



Comprehensive Review on Social and Environmental Practices in GVCs

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Abstract

Global value chains (GVCs) have become a key framework for understanding the complexities of international production divisions and sustainability outcomes. Despite their potential for enhancing sustainability, GVCs often present mixed economic, environmental, and social impacts due to the specialization and scale effects of offshoring and international trade. This paper systematically reviews the literature on sustainability in GVCs, focusing on the interplay between economic, environmental, and social outcomes. Drawing on a content analysis of over 74 articles published between 2010 and 2023, we identify key trends, theoretical frameworks, and gaps in the current body of knowledge. Our findings reveal that while GVCs can enhance sustainability and reduce social inequalities through improved technologies and practices, they also contribute to carbon leakage and the uneven distribution of social benefits. We propose a conceptual integrative model that incorporates these findings and offers directions for future research, particularly in addressing industry-specific sustainability challenges and the need for more equitable social and environmental outcomes in both emerging and advanced economies.

Keywords: *GVC, sustainability, governance models, systematic review.*

JEL Classification: M14, Q50.

Introduction

As market demand for a variety of products surged in the latter half of the 20th century, many organizations explored risky yet cost-effective production methods. Unfortunately, these strategies frequently undermine long-term effects on both society and the environment [Rajeev et al., 2017]. Both developing and advanced economies recognize the critical role of GVCs in growth and productivity. Moreover, these chains enable countries to leverage their comparative advantages by participating in production networks while integrating environmental, social, and economic considerations throughout the supply chain [Koberg & Longoni, 2019].

Research indicates that effective sustainable supply chain management (SSCM) can significantly enhance sustainability outcomes by fostering responsible practices across various stages of production. However, the unique characteristics of GVCs present specific challenges that necessitate tailored strategies to address sustainability concerns. Although the literature on GVCs and sustainability has expanded considerably, gaps remain in understanding how various configurations and governance mechanisms within these chains contribute to sustainable outcomes. This study aims to bridge this gap by systematically analyzing the existing literature on SSCM within the context of GVCs.

While investigating global value chains, recent studies often conflate them with supply chains. However, it is essential to distinguish between the two: supply chains focus primarily on managing the supplier base, determining outsourcing decisions [Lu & Swaminathan, 2015], and managing relationships with various suppliers. In contrast, GVCs represent holistic systems and governance structures of business value creation that span multiple economies, encompassing activities and resources both upstream and downstream [Greffì et al., 2005; Golgeci et al., 2020].

Importantly, a country's level of participation in GVCs can significantly influence its environmental footprint and social inequalities. For instance, [Meng et al., 2018] highlight that addressing the environmental impacts of GVCs is crucial for developing safer and more sustainable trade practices. [Wang et al., 2022] found that GVC participation can foster environmentally friendly growth by boosting per capita GDP while simultaneously reducing carbon emissions. However, the increasing complexity of GVCs presents challenges in fully understanding their environmental impacts [Wang et al., 2019]. Besides, research demonstrated a long-term equilibrium relationship between GVC participation, carbon emissions, economic growth, and energy consumption [Assamoi et al., 2020].

Moreover, altered patterns of international specialized production have influenced the scale, location, and cost of environmental impacts [Meng et al., 2018; Zheng, 2021]. Industries are increasingly held responsible for the environmental, social, and economic impacts resulting from both their own operations and those of their suppliers [Hartmann & Moeller, 2014]. Significant research has been conducted on sustainable supply chain management (SSCM), primarily focusing on first-tier suppliers [Lee, 2008; Walker & Jones, 2012]. However, the complexities of globalization and the increasing fragmentation of supply chains, along with heightened stakeholder demands for transparency and accountability, have underscored the importance of understanding the sustainability impacts of second and third-tier suppliers [Miemczyk et al., 2012]. In fact, many of the most pressing environmental and social challenges in supply chains often originate from suppliers situated in these lower tiers, commonly referred to as “lower-tier” suppliers [Ernst & Kim, 2002] or sub-suppliers [Grimm et al., 2011]. As firms strive to improve sustainable outcomes across their supply chain processes integrating environmental, social, and economic goals managing sustainability in global supply chains (GSCs) remains a significant challenge [Carter & Rogers, 2008; Seuring & Müller, 2008]. Given the increased recognition of sustainability issues in GVCs, this research aims to explore the factors influencing the integration of sustainable practices throughout the entirety of global supply chains. Specifically, the study seeks to identify the barriers and enablers that affect sustainability initiatives.

