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From trade-off to paradox: a configurational theorizing and "quantum" approach to the resilience–sustainability tension in global sourcing

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Abstract

Global sourcing is increasingly caught between two persistent pressures: to be sustainable and resilient. While this relationship is often framed as a trade-off, we draw on paradox theory to conceptualize it as a persistent paradox, especially for MNEs coordinating complex supplier networks. Most paradox research addresses either how tensions are embedded in organizational systems or how they are socially constructed by managers, but rarely both. Drawing on the "quantum" approach to paradox, we bridge these ontological and epistemological perspectives, arguing that the resilience–sustainability tension is rooted in the structure of global sourcing systems and made salient through how managers interpret and combine sourcing decisions. Following a configurational roadmap of three stages—scoping, linking, and naming—we theorize five systemic sourcing factors (location choice, supplier redundancy, inventory buffer, green certification, and the sustainability premium) and examine how they are evaluated by 72 Italian procurement managers through a factorial survey, a fuzzy-set qualitative comparative analysis, and interviews. Managers favor coherent bundles over standalone levers, combining certification-based sustainability assurance alongside resilience-oriented levers such as proximity, redundancy, and buffers. We conceptualize three archetypal sourcing logics—*integrator*, *resilience-first*, and *cost-only*—offering managers a practical vocabulary for framing and legitimating sourcing choices when both pressures collide.

Keywords Global sourcing · Resilience · Sustainability · Trade-off · Paradox theory · Supply chain · Configurational theorizing · Quantum approach · Vignette study · Factorial survey · Qualitative comparative analysis (QCA)

Introduction

In an era of heightened uncertainty and complexity, global sourcing is a balancing act between the twin, persistent pressures of sustainability and resilience. *Sustainability* is conceived as a *goal* and seeks the long-term well-being of economic, social, and environmental systems, serving as a guiding principle for the focal firm—especially multinational enterprises (MNEs)—in the design, management, and orchestration of their supply chains (Doh et al. 2023; Marano et al., 2024). By contrast, *resilience* refers to the *capability* of a system to withstand, adapt to, and recover from disruptions. This includes not only the ability to return to normal operating performance within an acceptable period after a disruption and to continue functioning, but also the capacity to grow and thrive in the face of turbulent change (Dau et al., 2023). While both sustainability and resilience are critical for MNEs' competitive advantage, their relationship is marked by both synergy and tension, as the pursuit of one can mutually reinforce or undermine the other (Cotta,

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Klink, Alten, & Al Madhoon, 2023; Rajesh, 2021). In practical terms, firms are expected to strengthen their operational resilience while lowering their environmental footprint.

Research in international business (IB) and global strategy (GS) has long examined how firms confront competing strategic demands, such as cost reduction vs. local responsiveness (Bartlett & Ghoshal, 1989), cost efficiency vs. flexibility (Kotha, 1995; Salvador et al., 2009), global integration vs. local adaptation (Svensson, 2001), and replication vs. adaptation (Jonsson & Foss, 2011). Building on this tradition, and particularly on recent work that conceptualizes persistent strategic contradictions as paradoxical rather than as simple trade-offs (Amaral, Reinecke, & Etter, 2026; Ambos, Fuchs, & Zimmermann, 2020; Luo & Chi, 2026; Pant & Ramachandran, 2017; Samiee et al., 2024; Tippmann et al., 2023), we treat resilience and sustainability as competing demands embedded in global sourcing systems. While these two demands can at times involve resource trade-offs, reducing their relationship to a binary *either/or* choice overlooks their interdependence and persistence over time. Similar to other core tensions faced by MNEs, the resilience–sustainability tension is not necessarily resolved through prioritization; rather, it may be addressed through configurations that accommodate both demands simultaneously. To capture this dynamic, we frame the resilience–sustainability tension embedded in global sourcing systems through the lens of a *paradox* rather than that of a *trade-off*.

Specifically, *paradox theory* encourages a *both/and* approach to understanding tensions (Miron-Spektor et al., 2018), highlighting how managers can embrace contradictory demands simultaneously rather than seek to resolve them through mutually exclusive choices. However, while there is a consensus around the definition of *paradox* as "persistent contradictions between interdependent elements" (Schad et al., 2016, p. 6), much of the literature on paradoxes remains focused on epistemological issues (i.e., how actors perceive and frame tensions) rather than on seeking an ontological grounding for what generates them (Schad & Bansal, 2018). Furthermore, research into paradoxes differs in how such tensions are conceptualized, as some studies treat paradoxes as inherent features of organizational systems, while others emphasize how they are socially constructed and enacted by organizational actors (Knight & Hahn, 2021).

Building on the "quantum approach" proposed by Hahn and Knight (2021), we position our study between these two perspectives. Specifically, we assume that the resilience–sustainability tension is rooted in the structural characteristics of global sourcing systems, but that its salience and implications depend on how managers interpret and organize interconnected sourcing decisions. We therefore view the resilience–sustainability tension as both embedded in global sourcing systems and shaped through managers' evaluations and sourcing decisions.

This perspective has important theoretical and empirical implications. On the one hand, if the resilience–sustainability tension is embedded in global sourcing systems, it cannot be understood through examining single-supplier sourcing decisions in isolation. Rather, the tension emerges through combinations of interdependent decisions regarding supplier location, redundancy, inventory, and sustainability standards (Cotta et al., 2023; Negri etal., 2021; Rajesh, 2021). Similarly, recent sustainability research calls for a systems-level perspective that can capture how paradoxical tensions unfold across interconnected organizational choices (Carmine & De Marchi, 2023). Likewise, Hahn and Knight (2021) argue that paradoxes become salient through specific organizational configurations rather than through isolated factors alone. For this reason, we adopt a configurational theorizing approach (Furnari et al., 2021; Greckhamer et al., 2018; Misangyi et al., 2017), which shifts attention from individual variables to combinations of conditions that allow us to recognize that different sourcing configurations may represent alternative ways of addressing the resilience–sustainability tension.

On the other hand, because the salience of this resilience–sustainability tension depends on how managers interpret and organize interconnected sourcing decisions, we develop and operationalize our configurational theorizing approach through a three-stage research design: (i) the *scoping* stage, to theorize and test the relevant factors underlying resilience–sustainability tensions; (ii) the *linking* stage, to identify the interdependencies among factors and their collective influence on system dynamics; and (iii) the *naming* stage, to conceptualize and label alternative patterns and managerial strategies to handle the resilience–sustainability tension (Furnari et al., 2021). Empirically, this corresponds to a multi-method approach in which we first zoom out to identify the key interdependent sourcing conditions underlying the resilience–sustainability tension (i.e., *location choice, supplier redundancy, inventory buffer, green certification,* and the *sustainability premium*) and then zoom in through (i) a factorial survey (FS) involving 72 Italian procurement managers to address the *scoping* stage, (ii) a fuzzy-set qualitative comparative analysis (fsQCA) to address the *linking* stage, and (iii) follow-up semi-structured interviews examining how these conditions combine into alternative sourcing configurations, to address the *naming* stage.

Results from the *scoping* stage show a preference for procurement strategies that rely on proximate (i.e., European) over distant (i.e., Asian) suppliers, and on redundancy

over single-supplier sourcing[1], as well as a preference for the decisive role of certification and buffers in managers' evaluations, while sustainability premiums prove to be negligible. Results from the *linking* stage highlight that supplier *green certification* is frequently a core condition in sourcing configurations, and that high-rated sourcing system designs typically rest on bundles that mix *inventory buffer*, proximity in the *location choice*, and *supplier redundancy* as resilience-oriented levers. Lastly, results from the *naming* stage reveal three archetypal approaches—*integrator*, *resilience-first*, and *cost-only*—each representing distinct combinations of sourcing methods that articulate different ways of organizing and justifying the resilience–sustainability tension, thus confirming the configurational logic that emerges from the previous stages.

We believe our study provides a fourfold contribution to the IB and GS literature. Firstly, in theoretical terms, it builds on the tradition in IB and GS of examining competing demands by framing the resilience–sustainability relationship as a paradoxical tension rather than as a trade-off, and it shows three alternative strategic responses to this emerging tension in global sourcing. Secondly, in conceptual terms, it demonstrates the value of the configurational theorizing approach in understanding paradoxical tensions, by integrating the ontological features of global sourcing systems with managers' epistemological evaluations (Schad & Bansal, 2018) and by showing how the resilience–sustainability tension is rooted in structural characteristics and becomes more or less salient depending on how managers evaluate and combine interconnected sourcing decisions (Hahn & Knight, 2021; Knight & Hahn, 2021). Thirdly, in terms of methodology, it integrates FS, fsQCA and semi-structured interviews (a set of methods and combinations that are quite uncommon in IB) to move from theorizing and testing salient levers to identifying and naming configurational "recipes" (Auspurg & Hinz, 2015; Fainshmidt et al., 2020; Furnari et al., 2021). Fourthly, in practical terms, it shows how procurement managers evaluate and justify the resilience–sustainability tension in global sourcing decisions by revealing a preference for designs that are bundle-based and by uncovering alternative archetypal approaches that organize these preferences (i.e., *integrator*, *resilience-first*, and *cost-only*).

