

Corporate Responsibility in Sustainable Supply Chains: Extended Roles and Implications

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Abstract— The concept of extended corporate social responsibility is explored in the context of increasing demands on companies to manage not only their own activities, but also the effects along the entire supply chain. The analysis focuses on the role of organizations in ensuring sustainable practices, including compliance with social and environmental standards by suppliers and partners. The study is based on a survey conducted among 137 respondents in the period December 2025 - February 2026. Descriptive statistics and correlation analysis methods were used to process the data. The results show a moderate positive relationship between transparency and control in supply chains, as well as between the perception of CSR as an extended responsibility and the degree of integration of social and environmental criteria in supplier management. The results obtained outline both the main challenges and opportunities for organizations in implementing extended corporate social responsibility in modern supply chains.

Keywords— Corporate social responsibility; Sustainable supply chains; Responsible supply chain management; ESG.

I. INTRODUCTION

With the overall development of society and technological progress, Corporate Social Responsibility (CSR) has acquired new dimensions. In modern business conditions, CSR is no longer perceived only as a specific management practice, which is limited to internal organizational dimensions. The new field of responsibility of CSR is also transferred to supply chains, as the topic becomes increasingly important in conditions of globalization and a complicated geopolitical situation.

In this sense, companies are now also responsible for their suppliers, which turns CSR from an internal organizational practice to an externally oriented responsibility. With the expansion of the scope of CSR, the focus is actually shifting significantly towards practical implementation, and not so much only on completed sporadic activities.

The new statements are also related to the adoption of additional regulatory requirements for companies - i.e.

CSR is no longer so much a "voluntary" practice and a decision only for the management of an organization. This creates conditions for higher transparency, which in turn allows for better control.

There is a wealth of research in the scientific literature on CSR, but there is a lack of a clear understanding of the roles and effects that the new requirements of extended CSR will lead to. In this regard, this report focuses on the way in which CSR is extended and how it is integrated into the overall supplier management – from the selection of suppliers, through the method of assessment and implementation of control, while identifying the main challenges and opportunities arising from these transformations.

Literature review

Corporate social responsibility is gaining new dimensions in the real economy, including supply chains, where the interest of scientists in recent years has also understandably increased, especially in terms of new regulatory requirements and technological advances.

In this context, Camilleri [1] emphasizes that responsible supply chain management is becoming a strategic tool, thanks to which business organizations combine their purely economic goals with socially responsible practices, while at the same time being able to build a long-term competitive advantage on this basis. This means that responsible supply chain management is not only an obligation to comply with new regulatory requirements. It is rather a strategic choice that is formed under the influence of various external and internal factors.

Roy, Silvestre and Singh [2] state that the implementation of sustainable practices in supply chains is influenced simultaneously by two very important aspects - both external pressure from stakeholders and internal organizational factors. The scientists comment that in this context reactive and proactive approaches are defined, and according to them proactive approaches are more effective in achieving sustainable results. In turn, Damert, Koep,

Online ISSN 3044-7771

<https://doi.org/10.68302/std2026.vol1.182>

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Guenther and Morris [3] add that pressure from stakeholders has a significant impact on the implementation of socially responsible practices in supply chains, and this effect varies depending on the degree of internationalization of companies.

In this sense, sustainable supply chain management can be seen as a process of institutional transformation that manifests itself through different mechanisms and leads to diverse outcomes. Chikwana, Alinaghian and Razmdoost [4] believe that sustainable supply chain management in modern conditions cannot be viewed solely as a result of company strategies, as it carries much greater potential and significance. According to them, it is a process of institutional change, determined by the interaction between external pressures and internal organizational factors.

Along with external environmental pressures, organizations are also motivated to implement responsible practices due to the desire to build and protect their corporate reputation. Hoejmoose, Roehrich and Grosvold [5] conclude that the implementation of responsible supply chain management is often motivated by the desire of organizations to protect their corporate reputation from negative public reactions. At the same time, however, they use these practices as a means of building a competitive advantage.

The real implementation of sustainable practices often faces significant constraints, especially in the context of small and medium-sized enterprises. Despite the growing pressure to implement socially responsible practices in supply chains, a number of studies highlight the existence of significant barriers, especially for small and medium-sized enterprises. The main barriers are mainly related to limited resources, short-term orientation, lack of coordination between partners and insufficient incentives to implement sustainable practices [6].