Despite these insights, there remains a lack of comprehensive analytical frameworks that integrate the domains of Global Value Chains (GVCs), sustainability, and international business. This research aims to address this gap by developing an analytical framework that

will help academic researchers and practitioners identify and understand the factors that impede the transition to sustainable GVCs. By providing a structured approach to analyze these interconnections, this study seeks to enhance the understanding of how sustainability can be effectively integrated into GVCs, ultimately guiding firms towards more responsible and sustainable practices.

1. Literature review

Sustainability outcomes include the implementation of environmentally and socially responsible practices, alongside the attainment of environmental, social, or economic performance [Koberg & Longoni, 2019]. In general, a sustainable business is defined as any organization that engages in environmentally friendly practices to ensure that every process, product, and manufacturing activity effectively addresses current environmental challenges while still maintaining profitability [Mardani et al., 2024; Rauter et al., 2017].

The concept of sustainability can be traced back to 1987, when it was defined in terms of the net productivity of biomass, emphasizing a positive mass balance per unit area over time [Conway, 1987]. In principle, an optimal sustainable growth policy seeks to maintain an “acceptable” rate of growth in per capita real incomes without depleting national capital assets or natural environmental assets [Turner, 1988]. Sustainable development is fundamentally about equity, defined as equality of opportunities for well-being, as well as the comprehensiveness of objectives [Soubbotina, 2004]. It is a social construct governed by decision-making rules based on values that relate to both current and future development, which must be understood in a dynamic environmental context, and intrinsically linked to society [Was, 2014]. Satisfying the needs of present and future generations relies on suitable conditions of human, natural, and economic capital to provide for human well-being [Biasi, 2019]. Ultimately, sustainable development embodies the idea that economic growth should be pursued in a manner that addresses broad environmental and social concerns, utilizing environmental and social resources sustainably [Bannerman, 2020].

While considerable research has been conducted on sustainable supply chain management (SSCM), the predominant focus remains on first-tier suppliers [Lee, 2008]. However, globalization and the fragmentation of supply chains, coupled with increasing stakeholder pressure for enhanced transparency and accountability, have raised concerns regarding the impact of second and third-tier suppliers on sustainability [Miemczyk et al., 2012; Tachizawa & Wong, 2014].

Global Value Chains represent a dynamic and evolving system in which value is continuously added to products through the expertise and resources of participants worldwide [Yuan & Mähönen, 2024]. This system fosters efficiency and specialization at various stages of the production process [Yuan & Mähönen, 2024]. GVCs have become integral to the world economy, often described as its “backbone” and “central nervous system” [Hochachka, 2023].

GVCs are crucial to contemporary globalization, linking producing regions with retailers and consumers worldwide. This intricate network of production and distribution processes holds significant potential for advancing sustainability and addressing climate change [Hochachka, 2023]. However, the environmental impacts associated with GVCs are complex and multifaceted. A notable concern is the “pollution haven” effect, where developing countries may become destinations for high-pollution industries due to weaker

environmental regulations [Qu et al., 2022]. This phenomenon raises significant ecological challenges, particularly as the sophistication of GVCs increases.

Despite these challenges, there is a growing trend among business actors within GVCs to address their social and environmental impacts. Increased consumer awareness, environmental campaigns, and regulatory pressures are driving companies to evaluate and mitigate the environmental footprint of their activities and those of their suppliers [Poulsen, 2021; Nadvi, 2008]. These efforts include reducing the social and environmental impacts associated with production and transportation, which are often geographically dispersed yet organizationally coordinated. Moreover, these issues underscore the necessity of integrating sustainable considerations into GVC strategies to ensure sustainable growth and mitigate adverse impacts on public health and future generations.

