# MULTINATIONAL ENTERPRISES AS AGENTS OF GLOBAL TRANSFORMATION TO ADDRESS GRAND CHALLENGES

**Abstract**

We review the literature on Multinational Enterprises (MNEs)' solutions to address Grand Challenges by aligning them to the Transformations for the Sustainable Development Goals (SDGs). We combine bibliometric techniques with qualitative analysis to map the literature spanning from 2015 to 2023 across leading journals in international business, management, and organization studies. By identifying common themes, we propose a framework on how MNEs' actions scale up to mitigate the Grand Challenges. The framework sheds light on MNEs' design, development and deployment of different solutions. Thus, our framework offers valuable insights into the role of MNEs in driving social change and contributing to the achievement of the SDGs. Nonetheless, we also identify the areas where the evidence in the literature remains elusive and potential avenues for future research. Our results and framework may guide managers and policymakers to implement solutions to mitigate pressing social needs.

# INTRODUCTION

Grand Challenges[1] (George et al., 2016) include wicked global problems whose complexity demands solutions from multiple actors and disciplines and are multinational by nature (Buckley et al., 2017; George et al., 2016). Multinational Enterprises (MNEs) are instrumental in addressing Grand Challenges due to their geographical influence, extensive reach, power, size, and vast discretional resources at their disposal. This means that part of the solution to Grand Challenges may emanate from MNEs' actions scaling up to the macro level (Moon, 2007). The UN calls for combined efforts to mitigate the Grand Challenges through the Millennium Development Goals and, more recently, the 17 Sustainable Development Goals (SDGs) (UN, 2015). Thus, MNEs' influence on mitigating Grand Challenges largely relies on their contribution to specific SDGs. While MNEs are crucial actors in driving solutions to Grand Challenges (Buckley et al., 2017), the extant international business literature offers a fragmented view on their impact, due to the magnitude, variety, and conceptual ambiguity of the challenges (Seelos et al., 2023). Specifically, research on Grand Challenges presents 'incommensurable ambiguities in conceptual attributes of Grand Challenges' (Seelos et al., 2023: 252), which may obstruct a comprehensive understanding of MNEs' role vis-a-vis Grand Challenges (George et al., 2016). This poses a serious barrier in advancing the literature on MNEs' solutions to Grand Challenges since imprecise conceptualizations and fragmented research across complex problems impede management and organizational scholarly progress and limit informing practice (Brammer et al., 2019; Seelos et al., 2023).

To shed light on these issues, we aim to answer the following research question: *Which are the MNEs' solutions to* mitigate *the Grand Challenges, and what mechanisms enable scaling up these solutions?* We review the literature on MNEs, Grand Challenges and SDGs in leading IB, management and organization journals during 2015-mid 2023. Review articles are valuable for knowledge contributions since they synthesize a body of literature, combining and widening the knowledge on an issue (Kunisch et al., 2023). We combine bibliometric techniques with qualitative analysis (Gaur and Kumar's, 2018), drawing on Sachs et al. (2019) SDG Transformations, which provide a series of 'building blocks' that guide the companies' efforts to contribute to the SDGs. As a result, a framework emerges that integrates MNEs' solutions to Grand Challenges through MNEs-led Transformations, the mechanisms that allow to scale up the solutions. This framework systematizes the existing management and organizational literature on the linkage MNEs-Grand Challenges and how the solutions scale up to the macro level. By examining the transformations led by MNEs that facilitate the translation of organizational actions to macro-level influence, we can gain insights into MNEs' capacity to drive systemic change in the context of Grand Challenges. Despite the growing interest in the role of MNE's towards Grand Challenges (Cuervo-Cazurra et al., 2022; George et al., 2016), to our best knowledge, this is the first attempt to integrate MNEs' solutions and mechanisms and provide an inventory of existing and pending evidence.

This paper makes two main contributions to literature. First, we provide insight on how MNEs' solutions scale up to the macro level. This is crucial because Grand Challenges are upper-level problems emanating solutions from various actors (George et al., 2016; Kunisch et al., 2023; Seelos et al., 2021). However, the specific solutions require mechanisms that allow them to scale up. In contrast to existing literature that focuses on solutions at the organizational level (i.e.,

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[1] The notion of grand challenge is attributed to Hilbert (1902) in the context of mathematics.

Montiel et al., 2021), we bridge both levels of analysis by identifying the mechanisms that widen the implementation of MNEs' solutions. Second, our framework reveals three dimensions encompassing Grand Challenges and their associated SDGs, MNEs' specific solutions, and enabling mechanisms. This architecture facilitates the assessment of existing evidence and the significant SDG transformations that remain unattended by management scholarship. In doing so, we extend the international business literature that jointly looks at MNEs and development (Buckley et al., 2017), drawing academic, managerial, and public policy attention and energies.

# METHODOLOGY

## Sample Selection

The sample selection process involves three stages: journal, article, and final sample selection, summarized in Figure 1. EThe process began with the selection of IB journals following Tüselmann et al.'s (2016) ranking and excluding journals rated below '3' by the Chartered Association of Business Schools (ABS3+) (Gaur & Kumar, 2018). Beyond IB publications, we used a mixed approach (Niittymies & Pajunen, 2020), adding 9 leading journals (ABS4+) in management, organization studies, and strategy, due to the interdisciplinary nature of MNEs and Grand Challenges. Two related special issues in the "Journal of International Business Policy"[2] and the "Journal of International Marketing"[3] were later included due to their relevance. The final sample of 19 journals is shown in Table 1.

Table 1 goes about here

We identified our article sample from selected journals using the authoritative and well-structured Web of Science (WoS) database (Birkle et al., 2020). The search strategy follows the AURORA[4] SDG Search Queries for each SDG (Shang et al., 2022; Sweileh, 2020), including "sustainable development goal," "grand challenge," "wicked problem", and "multinational* OR MNE* OR MNC*". Our sample spans from 2015, aligning with the SDGs introduction, to the latest available data as of September 2023.We selected only articles and reviews, resulting in 262 records.

Finally, the criteria for paper selection included: a) Addressing MNEs' active role on Grand Challenges and SDGs, rather than focusing solely on adaptation to institutional environments; b) Ensuring the work went beyond literature review or bibliometric analysis; and c) Connecting MNEs' efforts with at least one SDG. Because few articles make explicit use of the SDG terminology, the disaggregation of the SDGs into specific targets and indicators proved

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[2] See Journal of International Business Policy. Special Issue: The Sustainable Development Goals: What role for multinational enterprises? 4 (1), March 2021. https://link.springer.com/journal/42214/volumes-and-issues/4-1.