In response to these challenges and growing public expectations, the role of regulatory frameworks is increasing, which expand the scope of corporate responsibility. Both and Wilhelm [7] draw attention to the fact that modern regulations related to due diligence in supply chains require organizations to be responsible not only for the risks of their own activities, but also for the potential negative impacts on people and the environment.

Duarte et al. [8] emphasize that achieving sustainability in supply chains in practice requires balancing economic efficiency, environmental impacts and social justice. They also consider that in some cases prioritizing social goals can lead to compromises with economic efficiency or environmental optimization. This in turn means that sustainability in supply chains requires complex management choices between different, often competing priorities.

In this line of reasoning, digital technologies are being established as a very serious tool for overcoming some of the limitations and for improving management practices in supply chains. Qazi, Seuring and Khalid [9] emphasize the importance and role of modern technologies. According to them, the opportunities that artificial intelligence, big data and blockchain provide, give a serious opportunity to

increase transparency, traceability and efficiency in supply chains. According to scientists, there is also the opportunity to support the implementation of sustainable and socially responsible practices. In this sense, Qiao et al. [10] comment that when companies use data more actively in supply chains, they achieve more sustainable results, which is mainly due to greater transparency and better-informed decisions.

In the context of the increasing complexity of supply chains, supplier selection is becoming a critical process in which organizations must balance economic, environmental, and social criteria. According to Ziari, Soheyli, and Taleizadeh [11], the use of intelligent analytical approaches allows for a more precise assessment of suppliers, while also including additional elements such as risk of delay and sustainability of performance. Shishehgarkhaneh et al. [12] emphasize that Intelligent Recommender Systems are increasingly used in supply chains, being particularly useful for supporting complex management decisions, including supplier selection, logistics, and sustainable practices, as they provide a higher degree of transparency and adaptability. Blockchain technology is increasingly being applied in supply chains as a tool to increase transparency, efficiency, and competitiveness of companies [13]. The cited sources show that sustainability is increasingly being realized through specific analytical and technological solutions that support management decision-making.

However, with the increasing integration of artificial intelligence into supply chains, new questions arise regarding the transparency, fairness, and sustainability of decision-making. Karlsen, Mubeen, and Khan [14] draw attention to the fact that in recent years there has been an increasing use of artificial intelligence in supply chains. This in turn places additional demands on the transparency, accountability, and ethics of management decisions, especially in the absence of a unified framework for the responsible and explainable use of algorithms.

Issues of transparency and fairness of decision-making are becoming increasingly important, which is logically reflected in the increased scientific view on this topic. According to Li, Shi, Zhang and Chen [15], the application of the principles of responsible artificial intelligence can improve fairness between partners in the supply chain – both in terms of distribution and the procedures themselves, which in turn contributes to achieving competitive advantages. Park [16] also shares the opinion that the use of artificial intelligence in supply chains can contribute to achieving environmental goals, including by reducing carbon intensity and promoting circular practices. However, the scientist makes the reservation that the effects on social responsibility are not unambiguous and depend to a large extent on the presence of adequate management mechanisms and controls.

With the increasing use of AI and algorithmic management, new ethical and legal challenges related to transparency, data protection and labour rights compliance are emerging in organizations, which places additional demands on corporate responsibility in a digitalized environment [17, 18]. This broadens the understanding of

corporate responsibility to include, on the one hand, supply chain management, but also the way in which digital technologies and algorithms impact people, organizations and society.

In modern supply chains, extended corporate social responsibility is increasingly associated with issues such as supply security, process traceability, digital control and ESG compliance. Organizations are increasingly using digital technologies, data analytics, artificial intelligence and blockchain solutions to improve transparency, reduce supplier risks and ensure more sustainable and responsible supply chain management. In this sense, extended CSR is no longer seen only as an ethical or managerial approach, but also as part of the development of safer, technologically integrated and more efficient supply chain management systems.