2. Methodology

This study employs a systematic review methodology to investigate the factors influencing the sustainable transition of Global Value Chains (sustainable GVCs) and the adoption of eco-friendly practices. Systematic reviews follow a structured, transparent, and replicable process aimed at identifying, selecting, assessing, analyzing, and integrating research evidence on a specific topic [Becheikh et al., 2007; Cook et al., 1997; Tranfield et al., 2003]. The primary objective is to aggregate empirical research findings for analysis, synthesis, and evidence mapping [Halilem, 2010; Kitchenham & Brereton, 2013]. Our systematic review comprises seven steps: 1) defining the research question; 2) establishing inclusion and exclusion criteria; 3) identifying relevant studies; 4) selecting studies based on the criteria; 5) assessing study quality; 6) summarizing and synthesizing results; and 7) interpreting review findings.

Below, we detail each stage of the process. Our research questions center on three key themes: sustainable GVCs, industry-level influencing factors, and governance factors. This structure is crucial for mapping the various obstructive factors that companies may encounter within the same chain, particularly considering the different economic, social, and cultural contexts. This classification is derived from the articles analyzed during the initial stage of defining the research question.

We identified gaps in addressing the challenges associated with the sustainable GVC transition and organized all identified factors into a uniform framework presented in this article. We employed a standardized approach for analyzing the papers, beginning with descriptive analysis followed by a detailed thematic examination, as outlined by [Tranfield et al., 2003]. The descriptive analysis involved reviewing studies based on publication year, methodology, empirical context, unit of analysis, and theoretical frameworks. Our goal was to systematically synthesize the papers and highlight significant findings and implications related to our research questions.

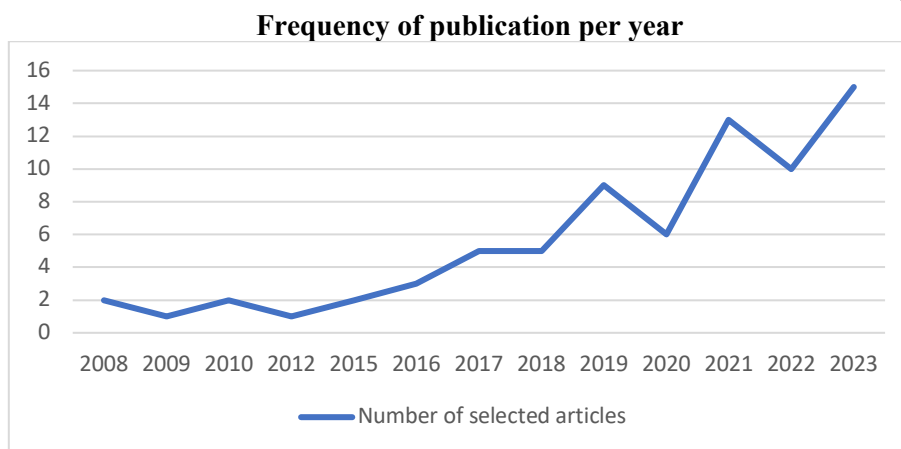
2.1. Descriptive findings

Tourism is an economic field for Romania with an important development potential, which is still insufficient and efficiently exploited and which can become a source of attraction for investors and foreign tourists. Still, this achievement is hampered by strong competition from neighboring countries and the scale of related competition problems. To increase the role of tourism in industry, achieving the goal of integrating European Tourism

and Compliance with Sustainable Development Requirements, the Government must continue to play an important role and initiate active policies leading to an increase in the number of tourists, tourism revenues, and the average length of stay (Gruescu et al., 2008: 694-702).

