

Stakeholder Requirements for Supply Chain Viability: A Vector-Based Consideration of Efficiency, Resilience, and Sustainability

Marcel Jaun

Bern University of Applied Sciences (Department of Industrial Engineering, Biel/Bienne, Switzerland)
Email: marcel.jaun@bfh.ch

Jörg H. Grimm

Bern University of Applied Sciences (Department of Industrial Engineering, Biel/Bienne, Switzerland)
Email: joerg.grimm@bfh.ch

Ann-Kathrin Gilliot

Bern University of Applied Sciences (Department of Industrial Engineering, Biel/Bienne, Switzerland)
Email: ann-kathrin@gilliot.de

Tim Auer

University of St.Gallen (PSCM-HSG, St.Gallen, Switzerland)
Email: tim.auer97@web.de

ABSTRACT

The concept of supply chain viability (SCV) has evolved into a thriving research area within supply chain management. SCV has largely been theorized from the narrow perspective of survival amid long-term crises. In this paper, we argue that organizations must balance the requirements of all stakeholders to achieve SCV. Based on a semi-systematic literature review and eight expert interviews, we have identified 26 overarching stakeholder requirements across the three SCV performance dimensions of efficiency, resilience, and sustainability. We found that the requirements diverge in content and priority across stakeholder groups. This divergence results in either paradoxical tensions or synergies. We subsequently introduce a vector-based model to analyze and compare the requirements systematically and present two research propositions. First, each identified stakeholder requirement influences efficiency, resilience, and sustainability simultaneously, albeit to varying degrees. Second, the aggregated direction and dispersion of all stakeholder requirements determine the priorities for the strategic development of SCV. This paper contributes to theory by introducing a stakeholder-focused approach to the systems-theoretical conceptualization that has dominated SCV research to date. For practitioners, the model provides a method for anticipating trade-offs and synergies, which can be used to prioritize future SCV practices.

Keywords: *supply chain viability, supply chain trade-offs, supply chain synergies, stakeholder requirements, supply chain sustainability*

1. INTRODUCTION

Supply chain management (SCM) has long focused on cost efficiency. This has led to greater complexity and global sourcing strategies that exploit low-cost opportunities (Hofmann & Langner, 2020). However, it has also created more fragmented supply chains that are more vulnerable to long-term disruptions, particularly during periods of geopolitical tension or natural disasters (Ivanov & Dolgui, 2022; Li *et al.*, 2023).

At the same time, ecological systems are reaching their limits, and the topics of environmental degradation and social exploitation within SCM remain ever-present. This paradigm shift has led to the development of more sustainable and human-centred SCM approaches, such as the industry 5.0 framework (Ivanov, 2023) and the regenerative SCM approach (Howard *et al.*, 2019; Ivanov, 2026). In these models, supply chains are required to contribute positively to society and minimize their environmental footprint in order to justify their existence (Hofmann & Langner, 2020).

In response to these challenges, the concept of supply chain viability (SCV) has emerged (Ivanov, 2020; Ruel *et al.*, 2024). SCV is defined as the ability of a supply chain to survive and adapt to environmental changes over a long period (Ivanov & Dolgui, 2022). SCV recognizes that long-term survivability cannot be achieved through a one-sided focus on cost efficiency alone, but rather requires an ongoing balance between three core performance objectives: efficiency, resilience, and sustainability (Auer *et al.*, 2024; Hofmann & Langner, 2020).

However, achieving this balance is complex, as these objectives often diverge in terms of content and priorities. This can lead to tensions and, ultimately, trade-offs (Jaun *et al.*, 2026; Wolf, 2014). One possible approach to managing

these tensions is to apply paradox theory (Smith & Lewis, 2011). According to this theory, these trade-offs should not be viewed as problems that can be permanently resolved, but rather as persistent, interrelated contradictions that must be balanced.

Before managing trade-offs, organizations must first understand the underlying drivers of these tensions. In this paper, we propose that these drivers are the diverse and often conflicting requirements of a focal organization's stakeholders (Chowdhury *et al.*, 2020; Wieland & Durach, 2021). Traditionally, organizations prioritized economic stakeholders; however, they increasingly must respect the requirements of non-economic stakeholders, such as nature and civil society, whose primary interests lie in long-term sustainability rather than short-term financial gains (Ivanov, 2020; Pagell & Shevchenko, 2014). However, Duzgun (2026) shows that actively considering non-economic stakeholders requires a strong internal environmental orientation, since governance alone rarely leads to the implementation of sustainability initiatives. In this context, Siems *et al.* (2023) also expanded the stakeholder role to include facilitator and inspector functions.

Despite the important role of stakeholders, the academic literature provides little guidance on identifying, comparing, and prioritizing their requirements across efficiency, resilience, and sustainability. Motivated by this gap, we applied stakeholder theory to understand how organizations can align their strategic SCV development with stakeholder requirements. Our guiding research question was therefore:

RQ: Which stakeholder requirements are relevant to supply chain viability, with the core performance objectives of efficiency, resilience, and sustainability?

To answer this question, we followed a qualitative approach. Firstly, we conducted a semi-systematic literature review. Secondly, we conducted eight expert interviews with stakeholders from various industries. We then reviewed the findings in a joint panel discussion. This paper makes three contributions to theory development:

- First, we introduce a stakeholder perspective to the predominantly systems-theoretical approaches in SCV research, and outline how stakeholder requirements act as underlying drivers behind SCV priorities.
- Second, we present 26 overarching stakeholder requirements across efficiency, resilience, and sustainability for eight different stakeholder groups and prioritized the most important groups.
- Third, we outline a vector-based analytical model to quantify and analyze these requirements systematically, as a basis for identifying trade-offs and synergies between the requirements as well as for determining SCV priorities.

The remainder of this paper is organized as follows: Section two reviews the literature and identifies the relevant stakeholder groups for SCV. Section three describes the methodological approach. Section four presents the stakeholder requirements and prioritizes the stakeholder groups. Section five outlines the vector-based analytical model, discusses the outcomes, and describes the theoretical and managerial implications. Section five concludes with a visual representation of the paper's main findings.

2. LITERATURE REVIEW

Maritime The theoretical background is presented in three subchapters. Firstly, we provide an overview of the SCV concept. Secondly, we outline how stakeholder theory relates to SCV and identify eight primary and secondary stakeholder groups relevant to SCV. Finally, we briefly review the literature on the trade-offs and synergies.

2.1 Supply Chain Viability (SCV)

Ivanov (2020) first introduced SCV, which addresses the long-term survival of SCs. Based on the principles of biology and ecology (Aubin, 1991) and cybernetics (Beer, 1985), viability refers to a system's ability to sustain itself and survive in a constantly changing environment. Ivanov (2020, p. 1415) defines SCV as “a dynamically adaptable and structurally changeable value-adding network able to (i) react agilely to positive changes, (ii) be resilient to absorb negative events and recover after disruptions, and (iii) survive long-term global disruptions by adjusting capacity utilization and allocations in response to internal and external changes, in line with sustainable developments, to ensure the provision of goods and services to society and markets over the long term.”

The term viability has also been used to refer to a single dimension, such as economic or financial viability (Cooney *et al.*, 2023) or operational viability (Al-Enazi *et al.*, 2021). In the SCM context, however, it is considered the next evolutionary step of resilience. Ruel *et al.* (2024) argue that, unlike traditional resilience, which usually focuses on a closed system's ability to return to its original state after a disruption, SCV is more oriented towards open-system capability to allow a bounce forward.