II. MATERIALS AND METHODS

The main objective of this study is to determine how business organizations perceive the expansion of CSR in supply chains and to what extent they are inclined to integrate it or have already integrated it into supplier management processes. In addition, the impact of the new requirements of extended CSR on transparency and control of supplies is also examined. In accordance with the set objective, the study focuses on two main areas - the relationship between transparency and control in supply chains, as well as the degree of integration of extended CSR into supplier management processes. The study is based on the following two hypotheses:

H1. Higher transparency in supply chains is associated with a higher level of control over suppliers.

H2. Companies that perceive CSR as an extended responsibility integrate social and environmental criteria to a greater extent in supplier management.

For this purpose, a questionnaire was developed, through which a total of 137 people (managers at various levels, company owners, employees and supplier representatives) were surveyed between December 2025 and February 2026.

The questionnaire is divided into 5 thematic sections. The first section examines the profile of the respondent (position in the company, total years of work experience, years in the company in the last position, gender, highest level of education), and also collects information about the profile of the company for which he/she works (sector, company size, presence of international suppliers). The second section of the questionnaire is mainly related to the understanding of the extended concept of CSR, the third identifies the degree of integration of the new concept of CSR in supplier management, the fourth is dedicated to the impact on transparency and control, and the fifth identifies the challenges due to the extended CSR and new practices, as well as the opportunities it creates.

The structure of the questionnaire is presented in more depth in Table 1. As can be seen from the table, each section is aimed at measuring specific aspects of the extended CSR in supply chains.

TABLE 1. STRUCTURE OF THE QUESTIONNAIRE

THEMATIC SECTION	MAIN PURPOSE	KEY DIMENSIONS	BASIC INDICATORS	TYPE SCALE
Section 1. Profile of respondents and companies	Identifying characteristics of respondents and organizations	Demographic and organizational characteristics	Position, work experience, education, sector, company size, presence of international suppliers	Nominal/ categorical
Section 2. Understanding of extended CSR	Assessment of the perception of CSR as an extended responsibility	Perception of CSR, scope of responsibility, importance of regulations	Responsibility towards suppliers, influence of regulations, perception of CSR as a strategic factor	Likert-type scale (5-point)
Section 3. Integration in supplier management	Research on the extent of CSR implementation in supplier management	Selection, evaluation and control of suppliers	Use of social and environmental criteria, supplier monitoring, compliance requirements	Likert-type scale (5-point)
Section 4. Transparency and control	Analysis of the relationship between transparency and control	Traceability, access to information, control mechanisms	Level of transparency, controllability, use of tracking technologies	Likert-type scale (5-point)
Section 5. Challenges and opportunities	Identifying the main barriers and benefits	Constraints, Incentives, Effects	Lack of resources, coordination, regulatory pressure, competitive advantages	Likert-type scale (5-point)

Each thematic section of the survey (with the exception of Section 1, which collects information about the profile of the respondent and the organization for which he works) corresponds to specific aspects relevant to the research objective. From this perspective, the second thematic section measures the perception of CSR as an extended responsibility, the third reflects the degree of its

integration into the management processes of suppliers, and the fourth is aimed at assessing transparency and control as separate, but at the same time interrelated dimensions. The variables were measured through a set of statements, rated on a five-point Likert scale, where higher values reflect a higher degree of agreement and, accordingly, a stronger manifestation of the phenomena

under study. The main variables are defined through groups of statements, rated on a five-point Likert scale. Transparency was measured through statements related to access to information about suppliers, traceability and visibility of processes in the supply chain. Control was measured through statements related to supplier monitoring, assessment procedures and applied control mechanisms. The perception of CSR as an extended responsibility was assessed through statements exploring the understanding of corporate social responsibility as a commitment that goes beyond the organization itself. The integration of CSR into supplier management was measured through statements related to the use of social and environmental criteria in the selection, assessment and monitoring of suppliers. For each of the main dimensions studied, summary indicators were calculated as the average values of the relevant statements.

The data analysis is carried out in two main stages. In the first stage, descriptive statistics are applied in order to present a general picture of the perceptions and practices of the respondents related to extended CSR. In the second stage, the analysis is aimed at examining the relationships between the main variables in accordance with the formulated research hypotheses. Specifically, correlation analysis examines the relationship between transparency and control in supply chains (H1), as well as between the perception of CSR as an extended responsibility and the degree of its integration into supplier management processes (H2). Given the nature of the data and the Likert scales used, Spearman's correlation coefficient (Spearman's rho) was applied to test the hypotheses.