The keywords used in the systematic review process were derived from factors identified as relevant gaps in previous systematic reviews and studies addressing the relationship between Global Value Chains (GVCs) and sustainability issues. During the initial selection phase, we focused exclusively on titles due to the overwhelming number of references, which exceeded 3,000. Titles were required to include specific keywords such as "Global Value Chain" or "GVC," along with terms like "Sustainability," "Environment," and "Social." This process initially yielded 3,682 papers, from which 85 duplicates were removed. We then reviewed the titles of the remaining 3,597 papers to assess their alignment with our research objectives.

Figure 1.



(Source: authors' processing)

From this review, 361 articles were selected for further consideration based solely on their abstracts. In the second stage, these abstracts were evaluated based on two key criteria: relevance to our research objectives and whether they addressed similar or complementary questions to those we are exploring, ensuring significant contributions to our work.

The third stage involved a deeper analysis of the content and methodology of the selected articles. Only those employing empirical qualitative or quantitative methods were retained, while theoretical and conceptual articles were excluded. This stage resulted in the retention of 113 articles and the exclusion of 248. Finally, a fourth examination was conducted on the remaining 113 articles, focusing on quality assessment. Each article was evaluated based on specific criteria, including clarity and justification of research objectives, alignment of research design, appropriateness of data collection and analysis methods, and the provision of valuable insights regarding the relationship between GVCs and the ecological dimension in international business activities. Ultimately, 74 papers met all criteria and were included in the systematic review.

Since 2008, the number of published articles has significantly increased, reflecting the growing interest in sustainability. A substantial amount of research has focused on the

environmental or social considerations of GVCs. Figure 01 illustrates the time-series evolution of publications on this topic. This field of research is characterized by its methodological richness, highlighting the complexity and significance of the subject matter. Researchers have employed a variety of approaches, ranging from quantitative techniques such as panel modeling, empirical estimations, autoregressive models, spatial analysis, and factor analysis to qualitative methods, including case studies, content analysis, and action research. This methodological variety enables a comprehensive exploration of the topic, accommodating diverse research questions and perspectives.

2.2. Thematic findings

Our systematic review identified three major themes, each comprising a group of determining factors that may either facilitate or hinder firms participating in Global Value Chains [GVCs] from implementing more sustainable eco-friendly practices in production.

The economic context plays a pivotal role in shaping ecological practices within GVCs. Factors such as market demand and customer preferences [Nishitani, 2009], regulatory environments [Swilling et al., 2022], and competitive pressures influence how firms integrate sustainable practices into their operations [Clarke & Boersma, 2015]. Additionally, new "rules of the game" or socio-political expectations are essential to support sustainability within organizations and across the societies in which businesses operate [Waddock, 2020]. For instance, firms in economically prosperous regions may have more resources to invest in green technologies and sustainable practices. Conversely, the technology gap indirectly influences carbon emissions through GVC positioning, often leading to increased emissions, particularly in developing nations with less stringent environmental regulations [Ye et al., 2020].

In certain developing countries like China, GVC embeddedness serves as a partial mediator in the relationship between digital economy development and eco-friendly innovations [Pan et al., 2022]. Legal and regulatory reforms, such as investor protection laws and the reduction of entry barriers, actively enhance countries' participation in GVCs by facilitating capital access and reducing financial constraints [Ajide, 2023]. However, middle-income countries must also strengthen their green initiatives and enforce environmental policies to close the gap with high-income countries and improve their positioning in GVCs [Liu et al., 2022].

Research by Assamoi et al. [2020] indicates that GVCs influence CO₂ emissions, economic growth, energy consumption, and trade openness. Shi et al. [2022] examined the Belt and Road countries, characterized by their dependency on resources and high levels of pollution, noting that these nations tend to have low environmental value-added in GVCs. They argue that developing countries often experience "pollution growth" and have become "pollution refuges" for more developed nations [Wang et al., 2022; Wang et al., 2019]. Consequently, for developing countries to achieve green and sustainable growth, significant efforts in the service sector are necessary. These countries must alter their governance styles and actively engage in the global service industry's division of labor to enhance technological development and achieve sustainable growth.