[3] See Journal of International Marketing. Special Issue, Part 2: Well-Being in a Global World—Future Directions for Research in International Marketing, 30 (3), September 2022. https://journals.sagepub.com/toc/jiga/30/3 https://journals.sagepub.com/toc/jiga/30/3.

[4] Aurora is a partnership of European universities to promote research related to SDGs and to drive societal change https://aurora-universities.eu/who-we-are/.

particularly useful[5]. In the first phase, three researchers evaluated 100 articles to validate the criteria and establish consensus. After discussions and resolving discrepancies, pairs of researchers reviewed the articles in a second phase, resulting in the identification of 50 final relevant articles across 11 journals.

Figure 1 goes about here

**Methods**

We provide an interpretative review, as opposed to an integrative review, due to the heterogeneity of the sample (Babones, 2016) in methods, perspectives, and the broad range of Grand Challenges and SDGs that address them. For doing so we apply a combination of methods. First, we use quantitative analyses based on Grand Challenges' attributes to depict an overview of the literature. Next, we develop qualitative analyses to characterize MNEs' solutions to Grand Challenges within the SDG Transformations umbrella, the mechanisms that facilitate the scalability of these solutions, and those yet to be analyzed.

**Codification**

*Quantitative approach.* Given the diverse conceptualizations of Grand Challenges by researchers (Brammer et al., 2019), coding our sample against their specific attributes can ensure consistent assessments within established dimensions. These attributes include types of phenomena, configurations of solutions, spatial scale of solutions, and locus of solutions (Seelos et al., 2023). Types of phenomena encompass societal, economic, and environmental barriers whose removal could address significant issues; configuration of solutions involves specific responses to particular problems or overarching mechanisms applicable to multiple objectives; the spatial scale of solutions underscores relevance and applicability, either generalizable or tailored to a geographic context; finally, the locus of solutions spans across home, host, or both (home-host), depending on the perspective adopted in seeking solutions.

Additionally, we categorized each paper as either theoretical or empirical, and identified the MNE's home region, the host region where the effects of its actions are observed, the MNE's sector or industry classification, and the theories authors relied on to support their propositions and conclusions. Each of the three researchers coded two-thirds of the papers, enabling the identification of agreements and discrepancies in the coding. All results were consolidated, and any disagreements were resolved collaboratively among the three authors until a consensus was reached.

*Qualitative approach.* Following data coding recommendations for qualitative analysis (Corbin & Strauss, 1990; Grodal et al., 2021) we first coded granular concepts and subsequently grouped them into higher-order categories. The unit of analysis is texts revealing specific MNEs' solutions (first-order themes). Subsequently, we grouped solutions that pertain to the same SDG Transformation (second-order themes). From these analyses, a higher-order category emerged as "overarching themes", that encompass MNEs' mechanisms to facilitate the scalability of their solutions to Grand Challenges. We implemented a similar procedure for coder assignment and dispute resolution as employed in the quantitative analysis.

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[5] For targets, the reference used was "Take Action for the Sustainable Development Goals - United Nations Sustainable Development" (under the headings "Goal X: Targets"). The reference for the indicators associated with each SDG is the global indicator framework for SDGs developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) in 2017 and the subsequent updates until 2023.

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# RESULTS

**Quantitative analysis. Descriptives and literature overview**

Figure 2 depicts the evolution of articles and their cumulative citations over time. We observe an overall increasing trend in publications and citations in the considered period, with a spike between 2020 and 2021.

Figure 2 goes about here

Three publications (*Journal of International Business Studies*, *Journal of International Business Policy,* and *International Business Review*) contain 66% of the documents. Figure 3 presents the unequal contribution of the analyzed publications to this literature, depicting the Lorenz curve and the Gini index of our database. Table 2 summarizes these publications and points to the bias toward international business publications, with only seven articles published in management and organizational journals outside this field.

Figure 3 & Table 2 go about here

We conduct a content analysis, distinguishing between exclusively theoretical approaches and empirical research. While most publications include an empirical study, twelve of them (n= 24%) focus on theory development. The majority of our sample (n= 72%) does not explicitly mention "SDG", "grand challenge" or "wicked problem" (these terms were only referenced in 8 articles within our database). Among the papers that explicitly discuss SDGs, only one was published before 2020. However, we find that the papers effectively analyze the goals, underscoring the efficacy of our search engine and the insights obtained from the analysis, since a search limited to explicit SDG mentions would blind most of the academic efforts in this domain. Moreover, we find a positive stance in the literature regarding MNEs' role towards the SDG, with most papers positioning MNEs as potential solutions to Grand Challenges.

Table 3 goes about here

Table 3 contains information distilled from the content analysis based on the Grand Challenges attributes, ie., types of phenomena, configurations of solutions, spatial scale of solutions, and locus of solutions. An initial examination of the *types of phenomena* analysed by the papers enables the differentiation of economic, social, and environmental Grand Challenges, each associated with different SDGs (United Nations, 2019). Specifically, SDGs 1 to 7 and 16 address Societal Grand Challenges, SDGs 8 to 12 and 17 delve into Economic Grand Challenges, and SDGs 13 to 15 tackle Environmental Grand Challenges. The literature shows a notable bias toward economic challenges (n=36), followed by the social aspect of the challenges (n=26). However, the environmental challenges receive less attention (n=10), probably due to the discipline of the selected journals (Figure 4). An examination of studies associated to each SDG reveals that SDG8 and SDG9 are the most frequent in our sample, accounting for 32% (n=16) and 30% (n=15), respectively. Works exploring SDG 16 follow (26%, n=13), signifying the interconnectedness between international business and institutions, and SDG12. In contrast, several SDGs are scarcely present in our sample (SDG1, 12%; SDG2, 12%; SDG4, 10%; SDG11, 8%; SDG14, 10%; SDG15, 10%; SDG17, 10%). These results contrast with those of Meschede (2020), who found SDG4 as prominent in the SDG literature across various scientific domains. This suggests that SDG4 may be a priority in domestic operations but not within an international context.

Regarding the configurations of solutions to the Grand Challenges, 40% of our sample address multiple SDGs or intertwined solutions (n= 20), whilst the remainder show separate solutions (n=30).