The statements used are grouped according to the main research dimensions and are developed based on the thematic areas identified in the scientific literature. Due to the limited scope of the study, no additional statistical verification of the internal consistency of the scales was conducted, which can be considered a limitation of the present study.

It should be noted that this study is limited in terms of scope and specific characteristics of the sample, therefore the results obtained should be interpreted with some caution and, respectively, cannot be fully generalized to all business organizations.

III. RESULTS AND DISCUSSION

The profile of the respondents is diverse and covers different perspectives. The data was collected through an online questionnaire, using professional contacts and business networks. The study used a non-representative targeted sampling of respondents, with the questionnaire distributed through professional contacts and business networks. Participants were selected based on their involvement in management activities, supplier relations or activities related to corporate social responsibility. Due to the specificity of the sample, the results obtained should be considered indicative of the studied group and not fully representative of all business organizations. Out of a total of 137 respondents, the majority are specialists (43%), the next largest group is formed by managers (middle and senior) – 31%, followed by representatives of suppliers –

17% and the smallest group of respondents is formed by representatives of executive level managers and owners (9%). In terms of experience, the sample largely covers more experienced representatives – the largest group according to this criterion are respondents with between 6-10 years of work experience (38%), followed by those with 11-15 years of experience (26%). Less represented are the groups of people with very long – more than 15 years of experience – 19% and those with only initial experience – 17%. – between 0-5 years. In terms of education, two almost equal groups are formed – 47% of respondents have secondary education, and another 42% have higher education. Only 11% of respondents stated that they have a lower level of education, which is easily explainable, considering the initial requirements that the respondents had to meet.

In terms of sector, the majority of the surveyed companies are in the service sector (39%), with companies related to production and industry also well represented (28%), followed by trade/retail (25%) and others (8%). In terms of company size, the largest number of representatives are large companies (46%), followed by those of medium-sized companies (31%), while small ones are represented with 23% participation in the sample. The majority of respondents stated that they use international suppliers (67%). This profile of the respondents participating in the study, as well as the enterprises they work for, allows for interesting conclusions to be drawn, related to extended corporate social responsibility.

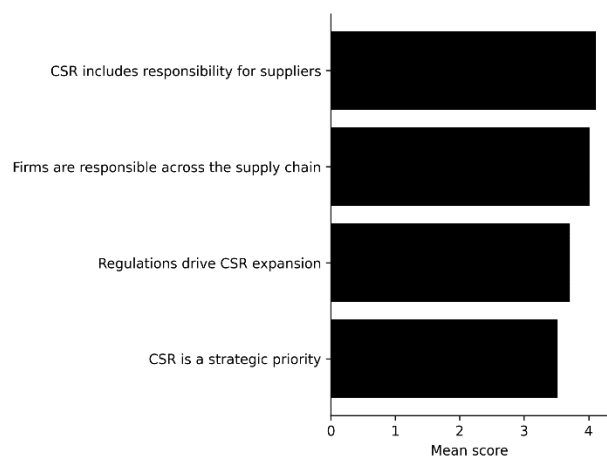


Fig. 1. Perception of Extended CSR.

The results of the second section of the survey show that respondents largely perceive corporate social responsibility as an extended requirement that goes beyond the organization itself. The average values of the main indicators range between 3.7 and 4.1, indicating a relatively high level of agreement among respondents. The high average values for the statements related to the responsibility of companies to their suppliers indicate a clear understanding that CSR should cover the entire supply chain, not just internal organizational activities.

At the same time, there is strong agreement regarding the role of regulatory requirements as a factor that further

stimulates the expansion of CSR. A significant part of the respondents share that it is the regulatory environment that contributes to the more active engagement of organizations with responsible practices towards their partners and suppliers. Therefore, among the organizations surveyed, there is a relatively high level of awareness of the extended role of CSR. This, in turn, creates prerequisites for its further implementation in management processes, including in the field of supplier management. The results related to the perception of extended CSR are presented in Figure 1.