However, governance within value chain scholarship, which emphasizes power relations among firms, differs from the governance of environmental geography, which focuses on state and nonstate institutional arrangements [Havice & Campling, 2017]. These governance forms intersect and influence each other within global production networks. In

environmental governance, economic imperatives for profit and market dominance often intersect with environmental concerns, creating dilemmas for sustainable resource management and regulatory frameworks [Havice & Campling, 2017]. The interplay between economic and environmental governance is significant, as both are deeply interconnected and mutually influential. Economic decisions within value chains, such as strategies for centralization and chain governance, impact environmental practices and outcomes [Havice & Campling, 2017]. Conversely, environmental regulations and conditions shape economic strategies and competitive dynamics among firms [Havice & Campling, 2017].

The social effects of GVCs are also significant; higher export prices correlate with an increase in labor income share when product quality is consistent, whereas higher quality at the same price reduces labor income share. Quality competition has a more substantial impact than price competition on labor income share [Sun et al., 2021]. Moreover, the dynamics of GVCs have resulted in a vast and unequal international division of labor, with powerful corporations leveraging legislative and institutional changes to enhance corporate mobility, thus redistributing income from productive workers to shareholders and executives [Aguire, 2017]. To mitigate the negative impacts of GVCs and enhance positive effects, [Szymczak, 2024] identifies two critical areas for policymakers: promoting labor mobility between industries and facilitating technology absorption and learning through participation in GVC networks.

Good governance practices are essential for maximizing the benefits of infrastructure investments and mitigating the negative effects of infrastructure deficiencies in transport, electricity, and water supply, thereby positively influencing African participation in GVCs [Ajide, 2023]. Without strong governance, the potential of infrastructure to enhance economic growth, productivity, and competitiveness through GVC participation cannot be fully realized. Additionally, governance initiatives, particularly those related to transparency in GVCs, significantly influence environmental upgrading [Poulsen et al., 2020]. Managing sustainability in GVCs is treated as a tradable asset that businesses can manage alongside other commodities. Lead firms play a crucial role in shaping sustainability practices across their networks; their approaches can significantly influence entire supply chains and impact environmental outcomes, economic performance, and social welfare [Ponte, 2019; Das, 2023].

Technological knowledge and innovation capabilities are crucial drivers of environmental improvements within GVCs [Hu et al., 2021]. A country's technological progress can alter its technology gap relative to the global technological frontier, thereby shifting its position within the GVC. Such advancements can lead to significant reductions in carbon intensity, particularly in high-emission industries [Ye et al., 2020]. To capitalize on these opportunities, countries should focus on enhancing their technological capabilities while adapting policies to align with global technological advancements [Ye et al., 2020]. By improving their positioning within GVCs, industries can transition towards cleaner, higher-end production methods, which contribute to reduced carbon emissions [Ye et al., 2020]. There is a positive correlation between a sector's position within the GVC and its capacity for green technology innovation [Hu et al., 2021]. This indicates that sectors more deeply embedded in GVCs are better equipped to develop and adopt environmentally friendly technologies [Hu et al., 2021].

Multinational corporations can enhance their overall sustainable performance by engaging in corporate governance actions that lead to sustainability outcomes within GVCs and Global Production Networks [GPNs]. The state is increasingly recognized as a crucial

actor within these frameworks, maintaining four roles—facilitator, regulator, buyer, and producer—in developing sustainability outcomes [Horner, 2016]. Furthermore, lead firms have the power to orchestrate sustainability in GVCs by employing a mix of directive and facilitative instruments to raise awareness and accountability [Ponte, 2020], alongside providing incentives that align private sector interests with broader societal and environmental goals [Ponte, 2020].

3. Research agenda

Our review's descriptive and thematic findings highlight a growing interest in sustainable Global Value Chains [GVCs] and eco-friendly practices. However, the literature reveals significant gaps that must be addressed for a more comprehensive understanding of this research area. We have organized the identified research gaps based on three elements suggested by Golcegi et al. [2019]: theoretical development, content development, and methodological development. This research aims to identify the key facilitating factors and challenging determinants influencing the sustainable transition in GVCs. By presenting these gaps, we hope to guide future researchers in exploring underdeveloped links within this field.