[1] As our sample consists of Italian procurement managers, the preference for European suppliers over Asian suppliers is likely to reflect familiarity and geographic proximity, which can influence managers' perceptions of supply chain visibility, coordination, and risk exposure.

Theoretical framework

MNEs and conflicting demands in international business and global strategy

A central concern of IB and GS research is how MNEs operate in competitive, dynamic, and heterogeneous environments (Tippmann et al., 2023). A consistent insight that emerges across this literature is that MNEs face multiple, persistent, and often conflicting strategic demands (Luo & Chi, 2026; Samiee et al., 2024; Tallman & Cuervo-Cazurra, 2021; Tippmann et al., 2023). While early work often framed these challenges in terms of *either/or*, a substantial body of research shows that MNEs frequently pursue competing demands simultaneously. Classic examples include the *transnational* strategy, which reconciles cost efficiency with local responsiveness (Bartlett & Ghoshal, 1989); *mass customization*, which combines efficiency and flexibility (Kotha, 1995; Salvador et al., 2009); and strategies such as *glocalization* and *flexible replication*, which integrate global standardization with local adaptation (Jonsson & Foss, 2011; Svensson, 2001).

These tensions are inherent in multinational enterprise activity. Because MNEs span countries, markets, and institutional contexts, they need to coordinate interdependent decisions across both headquarters and geographically dispersed units, under conditions of heterogeneity and uneven risk exposure. As Prahalad and Doz (1987) argue, such tensions are not only stronger than in domestic firms but are also highly context-dependent, as different units within the same MNE will face distinct combinations of pressures that resist simple either/or classification. Consequently, tensions that may be locally manageable in domestic settings become persistent and systemic in MNEs, reflecting both market trade-offs and the challenges of coordinating cross-border organizational systems.

Recent IB, GS, and managerial research has increasingly conceptualized these enduring contradictions as paradoxes rather than as trade-offs. For instance, Tippmann et al. (2023) describe the tension between entrepreneurship and replication in digital MNEs as a paradox addressed through "replicable innovation", while Samiee et al. (2024) highlight how firms simultaneously manage multiple country-of-origin effects. More recently, Amaral et al. (2026) showed that managing competing sustainability demands can generate an integration–differentiation paradox that complicates organizational implementation, while Luo and Chi (2026), drawing on the ambidextrous culture of MNEs to navigate paradoxical demands, argued that firms must simultaneously pursue resilience and growth through what they term *resilience duality*, an integrated capability that combines risk containment and opportunity pursuit as mutually reinforcing

rather than competing objectives. However, these studies have focused on either sustainability- or resilience-related paradoxes, without examining the tension that emerges from pursuing both objectives simultaneously.

Our study builds on and advances this research by focusing on a different, but increasingly relevant, conflicting demand faced by MNEs: the (re)configuration of global sourcing strategies under the simultaneous pressures of resilience and sustainability (Cotta et al., 2023; Rajesh, 2021). While neither resilience nor sustainability is a concern that is exclusive to multinational firms, their joint addressing becomes particularly acute in MNEs, as this tension emerges from MNEs' exposure to global disruptions, geopolitical instability, and escalating environmental expectations. Crucially, these pressures are particularly salient in cross-border settings, as they are amplified by managing country-spanning supplier networks with different risk profiles, regulatory regimes and sustainability standards, and by coordinating sourcing decisions across headquarters and geographically dispersed units. In this sense, the multinational nature of the firm acts as a property that amplifies and transforms a potentially episodic trade-off into a complex, persistent, and system-level paradoxical tension that involves multiple, global sourcing decisions rather than being confined to a single, local-versus-global sourcing decision (George & Oh, 2026; Larsen, Birkinshaw, Zhou, & Benito, 2023).

We therefore adopt paradox theory as a guiding lens to examine how managers of MNEs navigate this tension (Amaral et al, 2026; Luo & Chi, 2026; Samiee et al., 2024; Tippmann et al., 2023). This managerial perspective is consistent with recent calls for a microfoundational approach in IB research that links firm-level outcomes to the decisions and actions of specific individuals in MNEs (Santangelo et al., 2025)[2]. The core intuition we reach is that managers in MNEs are not simply forced to choose between resilience and sustainability, but can instead address both simultaneously through specific configurations of global sourcing decisions, echoing earlier IB and GS work on how MNEs pursue competing demands simultaneously. In arriving at this intuition, we identify and compare alternative global sourcing configurations, i.e., those that integrate both resilience and sustainability and those that prioritize one demand over the other, capturing the range of strategic responses available to managers in MNEs facing this tension.

[2] As explained in the empirical section, we will specifically focus on procurement managers, as they are the primary decision-makers responsible for global sourcing choices within MNEs.

From trade-off to a "quantum" perspective of paradox: Towards a systemic and configurational approach

Paradox theory has emerged as a useful framework for examining how managers in MNEs navigate contradictory yet interdependent demands, as an alternative and complement to trade-off logic (Luo & Chi, 2026; Samiee et al., 2024; Tippmann et al., 2023). While trade-off logic assumes that managers must choose between competing objectives, it also emphasizes how they can manage persistent tensions without resolving them through exclusion (Smith & Lewis, 2011). Such tensions may generate creativity and strategic renewal, but they may also lead to anxiety, paralysis, and suboptimal decision-making (Lewis, 2000; Pradies et al., 2021: 160-161). While some managers respond through an *either/or* logic, others adopt a *both/and* mindset that seeks integrative responses to competing demands (Miron-Spektor et al., 2018).

However, much paradox research remains primarily focused on the epistemological dimension of tensions, namely how actors perceive, frame, and make sense of contradictions, rather than on the ontological conditions that generate and sustain those contradictions (Schad & Bansal, 2018). This broader debate is reflected in different ways of conceptualizing paradoxes. The *inherent* perspective treats paradoxes as being embedded in organizational systems, whereas the *constitutive* perspective emphasizes how paradoxes are socially constructed and enacted by organizational actors (Knight & Hahn, 2021).

Building on the "quantum approach" proposed by Hahn and Knight (2021), we position our study between these two perspectives. Specifically, we assume that the resilience–sustainability tension is rooted in the structural characteristics of global sourcing systems, but that the salience of that tension depends on how managers interpret and organize interconnected sourcing decisions.

At the system level, this approach is particularly well suited to tackling "wicked problems" such as climate change, geopolitical instability, and supply chain vulnerability, which feed into the resilience–sustainability tension through complex interdependence, causal ambiguity, and evolving system dynamics (Ferraro et al., 2015; George et al., 2016). This tension is even more pronounced for MNEs, as they operate across heterogeneous environments where they are embedded in interdependent networks and are exposed to diverse risks. In such contexts, tensions rarely emerge from isolated organizational choices alone, but rather from interactions among multiple interconnected factors within a system. Recent paradox research, therefore, increasingly calls for a *systemic approach* that can capture how tensions unfold across interconnected organizational

choices and levels of analysis (Carmine & De Marchi, 2023; Schad & Bansal, 2018).

Likewise, Hahn and Knight (2021) argue that paradoxes become salient through organizational configurations, i.e., depending on how organizational actors interpret and organize multiple interconnected factors within a broader system. Accordingly, we complement paradox theory with the *configurational theorizing* approach (Furnari et al., 2021), which explicitly addresses causal complexity by focusing on how combinations of factors jointly shape an outcome (Misangyi et al., 2017). In our study, this is done by examining how sourcing factors (such as supplier location, redundancy, inventory buffers, and sustainability standards) interact with one another in shaping managers' evaluations of sourcing strategies, with the aim of detecting *conjunctural causality* and *equifinality* among these factors. The former implies that the effect of each sourcing factor depends on how it combines with the other factors, while the latter implies that different configurations may represent alternative ways that managers can address the resilience–sustainability tension (Furnari et al., 2021).

To conceptualize and operationalize the resilience–sustainability paradox as simultaneously embedded in global sourcing systems and shaped through managerial enactment, we first *zoom out* to elevate the level of analysis and reveal broader system interdependencies and recurring tensions, and then z*oom in* to identify the dominant factors and interactions through which tensions become salient in practice (Schad & Bansal, 2018). Accordingly, we build on the *configurational theorizing* approach and proceed through three stages: (i) the *scoping* stage, which identifies the relevant global sourcing system factors; (ii) the *linking* stage, which examines how these factors interact; and (iii) the *naming* stage, which identifies and labels recurring managerial patterns (Furnari et al., 2021). To do this, we first theorize the key sourcing factors underlying this tension and use an FS involving 72 Italian procurement managers to identify which factors are most salient in managers' evaluations, i.e., which factors address the *scoping* stage. We then use fsQCA to identify configurations of sourcing factors associated with the managers' evaluations and to capture conjunctural causality and equifinality among these factors, thus addressing the *linking* stage. Lastly, we use follow-up semi-structured interviews to interpret and label the resulting sourcing configurations in the *naming* stage.

Theoretical scoping: The resilience–sustainability tension in global sourcing

Building on the theoretical foundations outlined above, we first adopt a *zooming-out* strategy to identify the core systemic factors underlying the resilience–sustainability tension in global sourcing strategies. This section represents the theoretical component of the *scoping* stage of our configurational theorizing approach (Furnari et al., 2021) and aims to map the structural elements that give rise to tensions between the two objectives.