The results of the third section of the survey provide a more in-depth understanding of the extent to which the extended concept of corporate social responsibility is applied in the practice of organizations, in particular in supplier management processes. The average value for CSR perception is 3.86, while the average value for its integration in supplier management is lower (3.41), indicating a visible gap between perception and implementation.

In general, a positive trend is observed in terms of the integration of social and environmental criteria in the selection and evaluation of suppliers. A significant part of the respondents indicated that in addition to purely economic indicators, those related to sustainability and social responsibility are considered when making decisions. This shows that the concept of extended CSR is gradually being reflected in management practices.

At the same time, however, the analysis of the data shows that the degree of actual implementation of these principles is more moderate compared to their theoretical perception. There is a certain discrepancy between the understanding of the need to integrate CSR and the specific actions related to monitoring and control of suppliers. The lower values of the indicators related to the current control and tracking of suppliers' activities suggest that this process is not yet fully developed.

This discrepancy can be explained by a number of practical constraints, such as the need for additional resources, lack of implementation due to excessive complexity of processes, as well as the lack of established control mechanisms throughout the supply chain. From this perspective, although there is a positive attitude towards extended CSR, its full integration into supplier management processes is still in the process of development. The relationship between CSR perception and its integration in supplier management is illustrated in Figure 2.

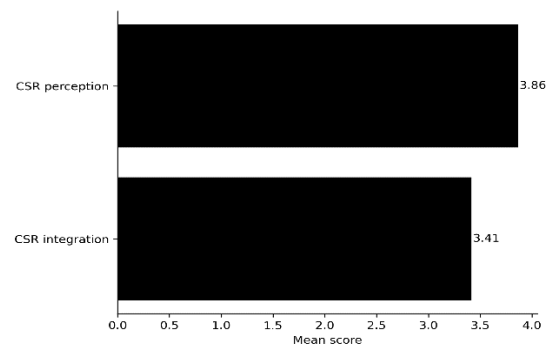


Fig. 2. Perception vs Integration in Supplier Management

The fourth thematic section is focused directly on examining the processes related to the supply chain, as well as the possibility of exercising greater control. That is, within the framework of this section, an answer is given to the question of how much the management of companies monitors what is happening in the supply chain and to what extent they can, in turn, influence and control these processes. In terms of transparency, the assessment related to access to information, traceability of supplies, as well as the level of visibility of the processes related to supplies themselves was studied. The average level of transparency is 3.72, while the level of control is lower (3.38), which confirms the presence of a gap between access to information and the ability to exercise control. After analysing the answers, the results indicate that a relatively moderate level of transparency is observed. Organizations have only basic information related to the activities of suppliers, but it does not categorically cover absolutely all elements of the supply chain. Therefore, with insufficient information, it is impossible to ensure better control in turn.

Regarding control over suppliers, the results show a rather moderate level of development of the relevant mechanisms. At present, the management of organizations has certain monitoring and evaluation tools, but what is also observed is that control is not applied to the same extent throughout the supply chain. In a number of cases, it is limited to individual stages or to key partners, which in turn does not imply the presence and application of a systematic and comprehensive approach.

On the other hand, it should also be noted that the availability of information about the activities of suppliers is not a sufficient condition for the implementation of effective control. This can be explained by the need for additional resources, clearly developed monitoring and evaluation procedures and subsequent management decision-making related to the analyses of this assessment. In this sense, it can be observed that control remains a reactive rather than a proactive management tool.

Despite the presented limitations, the data suggest the presence of a positive relationship between transparency and control, with the higher level of access to information creating prerequisites for more effective exercise of control functions. Although the relationship between transparency and control is complex, it can be concluded that transparency plays a fundamental role in improving control

in supply chains. The comparison between transparency and control is presented in Figure 3.