The dimensions that constitute SCV are the subject of ongoing discussion. Ivanov (2020) first outlined leagility, resilience, and sustainability as the building blocks. Other studies, for example, Kholaf *et al.* (2024), focused on robustness and resilience, while Kumar *et al.* (2022) focused on sustainability and reconfigurability. Most recently, Ivanov (2026) outlined the need to integrate SCV with regeneration (Howard *et al.*, 2019) to strengthen ecosystem survival. Hofmann and Langner (2020) presented a similar approach but also included efficiency alongside resilience and sustainability. They also suggest that, beyond viability, the next evolutionary step is liveability, which is conceptually close to regeneration. For this paper, we apply efficiency, resilience, and sustainability as the basic dimensions of SCV.

2.2 Key Stakeholders for SCV

To achieve SCV, organizations must consider the complex web of internal and external interests that influence their context, which we describe in this paper as the stakeholder requirements and which define the conditions under which SCs operate (Siems & Seuring, 2021; Svensson *et al.*, 2018). Stakeholder theory was introduced by Freeman (1984), who defines stakeholders as any group or individual who can affect or be affected by an organization's achievement of its objectives. Goertler *et al.* (2024) found that stakeholder theory has become increasingly important in SCM in recent years. This is due to mounting pressure to achieve sustainability goals and survive disruptions, both of which require a deeper understanding of the stakeholders involved.

Classical stakeholder literature distinguishes between primary and secondary stakeholders (Clarkson, 1995; Freeman, 1984). Primary stakeholders are those directly involved in value creation (e.g., suppliers, employees, and customers). Secondary stakeholders influence organizations more indirectly, for example, through societal pressure or institutional rules. More recent studies in SCM have built upon this perspective and identified a broad spectrum of actors that impact SCs, such as regulators, financial institutions, communities, or NGOs (Acquah *et al.*, 2023; Chang *et al.*, 2023; Grimm *et al.*, 2023; Lee *et al.*, 2022; Wagner Mainardes *et al.*, 2012; Post *et al.*, 2002; Svensson *et al.*, 2018; Wijewickrama *et al.*, 2022).

In the context of SCV, Ivanov (2020) conceptualizes a viable SC model, arguing that SCs are systems embedded within a broader ecosystem consisting of the economy, governance, nature, and society. SCs are influenced by economic structures, institutional frameworks, environmental conditions, and societal expectations (Fritz *et al.*, 2018).

For this paper, we adopted the well-established classification of stakeholders into primary and secondary categories. First, we identified three groups of primary stakeholders: Upstream stakeholders include suppliers, subcontractors, and service providers who supply materials, components, or production inputs (Andersson *et al.*, 2023; Kannan, 2018; Lee *et al.*, 2022; Wijewickrama *et al.*, 2022). Internal stakeholders include employees, management, and the board of directors, who coordinate SC decisions and implement operational strategies, as well as shareholders (Acquah *et al.*, 2023; Freeman, 1984; Wagner Mainardes *et al.*, 2012; Meixell & Luoma, 2015). Top management, in particular, is important for prioritizing sustainability-related requirements (Kitsis & Chen, 2021) and serves as an internal mediator that translates stakeholder requirements into outcomes (Asuah *et al.*, 2024). Downstream stakeholders include distributors, retailers, logistics partners, and end customers, who influence demand and market expectations (Andersson *et al.*, 2023; Qazi *et al.*, 2022).

Second, we identified five groups of secondary stakeholders: Market stakeholders influence market functioning and business interactions, including financial institutions, intermediaries, consultants, logistics service providers, research institutions, industry partners, and associations (Ferro *et al.*, 2017; Lee *et al.*, 2022; Mathivathanan *et al.*, 2018). Economy, in its broader sense, influences economic conditions and investment expectations, each of which can be affected by recession or inflation (Chang *et al.*, 2023; Ivanov, 2020). Governance includes governments, regulatory bodies, and international institutions that establish formal regulations and compliance requirements (Ivanov, 2020; Mourtaka & Sabar, 2022). Nature includes ecological systems and environmental constraints that affect resource availability and environmental impact (Ferreira Alves & Barcellos, 2021; Hofmann & Langner, 2020). Society includes communities, civil society organizations, NGOs, the general public, the media, and politics, which influence SCs through their norms, expectations, and reputational pressure (Boruchowitch & Fritz, 2022; Meixell & Luoma, 2015; Park-Poaps & Rees, 2010).

2.3 Managing Competing Stakeholder Requirements

Stakeholder groups interact with SCs in various ways. This interaction depends largely on the stakeholders' power and urgency (Co & Barro, 2009). Primary stakeholders more often articulate direct operational requirements, while secondary stakeholders usually define the broader context for SC activities (Partiwi *et al.*, 2023; Siems & Seuring, 2021). As these stakeholders have different, and sometimes conflicting, interests, their requirements may reinforce or compete with one another. This leads to tensions across the three SCV performance dimensions (Fayezi *et al.*, 2018). Paradoxically, economic stability serves as the most important driver and prerequisite for stakeholders to achieve far-reaching sustainability goals in circular supply chains (Kayikci *et al.*, 2022).

The literature describes several approaches to managing these tensions. Firstly, Rehman *et al.* (2026) contend that dynamic capabilities, such as absorptive capacity to understand and integrate external stakeholder knowledge into sustainable supply chain processes (Appiah, 2023), are crucial for addressing growing stakeholder pressure. Paradox theory offers a second useful perspective on these competing demands. It posits that organizations face tensions between contradictory yet interdependent elements that cannot be resolved permanently but must be managed over time (Smith & Lewis, 2011). In the SCM context, these tensions manifest primarily as trade-offs and potential synergies between efficiency, resilience, and sustainability (Sandberg, 2017). However, existing research has largely examined such relationships in isolation, focusing on dyadic trade-offs and synergies between individual dimensions, such as efficiency-resilience (Rajesh, 2021), efficiency-sustainability (Matos *et al.*, 2020), or resilience-sustainability (Carvalho *et al.*, 2014; Negri *et al.*, 2021; Negri *et al.*, 2024).

Therefore, decision-making in SCV is multidimensional, with stakeholder requirements affecting efficiency, resilience, and sustainability simultaneously. Existing approaches reduce this complexity to scalar representations, which obscure the requirements' directional and structural properties. This might limit the analysis of tensions and synergies (Keeney, 1996; Keeney & Raiffa, 1976). Later, in chapter 5, we attempt to address these limitations by interpreting stakeholder requirements as vectors in a three-dimensional performance space of efficiency, resilience, and sustainability (Harrison & Klein, 2007). Molaei *et al.* (2023) outlined a conceptually similar approach by developing a quantified optimization model that balances economic costs, emissions, and service levels to meet complex stakeholder requirements.