Any theoretical abstraction, however, necessarily entails setting boundaries, and thus it will yield only a partial representation of a broader decision space. In the present study, drawing on the supply chain resilience and sustainability literature (e.g., Cotta et al., 2023; Jiang, Jia, Blome, & Chen, 2020; Negri et al., 2021; Rajesh, 2021), we therefore identify five key interdependent "decision areas" or factors—*location choice, supplier redundancy, inventory buffer, green certification,* and *sustainability premium*—that shape the manifestation of this paradox in global sourcing strategies. These systemic factors do not constitute the complete set of elements weighted by managers involved in global sourcing, but they do represent a parsimonious selection guided by three complementary criteria.

Firstly, the five systemic factors collectively span some of the most relevant distinct domains of global sourcing system design, namely the geographic, relational, operational, governance, and financial dimensions (e.g., Jiang et al., 2020), which we respectively associate with *location choice*, *supplier redundancy*, *inventory buffer*, *green certification*, and *sustainability premium*. Secondly, each systemic factor is a structural, decision-controllable lever, that is, it is a design choice that firms can actively manipulate rather than an exogenous condition. This is a requirement for configurational analysis, which focuses on how firms design systems rather than on how they respond to external constraints (Furnari et al., 2021; Greckhamer et al., 2018). Thirdly, each systemic factor is repeatedly and independently identified in the supply chain resilience and sustainability literature as a locus where the tension between the two objectives emerges, ensuring that the selection is firmly grounded in prior theoretical and empirical work, and is not made ad hoc (e.g., Cotta et al., 2023; Negri et al., 2021; Rajesh, 2021). At the same time, the five systemic factors constitute a parsimonious yet sufficiently broad architecture within which the resilience–sustainability paradox can manifest across multiple system dimensions (Furnari et al., 2021; Greckhamer et al., 2018; Siggelkow, 2011). Individually, each factor activates a specific paradoxical mechanism, reinforcing one pole of the tension while potentially constraining the other. Collectively, however, their interaction structures the sourcing configurations through which the resilience–sustainability paradox manifests and is either amplified or mitigated[3].

[3] These factors also remain sufficiently concrete and decision-controllable to be operationalized transparently through vignette forms within the factorial survey methodology employed in the second part of the *scoping* stage (Atzmüller & Steiner, 2010; Auspurg & Hinz, 2015). Accordingly, although the choice of the factors was also partly driven by practical considerations related to survey operationaliza-

The first systemic factor concerns an important geographic dimension of global sourcing, i.e., the *location choice* of the main supplier, the paradoxical mechanism of which lies in the tension between proximate and distant sourcing. Proximate sourcing can reduce transport-related emissions, strengthen visibility and responsiveness, and facilitate collaborative supplier relationships, thus potentially supporting both sustainability and resilience (Cotta et al., 2023). However, this alignment is context-dependent: proximate suppliers may still be vulnerable to regional disruptions, while distant suppliers may provide greater flexibility or cost advantages (Choudhary, Ramkumar, Schoenherr, Rana, & Dwivedi, 2022; Negri et al., 2021; Tate, Ellram, Schoenherr, & Petersen, 2014).

The second systemic factor concerns a relational dimension of global sourcing, i.e., *supplier redundancy*, defining whether firms rely on a single supplier or maintain multiple backup suppliers. The paradoxical mechanism stems from the tension between concentration and diversification. Single-supplier sourcing can simplify coordination, reduce transaction costs, enable scale economies, and foster long-term supplier relationships that support sustainability goals (Cotta et al., 2023). However, reliance on a single supplier also concentrates risk and increases vulnerability to disruptions (Rajesh, 2021). Conversely, multiple-supplier sourcing strengthens resilience through redundancy and substitution flexibility (Christopher & Peck, 2004; Karutz, Riedner, Vega, Stumpf, & Damert, 2018), but may also increase emissions, complicate traceability, and weaken sustainability monitoring (Ivanov, 2018).

The third systemic factor concerns a specific operational dimension of global sourcing, i.e., *inventory buffers*. Here, the paradoxical mechanism lies in the tension between operational security and resource efficiency. Inventory stockpiles reinforce resilience by protecting operations from supply disruptions (Ivanov, 2018), yet maintaining inventory stockpiles also generates environmental and resource costs, including storage energy use, waste, and obsolescence risks (Karutz et al., 2018). Although firms may strategically design buffers to partially align resilience and sustainability objectives, such alignment is not always feasible.

The fourth systemic factor concerns *green certification*, which represents one of the main mechanisms through which firms govern supplier involvement and collaboration within global sourcing systems. The paradoxical mechanism stems from the tension between maintaining an open supplier pool and restricting sourcing to certified suppliers. Certification reduces information asymmetries and stabilizes supplier relationships by credibly signaling compliance with environmental and social standards (Goebel, Reuter, Pibernik, Sichtmann, & Bals, 2018). However, restricting sourcing to certified suppliers may simultaneously reduce sourcing flexibility and adaptive capacity in the event of disruption (Cotta et al., 2023).

The fifth systemic factor concerns the willingness of the buying firm to absorb a *sustainability premium* in the price of the purchased component, which may affect the financial dimensions of a global sourcing system. The paradoxical mechanism lies in the tension between short-term cost minimization and long-term investment. Buyers may accept higher prices in order to support environmental improvements such as low-carbon logistics, recycled materials, or the adoption of renewable energy sources. While such investments may temporarily reduce financial slack and resilience (Negri et al., 2021), they may also stimulate supplier innovation, strengthen supplier relationships, and create long-term value (Goebel et al., 2018; Hahn, Figge, Pinkse, & Preuss, 2018). The paradox in this dimension, therefore, unfolds across temporal horizons, as short-term constraints may coexist with longer-term opportunities to reinforce both resilience and sustainability.

Table 1 summarizes the paradoxical mechanisms associated with each global sourcing factor and their effects on resilience and sustainability.

As these five factors are theorized as interdependent system elements, their implications are not expected to be additive. The theoretical basis for this expectation lies in both systemic and configurational logic. From a systems perspective (Schad & Bansal, 2018; Siggelkow, 2011), the factors are not parallel levers that independently contribute to resilience or sustainability; rather, they are structurally coupled, meaning that the paradoxical consequence of activating one depends on the state of the others.

From a configurational perspective (Furnari et al., 2021; Greckhamer et al., 2018), this coupling takes three principal forms. In a first form, factors can act as complements, where the presence of one amplifies the effect of another on either resilience or sustainability; for instance, *green certification* combined with a *sustainability premium* reinforces sustainability assurance beyond what either achieves alone. In a second form, factors can act as substitutes or create tensions, where strengthening one objective through one factor may be offset or undermined by another factor. For instance, restricting sourcing to suppliers with *green certification* may reduce the pool of eligible suppliers, thereby limiting the effectiveness of *supplier redundancy* as a resilience mechanism during disruptions. These complementarity- and tension-generating dynamics mean that the resilience–sustainability paradox does not reside in any single factor but rather emerges from, and is shaped by, the overall configuration. A possible third form is partial alignment, where a factor simultaneously advances both objectives under specific

Footnote 3 (Continued)

tion, it remained theory-driven and grounded in the global sourcing literature and in the resilience and sustainability literature.

Table 1 The paradoxical mechanisms of the five global sourcing factors and their effects on resilience and sustainability

Global sourcing factor	Paradoxical mechanism	Effects on resilience	Effects on sustainability
Location choice	Proximity vs. distant sourcing	Access to local suppliers reduces international exposure, but also limits sourcing flexibility and substitution options provided by global suppliers, especially when local suppliers are disrupted	Proximate sourcing reduces transport emissions, improves supply chain visibility, and facilitates closer collaboration and monitoring of suppliers' sustainability practices
Supplier redundancy	Diversification vs. concentration	Multiple-supplier sourcing increases redundancy and adaptive capacity by allowing firms to substitute suppliers during disruptions	Single-supplier sourcing fosters relational depth, improving coordination, traceability, and sustainability monitoring while reducing transaction and resource fragmentation
Inventory buffers	Inventory stockpiles vs. resource efficiency	Inventory stockpiles decouple operations from supply shocks and maintain production continuity during disruptions	Lower inventory levels reduce resource consumption, storage energy use, waste, and obsolescence risks
Green certification	Open supplier pool vs. certified sourcing	Maintaining a broader supplier pool without relying on certifications increases sourcing flexibility and allows rapid substitution when disruptions occur	Certification credibly ensures supplier compliance with environmental and social standards and reduces monitoring uncertainty
Sustainability premium	Short-term cost minimization vs. long-term investment	Preserving financial slack strengthens resilience by maintaining the firm's ability to absorb shocks and respond to disruptions in the short term	Paying a sustainability premium enables environmental investments, supplier innovation, and long-term sustainability improvements

conditions (as a proximity-based *location choice* can do when it reduces transport emissions while also improving supply chain visibility), but this alignment is contingent and may be undermined by other factors in the bundle, such as the absence of *supplier redundancy*.

