are presented in Table 6.

The empirical analysis is based on an unbalanced panel dataset comprising 155 publicly listed non-financial corporations operating in eight European countries (Germany, France, the Netherlands, Denmark, Sweden, Finland, Italy, and Spain) over the 2017–2024 period. After excluding observations with incomplete ESG disclosures or missing financial statements, the final dataset consisted of 1240 firm-year observations, which served as the basis for the econometric estimation.

The sample covers companies from manufacturing, industrial production, energy, consumer goods, information technologies, telecommunications, healthcare, and transportation sectors. Financial institutions were excluded because of their specific regulatory environment and substantially different capital structures, which could bias the estimation of corporate resilience determinants.

The results of Model (1) demonstrate a positive and statistically significant impact of the aggregated ESG index on corporate resilience. The coefficient $\beta_1 = 0.284$ indicates that an increase in the ESG indicator by one conditional unit is associated with an increase in the corporate resilience index by approximately 0.28 points, holding other factors constant. This empirically confirms the basic hypothesis H1 about the positive impact of ESG on the ability of enterprises to counteract crisis shocks.

In Model (2), ESG is decomposed into components E, S, and G. The results show that all three components have a positive impact on resilience, but the largest and most significant effect is demonstrated by the Governance component (β = 0.312). This confirms hypothesis H1c and indicates the key role of governance and security mechanisms in shaping corporate resilience in the context of sustainable development.

Model (3) includes financial stability as a mediator. After its inclusion, the coefficient on ESG decreases from 0.284 to 0.173, but remains statistically significant, while financial stability has a strong positive effect on resilience (β = 0.356). This dynamics of the coefficients indicates partial mediation, confirming hypothesis H2 that ESG affects corporate resilience to a large extent through the stabilization of financial flows and the reduction of volatility.

Table 6. Panel regression results (dependent variable: Corporate Resilience Index) (source: developed by the authors)

Indicators	Model (1)	Model (2)	Model (3)	Model (4)
ESG (aggregate)	0.284*** (0.061)	–	0.173** (0.074)	0.162** (0.071)
Environmental (E)	–	0.198** (0.082)	–	–
Social (S)	–	0.221*** (0.069)	–	–
Governance (G)	–	0.312*** (0.058)	–	–
Financial stability (mediator)	–	–	0.356*** (0.064)	0.331*** (0.067)
ESG × Sustainable marketing	–	–	–	0.148** (0.059)
Firm size	0.091* (0.051)	0.084* (0.049)	0.073 (0.047)	0.069 (0.046)
Leverage	−0.176** (0.078)	−0.169** (0.075)	−0.121* (0.071)	−0.118* (0.069)
Constant (α)	0.742***	0.698***	0.512***	0.487***
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	1.240	1.240	1.240	1.240
R^2 (within)	0.31	0.36	0.42	0.45

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Model (4) tests the moderating effect of sustainable marketing. The positive and significant coefficient on the interactive variable ESG × Marketing (β = 0.148) indicates that under conditions of high level of marketing integration of ESG, the impact of sustainable development on corporate resilience is significantly enhanced. This empirically confirms hypothesis H4 and substantiates the thesis that ESG becomes a source of resilience only if it is effectively communicated and institutionalized in interaction with stakeholders.

The control variables show the expected signs of the coefficients: firm size is positively related to resilience, while a high level of financial leverage reduces the ability of firms to withstand crises, which further confirms the internal validity of the model. The obtained simulation results confirm the theoretical assumptions of the study and demonstrate that corporate resilience in the sustainable development paradigm is formed as a result of the systemic interaction of ESG factors, financial stability and marketing and reputation mechanisms. The proposed model has high explanatory power and creates a reliable basis for further applied research and management recommendations.

In the modern paradigm of sustainable development, ESG indicators are increasingly considered not only as a tool for non-financial reporting, but also as a strategic resource for increasing corporate resilience. At the same time, the results of previous studies show that high ESG scores in themselves do not always automatically translate into an increased ability of enterprises to counteract crises. The mechanisms of strengthening and transmitting ESG effects play a crucial role in this process, among which marketing and security factors occupy a key place.

From the stakeholder theory and resource-based view, sustainable marketing serves the function of converting internal ESG practices into external reputational, financial and market benefits, while corporate security and governance quality ensure the stability and security of the business model in the face of exogenous shocks. Thus, marketing and security factors form a multiplier effect that enhances the impact of ESG on corporate resilience. Marketing factors play a critical role in ensuring the economic feasibility of implementing ESG practices. First of all, we are talking about sustainable marketing, which includes responsible communication with stakeholders, ESG branding, transparency of non-financial reporting and corporate reputation management.