Figure 4 goes about here

Moving to the *spatial scale of solutions*, we initially distinguish between regional (n=14) - host and home countries located in two or fewer regions-, and global (n=24) studies (Table 3). Finally, the *locus of solutions* to Grand Challenges refers to the articles' focus on the host country (n=38), the home country (7), or both (5) (Table 3). Figures 5 and 6 offer details on the location and economic development of these countries. We find an overrepresentation of Europe and Central Asia in the sample of home and host countries. Interestingly, the ranking of most analysed regions coincides with the UNDP ranking ("Sustainable Development Report" 2022). This may imply that those regions with better SDG advancements are likely to disclose a broader amount of data that facilitates the research settings. As regards host countries, a growing number of studies analyse East Asia, Latin America, the Middle East and Africa. For East Asia and the Pacific, this trend reflects the increasing importance of China as host country. Latin American & Caribbean region shows a worldwide interest, especially from US researchers, following US FDI outflows to the region. The South Asia region comprises some of the leading producers in the world, with many facilities integrated into global value chains. Figure 5 also shows the breakdown of most frequent SDGs across regions, and home or host focused studies. SDG 8 and SDG 9 prevail, in coherence with findings in Figure 4.

Figure 5 and 6 go about here

Figure 6 completes the analysis of location, adding information regarding the economic development (World Bank economic classification) in the host and home countries involved in each study. As in previous cases, the same study can simultaneously analyse countries from various income levels. We observe that low-income economies are misrepresented as home countries. That is, studies on advanced-country MNEs (AMNEs) are predominant in our sample as compared to emerging-country MNEs (EMNEs), whereas digital MNEs (DMNEs) are absent.

We also analyse the industry specialization of the studies, led by studies on industrial MNEs (40%, n=20). Other sectors are less represented such as agriculture (18%, n= 9) or finance (22%, n=11), despite its paramount role in mitigating Grand Challenges and achieving the SDG (Addis Ababa Conference, 2015).

To analyse the knowledge structure in the research field and explore relationships among topics, we perform a co-word analysis (He, 1999). We use keywords (Choi et al., 2011) and add two additional fields from the content analysis, the Grand Challenges addressed in each document and the theoretical lens. Figure 7 illustrates the co-word network using the association strength from VOSViewer software (van Eck & Waltman, 2010). The colours in the network indicate clusters identified by the VOS algorithm, which evaluates the intensity of relationships between topics. Node size reflects association strength, i.e., the number and intensity of links between each topic and the network. The position of each topic in the network is defined by the algorithm that locates them according to their links with the rest (Waltman et al., 2010).

Figure 7 goes about here

The network layout highlights three dominating clusters: 'economic Grand Challenges' (green), 'societal Grand Challenges' (blue), and 'institutional theory' (yellow). However, these different

thematic clusters also present strong connections to keywords outside of their respective thematic groups within the network. The 'economic Grand Challenges' cluster embeds innovation-related topics, and its centrality signals the focus of international business, management, and organizational literature on economic issues.

Institutional theory emerges as the most frequent theoretical framework (n= 17), demonstrating strong linkages with central nodes in other clusters, particularly 'economic Grand Challenges' and 'societal Grand Challenges'. The red cluster, also close to the network's centre, contains terms related to theoretical approaches such as 'transaction cost economics' (n= 6), 'IB theory' (n= 6), 'internalization theory' (n= 2), and 'OLI paradigm' (n=2). The position of these theoretical frameworks in the network aligns with George et al.'s (2016) observation regarding the limited adoption of theories from other fields within international business academia. We observe some attempts in our sample, such as 'stakeholder theory' or 'dynamic capabilities', albeit positioned peripherally in the network, suggesting a limited role in the field.

The 'societal Grand Challenges' cluster incorporates 'corruption' as a prominent topic, denoting MNEs' anti-bribery efforts. Several topics lie outside this cluster, including 'environmental grand challenge', which exhibits strong connections with other Grand Challenges and some keywords. However, it occupies a more peripheral position in this literature, with fewer associated documents.

**Qualitative analysis. MNEs' solutions to Grand Challenges through SDG Transformations**
We draw on Sachs et al.'s (2019) SDG Transformations to structure the literature on MNEs' solutions to Grand Challenges. Sachs et al. (2019) propose six Transformations for the SDGs, each associated with different Grand Challenges. A framework emerges that systematizes MNEs' contribution to the SDGs and specific mechanisms for the scalability of their solutions to Grand Challenges (Table 4). The framework exhibits a hierarchical categorization system, aligning Grand Challenges with the SDG as aggregated dimensions. The specific MNEs' solutions act as first-order themes, subsequently grouped under SDG Transformations or second-order themes.
In the following, we present the evidence found regarding MNEs' solutions to the societal, environmental, and economic challenges, respectively, across the underlying SDG Transformations.

*MNEs-led Transformations to mitigate Societal Grand Challenges.* Due to MNEs' unique position across countries with different levels of social rights advancement, their actions to mitigate societal Grand Challenges serve as a demonstration of evolving social norms (Fang et al., 2023), disseminating practices that alleviate such challenges and pave the way for social transformation. The required SDG Transformations to tackle societal Grand Challenges encompass access to education and healthcare, promote R&D and decent work. Regarding education, MNEs can actively promote knowledge enhancement in host countries by focusing on primary stakeholders, specifically employees, through training and in-house programs (Sambharya & Goll, 2021). In addition, MNEs offer joint R&D programs that incorporate and develop local talent and inclusive open innovation processes (Pérez-Aleman & Ferretti, 2023). These serve a dual-way process where employees may strengthen their contribution to MNEs' innovation actions and, simultaneously, MNEs introduce non-monetary forms of compensation, through education and dissemination of innovative solutions stemming from their R&D at home or abroad. Other solutions involve MNEs distributing their R&D units across host markets to bring knowledge opportunities for local employees and communities while accessing globally dispersed expertise (Mavroudi et al., 2023). MNEs can mitigate gender-based inequalities by

promoting women to managerial positions and partnering with local female entrepreneurs (Fang et al., 2023). Moreover, MNEs can address societal Grand Challenges beyond their boundaries by advocating for the upscale of social and labor conditions in global supply chains (Goerzen et al., 2021; Rikkinen et al., 2017), which delves into significant SDG transformations.