Hence, different combinations may amplify, attenuate, or reconfigure the tension depending on the surrounding bundle, thus motivating a conjunctural analysis of their linkages (Furnari et al., 2021; Greckhamer et al., 2018; Misangyi et al., 2017). The analysis of equifinality is likewise relevant because distinct combinations of *location choice*, *supplier redundancy*, *inventory buffer*, *green certification* and *sustainability premium* may represent alternative ways of organizing the same underlying tension without implying a single, universally preferred sourcing strategy design (Fainshmidt et al., 2020; Furnari et al., 2021). Two questions, therefore, become particularly relevant, i.e. which factors are most salient in managers' evaluations of sourcing strategies, and how do these factors combine into configurations that amplify or mitigate the tension. These questions provide the basis for the empirical analysis that follows.

Empirical setting

Methodology

In line with the "quantum" approach (Hahn & Knight, 2021; Knight & Hahn, 2021), we conducted a data collection campaign with the goal of identifying the most salient factors and configurations of the system under which the resilience–sustainability tension is amplified or mitigated, depending on how managers interpret different global sourcing scenarios that reflect different combinations of the five factors.

To do this, we adopted a multi-method empirical test design structured around three sequential steps, each corresponding to a stage in our configurational framework, i.e., *scoping, linking,* and *naming* (Furnari et al., 2021). Firstly, a factorial survey (FS) experiment was used to complement the theoretical side of the *scoping* stage and assess which individual sourcing factors procurement managers consider to be salient when evaluating strategies that involve resilience and sustainability objectives. Secondly, a fuzzy-set qualitative comparative analysis (fsQCA) was used in the *linking* stage to examine how these factors combine into configurations associated with high managerial willingness to adopt a sourcing strategy. Thirdly, follow-up semi-structured interviews were conducted to interpret the emergent configurational patterns and uncover the underlying decision logics, addressing the *naming* stage. Together, these methods progressed from assessing factor salience to identifying causal combinations and, finally, to developing interpretive

archetypes, so operationalizing the *zoom-out* to *zoom-in* logic of our theoretical framework (Schad & Bansal, 2018).

The first step of our *zooming-in* process consisted, therefore, of a FS experimental design, which constituted *empirical scoping*, following the *theoretical scoping* mentioned above, through which the salience of theorized systemic factors for managers was assessed. This approach enabled the construction and administration of vignettes, simulating realistic procurement decisions (Atzmüller & Steiner, 2010) in which resilience and sustainability co-occurred. This is because, by combining an orthogonal experimental design with a survey format, FS supports both internal and external validity (Auspurg & Hinz, 2015). Hence, FS identifies which factors and levels materially shape evaluations (and which appear negligible), thus thinning and prioritizing the factor space for configurational analysis. Conceptually, this approach takes an initial step—from *zooming-out* to *zooming-in*—from an ontological mapping of systemic properties to a more epistemological understanding of how managers perceive and enact those properties in practice (Schad & Bansal, 2018).

The flexibility of this method also reduces social desirability bias, enhancing the reliability of data on sensitive topics (Steiner, Atzmüller, & Su, 2016) such as resilience and sustainability. It enables participants to evaluate multiple scenarios by altering dimensions within the vignettes (i.e., *factors*), thus measuring the influence of different variables of the factors, defined as *levels*, on their decisions (Auspurg & Hinz, 2015).

In this study, the vignettes illustrated global procurement (i.e., sourcing) strategies implemented by a generic manufacturing MNE based in Italy. Procurement was chosen since it is an ideal context for exploring the management of the tension between resilience and sustainability, due to its dual role in securing continuous supply and minimizing environmental impact (Hallikas, Lintukangas, & Kähkönen, 2020; Negri et al., 2021). The advantage of this method lies in its capacity to test theoretical assumptions against practical outcomes, particularly in areas like procurement, where resilience and sustainability may conflict (Eckerd, DuHadway, Bendoly, Carter, & Kaufmann, 2020). This is because, by focusing on individual managerial decision-making rather than organizational behavior, FS can reveal underlying attitudes and intentions (Eckerd, 2016).

The strategies presented in the vignettes focused on sourcing a strategic component classified as *high-profit impact* and *high-supply risk*, according to the Kraljic Matrix (Kraljic, 1983). To define the vignettes and the survey and ensure the study's validity, we conducted a preliminary pilot study with ten procurement managers who did not participate in the main study (see Supplementary Appendix 1.1 for more details). The main study specifically targeted procurement managers employed by MNEs operating within the manufacturing sector in Italy. Several considerations guided this choice.

Firstly, Italy provides a strong context for examining global sourcing strategies: in 2025, manufacturing generated 80% of goods exports, and Italy ranked fifth worldwide among goods exporters and ninth among importers (Istituto Nazionale di Statistica [Istat], 2026). This makes Italy a representative and strategic context for examining industrial procurement dynamics in advanced economies. Secondly, restricting the study to a single regulatory, cultural, and economic context allows control over cross-country institutional heterogeneity (such as variations in public procurement law and dispute resolution norms) that could confound managers' evaluations. Thirdly, the Italian manufacturing sector spans multiple subsectors (e.g., automotive, machinery, pharmaceuticals) common across Europe, making our findings likely generalizable to broader European contexts. Furthermore, MNEs significantly influence the landscape of the Italian economy, generating over 75% of manufacturing exports and over 70% of manufacturing export-import flows with Italy's top ten trade partners, providing fertile terrain for investigating procurement evaluations involving strategic inputs (Istituto Nazionale di Statistica [Istat], 2026).

Data collection

The data were collected between February and June 2024, following a systematic sampling and verification procedure that was designed to ensure a high-quality respondent pool. Participants were initially identified through professional directories, industry associations, and corporate websites. An initial sample of 195 managers underwent a multi-stage screening process, including role verification, cross-checking of details with publicly available information, and monitoring for low-quality responses. Participants who failed these checks were excluded from the sample. Of the 195 managers contacted, 109 completed the study. After excluding 23 incomplete responses and 14 that failed to meet the inclusion criteria (e.g., insufficient experience, not employed by MNEs, central tendency bias in responses), the final sample included 72 procurement managers with complete, high-quality data. For an overview of the multi-stage screening process, see Supplementary Appendix 1.1.

Variables

Dependent variable. The managers evaluated each vignette by responding to the question "*Would you adopt this purchasing strategy?*" using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). This five-point assessment, termed *vignette evaluation,* represents the dependent variable of our analysis and assumes values from



1 to 5. It quantifies managers' judgments of the strategy presented in each scenario.

Independent variables. The vignettes describe realistic procurement scenarios for a strategic component, from which both resilience and sustainability objectives emerge. The independent variables in our analysis are defined as *factors*, and correspond to the five key global sourcing factors identified earlier. Each factor includes two or three *levels*, representing specific options or categories assigned to that factor (Auspurg & Hinz, 2015). The final structure of each vignette is a presentation of one level from each of the five factors.

The first factor in our vignettes is *location choice* (A), which reflects the location of the main supplier of the strategic component, with options (levels) including Asia, Europe (excluding Italy), and Italy. The second factor is *supplier redundancy* (B), which focuses on the approach to sourcing the strategic component, with levels including single-supplier sourcing, backup supplier in Europe, or backup supplier in Asia. The third factor is *inventory buffer* (C), which considers the presence or absence of an inventory buffer for the strategic component. The fourth factor is *green certification* (D), which concerns whether the main supplier holds a recognized third-party environmental certification (e.g., ISO 14001). The fifth, and last, factor of the vignettes is the *sustainability premium* (E), which addresses whether the quoted unit price includes additional spending on concrete environmental actions (e.g., low-carbon transport/fuels, recycled or low-carbon materials). The specific levels for each factor are presented in Table 2.

Table 2 Factors and levels of the vignettes

Factors	Levels
A. Location choice	A1: Europe (excluding Italy) A2: Asia A3: Italy
B. Supplier redundancy	B1: Single-supplier sourcing B2: Backup supplier in Europe B3: Backup supplier in Asia
C. Inventory buffer	C1: Present C2: Absent
D. Green certification	D1: Certified D2: Not certified
E. Sustainability premium	E1: Included E2: Not included

Final sample, descriptive statistics, and econometric model

Each manager received pre-assessment information (Fig. 1) to standardize the understanding and evaluation basis. To mitigate respondent fatigue while maintaining response comparability, the vignettes were divided into six sets of 12 (Su & Steiner, 2018). Further details on the construction and randomization of the vignette sets (Auspurg & Hinz, 2015; Steiner et al., 2016; Su & Steiner, 2018) are provided in Supplementary Appendix 1.2.

Accordingly, the full factorial design resulted in 72 unique vignettes ($3 \times 3 \times 2 \times 2 \times 2$), each representing a unique scenario (an example of a vignette is given in Fig. 2). Each manager was randomly assigned to a set of 12 vignettes and received comprehensive pre-assessment information to standardize the understanding of the vignettes and the evaluation process. This design generated 864 independent evaluations (72 managers × 12 vignettes per set), with each vignette rated by 12 managers.