Despite the extensive research on sustainable GVCs, there is a notable absence of a unifying theoretical framework. Developing such a framework could integrate existing knowledge and enhance our understanding of GVC dynamics. Specifically, future research should investigate how market entry choices vary across countries while considering the critical nature of environmental issues for firms [Golcegi et al., 2019]. This inquiry aims to explore whether the geographic distribution of a company's exports correlates with its environmental strategies and how this relationship influences its propensity for environmental innovation. Essentially, it examines how the internationalization of business activities impacts environmental practices within sustainable GVCs.

The hypothesis of pollution havens and competition among developing countries to attract multinational capital under stricter pollution controls is under-explored and could yield valuable insights. Investigating alternative pollution control tools beyond pollution permits may also provide new perspectives [Pi & Liu, 2023]. The dynamics of Corporate Social Responsibility [CSR] standard-setting reveal complexities that vary across product categories and sustainable GVCs, underscoring the need for a contextual understanding rather than a blanket assumption of negative consequences [Fransen et al., 2019]. This necessitates further research to enhance our understanding of these dynamics and improve the social embedding and governance outcomes of global standards in sustainable GVCs. Future studies should examine how international standards are formulated and enforced, emphasizing their impact on global governance structures. Understanding who shapes these standards, how they are implemented, and their broader implications for global trade dynamics is crucial [Nadvi, 2008]. Furthermore, research should consider the social effects of GVCs and partnerships as part of a broader system addressing social-ecological problems, adopting a problem-driven approach to develop a deeper theoretical understanding of sustainable change [Bitzer & Glasbergen, 2014]. This nuanced perspective is essential for advancing the role of partnerships in achieving sustainability goals.

Additionally, individual actions by businesses, NGOs, governments, and other institutions must be systematically coordinated to effectively tackle environmental grand challenges and develop comprehensive solutions [Geref & Lee, 2016].

Limitations related to data accuracy and aggregation emphasize the need for improved data collection and methodological approaches. Future research should focus on gathering more precise, sector-specific data and refining analytical methods. Specifically, it should investigate sectoral carbon trade intensity and the factors driving changes in carbon trade intensity among major economies. Moreover, there is a need to develop new databases and explore more recent evidence to provide a comprehensive understanding of carbon emissions within the context of sustainable GVCs. Although many selected articles have explored sectoral carbon trade intensity and the factors influencing changes in this area among major economies, further examination of middle-income and low-income countries is necessary.

Conclusion

Our review's descriptive and thematic findings highlight a growing interest in sustainable Global Value Chains [GVCs] and eco-friendly practices. However, significant gaps in the literature must be addressed for a more comprehensive understanding of this research area. We have organized the identified research gaps based on three elements suggested by Golcegi et al. [2019]: theoretical development, content development, and methodological development. This research aims to identify key facilitating factors and challenging determinants influencing the sustainable transition in GVCs. By presenting these gaps, we hope to guide future researchers in exploring underdeveloped links within this field. Despite the extensive research on sustainable GVCs, there is a notable absence of a unifying theoretical framework.

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This nuanced perspective is essential for advancing the role of partnerships in achieving sustainability goals. Moreover, individual actions by businesses, NGOs, governments, and other institutions must be systematically coordinated to tackle environmental grand challenges effectively and develop comprehensive solutions [Geref & Lee, 2016]. Limitations related to data accuracy and aggregation emphasize the need for improved data collection and methodological approaches. Future research should focus on gathering more precise, sector-specific data and refining analytical methods. Specifically, it should investigate sectoral carbon trade intensity and the factors driving changes in carbon trade intensity among major economies. Furthermore, there is a need to develop new databases and explore more recent evidence to provide a comprehensive understanding of carbon emissions within the context of sustainable GVCs. Although many selected articles have explored sectoral carbon trade intensity and the factors influencing changes in this area among major economies, further examination of middle-income and low-income countries is necessary.

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