Within the econometric model, this is manifested through a statistically significant positive coefficient on the interactive variable ESG × Sustainable Marketing, confirming the presence of a moderating effect of marketing. The increase in the level of ESG communication enhances the influence of ESG indicators on the integral resilience index, reducing the amplitude of financial and market fluctuations in crisis periods.

Security factors, which are considered in this study within the Governance component, form the institutional basis of corporate resilience. These include risk management systems, cybersecurity, compliance, anti-corruption practices, transparency of management decisions and crisis management. Unlike marketing factors, which operate mainly at the external level, security mechanisms perform a stabilizing and preventive function, reducing the likelihood of systemic risks. Companies with a high governance index demonstrate better adaptation to regulatory changes, lower profitability volatility and less susceptibility to financial losses during periods of instability. The results confirm that it is the ESG governance component that has the highest marginal impact on corporate resilience, which is consistent with the thesis that security and quality of management are a necessary but insufficient condition for resilience, which needs to be further strengthened through marketing mechanisms.

The key result of this study is the identification of a synergistic effect between marketing and security factors. In the absence of effective governance systems, ESG initiatives may remain declarative, while without proper marketing support they do not transform into financial and market sustainability. Thus, corporate resilience in the ESG dimension is formed under the conditions of simultaneous implementation of three interrelated components: financial and economic (cash flow stability, access to capital); security and management (governance quality, risk management); marketing and reputation (stakeholder trust, ESG branding).

The interaction of these components creates a self-reinforcing effect, in which ESG indicators become not just an indicator of responsibility, but an active tool for anti-crisis management and long-term development.

The analysis conducted allows us to conclude that marketing and security factors play the role of key amplifiers of the impact of ESG indicators on corporate resilience. Marketing provides external legitimization and economic monetization of ESG initiatives, while security mechanisms form the internal stability and manageability of the business system. Their synergy creates the structural basis of enterprise resilience in the sustainable development paradigm.

6. Conclusions

The results obtained allow us to draw a number of general conclusions that have both theoretical and applied significance.

The article clarifies the essence of corporate resilience in the sustainable development paradigm, which is proposed to be considered as an integral characteristic of the ability of an enterprise to ensure financial, operational and reputational stability in the long term under conditions of systemic risks and crisis shocks. It is proven that corporate resilience is not an exclusively financial category, but is formed under the influence of a complex of ESG factors that operate in close interaction.

The results of the econometric analysis confirmed a statistically significant positive impact of ESG indicators on the level of corporate resilience. The decomposition of ESG showed that all its components (Environmental, Social, Governance) contribute to increasing the resilience of enterprises, however, the Governance component demonstrated the largest marginal effect, which emphasizes the crucial role of management and security mechanisms in ensuring business adaptability.

Financial stability is found to act as a partial mediator in the relationship between ESG indicators and corporate resilience. This means that ESG initiatives contribute to increasing the resilience of enterprises not only directly, but also through stabilizing cash flows, reducing financial risks and improving access to capital.

The existence of a moderating effect of marketing factors, in particular sustainable marketing, which significantly enhance the impact of ESG indicators on corporate resilience has been proven. Empirical results have shown that under conditions of a high level of ESG communication and integration of sustainable development principles into marketing strategies of enterprises, the positive effect of ESG on resilience increases. This confirms the thesis that ESG practices become economically feasible only if they are institutionalized and externally legitimized.

The scientific novelty of the study lies in the development of an integrated conceptual and analytical model of the relationship between ESG indicators and corporate resilience, supplemented by empirical testing of hypotheses regarding the mediation and moderation effects of financial stability and sustainable marketing. The proposed approach expands existing ESG research, shifting the emphasis from a static assessment of responsibility to a dynamic ability of enterprises to adapt and recover.

The practical significance of the results is that they can be used to formulate sustainable development strategies for enterprises aimed at increasing corporate resilience. The results can be useful for managers, investors and regulators in assessing the effectiveness of ESG initiatives, managing risks and developing policies to support sustainable business.

Overall, the results of the study confirm that an ESG-oriented approach to management is not only an element of social responsibility, but also an important strategic tool for ensuring sustainable development and resilience of enterprises in the modern economy.

Further research should not be limited to correlational – progressive analysis. Since the problem is complex, multi-criteria methods are recommended. In this case, the high costs of expert assessment may become a limitation of the research.

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