3. METHODOLOGY

Given the interdisciplinary nature of the research question, we adopted an exploratory approach. First, we conducted a semi-systematic literature review (Snyder, 2019) to identify an initial set of stakeholder groups and their requirements relating to efficiency, resilience, and sustainability. We synthesized relevant perspectives and did not aim to achieve complete coverage. Second, we expanded

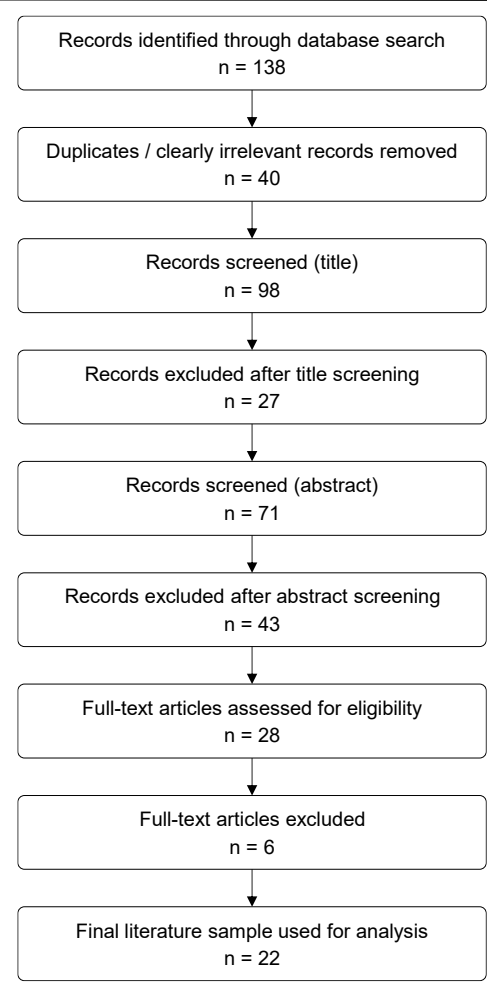


Figure 1 Literature Selection Process

and validated the findings through eight semi-structured interviews with SC experts from various stakeholder groups. Thirdly, we conducted a joint expert workshop to validate, extend, and prioritize the results.

3.1 Data Collection

3.1.1 Semi-Systematic Literature Review

This We conducted the semi-systematic literature review in the following databases: EBSCO, Emerald, JSTOR, MDPI, ScienceDirect, Scopus, Springer, Taylor and Francis, and Wiley. We limited the search to English-language publications and open-access articles. The timeframe spanned from 1998 to 2023.

The search strategy combined three keyword groups. The first group covered the stakeholder perspective (“stakeholder”, “partner”). The second group covered the SC context (“supply chain”, “value chain”). The third group included terms related to requirements (“requirements”, “needs”, “framework”, “theory”, “model”, “mapping”). Several keyword combinations were applied. Stakeholder-related terms had to appear in the title, whereas SC terms could also appear in the abstract.

The initial database search returned approximately 138 records. Figure 1 illustrates the review's selection process. 98 articles remained for title screening. Articles were excluded if the title did not show an obvious link to SCM or stakeholder perspectives. This reduced the sample size to 71 papers. During abstract screening, papers were excluded if

stakeholders were mentioned only superficially or if the focus was limited to general CSR debates without an SC perspective. After abstract screening, 28 articles remained.

We then assessed the full texts to identify papers that provided concrete examples of stakeholder requirements related to efficiency, resilience, and sustainability. We excluded articles that focused primarily on theoretical discussions without addressing these requirements. This final screening resulted in a sample of 22 articles, listed in Appendix 1.

3.1.2 Expert Interviews

To validate and extend the literature review findings, we conducted eight semi-structured expert interviews. Table 1 provides an overview of the interview participants. To ensure diversity, we selected experts from different industries and positions across the SC. However, the sample may have introduced a bias towards strategic and Western perspectives. Operational roles and SMEs operating in less formalized SCM contexts may therefore be underrepresented.

Two researchers conducted the interviews online. A semi-structured interview guide was used to ensure consistency. This guide consisted of six sections: an introduction; questions on the SC; questions on identifying and understanding stakeholders; and questions on stakeholder requirements towards the focal company. Appendix 2 provides the interview guide.

Table 1 Details of the Interviewee Sample

No.	Industry	Position and Focus Area	Years of Experience	Employees	Interview Duration
1	Logistics	Senior Sustainability Manager	15	500	48 min
2	Consulting	Managing Partner	16	5	47 min
3	Consulting	Senior Partner	10	8.2k	41 min
4	Logistics	4PL Head of Account	18	>10k	41 min
5	Manufacturing	Head of Supply Chain Management	15	1.7k	49 min
6	Luxury Goods	Head of Supply Chain Management	11	150	39 min
7	Consulting	Senior Director	30	>160k	48 min
8	NGO	Head of Markets	32	300	44 min

All interviews were recorded and transcribed. These transcripts were then manually reviewed and corrected for accuracy before being sent to the interviewees for their review.

3.2 Data Analysis

3.2.1 Coding Stakeholder Requirements

The qualitative content analysis followed an inductive approach, as outlined by Mayring (2010). Two researchers reviewed each paper and identified and labeled both stakeholders and stakeholder-related requirements. The coding process was iterative and consisted of three rounds.

In the first round, the researchers extracted relevant passages from the literature that referred to stakeholder expectations or requirements. Each paper was reviewed independently by the two researchers, who assigned preliminary codes to the identified stakeholder requirements. The two coding sets were then compared in a joint workshop. The researchers discussed and resolved any discrepancies through consensus-building. The agreed codes were then consolidated into a single coding set, which formed the basis for subsequent analysis.

In the second round, one researcher consolidated the coding set. All coded statements were paraphrased and contextualized. Conceptually similar statements were grouped, and overlapping codes were merged. The team removed duplicate entries and repeatedly reviewed the resulting requirement groups to avoid redundancy. This process produced 22 stakeholder requirements.

In the third round, the two researchers jointly reviewed and validated the consolidated set of requirements in a second workshop. During this stage, the requirement categories were refined, and their matching to the three SCV performance dimensions was finalized.

3.2.2 Validation and Extension Through Expert Interviews

Expert interviews refined the stakeholder requirements identified in the literature review. The interviews were analyzed using the requirement categories from the literature as an initial coding framework.

First, the interview transcripts were screened for text referring to stakeholder requirements or tensions among the three SCV performance dimensions. These were then coded according to the identified requirement categories.

Secondly, the coded passages were reviewed to determine whether the experts' views aligned with the requirements identified in the literature. The interviews, therefore, mainly served to validate the findings.

When requirements did not fit into existing categories, they were adapted or extended to reflect empirical insights. Only four new categories emerged from the interview data, resulting in a final set of 26 requirements.

Finally, the two researchers jointly reviewed the consolidated set of requirements and refined it based on combined insights from the literature and expert interviews.

3.3 Prioritization and Analysis of Stakeholder Requirements

Preliminary results were reviewed at a workshop attended by experts who had previously participated. The objectives were threefold. First, we validated and refined the stakeholder requirement framework. The experts reflected on the results and discussed whether the framework had captured all the relevant requirements. One of the researchers moderated the session. We adjusted the wording and interpretation of the requirements accordingly.

Second, we conducted a stakeholder prioritization session. We printed a large stakeholder map showing the stakeholder groups and their respective stakeholders. Each participant received five voting stickers per SCV performance dimension. Participants placed their stickers on the stakeholder groups they considered most important for the focal company. These results formed the basis for the stakeholder prioritization presented in Section 4.2.

Thirdly, we ran a World Café session to interpret the identified requirements and to discuss how the focal company could analyze and prioritize the development of SCV practices. We formed three groups, each discussing one question at a table moderated by a researcher. After a given time, the groups moved to the next table. The moderator then introduced the previous group's results, after which the new group resumed discussing and built on these insights. This process continued until all groups had passed through all tables. The outcomes of this session formed the basis for the vectorization model that we subsequently proposed in the discussion.

Lastly, to analyze the vector model in Chapter 5.1, we used a systematic coding scheme (see Table 2) to assess all 26 stakeholder requirements across the three SCV dimensions. The authors performed the coding alone. It is important to note that in practice, each company can conduct the evaluation independently and is not required to follow the standardized coding scheme presented here. First, we determined the dominant dimension for each requirement. We then assessed whether the requirement had secondary effects on the other two dimensions. If so, we assigned one of the five heuristic requirement patterns. The resulting vector values are normalized and sum to one. These vectors, therefore, indicate the relative orientation of each requirement across the three dimensions. However, given the nature of this method, treat the vectors as analytical approximations rather than statistically validated empirical weights.