Table 3 presents a summary of the respondents' managerial characteristics, detailing frequencies and distributions of basic characteristics such as *position*, *gender*, *education level*, and *background*. In particular, *background homogeneity* distinguishes managers who have primarily worked within a single sector (*homogeneous*) from those with cross-sector experience (*heterogeneous*). Additionally, *inter-firm mobility* classifies respondents as having worked in three

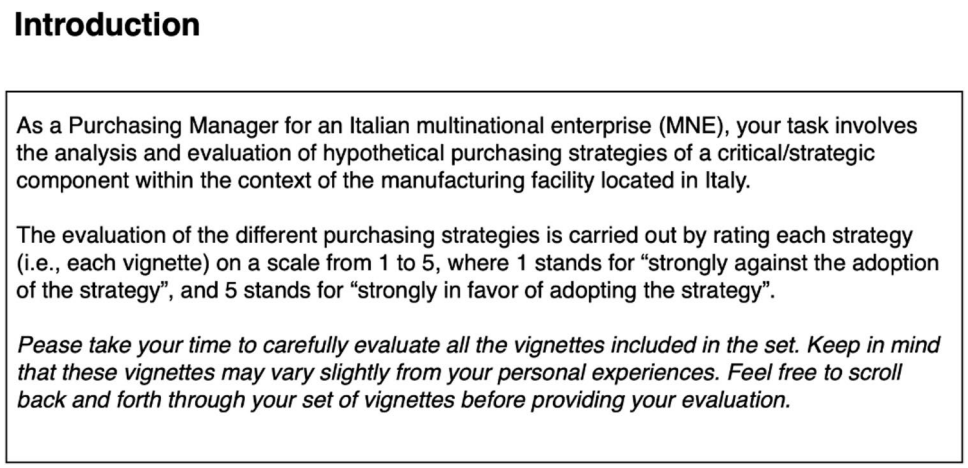


Fig. 1 Introductory section shown before each vignette set

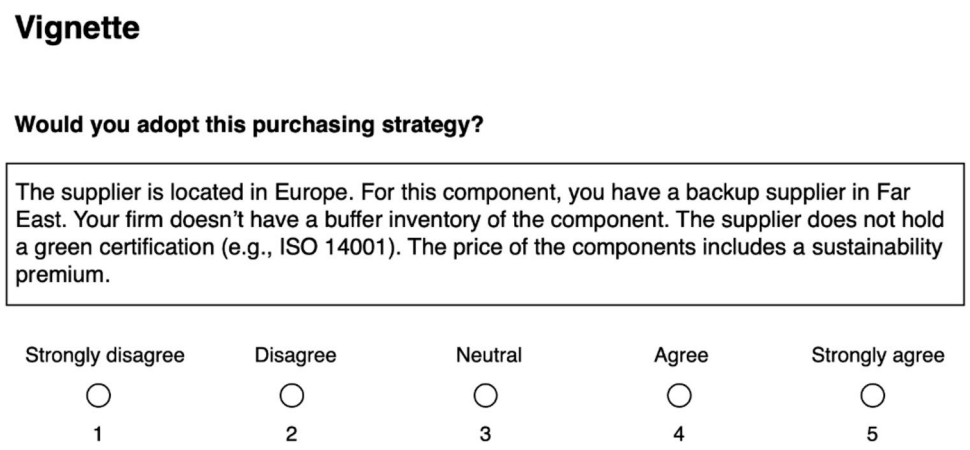


Fig. 2 Example vignette of a procurement strategy for selecting the supplier of a strategic component

Table 3 Descriptive statistics of managers ($N = 72$)

	Frequency	%
Position		
Manager	32	44.44%
C-Level	40	55.56%
Gender		
Male	58	80.56%
Female	14	19.44%
Education		
Basic (Diploma or Bachelor's Degree)	14	19.44%
Advanced (Master's or Doctoral Degree)	58	80.56%
Background homogeneity		
Heterogeneous (different sector)	32	44.44%
Homogeneous (same sector)	40	55.56%
Inter-firm mobility		
Lower mobility (≤ 3 companies)	34	47.22%
Higher mobility (> 3 companies)	38	52.78%

or fewer companies (*lower mobility*) or in more than three companies (*higher mobility*).

Given the ordinal nature of the dependent variable, we adopted an *ordinal logistic mixed-effects regression model* to analyze the data, with standard errors clustered at the respondent level to adjust for within-respondent correlation (Atzmüller & Steiner, 2010; Su & Steiner, 2018). Further methodological details are provided in Supplementary Appendix 1.3. Table 4 provides a summary of the descriptive statistics for the six sets, detailing the number of observations, distribution characteristics, and a breakdown of the response frequencies for each evaluation score.

Table 4 Descriptive statistics (sets)

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Total
Observations	144	144	144	144	144	144	864
Vignette evaluation: 1	29 (20.14%)	25 (17.36%)	17 (11.81%)	6 (4.17%)	10 (6.94%)	21 (14.58%)	108 (12.50%)
Vignette evaluation: 2	32 (22.22%)	28 (19.44%)	57 (39.58%)	42 (29.17%)	52 36.11%)	40 (27.78%)	251 (29.07%)
Vignette evaluation: 3	24 (16.67%)	28 (19.44%)	22 (15.28%)	23 (15.97%)	27 (18.75%)	33 (22.92%)	157 (18.15%)
Vignette evaluation: 4	46 (31.94%)	44 (30.56%)	41 (28.47%)	64 (44.44%)	41 (28.47%)	37 (25.69%)	273 (31.57%)
Vignette evaluation: 5	13 (9.03%)	19 (13.19%)	7 (4.86%)	9 (6.25%)	14 (9.72%)	13 (9.03%)	75 (8.64%)
Mean	2.875	3.028	2.750	3.194	2.979	2.868	2.949
Std. Dev	1.3056	1.3166	1.1374	1.0596	1.1495	1.2133	1.205
Variance	1.704	1.733	1.294	1.123	1.321	1.472	1.453
Skewness	– 0.070	– 0.162	0.215	– 0.287	0.152	0.065	– 0.033
Kurtosis	1.735	1.829	1.923	1.940	1.933	1.975	1.881
25th percentile	2	2	2	2	2	2	2
Median (50th percentile)	3	3	2	4	3	3	3
75th percentile	4	4	4	4	4	4	4

Results

Scoping stage: Empirical scoping results

Consistent with our "quantum" approach and the configurational roadmap, our results serve as an "*empirical scoping*" device. Following on from the *zooming-out* step that mapped the five systemic factors, the FS analysis examines which factors managers consider salient when evaluating sourcing strategies. Put differently, the FS analysis converts the ontological system-level account of the resilience–sustainability tension into epistemological evidence of enacted decision logics, a first step towards *zooming-in* on managerial evaluation. The results of the econometric estimations run after the FS analysis are presented in the *base model* shown in Table 5.

The *base model* examines the main effects of the five key factors on the final evaluation of the vignettes. The findings indicate that, in terms of *location choice* (A), Italian managers are significantly less likely to choose a sourcing strategy based in Asia (A2) compared to Europe. By contrast, sourcing from Italy (A3) does not show a statistically significant impact compared to sourcing from other European locations. Turning to *supplier redundancy* (B), the results show that managers prefer to include a backup supplier—either in Europe (B2) or Asia (B3)—over single-supplier sourcing (B1). This suggests an amplified focus on risk mitigation and flexibility when sourcing strategic components. The presence of an *inventory buffer* (C) plays a critical role in sourcing strategy selection. Managers are significantly less likely to adopt strategies that do not include a buffer (C2). Similarly, *green certification* (D) strongly influences preferences, with strategies involving non-certified suppliers (D2) being favored considerably less. In contrast, the inclusion or exclusion of a *sustainability premium* (E1/E2) does not significantly affect managers' choices, indicating that cost considerations relating to sustainability may not be a primary determining factor in their decision-making.

Linking stage: Configurational patterns in global sourcing

To move from the analysis of factor salience in the *scoping* stage to the identification of causal configurations in the *linking* stage, we apply fsQCA, which allows us to examine how these factors combine into alternative sourcing designs associated with high *adoption attractiveness*, that is, high managerial willingness to adopt the strategy. In practical terms, the analysis asks whether different bundles of *location choice* (factor A), *supplier redundancy* (B), *inventory buffer* (C), *green certification* (D) and *sustainability premium* (E)

Table 5 Ordinal logistic mixed-effects regression model (base model)

	Base model
Vignette set	
Set 1—ref.	
Set 2	0.275 (0.313)
Set 3	– 0.194 (0.262)
Set 4	0.595 [0.019] (0.254)
Set 5	0.187 (0.234)
Set 6	0.021 (0.237)
A: Location choice	
A1 (Europe)—ref.	
A2 (Asia)	– 0.605 [0.000] (0.131)
A3 (Italy)	0.096 (0.104)
B: Supplier redundancy	
B1 (Single-supplier sourcing)—ref.	
B2 (Backup supplier in Europe)	1.265 [0.000] (0.184)
B3 (Backup supplier in Asia)	0.669 [0.000] (0.141)
C: Inventory buffer	
C1 (Buffer)—ref.	
C2 (No buffer)	– 1.031 [0.000] (0.168)
D: Green certification	
D1 (Green certification)—ref.	
D2 (No green certification)	– 1.753 [0.000] (0.190)
E: Sustainability premium	
E1 (Sustainability premium)—ref.	
E2 (No Sustainability premium)	– 0.055 (0.186)
Thresholds (cut points)	
/cut1	– 3.252 (0.290)
/cut2	– 1.244 (0.235)
/cut3	– 0.271 (0.241)
/cut4	2.132 (0.264)
Random effects	
var(_cons)	0.095 (0.071)
Model statistics	
Number of observations	864
Number of respondents	72
Wald $chi^2(df)$	178.20 (12)
Prob > chi^2	[0.000]
Intraclass correlation coefficient (ICC)	0.028 (0.020)