Grand Challenges involving inequalities in healthcare access and affordability, including medical assistance and pharmaceutical products such as vaccines, can be addressed through MNEs ventures with local manufacturing companies (Fu et al., 2022), co-development of new therapeutics and diagnostics (Pérez-Aleman & Ferretti, 2023), and investments in healthcare in host offering more nutritional products and healthcare benefits to primary stakeholders (Montiel et al, 2021).

As a result, we observe that MNEs' transformations to address societal Grand Challenges focus on building human capital through educational efforts, R&D dissemination, and healthcare promotion. This means that mitigating societal Grand Challenges requires addressing inequalities of opportunities or exogenous circumstances that matter for opportunities in life (Sen, 1999). That is, promoting opportunities for individuals to build and develop social capital, for example, through education and health assistance. Nonetheless, we observe scant evidence in Transformation 1 across the solutions related to education, and in Transformation 2 related to . health.

*MNEs-led Transformations to mitigate Environmental Grand Challenges.* Environmental Grand Challenges are linked to the overuse of natural resources, their subsequent depletion, and the climate change derived from polluting industrial gases. MNEs can invest to minimize environmental harm and improve awareness and dissemination of the required transformations to address the environmental Grand Challenges (Maksimov et al., 2022). The climatic urgency (Stern, 2015) urges solutions that involve several actors so that MNEs are capable to build networks of different actors and orchestrate- or join- partnerships that promote environmental collaboration in an agile manner (Bouguerra et al., 2021). MNEs' transformations to mitigate environmental Grand Challenges require the creation of organizational cultures that encourage green behaviour and facilitate collaborative efforts stimulating employees and partners (Lasrado & Zakarias, 2020). Another solution to fight environmental Grand Challenges consists in MNEs' stewardship by direct investments in reducing resource usage in host countries through product or process innovation based on renewable energy and water usage efficiency (Montiel et al., 2021). Moreover, MNEs can foster infrastructure electricity to facilitate their operations in the host country (Garrone et al., 2019) and simultaneously improve capital endowments in green projects, thus substituting government investments in the provision of public goods through political CSR (Boddewyn & Doh, 2011; Scherer et al., 2014). Beyond investments, MNEs can disseminate best practices to address environmental challenges across their global supply chain, which in turn improve MNEs action towards the Grand Challenges since this requires cooperation outside their control (Van Holt et al., 2021). Improving governance systems across the value chain allow monitoring the overall impacts, for example, through disclosures of scope 3 GHG enabled via blockchain (Ciulli & Kolk, 2023). Another example of MNEs' solutions to tackle environmental challenges consists in offering clean energy training programs to local entrepreneurs (Montiel et al., 2021). Beyond the potential benefits in mitigating environmental challenges, these actions yield intangibles that can generate savings and avoid costs related to environmental risks (Van Holt et al., 2021) including physical and transition climate change risks. Regarding overlooked solutions to the environmental grand challenge by MNEs' literature, we find a lack of research evidence across multiple Transformations, in coherence with prior findings

in the quantitative analysis. For example, we identify a lack of research regarding MNEs' solutions for zero-carbon electricity generation or renewable electrification. Solutions associated with biodiversity protection and agricultural business models are also absent, which opens the path for academic interest.

*MNEs-led Transformations to mitigate Economic Grand Challenges.* Economic Grand Challenges involve major global transformations such as the digital challenge and the demographic challenge. Although both mark a success for humanity, the demographic challenge involves tensions associated with the social and labour inclusion of larger cohorts in older ages, that often entail ageism and intergenerational competition for economic resources, with a potential burden in health and public pensions funding (Bloom et al., 2012); in turn, the digital challenge brings a digital divide and digital exclusion. MNEs can address these challenges through direct action in developing and creating decent work opportunities and intergenerational workforces, sustainable cities and renewing local connectedness (Lorenzen et al., 2020).

Digital technologies, specifically blockchain and artificial intelligence (AI) innovations, offer affordances to MNEs that accelerate the solutions to Grand Challenges (Ciulli & Kolk, 2023). Improved technologies allow a massive and scale-up access and rapid uptake of MNEs' solutions, be they digital financial inclusion (Wormald et al., 2021) or rapid diagnostic tests (Sachs, 2015). For example, multinational banks can use AI applications to predict farmers' creditworthiness (Ciuilli & Kolk, 2023) and incremental financial innovation to foster sustainable development through new financial services for end users-thus improving financial inclusion- or for financial markets- such as providing liquidity to carbon credit markets-. In addition, new technologies offer tremendous opportunities for MNEs, such as GeoAI techniques that underlie innovative solutions for end markets.

Against this background, we find a lack of research concerning MNEs' financial solutions to the Grand Challenges, and across many Transformations associated to the economic grand challenge. For example, works related to MNEs' solutions for sustainable cities are absent, including sustainable infrastructures and mobility.

*A framework on MNEs' mechanisms to mitigate Grand Challenges through SDG Transformations.* After classifying MNEs' solutions under the SDG Transformations, we identify higher-order categories for central or overarching themes, linking multiple themes to unveil how MNEs' solutions scale up to the macro level and mitigate Grand Challenges. The analyzed papers show how the management and organizational literature unveils SDG Transformations to mitigate the Grand Challenges *specific to MNEs*. We noticed different scope of mechanisms or transmission channels to achieve the solutions, whereby MNEs directly act through 'Intervention Mechanisms', or can use indirect or induced mechanisms to mitigate the Grand Challenges. We labelled these as 'Amplification mechanisms' since they allow for the scalability of the solutions. These mechanisms are unique to MNEs due to their privileged position to communicate to global audiences, affecting numerous stakeholders across diverse regions, allowing the dissemination of managerial best practices worldwide (Cantwell et al., 2010), and their standardization and institutionalization. Thus, we grouped the different solutions into Intervention and Amplification mechanisms as higher order categories (Table 4). These mechanisms draw on MNEs' ability to generate cross-national diffusion of organizational practices (Guler et al., 2002). *Intervention Mechanisms* entail specific practices that may spread from MNEs to other organizations following network ties, including knowledge networks (Phelps et al., 2012). In turn, A*mplification Mechanisms* cover processes of institutionalization of MNEs' solutions driven by social

comparison and cross-border isomorphism (Haxhi & Van Ees, 2010) that allow the diffusion of certain MNEs practices. Table 5 examines in depth the identified mechanisms that leverage MNEs' solutions. Intervention mechanisms encompass specific and tangible solutions to the Grand Challenges, such as stewardship, global value chain management, providing equal opportunities and political CSR; whereas amplification mechanisms embed advocacy, dissemination, demonstration, and collaboration. For example, in Garrone et al. (2019) MNEs advocate for clean energy infrastructures, providing public support and potentially influencing public opinion and future regulation. In turn, dissemination mechanisms such as those in Montiel et al., (2021), involve distributing knowledge and know-how to broader audiences, which increases awareness on the Grand Challenges and how to solve them. Demonstration involves a practical representation of a solution that may inspire others and stimulate the emulation of such solutions. This mechanism is manifested in Fang et al. (2023) which shows how MNEs can demonstrate evolving social norms by promoting women to managerial positions. Finally, we find numerous examples of collaborative mechanisms through which MNEs' amplify the scope of their solutions to Grand Challenges, such as partnerships or MNEs' participation in multistakeholder consortia to develop innovations (Pérez-Aleman et al., 2023).