Table 2 Coding Scheme for Assigning Vector Patterns to Stakeholder Requirements

Requirement Patterns	Normalized Vector Pattern (Primary/Cecondary/Residual Dimension)
Primarily one-dimensional requirement	(0.90, 0.10, 0.00)
Dominant requirement with weak cross-dimensional effects	(0.70, 0.20, 0.10)
Dominant requirement with strong cross-dimensional effects	(0.60, 0.25, 0.15)
Balanced requirement across two dimensions	(0.45, 0.40, 0.15)
Balanced requirement across all three dimensions	(0.40, 0.30, 0.30)

Table 3 Stakeholder Requirements Across SCV Dimensions

Stakeholder Group	Efficiency-Related Requirements	Resilience-Related Requirements	Sustainability-Related Requirements
Upstream (primary)	(UE1) Accurate, predictable, and continuous demand forecasts to stabilize and streamline planning certainty. (UE2) Active support of joint development efforts and resource transfer (e.g., investments in innovation or process improvements).	(UR1) Cooperative risk-sharing mechanisms (e.g., joint contingency planning or buffer financing). (UR2) Financial reliability in times of crisis (e.g., payment security or flexible contract terms).	(US1) Providing sustainability expertise (e.g., through training, supplier codes, templates, or collaborative auditing).
Internal (primary)	(IE1) Cost-effectiveness and profit-making (e.g., employees seeking bonuses, CEOs reporting growth, shareholders expecting dividends).	(IR1) Maintaining financial stability and long-term economic viability (e.g., robust financial structures or liquidity management).	(IS1) Forward-looking and responsible strategic approach to sustainability (e.g., top management addresses sustainability risks proactively).
Downstream (primary)	(DE1) Supply of high-quality products with consistent characteristics at an attractive price. (DE2) Responsive and competent customer service (e.g., accessible service channels and problem solving).	(DR1) Reliable product delivery, even during disruptions (e.g., through decentralized warehousing, safety stocks, or flexible transport).	(DS1) Products that are ethically and sustainably produced, with transparent and credible characteristics (e.g., proof of origin, fair working conditions, low environmental impact).
Market (secondary)		(MR1) Cooperative behavior in times of crisis to overcome disruptions together (e.g., between competitors).	(MS1) Investments in modern, resource-efficient technologies that contribute to environmental performance or regulatory compliance. (MS2) Integrating sustainability into product and service design (e.g., reducing material intensity, increasing service life, circular business models).
Economy (secondary)	(EE1) Preservation or, ideally, expansion of workplaces, as well as directly contributing to economic growth.	(ER1) Stable cash flows, sensible debt structures, constant return on capital, and transparent financial reporting (e.g., for financial institutions).	

Table 3 Stakeholder Requirements Across SCV Dimensions (Cont'd)

Stakeholder Group	Efficiency-Related Requirements	Resilience-Related Requirements	Sustainability-Related Requirements
Governance (secondary)		(GR1) Compliance with environmental, labor, and product safety laws (e.g., EU corporate due diligence directive) and participation in auditing and certification schemes (e.g., ISO, OHS, or EMAS).	(GS1) Social responsibility along the entire value chain (e.g., prevention of child labor, forced labor, discrimination, or corruption). (GS2) Introducing health and safety management that goes voluntarily beyond legal standards and compliance. (GS3) Minimizing the use of hazardous substances and ensuring compliance with evolving environmental regulations.
Nature (secondary)		(NR1) Ensuring the long-term supply of resources for nature and people (e.g., overcoming the scarcity of resources such as water, nutrients, and rare substances).	(NS1) Preserving biodiversity and the conditions that enable humans and nature to coexist in the long term (including global warming).
Society (secondary)			(SS1) Transparent disclosure of procurement practices, working conditions, carbon footprint, and environmental impact (e.g., sustainability reporting). (SS2) Reducing environmental impact by investing in environmental improvements and employee training (e.g., reducing CO₂ emissions and managing waste). (SS3) Adherence to social responsibility standards (e.g., fair and transparent contracting, living wages, promotion of diversity and equal opportunities, creation of safe and inclusive working environments).

4. RESULTS

4.1 Stakeholder Requirements Across SCV Dimensions

The literature describes numerous requirements from both primary and secondary stakeholders towards the focal company. These can generally be attributed to one of three SCV performance objectives, but each requirement also affects the other dimensions. The assigned dimension reflects the one it is most closely related to.

The literature review identified 26 requirements, presented in Table 3. The tables map stakeholder groups (rows) to the three SCV performance dimensions (columns). The tables either describe the groups' specific requirements or indicate their strategic priority by showing how many requirements have been described. Please note that the ID in brackets will be used as a reference later in subchapter 5.1.

The first letter indicates the stakeholder group, the second letter indicates the corresponding performance dimension, and subsequent numbers indicate chronological order.

Primary stakeholders (upstream, internal, downstream) focus mainly on operational and economic stability, for example, through accurate demand forecasting, cost-effectiveness, and supply continuity even in times of crisis. In contrast, secondary stakeholders such as governance bodies, society, and the natural environment tend to prioritize compliance with legal frameworks and ethical production standards, as well as the protection of natural resources.

4.2 Stakeholder Prioritization Across SCV Dimensions

The importance of each stakeholder group varies from organization to organization. However, we identified a prioritization of stakeholder groups, visualized in Table 4. We assessed each group based on its influence on SCV

Table 4 Stakeholder Prioritization Across SCV Dimensions

Priority Level	SCV Performance Objectives		
	Efficiency	Resilience	Sustainability
High priority	Internal	Downstream	- Governance - Nature - Society
Moderate priority	- Market - Upstream - Downstream - Economy	- Market - Internal - Economy - Governance	- Market - Upstream - Internal - Downstream
Low priority	- Governance (Nature) (Society)	- Upstream - Nature (Society)	Economy

decisions and its interest in the relevant performance dimension, and assigned it to exactly one SCV performance dimension.

In terms of strategic relevance, the distribution of requirements and the results of the expert workshop suggest that internal and downstream stakeholders should be prioritized across all three dimensions, given their significant role in value creation. In the context of sustainability, governance, nature, and society are the main drivers, as they define the regulatory and ethical framework. Meanwhile, internal stakeholders often exert little pressure on the organization to pursue sustainability.

Even if certain stakeholder groups are classified as low priority, this does not mean that they have no interests. In this context, however, they are less likely to drive this dimension.

5. DISCUSSION

Recent research (Ivanov, 2020; Ivanov, 2026) has defined the scope of SCV. In this study, we build on these models by first identifying eight relevant stakeholder groups and then deriving 26 stakeholder requirements across the SCV performance objectives of efficiency, resilience, and sustainability. While our results provide insights into stakeholders' perspectives on SCV, the question inevitably arises: how can an organization move forward? In the discussion, we propose an approach to analyzing these requirements and establishing priorities for further SCV development.

First, we introduce a vector-based approach to analyzing stakeholder requirements. Next, we discuss the study's overall outcomes and propose two research propositions for future validation. Finally, we describe the theoretical and managerial implications and conclude with a visual summary of our study.

5.1 Vector-Based Analysis of Stakeholder Requirements Across SCV Dimensions

Reflecting on the results in Table 3, it was difficult to assign each requirement to a single dimension, because each requirement may influence efficiency, resilience, and sustainability simultaneously, albeit to varying degrees. Therefore, we consider stakeholder requirements to be multidimensional drivers of SCV. If each requirement influences all three dimensions, it may be important to understand the overall structure of the requirements to derive implications for SCV development.