(i) Coefficients are log-odds for higher response categories. Standard errors (s.e.) are given in parentheses. Reference categories are indicated by (ref.), ensuring that the estimated coefficients can be understood as contrasts relative to these baseline levels. We report exact *p* values for the significant coefficients. Wald Chi2 (df): Wald chi-squared statistic with degrees of freedom in parentheses; (ii) The *intraclass correlation coefficient* (ICC) remains low (below 10%), suggesting that while individual-level heterogeneity among respondents is not negligible, most of the variation in vignette evaluations stems from how each manager responds to different scenarios. This supports the use of mixed-effects modeling, as it captures both respondent-level variability and within-respondent consistency in judgments

Table 6 Model B (relaxed proximity anchors). Metrics: consistency (Con.) = 0.860, coverage (Cov.) = 0.696, PRI = 0.823

Path	Interpretation	Location choice	Regional redundancy (EU)	Distant redundancy (Asia)	Inventory buffer	Green certification	Sustainability premium	Con.	Cov.
1	Regional backup with a certified core is a lean sufficient recipe when proximity is not required		●	□		●		0.90	0.31
2	Exploratory configuration		□	●		●	●	*0.76*	*0.13*
3	Sufficient without a regional backup: buffers + certified core, with no sustainability premium		□		●	●	⊗	0.83	0.14
4	Non-proximate network: distant backup plus buffers; sufficiency holds even with a premium price	⊗	□	●	●		●	0.91	0.06
5	Non-proximate (i.e., Asia) core supported by regional backup and buffers; sufficiency when no premium is charged	⊗	●	□	●		⊗	0.99	0.07
6a	Proximity + buffers + certification remain a robust route	●	□		●	●		0.97	0.20
6b	Equifinal to 6a with the alternative redundancy split	●		□	●	●		0.97	0.20

Note. Rows below the a priori sufficiency thresholds (consistency < 0.80 or PRI < 0.75) are reported only as "exploratory". 6a/6b are logically equifinal variants in the intermediate solution (alternative redundancy splits, Europe vs. Asia), both collapsing into the same parsimonious recipe

Condition mapping. location choice (supplier proximity) = A ∈ {Italy, Europe excl. Italy}; regional redundancy (EU) = B2 present; distant redundancy (Asia) = B3 present; inventory buffer = C1 present; green certification = D1 present; sustainability premium = E1 present

Legend. ● core presence; ○ peripheral presence; ⊗ core absence; □ peripheral absence; blank = irrelevant. Core vs. peripheral assignment follows the comparison of *intermediate vs. parsimonious* solutions

are sufficiently attractive for managers to favorably evaluate a sourcing strategy.

We estimate two *factor-level* models that retain the conditions of the FS. Model A uses a more anchored calibration of *location choice* (*supplier proximity*, factor A), while model B relaxes these anchors. To keep the main discussion focused on the substantive configurational patterns, we report the relaxed-anchor model in Table 6, while the full calibration procedure, alternative specifications, and robustness checks are reported in the Supplementary Appendix. Model B relaxes the proximity anchors in order to avoid presupposing *proximity* as a "win-win", that is, as simultaneously supporting resilience and sustainability, and to reflect that local sourcing can also introduce new local shocks and regulatory or cost frictions. Thus, it offers a cautious representation of *location choice* while preserving the factor-level structure derived from the FS.

We use standard fsQCA notation: a solid dot (

●

) denotes *core presence* of a condition, an open dot (

○

) denotes *peripheral presence*, a *core absence* (

⊗

) indicates that the negation of a condition is core, and a *peripheral absence* (

□

) indicates that the negation is peripheral. A blank cell means that the condition is neither required nor precluded in that configuration (Greckhamer et al., 2018; see also Witt, Fainshmidt, & Aguilera, 2022 for symbol conventions)[4].

Table 6 shows that no single-supplier sourcing factor is sufficiently attractive on its own. Instead, high *adoption attractiveness* emerges through multiple combinations of

[4] Configurations are retained when they meet established sufficiency criteria (Fainshmidt et al., 2020; Greckhamer et al., 2018), namely a desirable high *coverage*, *consistency* ≥ 0.80, and *proportional reduction in inconsistency (PRI)* ≥ 0.75, while rows below these thresholds are reported only as exploratory, and *consistency* and *coverage* range from 0 to 1. *Consistency* measures the degree to which a given configuration is a subset of the outcome set. A higher *consistency* indicates stronger evidence that the identified configuration consistently coincides with the outcome; *coverage* assesses the explanatory power of the identified configurations, indicating the proportion of membership in the outcome set explained by these configurations. While higher *coverage* is generally desirable, no widely agreed-upon minimum threshold exists. Moreover, *PRI* provides a stricter consistency criterion by penalizing contradictory configurations.

Table 7 Managers involved in the semi-structured interviews

Interviewee	Industry (standard label)	Company size (revenues)	Job title
Manager A	Printing & packaging	1.5 B€	Procurement Manager Indirect Goods & Services
Manager B	Pharmaceuticals	4.5 B€	Site Procurement Manager and European Category Manager
Manager C	Utilities (energy & environment)	14 B€	Head of Direct Procurement
Manager D	Industrial technology & services	79 B€	Chief Procurement Officer
Manager E	Home appliances	12 B€	Commodity Senior Manager
Manager F	Energy (power generation)	34.5 B€	Head of Procurement
Manager G	Chemicals	300 M€	Supply Chain and Purchasing Director
Manager H	Industrial coatings & surface treatment	17 M€	Procurement Manager Direct Goods
Manager I	Home appliances (white goods)	12 B€	Category Manager

conditions that support conjunctural causality and equifinality. The dominant configuration is path 1, where *regional redundancy* and *green certification* form a lean sufficient recipe, even without *supplier proximity*. This suggests that managers value sourcing strategy designs that combine sustainability assurance with resilience safeguards. Similar certification-based configurations appear in path 3, where *green certification* combines with *inventory buffer* and the absence of the *sustainability premium*, and in paths 6a/6b, where *proximity, inventory buffer*, and *green certification* jointly support high *adoption attractiveness*.

At the same time, *green certification* is not a universal stand-alone solution. Paths 4 and 5 show that non-proximate sourcing strategy designs can also be attractive when supported by resilience-oriented safeguards such as *distant* or *regional redundancy* and *inventory buffer*. Managers therefore appear willing to accept geographically distant sourcing when sufficient operational slack and backup capacity are in place.

The findings also clarify the role of the *sustainability premium*. Consistent with the FS results, this premium is not a decisive stand-alone driver of adoption, but instead operates in a context-specific way. It appears in path 4, but is absent from paths 3 and 5, where certification and resilience safeguards are sufficient without higher sustainability-related costs. Robustness tests reported in the Supplementary Appendix further show that removing the premium increases coverage while leaving the main configurational logic unchanged, suggesting that managers distinguish between sustainability assurance (*green certification*) and sustainability-related price increases (*sustainability premium*)[5], and place greater emphasis on the former when evaluating sourcing configurations.

[5] The outcome-complement test confirms that low *adoption attractiveness* is not merely the mirror image of high adoption (Fainshmidt et al., 2020; Misangyi et al., 2017). Across the alternative designs, non-adoption is organized mainly around the absence of *green certification*, frequently combined with the absence of *inventory buffer*, while *Supplier proximity*, *supplier redundancy*, and the *sustainability premium* play more conditional roles. This asymmetry reinforces the value of a configurational approach, as the same sourcing factor does not simply operate in opposite directions, but combines differently depending on whether managers evaluate a strategy as attractive or unattractive.

Naming stage: Follow-up semi-structured interviews

To complement the *scoping* and *linking* stages, we conducted nine follow-up semi-structured interviews with procurement managers (Table 7), selected from the sample that participated in the original study and spanning diverse industries and company sizes, to gather diverse perspectives. The aim was to conceptualize the emergent patterns and to illuminate how the causal recipes identified through fsQCA translate to managerial logics (Qu & Dumay, 2011). A shared protocol for interviews and analysis ensured comparability, while open-ended conversation surfaced context, trade-offs, and decision rationales.

This design supports pattern coding and cross-case synthesis (see Table 8 for a comparative synthesis; a tabular summary of the evidence from each interview is available in Supplementary Appendix 3). The interviews allowed us to collate the actual behavior of managers, who made frequent reference to their daily business and provided practical examples, thus complementing the somewhat aseptic context of the vignettes. The interviews confirmed that managers rarely rely on single levers; instead, they adopt coherent bundles that embody distinct, paradox-oriented mindsets. From this evidence of convergent and contrasting behaviors, we identify three archetypes: *integrator*, *resilience-first*, and *cost-only*.