To shed light on the overlooked mechanisms by the literature, we measure the salience of each mechanism in our sample. Table 5 shows relative and absolute measurements of salience. Relative metrics identify the most frequent mechanisms in our sample for Intervention Mechanisms and Amplification Mechanisms, respectively. We find that within the former GVC Management and Political CSR receive less academic attention, whereas for the later, advocacy and dissemination are the most overlooked. When we analyze the salience of the mechanisms in absolute terms, comparing their frequency, we observe that advocacy and dissemination represent the most neglected mechanisms. In contrast, demonstration and collaboration lead the table on most examined mechanisms.

<center>Table 4 goes about here</center>

<center>Table 5 goes about here</center>

*Future Research Lines.* These findings open avenues for future research and corporate attention. Table 5 proposes specific research questions for future researchers to examine the identified mechanisms. These may broaden the field of research whilst at the same time framing research on MNEs' solutions to Grand Challenges within a structured framework. There are opportunities to delve into specific strategies through which MNEs can positively contribute to equal opportunities by engaging in education, health, and innovation. The presence of more explicit evidence of MNEs being associated with "avoiding harm" (rather than "doing good") (van Zanten and van Tulder, 2018), along with the limited autonomy of MNEs to achieve these objectives effectively, opens the door to new research related to multi-stakeholder collaboration.

Although recent conceptual research has emphasized the need for a more in-depth exploration of knowledge transfer mechanisms in global value chains, we find a paucity of empirical investigations on MNEs' solutions to Grand Challenges that involve the management of their global value chain. Subsequent research endeavours could investigate the pathways through which knowledge disseminates within a global value chain, considering bidirectional flows, and explore distinct behaviours within the network that either facilitate or hinder these dynamics. This would contribute to harnessing the potential that MNEs have for dissemination practices across their global value chains, increasing awareness about Grand Challenges.

Additionally, MNEs can leverage their influence to engage with governments, international organizations, and other stakeholders, advocating for policies and practices that support practical solutions to Grand Challenges, not only through their economic clout (especially for Grand Challenges connected with MNEs' core business) but also thanks to their diplomatic reach. An agenda for future research on political CSR linked to solutions to Grand Challenges, multi-level governance, and the management of responsible innovation in addressing these challenges would clarify MNEs' role.

Finally, the use of conventional IB theories to examine the role of MNEs in addressing Grand Challenges calls for broader theoretical lenses, in agreement with George et al. (2016). The phenomenological nature and complexity of Grand Challenges would require scholars to diversify their array of theories, encompass multidisciplinary viewpoints, and employ advanced, often multiple, methodological approaches, including the mobilization of interdisciplinary research teams, as highlighted by Buckley et al. (2017).

## DISCUSSION AND CONCLUSIONS

Through an interpretative review, this research responds to the calls for effective solutions to Grand Challenges and advancing the SDGs (Buckley et al., 2017). Both the Grand Challenges and their potential solutions for achieving the SDGs transcend national borders making MNEs, uniquely equipped to address them due to their global reach (Buckley et al., 2017). We analyze the literature on MNEs vis-à-vis Grand Challenges and the SDGs using quantitative and qualitative methods based on Grodal et al.'s (2021) active categorization coding process. By connecting the Grand Challenges with the required transformations for the SDG (Sachs et al., 2019), we unveil the specific solutions and mechanisms MNEs may implement to mitigate Grand Challenges. A framework emerges that allows MNEs and other stakeholders to address specific Grand Challenges through identified MNEs-led Transformations. We find several overlooked themes in current organizational and management research, such as dominant isolated MNEs' solutions to Grand Challenges instead of intertwined, the relative insignificance of studies concerned with MNEs' solutions to environmental Grand Challenges as compared to economic and social problems, and the lower research interest on amplification mechanisms such as advocacy and dissemination.

This work contributes twofold to the research on MNEs as agents of change in the face of Grand Challenges. First, we enhance our understanding of how MNEs' solutions scale to a macro level. Unlike prior organizational-level solutions (i.e., Ciuilli & Kolk, 2023; Montiel et al., 2021), we explain how MNEs' actions are translated to an upper-level to effectively address the Grand Challenges. We identify two mechanisms, intervention and amplification, which leverage MNEs' unique and privileged position given their power and presence cross countries. Collaboration and demonstration emerge as the most common mechanisms for escalating MNEs' solutions, while advocacy and dissemination require further exploration. Depicting MNEs' role based on mechanisms deepens our understanding of the effective means through which MNEs' can contribute to mitigate Grand Challenges. Second, we develop a framework that connects Grand Challenges, required transformations for mitigation through SDG advancement, and solutions outlined in management literature. To our best knowledge, this is the first study providing an integrated picture of existing evidence across domains, which serves as a compendium of MNEs' solutions and their course of action.

To assess overlooked themes in MNEs' solutions to Grand Challenges, we draw on their attributes (Seelos et al., 2023). We find that the configurations of solutions to Grand Challenges proposed by the literature focus on isolated solutions rather than intertwined solutions, overlooking the solid interrelationships within Grand Challenges and within the 17 SDGs (Le Blanc, 2015), which require integrated solutions. Isolated configurations of MNEs' solutions obey the growing research stream on SDG cherry-picking (Heras-Saizarbitoria et al, 2022). Thus, drawing on our framework, we call for studies on intertwined MNEs' solutions to address the challenges comprehensively.