Building on these insights and multi-objective decision-making and configuration-based perspectives (Harrison & Klein, 2007; Keeney & Raiffa, 1976;

Venkatraman, 1989), we propose representing each stakeholder requirement as a three-dimensional vector space. This vector-based representation reflects each requirement's simultaneous impact across all three dimensions and enables systematic comparison with others. Also, vectorization lets us interpret the requirements on an aggregated level.

5.1.1 Formal Model

First, each stakeholder requirement is defined as a vector (1) where $r_{j,i}$ denotes the relative influence of requirement i on dimension j .

$$r_i = (r_{E,i}, r_{R,i}, r_{S,i}) \in \mathbb{R}^3 \quad (1)$$

$$r_{j,i} \in [0,1], \quad \sum_{j \in \{E,R,S\}} r_{j,i} = 1 \quad (2)$$

For comparability across requirements, each vector is normalized (2). Accordingly, each vector reflects the relative distribution of importance across the three SCV dimensions, rather than the absolute performance contribution. The complete set of all stakeholder requirements is now defined as (3).

$$R = \{r_1, r_2, \dots, r_n\} \quad (3)$$

R can be analyzed at two levels. Firstly, a pairwise comparison of the vectors reveals similarities and differences. We suggest using the Euclidean distance to calculate the similarity between two vectors r_i and r_k (4). Small distances indicate similarity, while large distances indicate divergence.

$$d_{i,k} = \|r_i - r_k\|_2 = \sqrt{\sum_{j \in \{E,R,S\}} (r_{j,i} - r_{j,k})^2} \quad (4)$$

Secondly, we propose three measures to analyze R at the aggregate level and thereby derive its overall structural properties. We suggest analyzing the aggregated direction of R , defined as the mean vector (5) with components (6).

$$\bar{R} = \frac{1}{n} \sum_{i=1}^n r_i \quad (5)$$

$$\bar{R}_j = \frac{1}{n} \sum_{i=1}^n r_{j,i} \text{ for } j \in \{E, R, S\} \quad (6)$$

Table 5 Vectorization of Stakeholder Requirements (Full List in Appendix-3)

r_i	Stakeholder Group	Dominant Dimension	ID	Short Description of the Requirement	Vectorization $r_i = (E, R, S)$
r_1	Upstream	Efficiency	UE1	Demand forecast stability	$r_1 = (0.90, 0.10, 0.00)$
r_2	Upstream	Efficiency	UE2	Joint development support	$r_2 = (0.60, 0.25, 0.15)$
r_3	Upstream	Resilience	UR1	Cooperative risk-sharing	$r_3 = (0.40, 0.45, 0.15)$
r_4	Upstream	Resilience	UR2	Financial reliability in crisis	$r_4 = (0.25, 0.60, 0.15)$
...	...	...	...	...	...

Table 6 Pairwise Comparison of Stakeholder Requirements to Indicate Potential Tensions and Synergies

Comparison	Differences	d_{ik}	Interpretation
r_1 VS r_6 (UE1 vs IE1)	E: $0.90 - 0.90 = 0.00$ R: $0.10 - 0.10 = 0.00$ S: $0.00 - 0.00 = 0.00$	$d_{1,6} = 0.000$	Complete alignment (case where vectors are the same and d_{ik} is zero). Both requirements are based on a strongly efficiency-oriented approach.
r_6 VS r_{26} (IE1 vs SS3)	E: $0.90 - 0.10 = 0.80$ R: $0.10 - 0.20 = -0.10$ S: $0.00 - 0.70 = -0.70$	$d_{6,26} = 1.068$	Very high divergence between E and S. Classic trade-off between internal cost/profit requirements and society-driven social responsibility standards.
r_9 VS r_{14} (DE1 vs MS1)	E: $0.45 - 0.30 = 0.15$ R: $0.15 - 0.30 = -0.15$ S: $0.40 - 0.40 = 0.00$	$d_{9,14} = 0.212$	A hidden synergy may exist between E and S. Resource-efficient technologies could improve sustainability performance while supporting attractive product offerings.
r_7 VS r_{19} (IR1 vs GS1)	E: $0.40 - 0.15 = 0.25$ R: $0.45 - 0.25 = 0.20$ S: $0.15 - 0.60 = -0.45$	$d_{7,19} = 0.552$	Classical trade-off situation. Internal financial stability and value-chain social responsibility both support SCV, but follow different investment logics.
r_5 VS r_{24} (US1 vs SS1)	E: $0.10 - 0.25 = -0.15$ R: $0.20 - 0.15 = 0.05$ S: $0.70 - 0.60 = 0.10$	$d_{5,24} = 0.187$	Interesting synergy potential for transparency enhancement. Supplier-side sustainability expertise may enable credible external disclosure and joint enhancement activities.
r_2 VS r_{18} (UE2 vs GR1)	E: $0.60 - 0.15 = 0.45$ R: $0.25 - 0.45 = -0.20$ S: $0.15 - 0.40 = -0.25$	$d_{2,18} = 0.552$	A somewhat counterintuitive tension. Joint development and compliance/certification both support SCV, but might follow different logics: capability building versus control.

$\bar{R}$ describes the overall orientation of R and specifies which dimension is the most required by the stakeholders. Next, we can analyze the internal consistency of R , defined as the average Euclidean distance of each vector to the aggregated direction (7). Structural heterogeneity H (8) describes the overall level of dispersion within R . Low values indicate that the requirements are structurally aligned and coherent. High values, by contrast, suggest a heterogeneous, tension-prone configuration. The absolute value of H has no fixed upper bound of 1; rather, it depends on the geometric structure of the requirement space. Therefore, it is primarily interpreted relative to other sets of requirements.

$$d_i = \|r_i - \bar{R}\|_2 = \sqrt{\sum_{j \in \{E, R, S\}} (r_{j,i} - \bar{R}_j)^2} \quad (7)$$

$$H = \frac{1}{n} \sum_{i=1}^n d_i \quad (8)$$

Lastly, we recommend dimensional dispersion to identify where structural tensions are most pronounced. For each dimension j , dispersion is defined as the standard deviation (9) where the mean value corresponds to the aggregated direction (10). The resulting dispersion vector (11) indicates how much the requirements vary within each dimension. It specifies where structural tensions are concentrated.

$$\sigma_j = \sqrt{\frac{1}{n} \sum_{i=1}^n (r_{j,i} - \mu_j)^2} \quad (9)$$

$$\mu_j = \bar{R}_j \quad (10)$$

$$\sigma = (\sigma_E, \sigma_R, \sigma_S) \quad (11)$$

Together, $\bar{R}$, H and σ yield an analytical representation of R , in which their collective direction, as well as their internal similarities and divergences, becomes observable and comparable.

5.1.2 Application to the Identified Stakeholder Requirements

We applied the vector-based model to the full set of the 26 stakeholder requirements identified in Section 4.1. Please refer to Subchapter 3.3 and Table 2 for the coding scheme used to assign vector patterns to stakeholder requirements. Table 5 presents the first four stakeholder requirements. The full table appears in Appendix 3. The dominant dimension matches Table 3 and shows each requirement's primary objective. The “Vectorization” column shows the relative influence of each dimension. For example, r_2 is an efficiency-dominated requirement (0.60), with strong cross-dimensional effects on resilience (0.25) and sustainability (0.15).