(i) The *integrator* archetype (Managers B, C, and F) treats sustainability as a *non-negotiable qualification gate*, since suppliers without *green certification* do not enter the buyer's

Table 8 Comparative table of the characteristics of the three archetypes identified in the *naming* stage

	Integrator (Managers B, C, F)	Resilience-first (Managers A, D, I)	Cost-only (Managers E, G, H)
Decision logic	**Compliance-first design**: hard sustainability gates + institutionalized resilience (dashboards/risk offices)	**Portfolio segmentation** by category/visibility; resilience structure first, sustainability applied selectively	**Cost-first default**; resilience handled tactically; sustainability only if regulator forces it
Connection with fsQCA configurations	Mirrors the certification-based configurations in Table 6, especially paths 1, 3, and 6a/6b, where *green certification* combines with *regional redundancy*, *proximity*, and/or *inventory buffer*	Reflects the redundancy-and-buffer logic in Table 6, especially paths 4 and 5, where non-proximate sourcing designs become attractive when supported by backup capacity and *inventory buffer*	Does not visibly map onto a specific fsQCA path, as cost minimization was not included as a focal condition in the vignette design; it emerged through the open-ended interviews
Sustainability "gate"	**Non-negotiable** (code of conduct, ISO/Ecovadis); non-compliant suppliers are screened out	**Selective gate** (e.g., packaging/energy) or else **scored preference** in tenders	**Minimal/conditional**: accept self-declarations or ignore unless mandated
Paying green premiums	**Yes, when strategic** (embedded in technical scoring or corporate programs, e.g., green energy)	**Targeted**: for niche/marketing or consumer-visible parts; rarely for mass lines	**No/rare**: only when obliged; price leadership dominates
Resilience strategy	**Institutionalized**: dual/backup as policy; executive visibility; capacity and logistics actively managed	**Governance-heavy**: dual/backup + **buffer capacity clauses**, tier mapping; buffers used **wisely** (VMI for offshore)	**Tactical**: dual/multi; **nearshore for critical materials**; use safety stock (own/supplier/distributor)
Buffers	Prefer **throughput assurance** (supplier/contracted stock, finished-goods buffers when needed)	**Supplier-side/VMI** tied to forecasting; **no-buffer + long-haul = no go**	**Pragmatic**: own safety stock + negotiated supplier/distributor stock; not optimized for sustainability
Location	Location is **secondary** to compliance/resilience; often preference for Europe when it eases certs and logistics	**Category-contingent: European backup + low-cost-country primary** if buffered	**Cycle-driven**: pivot to **China/ low-cost-country** on price; localize critical items for continuity
Treatment of green certification	**Gate + score**: mandatory to qualify; also influences technical score	**Improves scores;** mandatory in defined scopes; monitored via audits	**Low salience** unless required; skepticism toward "paper" certificates
When resilience vs. sustainability collide	Keep the **green gate**; solve **via supply chain design** (dualization, buffers, contracts) rather than relaxing standards	Maintain resilience (dual-supplier sourcing/VMI); apply sustainability where it **fits the design**; avoid sustainability certification and premium price without buffers	**Flow wins**: pay for **stock/options**, not greener features; any green effects are **incidental** (e.g., shorter transport)
Signature behavior	CEO/CFO dashboards; "unsustainable suppliers do **not** exist in the system"	"Keep **Europe as backup**, majority in **low-cost-country, with VMI**; green premiums only in **niche**."	"**Dual and local for critical materials; no** green premium; certify **only if required**."

Note. Vendor managed inventory (VMI): a system in which the buyer's stock is managed directly by the supplier, who independently determines the replenishment process. It may include the customer's approval of the reorder proposal

vendor list and are screened out, while a *sustainability premium* is paid when such a premium is factored into corporate decarbonization programs or is embedded in tender scoring among vendors that meet minimum thresholds. For example, Manager B stated: "*Suppliers must have Ecovadis (bronze+) or similar scoring to qualify.*" Managers in this group represent companies that are particularly sensitive to sustainability, operating in the energy and pharmaceutical industries.

Resilience is strategically embedded in supply chain design and management, through institutionalized practices concerning risk governance, redundancy, and buffering: to address these respectively, risk offices sit within procurement, while dual-supplier sourcing, together with capacity-assurance plans, are structured and formalized as proactive choices to manage disruptions (see Miandar, Johnsen, & Caniato, 2024). As Manager C explained: "*Resilience is treated as the sum of monitored risks (HSE, financial, cyber, reputational, etc.) in a risk rating*". Finally, location choice is secondary to compliance and resilience: Europe is preferred only when it eases certifications and logistics. In the words of Manager F: "*Europe is preferred for resilience, logistics and certifications*". Hence, tensions between sustainability and resilience are addressed structurally, mirroring the certification-based configurations reported in Table 6, especially those where credible sustainability assurance is combined with resilience-oriented levers such as *regional redundancy*, *proximity*, and *inventory buffer*. This logic is particularly visible in *path 1* and *paths 6a/6b*, while the anchored calibration reported in the Supplementary Appendix provides additional evidence of robustness.

(ii) The *resilience-first* archetype (Managers A, D, and I) prioritizes resilience via supply chain design and governance, since this archetype operates in technological sectors that are highly exposed to supply chain disruptions. Redundancy (backup suppliers), business continuity clauses in supply contracts, and multi-tier supply chain mapping are well-established practices. Manager A reported that: "*We have a strong preference for dual sourcing and for having a technically approved alternative even when commercial scale would favor single sourcing*". Buffers are chosen specifically rather than inflated across all inventory categories, indicating formal, strategically designed resilience governance. Sustainability is a *selective gate* that becomes binding only under specific category rules, often when downstream customers require sustainable finished products and are willing to pay more, i.e., when sustainability is monetizable in the downstream market. Manager D stated: "*Sustainability is a qualification parameter; we have a preference (and sometimes an obligation) for certified suppliers, but we cannot exclude all non-certified SMEs*". Location choice is category-contingent: low-cost countries are selected if buffered and combined with a backup supplier based in Europe. Manager I reported: "*We adopt local/near-shore for packaging; LCC for commoditized electronics. The sourcing strategy is dual by default; single only if patent-restricted*". This reflects the redundancy-and-buffer logic shown in Table 6, especially in paths 4 and 5, where non-proximate sourcing designs become attractive when supported by backup capacity and *inventory buffer*. In these configurations, *green certification* and the *sustainability premium* play more conditional roles, confirming that resilience-oriented safeguards can carry greater explanatory weight when proximity assumptions are relaxed.

(iii) The *cost-only* archetype (Managers E, G, and H) pursues cost leadership, with resilience practices applied tactically without a cohesive vision, and sustainability considered marginal unless legally required. This archetype operates in smaller companies and in industries under strong cost pressures. As Manager E reported: "*Sustainability is highly visible in corporate communications, but it is not a purchasing driver; cost dominates actual buying*". Strong anti-single-supplier sourcing preferences, near-shoring for critical materials, split local/global mixes for non-critical items, and buffers: all these practices are applied as heuristics based on managers' informal experience. For example, Manager G explained that "*for strategic materials we cap Asia exposure and source at least 50% from European suppliers. For commodities, we fully allocate to China or India to cut costs, using EU distributors' stocks as a buffer*". Moreover, practices are reactive to disruptions rather than analytically planned. Sustainability has low, if any, salience. Certifications are rarely requested of suppliers, only when legally mandated, and there is strong skepticism toward certifications and self-declarations. Because regulatory timing involves frequent announcements, ambiguities, and delays, it creates stock buildups and volatility; sustainability is therefore viewed as a burden rather than a virtue, and firms are not willing to pay a sustainability premium. Manager H stated: "*Sustainability is not a priority; we have no supplier certification requirements, suppliers' self-declarations are collected if mandatory, but they are not verified, so this is just 'sustainability on paper', disconnected from practice*". Unlike the other two archetypes, this category does not clearly emerge from the *linking* stage, since cost mechanisms were not modeled in the configurational analysis. Its identification underscores the value of follow-up interviews in capturing decision-making rationales not revealed by quantitative patterns.

Discussion and conclusions

Connecting the scoping, linking, and naming stages

Within the *scoping* stage, our ontological analysis identifies five structural factors that shape the resilience–sustainability

tension in global sourcing strategy: *location choice*, *supplier redundancy*, *inventory buffer*, *green certification*, and the *sustainability premium*. The empirical test of the *scoping* stage reveals that all these factors—except the *sustainability premium*—significantly influence sourcing evaluations, indicating that global sourcing decisions are shaped by both resilience and sustainability considerations that can give rise to tensions. Managers show a clear preference for proximity sourcing. The absence of a significant *Italy* versus *other-Europe* difference may reflect the integrated European setting in which respondents operate, where intra-Europe sourcing is evaluated within a relatively unified space; accordingly, the more decision-salient contrast may be Europe versus Asia rather than Italy vis-à-vis other European locations. At the same time, these managers value *supplier redundancy* by maintaining backup partners in Europe or Asia, thereby combining local advantages with international diversification. Lastly, inventory stockpiles remain a highly salient element, as managers are generally reluctant to adopt strategies that exclude buffers. Overall, these results indicate that managers are willing to enhance resilience by preferring more local supply chains while maintaining regional or global backup suppliers that reduce overreliance on specific locations, and by increasing inventory levels (Gereffi, 2020, 2023; Strange, 2020). Sustainability is also a driver of managerial preferences: suppliers with environmental certifications and shorter supply routes lower emissions, improve transparency, and mitigate reputational and operational risks (Cotta et al., 2023; Hallikas et al., 2020). However, these strategies can create paradoxical tensions: buffers may increase resource consumption and waste, while certified suppliers, despite enhancing sustainability, can limit the supplier pool and reduce flexibility (Karutz et al., 2018; Schad & Bansal, 2018).