Regarding types of Grand Challenges phenomena analyzed in management literature, we find a focus on economic Grand Challenges, followed by societal and, far behind, environmental challenges. Anecdotal evidence on environmental challenges, such as zero-carbon or biodiversity solutions, and, overall, MNEs' role in the energy transition, was robust to various analyses. The lack of attention to environmental issues within the disciplines analyzed contrasts with the relevance of environmental issues, in particular the energy transition, across adjacent disciplines, and underlies recent research initiatives (i.e., Verbeke, 2021).

Across economic Grand Challenges, we find that research on MNEs' solutions in transformations for Sustainable Cities and Communities is overlooked, possibly due to complexity owing to the large number of stakeholders involved and the distribution of responsibilities between national and local levels of government, as well as its multisectoral nature (Sachs et al., 2019). This conclusion is also consistent with the findings of Van Zanten and Van Tulder (2018), which reflect that MNEs' contribution to the development of key infrastructure for access to basic services (e.g., electricity) occurs as long as that falls within the MNE's field of activity or because it is necessary for the development of its core functions. Our work also demonstrates limited evidence regarding the use that MNEs make of emerging technologies (such as AI, blockchain, etc.) to devise solutions for Grand Challenges. This may be due, as noted by Ciulli and Kolk (2023), to the general approach by IB researchers to the relationship between digitalization and sustainable development, presenting digitalization as a composite phenomenon rather than delving into the specific underlying technologies. Such comprehensive analyses leave less room for exploring the unique features, opportunities, and limitations inherent to each of these technologies and uncovering their distinct implications for the impact of MNEs on sustainable development. Moreover, we find an absence of research focused on digital MNEs (DMNEs) or born-digital (Srinivasan and Eden, 2021), which calls for further research on the potential of specific emerging technologies in addressing Grand Challenges in conjunction with MNEs.

Concerning the locus of solutions, our findings show that developing economies are under-researched both as home and host countries. This implies that research on emerging MNEs (EMNEs) is still nascent in this domain, and that developing host countries are absent from most studies. This may be due to a lack of interest from MNEs which delves into lack of data for researchers, or, alternatively, existing MNEs operations in developing countries with no available data. For example, it is remarkable that extractive industries and base materials sectors were not used as focus of inquiry in the reviewed literature. However, most metals and mining MNEs tend to expand into developing economies where natural resources lie. This calls for research on the specific role of MNEs in developing countries and the underlying complexities in tackling Grand Challenges across developing host countries.

Our review could not find research evidence on the involvement of MNEs in financing responses to the Grand Challenges. Considering that funding for achieving the SDGs is still a pressing need (Mazzucato, 2023), further research on the role of private financing is required.

Finally, further management research must delve into these matters to ascertain their actual occurrence, distinguishing genuine actions from mere rainbow-washing (i.e., adopting the rainbow colors of the SDGs in marketing and communication without proper action) (Cuervo-Cazurra et al. 2022) and SDG-Picking (Heras-Saizarbitoria et al, 2022), ultimately offering valuable insights for businesses and governments on effective strategies and actions (Ghauri, 2022).

Notwithstanding the contributions of this research, it also presents some limitations. First, the journal selection criteria have followed best practices in extant IB literature, however, academic journal relevance in a particular discipline can be a controversial and dynamic state. This implies that, although our selection of mainstream journals in IB and management is justified, future works could replicate our study beyond the 19 journals selected, including specialist journals. Another limitation relies on the identified mechanisms that, far from being an exhaustive list, represent the mechanisms where evidence exists in our sample. This implies that additional existing or potential mechanisms and solutions may arise.

Our work serves as a bridge between academia and practice by spanning disciplinary boundaries and engaging practitioners (Kunisch et al., 2023). Building a framework with specific solutions that MNEs can implement to solve Grand Challenges translates into practical advice that can foster progress in mitigating them since managers have a systematic categorization of available solutions across themes, which can be replicated and extended. Moreover, the framework provides clues to policymakers at national and international level on effective regulation to achieve the required collaboration with the private sector. The framework strengthens our understanding of MNEs' role in UN's Decade for Action to deliver the SDG, and may guide joint forces from MNEs, policymakers, and academic audiences in mitigating pressing environmental and social problems.

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# FIGURES AND TABLES

**Table 1** Journal Sample

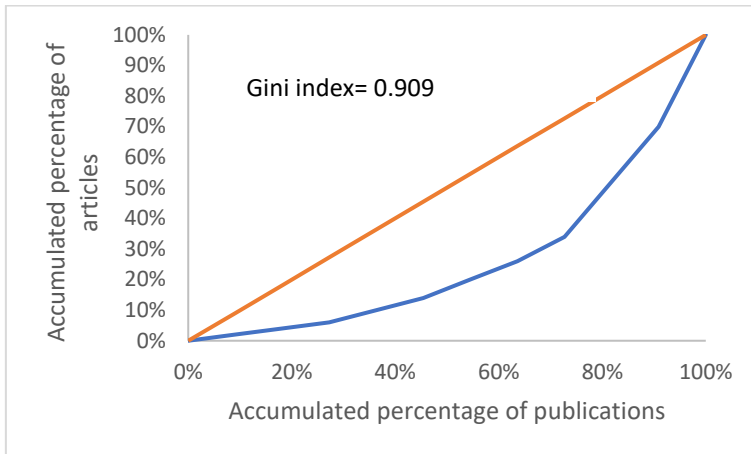| Selected international business journals | Selected management & organization journals |
| --- | --- |
| *Asia Pacific Journal of Management* | *Academy of Management Journal* |
| *Global Strategy Journal* | *Academy of Management Perspectives* |
| *International Business Review* | *Academy of Management Review* |
| *Journal of International Business Studies* | *Administrative Science Quarterly* |
| | *Journal of Management* |
| *Journal of International Business Policy* | *Journal of Management Studies* |
| *Journal of International Management* | *Organization Science* |
| *Journal of International Marketing* | *Organization Studies* |
| *Journal of World Business* | *Strategic Management Journal* |
| *Management International Review* | |
| *Management and Organization Review* | |