The complete set of requirements R is defined as (12). We can now conduct a pairwise comparison of the selected stakeholder requirements. Table 6 provides interesting comparisons that reveal trade-offs. Due to the large number

of possible comparisons (325), it would not be feasible to discuss all of them in this paper; therefore, we have limited ourselves to six interesting cases emerging from the prioritized stakeholder groups (please see Table 4).

$$R = \{r_1, r_2, r_3, r_4, r_5, r_6\} \quad (12)$$

Additionally, we adopt the Euclidean distance (4) for each comparison. Because we applied structured heuristic coding, several requirements share the same vector; therefore, the Euclidean distance may be 0 or 1 in those cases. The pairwise distances (4) provide a local diagnosis of R larger distances (e.g., r_6 vs r_{26} / $d_{6,26} = 1.068$) suggest stronger tension and potential trade-offs between requirements, whereas smaller distances indicate greater similarity (e.g., r_5 vs r_{24} / $d_{5,24} = 0.245$), which may result in synergies.

Moving on to analyze R , we first calculate the aggregated dimension $\bar{R}$ (13), based on (5) and (6). For these calculations, we again use all 26 vectorized requirements. $\bar{R}$ indicates a relatively balanced structure overall across the 26 stakeholder requirements. Efficiency has the highest value, closely followed by sustainability, with resilience ranking slightly lower. This is interesting. Although many of the requirements in Table 3 appear to be sustainability-oriented, vectorization does not clearly shift the overall picture in that direction. Instead, a nearly balanced SCV structure emerges, with efficiency showing slight dominance. Achieving balance across all three dimensions also aligns with the fundamental concept of SCV.

$$\begin{aligned} \bar{R}_E &= 0.346 \\ \bar{R}_R &= 0.317 \\ \bar{R}_S &= 0.337 \\ \bar{R} &= (0.346, 0.317, 0.337) \end{aligned} \quad (13)$$

Although $\bar{R}$ does indicate the overall direction of the set, it does not indicate whether the set consists of homogeneous or heterogeneous requirements. To determine this, we apply (8) to measure H (14). This can be used to compare different sets of requirements, but not as a standardized dimension. When interpreting H standalone, it may indicate moderate dispersion around the aggregated direction: the requirements are not fully aligned, but they are not strongly in tension either.

$$H = 0.323 \quad (14)$$

Applying the dimensional dispersion (11) to R (15), it can be seen that the tensions are not distributed evenly across the three SCV dimensions. Dispersion is highest in efficiency, followed by sustainability, with resilience showing the least variation. Resilience may function as a connective dimension within SCV, while efficiency and sustainability may be more likely to be structurally opposed.

$$\begin{aligned} \sigma_E &= 0.241 \\ \sigma_R &= 0.170 \\ \sigma_S &= 0.222 \\ \sigma &= (0.241, 0.170, 0.222) \end{aligned} \quad (15)$$

In summary, this vector-based approach offers a structured analysis of the complex set of stakeholder requirements. At the local level, pairwise comparisons can capture tensions and synergies among individual requirements, thereby indicating hidden possibilities for SCV improvement. At the aggregated level, three measurements can be carried out: aggregated direction defines the overarching strategic direction; structural heterogeneity measures the overall dispersion of the requirement set; and dimensional dispersion identifies the strongest structural tensions. These measurements quantify the requirements. Based on these, priorities for strategic SCV development can be derived.

5.2 Prioritizing SCV Practices Based on Stakeholder Requirements

As shown by the vectorization, different stakeholder requirements are driving forces behind SCV practices, as Gualandris and Klassen (2018) also identified. In line with Ivanov (2020), who asserts that the SCV ecosystem involves an interplay between organization, nature, society, the economy, and governance, and with Ferro *et al.* (2017), who state that primary stakeholders impose a broad set of requirements, we argue that both primary and secondary stakeholders articulate their interests as requirements. This creates a complex system of pressures whereby each stakeholder requirement may affect efficiency, resilience, and sustainability simultaneously. These requirements often diverge in content and priority across stakeholder groups, resulting in either paradoxical trade-offs or synergies. Based on this observation, we suggest **Proposition A**: In the context of SCV, stakeholder requirements typically influence efficiency, resilience, and sustainability simultaneously, albeit to varying degrees. Proposition A could be falsified if future studies show that requirements act as unidimensional drivers (e.g., a requirement impacts only one SCV dimension and has no secondary effects on the others).

Pairwise comparisons of requirements suggest that stakeholder requirements may lead to trade-offs or synergies. In terms of trade-offs, the literature provides a broad range of research, but this mostly focuses on dyadic tensions, such as efficiency vs. resilience (Ivanov, 2017; Rajesh, 2021), efficiency vs. sustainability (Matos *et al.*, 2020), and resilience vs. sustainability (Carvalho *et al.*, 2014). As outlined in Proposition A, we found that trade-offs in achieving SCV lead to recurring dyadic configurations, but occur even more frequently in triadic configurations between all three dimensions.

Turning to synergies, the SCM literature offers various insights, particularly regarding the relationship between resilience and sustainability, or “lean and green” (Borbon-Galvez *et al.*, 2025; Fahimnia & Jabbarzadeh, 2016; Negri *et al.*, 2021; Negri *et al.*, 2024). However, as Pagell and Shevchenko (2014) discovered, synergies frequently depend on economic viability, meaning they are more likely to emerge when they generate cost advantages. Consequently, stakeholder requirements that are not directly tied to economic outcomes, such as those related to nature and society, are more likely to be deprioritized in practice. This creates a conundrum: organizations often face trade-offs with no economically viable synergies, yet they still need to manage these tensions to maintain SCV. The dynamic

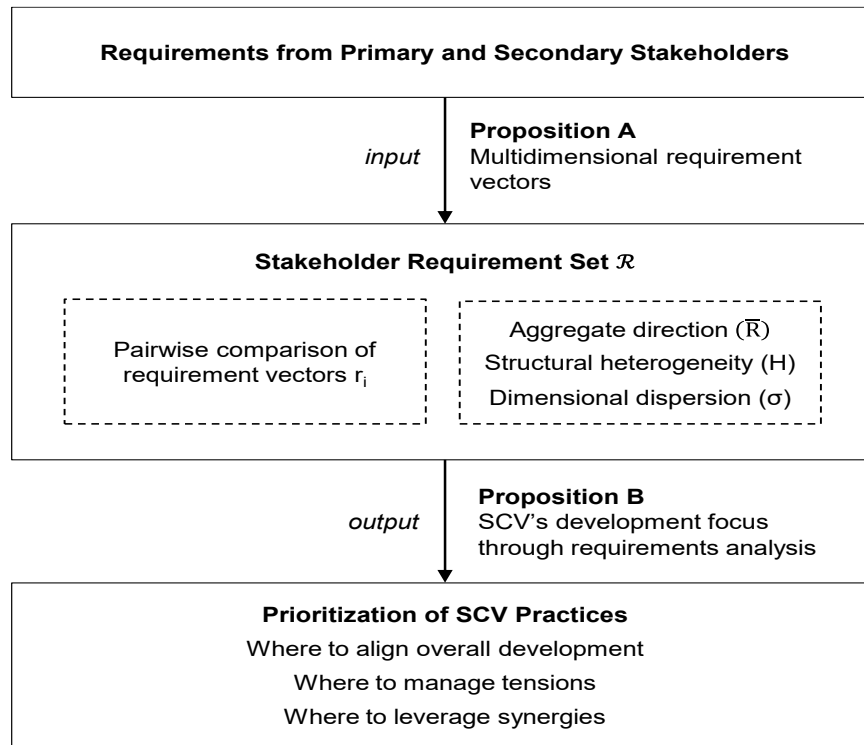


Figure 2 Conceptual Model for Structuring Stakeholder Requirements and Prioritizing SCV Practices

capabilities view (Chowdhury *et al.*, 2019; Teece *et al.*, 1997) or paradox theory (Sandberg, 2017) could provide guidance. Technical capabilities could also assist, for example, digital twins could help organizations use multi-criteria optimization frameworks to evaluate cost, emissions and circularity indicators jointly (Elghomri & Messaoudi, 2026). We imagine that the organization's ability to identify and balance non-synergistic trade-offs between stakeholder requirements could become an important dynamic capability for achieving SCV. This aligns with Multaharju (2016) observation that different stakeholder groups weigh the dimensions of sustainability entirely subjectively, which is why balancing these expectations is a core task of risk mitigation in the supply chain.