The fsQCA results of the *linking* stage demonstrate consistency and complementarity in capturing the configurational complexity inherent in global sourcing decisions. Four regularities stand out. First, fsQCA confirms the paradoxical, systemic nature of the tension (Sandberg, 2017; Schad & Bansal, 2018; Smith & Lewis, 2011): there is no single universally preferred design, yet there are multiple sufficient configurations for high *adoption attractiveness,* the coherence of which rests on how the levers are combined. Second, *green certification* (D) is frequently core, underscoring *equifinality* rather than a single universal lever. This aligns with the idea that adherence to environmental standards (captured via *green certification*) is a central governance element in high-rated configurations, despite potentially constraining flexibility and consequently adding complexity to resilience management. Third, managers work with bundles—*proximity*, *(regional/distant) supplier redundancy*, and *inventory buffer*—rather than with single levers, accepting different recipes associated with high *adoption attractiveness* and showing that managers may also evaluate non-proximate sourcing designs favorably when these are supported by adequate resilience safeguards. Fourth, the *sustainability premium* is second-order at adoption (its removal improves parsimony and coverage), yet fsQCA reveals conditional roles (e.g., model B, path 4), consistent with what Furnari et al. (2021: 791) describe as "*conjunctural causation*" in configurational logic, where some conditions matter primarily in combination with others (Greckhamer et al., 2018). This pattern matches previous research (Goebel et al., 2018), which shows heterogeneous willingness to invest in *green certification* for assurance but high price sensitivity to the *sustainability premium*, reinforcing our theoretical separation of assurance (*green certification*) from investment/price (*sustainability premium*).[6]

Finally, the semi-structured interviews in the *naming* stage allow us to build a comprehensive and integrated view of how managers navigate the resilience–sustainability tension, highlighting nuances and specificities. In particular, the interviews both corroborate and extend the configurational results. They corroborate them by confirming that *green certification*, *inventory buffers*, and *supplier redundancy* operate as bundled conditions in accepted sourcing strategies, and by showing how managers frame *green certification* as either indispensable (*integrator* archetype), conditional (*resilience-first* archetype), or irrelevant (*cost-only* archetype). They extend the configurational results by surfacing the cost logic, which the *linking* stage could not capture because price mechanisms were modeled only indirectly through *location choice* and the *sustainability premium*. This result shows that while the theoretical and empirical *scoping* stage and the *linking* stage of the configurational analysis allow for mapping the ontological and epistemological structure of system-level tensions, further qualitative insights are needed to uncover additional epistemological frames that shape how managers make sense of, and sometimes sidestep, those tensions.

Theoretical contributions

We believe our study makes several contributions to IB and GS research. In terms of theory, our study contributes to the debate on conflicting strategic demands in MNEs. While the literature in this area has long emphasized that MNEs must navigate persistent tensions (Bartlett & Ghoshal, 1989; Luo & Chi, 2026; Prahalad & Doz, 1987; Tallman & Cuervo-Cazurra, 2021; Tippmann et al., 2023), we extend this line of thinking by examining the increasingly salient tension

[6] As a supplementary check, we interacted the five FS factors in an ordinal mixed-effects model; the significant interactions (A2 × C2<0; B2 × D2<0) are consistent and reported in Supplementary Appendix 4 (Auspurg & Hinz, 2015; Furnari et al., 2021).

between resilience and sustainability in global sourcing. Drawing on paradox theory, we shift the analytical focus from a trade-off reasoning based on *either/or* logic toward a paradox perspective grounded in a *both/and* understanding of persistent tensions (Cotta et al., 2023; Rajesh, 2021; Schad & Bansal, 2018; Smith & Lewis, 2011). By framing resilience and sustainability as interdependent yet competing demands, we show how sourcing decisions can simultaneously reinforce and constrain each dimension, thereby generating a paradoxical tension that persists over time rather than being resolved through simple optimization. Adopting a microfoundation perspective, our findings show that managers in MNEs do not respond to this tension through a single optimal solution, but rather through distinct sourcing logics. Specifically, we identify three archetypal approaches through which managers articulate and justify bundle-based sourcing designs under the resilience–sustainability tension—*integrator*, *resilience-first*, and *cost-only*—thereby extending IB and GS research on conflicting demands by showing how MNEs enact alternative strategic responses to this emerging tension in global sourcing. This also complements recent evidence showing that the challenge is not only recognizing paradoxical tensions, but also translating them into coherent organizational practices (Amaral et al., 2026).

In conceptual terms, we make a contribution to the IB and GS literature by introducing a systemic and configurational theorizing perspective for analyzing the resilience–sustainability nexus in global sourcing (Carmine & De Marchi, 2023; Furnari et al., 2021; Greckhamer et al., 2018; Misangyi et al., 2017; Schad & Bansal, 2018). Building on the "quantum" approach (Hahn & Knight, 2021; Knight & Hahn, 2021), we position our study between the *inherent* and *constitutive* perspectives of paradox by conceptualizing the resilience–sustainability paradox as simultaneously embedded in global sourcing systems and shaped through managerial enactment. In doing so, we follow a three-stage process consisting of *scoping*, *linking*, and *naming*, through which we first zoom out to identify the main structural sourcing factors that generate the resilience–sustainability tension, then we zoom in to examine what factors are more salient and how they are combined into alternative sourcing configurations, and finally we synthesize these patterns into three archetypal approaches, or sourcing logics, that capture how managers articulate and justify bundle-based sourcing strategies.

Lastly, in terms of methodology, we integrate FS analysis with fsQCA and qualitative interviews, approaches that remain relatively uncommon in IB and GS research and the combination of which is even less frequently adopted. This multi-method design allows us to move from theorizing salient sourcing levers to identifying causal recipes associated with high willingness to adopt (Auspurg & Hinz, 2015; Fainshmidt et al., 2020), thereby bridging the *zooming-out* and *zooming-in* perspectives and providing a concrete operationalization of the configurational theorizing and the "quantum" approach to paradoxical tensions.

Managerial contributions

For decision-makers involved in global sourcing, such as procurement managers and supply chain managers, our results indicate that resilience and sustainability requirements co-enter sourcing evaluations, alongside the distinctive and persistent need for cost discipline. Managers' preferences are not organized around single levers but around coherent bundles: credible sustainability assurance through certification recurrently anchors high-rated designs, while resilience is typically supported through combinations of redundancy, buffers, and (depending on the proximity assumptions) supplier location. At the same time, the *sustainability premium* tends to be second-order at the adoption stage, suggesting that price-based sustainability is often not decisive in evaluations, even when it can play a conditional role in specific configurations.

Thus, the practical value of our study is not to prescribe which design objectively "works", but to shine a light on how managers themselves frame, compare, and legitimate alternative bundle-based approaches when resilience and sustainability pressures co-occur. The three archetypal approaches synthesized in the paper can therefore be used as a diagnostic vocabulary for structuring internal discussions (e.g., what is treated as a non-negotiable gate, what is made category-contingent, and which levers are bundled to maintain coherence), and for anticipating where tensions are more likely to surface when one lever is adjusted without recalibrating the broader configuration.

Limitations and future research avenues

As with any study, our work has certain limitations. However, we view these not as constraints but as promising avenues for future research. Firstly, our empirical setting centers on manufacturing MNEs operating in Italy. This boosts internal consistency but may limit generalizability. Replicating the design across sectors, geographies, and institutional settings would test the transferability of the identified recipes and the weight of certification where standards or oversight capacity diverge. Secondly, our scoping phase identified five specific systemic factors as the core building blocks of sourcing configurations. While they are grounded in prior literature, these represent only a partial abstraction of a broader decision space, which was necessary to ensure theoretical parsimony and analytical tractability. Future research could extend our framework by incorporating additional and contextual factors. Thirdly, FS captures willingness to adopt in vignette form; actual implementation



under real constraints (e.g., capacity, contracts) may reorder priorities. Linking scenario-based evaluations to observed sourcing choices over time would reinforce external validity. Fourthly, while fsQCA reveals sufficient bundles, it does not rank cost-effectiveness among equifinal paths. Future work could integrate performance or emission outcomes, comparing the efficiency of competing recipes. Lastly, we initiate but do not exhaust the *zooming-in* on micro-logics: the semi-structured interviews are intended to inform the *naming* stage by clarifying the rationales behind configurations. A deeper analysis of how managers cognitively frame these tensions through their paradox-oriented mindset would enrich the epistemological side of our ontological map (Furnari et al., 2021). Future research could also examine how the *archetypal sourcing logics* vary across functional, cultural, industrial, and institutional contexts, plus whether different category constraints (e.g., complexity, criticality, asset-specificity, regulatory requirements, supply risk, demand volatility, etc.) systematically privilege one logic over another.

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Data availability The data supporting this study are not publicly available due to the protection of personal data of research subjects. The data were collected from managers under commitments of confidentiality and anonymity, and their full disclosure could compromise participants' privacy. Extensive methodological documentation is provided in the manuscript and Supplementary Appendix to ensure transparency and replicability.

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