**Figure 1** The Sample Selection Process
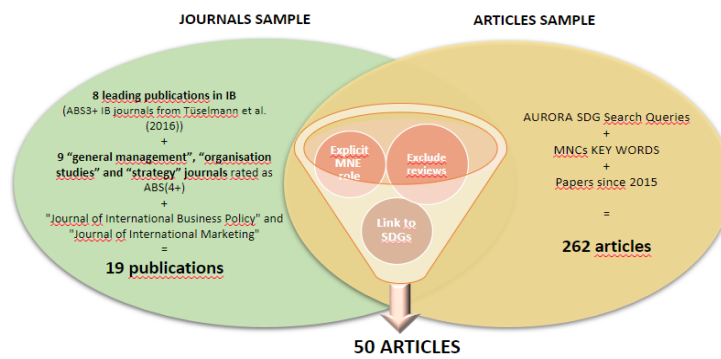


**Figure 2** Evolution of Articles and Citations
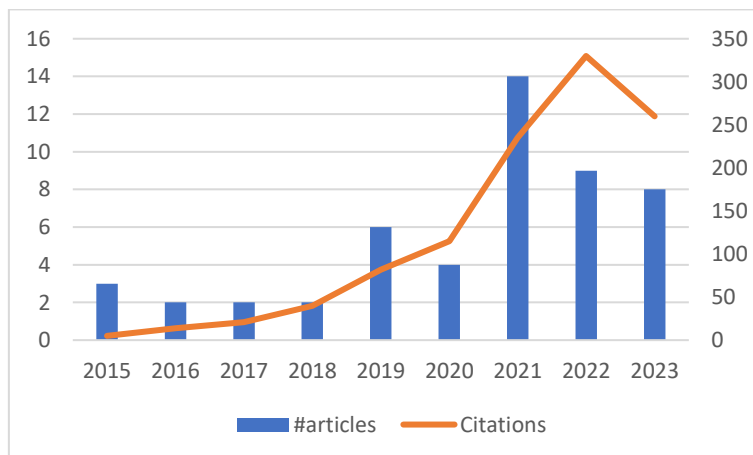
**Figure 3** Lorenz Curve and Gini Index for the Sources of Articles



**Table 2** Most Frequent Publications

| Publication | # articles | % |
|---|---|---|
| *Journal of International Business Studies* | 15 | 30% |
| *International Business Review* | 9 | 18% |
| *Journal of International Business Policy* | 9 | 18% |
| *Journal of International Management* | 4 | 8% |
| *Journal of World Business* | 3 | 6% |
| *Journal of Management Studies* | 3 | 6% |
| *Global Strategy Journal* | 2 | 4% |
| *Strategic Management Journal* | 2 | 4% |
| *Asia Pacific Journal of Management* | 1 | 2% |
| *Management International Review* | 1 | 2% |
| *Academy of Management Perspectives* | 1 | 2% |

**Table 3** Contrasting Grand Challenges attributes and MNEs' solutions

| Grand Challenges attributes | MNEs' solution | Exemplary papers[6] |
|---|---|---|
| **Types of phenomena** | Economic (36) | *Goerzen et al. (2021); Reinecke and Donaghey (2021); Fu et al. (2020); Ketteni and Kottaridi (2019); Rathert (2016); Godinez and Liu (2015); Lorenzen et al. (2020); Thakur-Wernz and Samant (2019); Brandl et al. (2019); Pisani and Ricart (2018); Ivus (2015); Ramirez (2021); Brandl et al. (2022); Riikkinen et al. (2017); Maksimov et al. (2022); Keig et al. (2015); Narula (2019); Reade et al. (2019); van der Straaten et al. (2020); Srinivasan et al. (2021); Montiel et al. (2021); Liou and Rao-Nicholson (2021); Kiefner et al. (2022); Ciulli and Kolk (2023)* |
| | Social (26) | *Keig et al. (2015); Yi et al. (2018); Reade et al. (2019); Garrone et al. (2019); Lasrado and Zakaria (2020); Srinivasan et al. (2021); Montiel et al. (2021); Maze and Chailan (2021); Liou and Rao-Nicholson (2021); Nippa et al. (2021); Bouguerra et al. (2021); Stevens and Newenham-Kahindi (2021); Kiefner et al. (2022); Li et al. (2022); Saeed et al. (2022); Ciulli and Kolk (2023)* |
| | Environmental (10) | *Lasrado and Zakaria (2020); Srinivasan et al. (2021); Montiel et al. (2021); Liou and Rao-Nicholson (2021); Nippa et al. (2021); Bouguerra et al. (2021); Kiefner et al. (2022); Maksimov et al. (2022); Ciulli and Kolk (2023)* |
| **Configurations of solutions** | Separate solutions (30) | *Godinez and Liu (2015); Ivus (2015); Rathert (2016); Riikkinen et al. (2017); Pisani and Ricart (2018); Garrone et al. (2019); Brandl et al. (2019); Ketteni and Kottaridi (2019); Thakur-Wernz and Samant (2019); Lorenzen et al. (2020); Fu et al. (2020); Ramirez (2021); Stevens and Newenham-Kahindi (2021); Reinecke and Donaghey (2021); Brandl et al. (2022); Li et al. (2022); Saeed et al. (2022)* |
| | Intertwined solutions (several SDGs) (20) | *Keig et al. (2015); Narula (2019); van der Straaten et al. (2020); Lasrado and Zakaria (2020); Srinivasan et al. (2021); Montiel et al. (2021); Nippa et al. (2021); Bouguerra et al. (2021); Liou and Rao-Nicholson (2021); Kiefner et al. (2022); Maksimov et al. (2022); Ciulli and Kolk (2023)* |
| **Spatial scale of solutions** | Regional (14) | *Riikkinen et al. (2017); Thakur-Wernz and Samant (2019); Lasrado and Zakaria (2020); Reinecke and Donaghey (2021); Bouguerra et al. (2021); Ramirez (2021); Kiefner et al. (2022)* |
| | Global (24) | *Godinez and Liu (2015); Ivus (2015); Rathert (2016); Pisani and Ricart (2018); Garrone et al. (2019); Ketteni and Kottaridi (2019); Lorenzen et al. (2020); Fu et al. (2020); van der Straaten et al. (2020); Montiel et al. (2021); Stevens and Newenham-Kahindi (2021); Maksimov et al. (2022); Brandl et al. (2022)* |
| **Locus of solutions** | Home country (7) | *Kiefner et al. (2022); Riikkinen et al. (2017); Thakur-Wernz and Samant (2019); Maksimov et al. (2022); Lasrado and Zakaria (2020); Li and Reuer (2022)* |
| | Host country (38) | *Godinez and Liu (2015); Ivus (2015); Rathert (2016); Pisani and Ricart (2018); Garrone et al. (2019); Narula (2019); Brandl et al. (2019); Ketteni and Kottaridi (2019); Lorenzen et al. (2020); Fu et al. (2020); van der Straaten et al. (2020); Goerzen et al. (2021); Srinivasan et al. (2021); Montiel et al. (2021); Nippa et al. (2021); Bouguerra et al. (2021); Ramirez (2021); Liou and Rao-Nicholson (2021); Stevens and Newenham-Kahindi (2021); Reinecke and Donaghey (2021); Brandl et al. (2022); Ciulli and Kolk (2023)* |
| | Home-Host country (5) | *Keig et al. (2015); Konara et al. (2021); Saeed et al. (2022)* |

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[6] For "exemplary papers" we selected works that surpass the average number of citations for their year/area according to the Clarivate ranking from 2014-2021. In 2022 we maintain a similar criterion to that of 2021, and for 2023 we require a minimum of one citation.