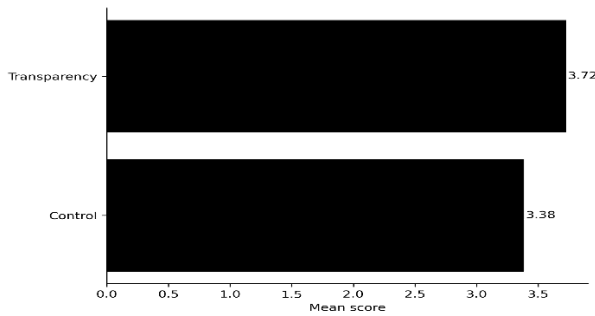


Fig. 3. Transparency and Control in Supply Chains

The fifth section is aimed at identifying the main challenges and opportunities that arise when implementing extended CSR in supply chains. The main identified barriers are related to the lack of sufficient resources; lack of effective coordination with suppliers; difficulties in controlling the entire supply chain; additional costs; additional administrative burden. The highest average values are observed for reputation benefits (3.92) and lack of resources (3.84), indicating that respondents perceive both challenges and opportunities as significant. The main challenges and opportunities identified by respondents are summarized in Figure 4.

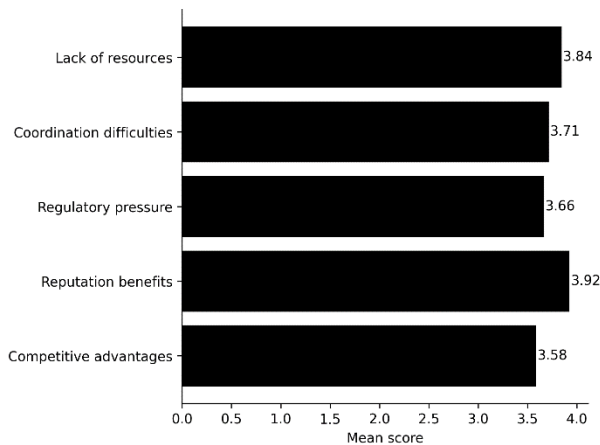


Fig. 4. Challenges and Opportunities of Extended CSR in Supply Chains

At the same time, the identified opportunities are related to better reputation; ensuring a better level of transparency; more options for choosing suppliers, creating real opportunities for achieving competitive advantage. These observations in turn lead to the conclusion that extended CSR is not perceived unilaterally only as a mandatory additional requirement or administrative burden that companies have to deal with. At the same time, extended CSR is also identified as a potential management tool for improving the sustainability and reliability of supply chains.

IV. CONCLUSIONS

The present study summarizes the main observations related to the requirements and implementation of extended CSR in the real management processes of companies.

The testing of the research hypotheses is based on correlation analysis between the main variables.

TABLE 2. CORRELATION ANALYSIS OF THE RESEARCH HYPOTHESES

Hypothesis	Variables	Correlation coefficient	Interpretation
H1	Transparency – Control	$r = 0.42$	Moderate positive relationship
H2	CSR perception – CSR integration	$r = 0.38$	Moderate positive relationship

The first hypothesis (H1), which assumes that higher transparency in supply chains is associated with a higher level of control over suppliers, finds only partial confirmation in the results of the study. The analysis shows a positive correlation between transparency and control ($r = 0.42$), indicating a moderate relationship between the two variables. This suggests that higher levels of transparency are associated with higher levels of control, although the relationship is not strong enough to indicate a strong dependency. The data show that there is a positive relationship between them, as better access to information and higher traceability create conditions for more effective control. At the same time, however, it is established that this relationship is not automatic, since the presence of transparency does not always lead to consistent and systematic application of control mechanisms.

The second hypothesis (H2), related to the statement that organizations that perceive CSR as an extended responsibility, to a greater extent integrate social and environmental criteria in supplier management, also receives partial confirmation. A positive correlation is also observed between the perception of CSR as an extended responsibility and its integration into supplier management processes ($r = 0.38$). This indicates that organizations with a stronger understanding of extended CSR tend to integrate it to a greater extent, although the relationship remains moderate. The results show a clear understanding and positive attitude towards the extended concept of CSR, which is reflected to a certain extent in management practices. However, there is a gap between the perception of CSR and its actual implementation, which indicates that the integration process is not yet fully completed.

In this line of reasoning, the extended concept of CSR has the potential to establish itself as an important management mechanism for adapting companies to the ever-growing expectations and requirements of modern society.

ACKNOWLEDGEMENTS

The publication is funded by the University of National and World Economy (Sofia, Bulgaria) under the project

NID NI-32/ 2025 on the topic: “Aspects of CSR implementation in Bulgarian conditions”.

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