To conclude, we will revisit our proposed vector-based approach. The model has its limitations. It is unclear how organizations should determine the exact vector weights, so vector assignment is subjective. Metrics like H lack reference values or benchmarks, limiting their interpretation. Mathematically separating efficiency, resilience, and sustainability may oversimplify the reality of these dimensions. We also assume that long distances lead to high tensions, but this may not hold for all requirements. Despite these constraints, we believe that this model could be a useful starting point for organizations to understand the scope of their requirements. Based on this approach, we formulate **Proposition B**: The aggregated direction and dispersion of stakeholder requirements determine the priorities for the strategic development of SCV across efficiency, resilience, and sustainability. B could be falsified by studies that demonstrate organizations can achieve SCV while setting priorities that are decoupled from, or at odds with, the aggregated dimension and dispersion of their stakeholder requirements. Figure 2 summarizes the key findings.

5.3 Theoretical Implications

This study builds upon existing SCV research by introducing a stakeholder perspective to the structural and systems-theoretical approach that has dominated to date. While Ivanov (2020) conceptualizes a viable SC as an open system that interacts with macroenvironmental feedback loops, such as the economy, governance, nature, and society, our study operationalizes these abstract macro systems by describing them as stakeholder requirements.

Firstly, we argue that stakeholder requirements drive the development of SCV practices. By breaking down Ivanov's (2020) macro-environments into specific primary and secondary stakeholder groups, we explain how these systems exert pressure on organizations.

Secondly, we argue that stakeholder requirements are multidimensional, affecting efficiency, resilience, and sustainability simultaneously to varying degrees. Adopting this three-dimensional perspective can help to identify synergies and trade-offs between requirements.

Thirdly, we argue for quantifying each requirement by vectorizing it to identify trade-offs and synergies. While the VSC model recognizes the importance of adaptive transitions between structural SCV designs, it does not specify when or in which direction these transitions should occur. The aggregated direction of stakeholder requirements could signal to management which SCV dimension needs development to maintain viability in specific situations.

Lastly, we argue for extending the dyadic discussion of synergies and trade-offs to include a triadic perspective (efficiency, resilience, and sustainability), as pursuing SCV often yields complex triadic configurations in which value creation must span profit, people, and society simultaneously.

5.4 Managerial Implications

Since our 26 presented requirements remain on a general level, stakeholder requirement identification must be tailored and prioritized to each organization. Chapter 4.2 offers guidance on prioritizing stakeholders based on dominant SCV dimensions. However, the success of this approach hinges on identifying concrete stakeholder requirements specific to each organization. This will require collecting primary and secondary data (e.g., through interviews, observations, or desk research) before conducting the proposed vector analysis.

Achieving SCV also requires organizations to prioritize the needs of stakeholders without an economic interest, such as society and nature. Historically, these non-economic requirements have often been deprioritized in favor of short-term financial gains. However, integrating these requirements is essential for long-term viability.

Organizations could also use our vector-based analysis to identify underlying trade-offs and synergies. This supports the organization in prioritizing the development of specific SCV practices.

Finally, organizations should address non-synergistic trade-offs. Resilience and sustainability, in particular, often require strategic investments that constrain short-term profitability. Instead of traditional optimization, organizations could require the development of dynamic capabilities and paradox management strategies to balance these tensions over time.

5.5 Limitations

In addition to the limitations of the vector-based model discussed above, this study has further limitations. From an empirical perspective, our methodological approach was backwards-looking and biased towards similar large Western European organizations and interviewees. Therefore, the expert panel and its results, particularly the prioritization that we proposed, are also biased. This has several consequences: Firstly, because there is little insight into SCV, backwards-looking empirical research is unlikely to provide much guidance. More simulation-based, action-oriented research would be highly valuable in further developing SCV (Pagell & Shevchenko, 2014). Secondly, we may have overlooked radically different organizations and supply chains that could be highly innovative and have a different approach to stakeholders, but which are usually considered outliers. The same applies to the interviewees: focusing on outliers would lead to interviewees who think differently about viability compared to managers of large enterprises, whose possible range of action and behaviour is sometimes limited. Given the limitations of this paper, future studies building on this approach should examine these outliers, who are freer to innovate and can truly become viable. Outliers could include other organizations, such as small and medium-sized enterprises, micro-enterprises, start-ups, non-governmental organizations, communities, and organizations from different cultural backgrounds or developing countries.

Consequently, requirements that are more typical of such outliers or organizations operating in non-Western contexts may be underrepresented. This limitation suggests an implication: Large companies face greater regulatory pressure and public scrutiny and have a wider range of internal stakeholders. By contrast, SMEs are often less

constrained by formal regulations and therefore enjoy greater strategic flexibility. This flexibility could enable SMEs to adopt a more proactive approach to SCV and to experiment with creative configurations that generate synergies among efficiency, resilience, and sustainability.

5.6 Research Avenues

We suggest four directions for future research. Firstly, methods should be developed to elicit, weight, and quantify SCV-related stakeholder requirements. Secondly, a more detailed analysis of stakeholder requirements across different types of organizations, industrial contexts, and continents would be valuable. In this context, it would be interesting to study how non-economic stakeholders, such as society and nature, could be better integrated and prioritized in the future. Thirdly, researching how organizations can convert SCV trade-offs into SCV practices seems promising. Klemann *et al.* (2025) have suggested several initial approaches, including ecosystem development, total cost optimization, and shared risk management. Fourthly, it would be useful to refine and further develop the vector-based model, particularly through action- or simulation-based research. It would also be valuable to explore whether a detailed vector-based analysis of requirements could yield innovative supply chain configurations. These next steps could help the SCV research field move from theory to practical implementation strategies.

6. CONCLUSION

This study considers SCV as a response to the requirements of primary and secondary stakeholders. The requirements often affect efficiency, resilience and sustainability at the same time. This frequently creates tensions and synergies that will guide the development of meaningful SCV practices. We have introduced an approach to analyze the requirements vectors for deriving possible priorities for future SCV practices. Since Ivanov introduced the concept of SCV in 2020, numerous studies have built on it. However, the concept remains largely theoretical. We do hope that our study might inspire more practice-oriented research on SCV.

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CONFLICTS OF INTEREST

The authors declare that no competing interests could have influenced the outcomes or interpretations of this study.

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Marcel Jaun is a research assistant at the Bern University of Applied Sciences in Switzerland. His research interests include supply chain viability and the development of viable-regenerative entrepreneurial designs.

Jörg Grimm is a professor of supply chain management at Bern University of Applied Sciences, a lecturer at the University of St. Gallen and founder of Swiss SupplyChainTech. Having completed his PhD at the University of St. Gallen, he went on to hold management positions at Swiss Federal Railways (SBB).

Ann-Kathrin Gilliot is a former Master's student at Bern University of Applied Sciences, where she specialized in supply chain management in the food sector.

Tim Auer is a former PhD student and research associate specializing in supply chain management at the University of St. Gallen. His research interests include supply chain resilience and viability.

APPENDIX-1. LITERATURE USED FOR REQUIREMENTS ANALYSIS

Year	Authors	Title
2023	Acquah <i>et al.</i>	When stakeholder orientations matter: Modelling employee orientation, shareholder orientation and supply chain orientation as necessary and sufficient conditions for firm performance
2021	Ferreira Alves & Barcellos	Mapping the Key Stakeholders toward Supply Chain Sustainability: Evidence from the Brazilian Beef Supply Chains
2022	Andersson <i>et al.</i>	Sustainable development considerations in supply chains: Firms' relationships with stakeholders in their business sustainability practices—A triangular comparison
2022	Boruchowitch & Fritz	Who in the firm can create sustainable value and for whom? A single case study on sustainable procurement and supply chain stakeholders
2023	Chang <i>et al.</i>	Requirement-driven sustainable supplier selection: Creating an integrated perspective with stakeholders' interests and the wisdom of expert crowds
2020	Chowdhury <i>et al.</i>	Dynamic sustainability requirements of stakeholders and the supply portfolio
2019	Chowdhury <i>et al.</i>	Dynamic capabilities for meeting stakeholders' sustainability requirements in supply chain
2009	Co & Barro	Stakeholder theory and dynamics in supply chain collaboration
2017	Ferro <i>et al.</i>	Validating a framework of stakeholders in connection to business sustainability efforts in supply chains
2018	Fritz <i>et al.</i>	A supply chain perspective of stakeholder identification as a tool for responsible policy and decision-making
2022	Kayikci <i>et al.</i>	Analyzing the drivers of smart sustainable circular supply chain for sustainable development goals through stakeholder theory
2018	Kannan	Role of multiple stakeholders and the critical success factor theory for the sustainable supplier selection process
2021	Kitsis & Chen	Do stakeholder pressures influence green supply chain practices? Exploring the mediating role of top management commitment
2015	Meixell & Luoma	Stakeholder pressure in sustainable supply chain management: A systematic review
2023	Molaei <i>et al.</i>	Creating a comprehensive sustainable supply chain optimization model that aligns with stakeholder requirements and ecological factors
2022	Mourtaka & Sabar	A Framework of Key Stakeholders and Their Influence on Sustainable Supply Chain Management
2010	Park-Poaps and Rees	Stakeholder Forces of Socially Responsible Supply Chain Management Orientation
2022	Qazi <i>et al.</i>	Does the stakeholder's relationship affect supply chain resilience and organizational performance? Empirical evidence from the supply chain community of Pakistan
2023	Siems <i>et al.</i>	Stakeholder roles in sustainable supply chain management: a literature review
2021	Siems & Seuring	Stakeholder management in sustainable supply chains: A case study of the bioenergy industry
2018	Svensson <i>et al.</i>	Developing a theory of focal company business sustainability efforts in connection with supply chain stakeholders
2014	Wolf	The Relationship Between Sustainable Supply Chain Management, Stakeholder Pressure and Corporate Sustainability Performance

APPENDIX-2. INTERVIEW PROTOCOL

Interviewee:

Organization:

Permission to record interview:

General questions

Could you briefly describe your company and your role within it?

What current issues are you working on in terms of supply chain efficiency, resilience and sustainability? What do you see as the biggest challenge at the moment?

Stakeholder identification

Which key stakeholders do you consider for supply chain strategy topics?

How did you identify these stakeholders?

Requirements received from stakeholders

What efficiency, resilience and sustainability requirements do stakeholders place on your company?

How are you made aware of these requirements?

What challenges do you face in identifying or responding to them?

What data sources and methods do you use to gather and assess these requirements?

Requirements set by the focal company

What specific efficiency, resilience and sustainability requirements does your company impose on its stakeholders (e.g. suppliers, partners)?

How are these requirements developed and communicated?

Prioritization and trade-offs
How do you prioritize between the different stakeholder requirements?
Do you give greater weight to efficiency, resilience, or sustainability? Why?

Closing questions
Are there any additional aspects you would like to add?

APPENDIX-3. VECTORIZATION OF STAKEHOLDER REQUIREMENTS (FULL TABLE)

r _i	Stakeholder Group	Dominant Dimension	ID	Short Description of Requirement	Vectorization
r ₁	Upstream	Efficiency	UE1	Demand forecast stability	r ₁ = (0.90, 0.10, 0.00)
r ₂	Upstream	Efficiency	UE2	Joint development support	r ₂ = (0.60, 0.25, 0.15)
r ₃	Upstream	Resilience	UR1	Cooperative risk-sharing	r ₃ = (0.40, 0.45, 0.15)
r ₄	Upstream	Resilience	UR2	Financial reliability in crisis	r ₄ = (0.25, 0.60, 0.15)
r ₅	Upstream	Sustainability	US1	Sustainability expertise	r ₅ = (0.10, 0.20, 0.70)
r ₆	Internal	Efficiency	IE1	Cost-effectiveness and profit-making	r ₆ = (0.90, 0.10, 0.00)
r ₇	Internal	Resilience	IR1	Financial stability	r ₇ = (0.40, 0.45, 0.15)
r ₈	Internal	Sustainability	IS1	Responsible sustainability strategy	r ₈ = (0.30, 0.30, 0.40)
r ₉	Downstream	Efficiency	DE1	High-quality products at attractive price	r ₉ = (0.45, 0.15, 0.40)
r ₁₀	Downstream	Efficiency	DE2	Responsive customer service	r ₁₀ = (0.90, 0.10, 0.00)
r ₁₁	Downstream	Resilience	DR1	Reliable delivery during disruptions	r ₁₁ = (0.20, 0.70, 0.10)
r ₁₂	Downstream	Sustainability	DS1	Sustainable and transparent products	r ₁₂ = (0.15, 0.40, 0.45)
r ₁₃	Market	Resilience	MR1	Cooperative crisis behavior	r ₁₃ = (0.40, 0.45, 0.15)
r ₁₄	Market	Sustainability	MS1	Resource-efficient technologies	r ₁₄ = (0.30, 0.30, 0.40)
r ₁₅	Market	Sustainability	MS2	Sustainable product/service design	r ₁₅ = (0.30, 0.30, 0.40)
r ₁₆	Economy	Efficiency	EE1	Workplaces and economic growth	r ₁₆ = (0.60, 0.15, 0.25)
r ₁₇	Economy	Resilience	ER1	Stable cash flows and financial reporting	r ₁₇ = (0.20, 0.70, 0.10)
r ₁₈	Governance	Resilience	GR1	Compliance and certification	r ₁₈ = (0.15, 0.45, 0.40)
r ₁₉	Governance	Sustainability	GS1	Social responsibility in the value chain	r ₁₉ = (0.15, 0.25, 0.60)
r ₂₀	Governance	Sustainability	GS2	Health and safety beyond compliance	r ₂₀ = (0.15, 0.25, 0.60)
r ₂₁	Governance	Sustainability	GS3	Hazardous substance reduction	r ₂₁ = (0.30, 0.30, 0.40)
r ₂₂	Nature	Resilience	NR1	Long-term resource supply	r ₂₂ = (0.15, 0.45, 0.40)
r ₂₃	Nature	Sustainability	NS1	Biodiversity and coexistence	r ₂₃ = (0.30, 0.30, 0.40)
r ₂₄	Society	Sustainability	SS1	Transparent disclosure	r ₂₄ = (0.25, 0.15, 0.60)
r ₂₅	Society	Sustainability	SS2	Environmental improvements and training	r ₂₅ = (0.10, 0.20, 0.70)
r ₂₆	Society	Sustainability	SS3	Social responsibility standards	r ₂₆ = (0.10, 0.20, 0.70)