**Figure 4** Article distribution across SDGs and Grand Challenges
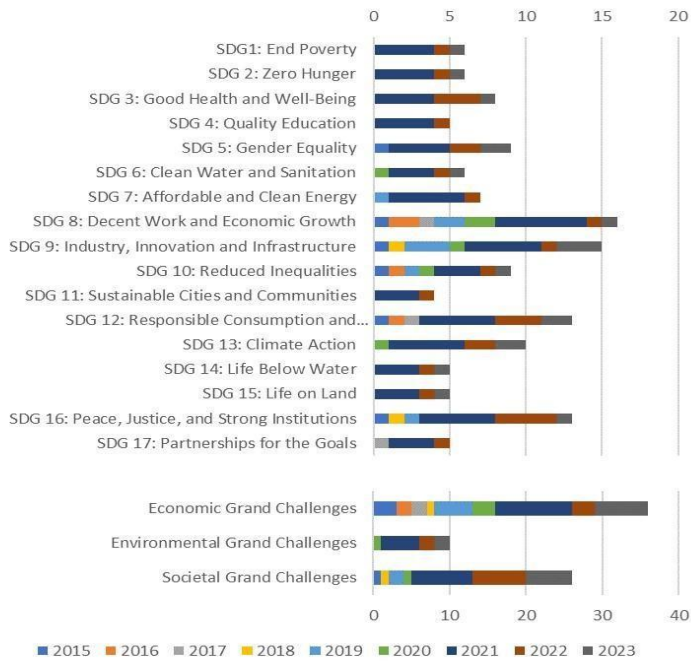


**Figure 5.** Home and host focused studies based on geographical region and their associated SDGs
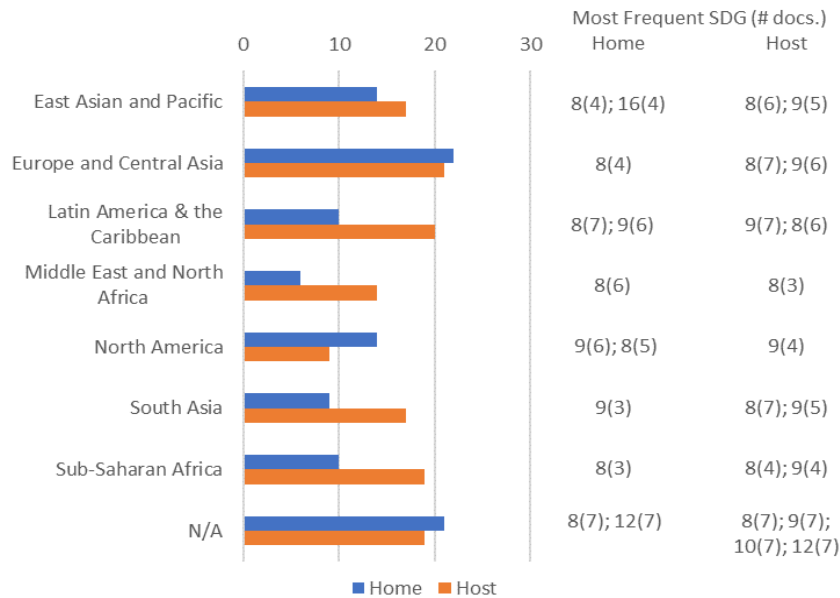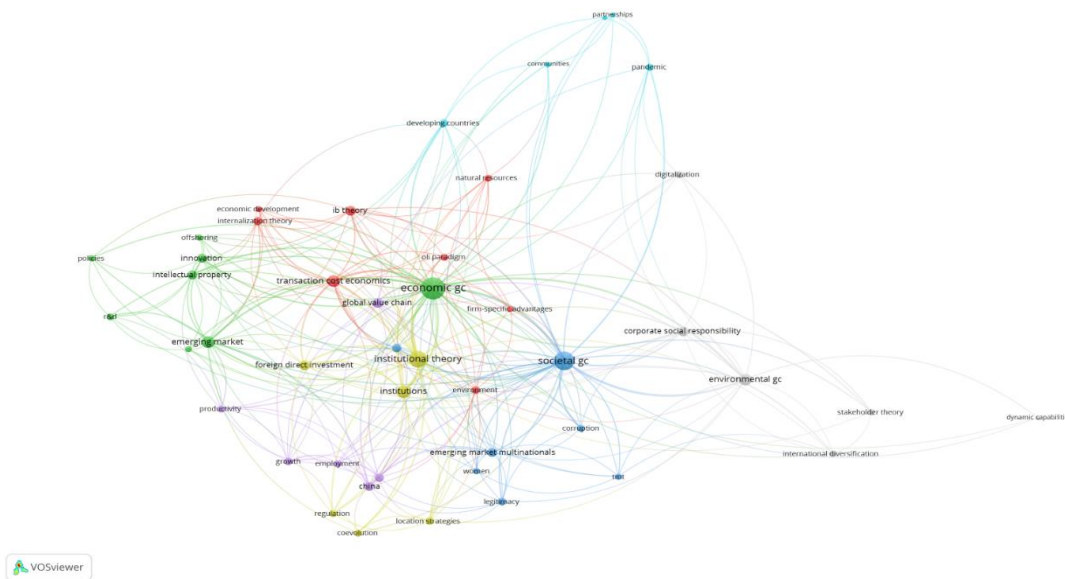


Note: Country classification based on current World Bank economic classification.

**Figure 6.** Home and host focused studies based on income level
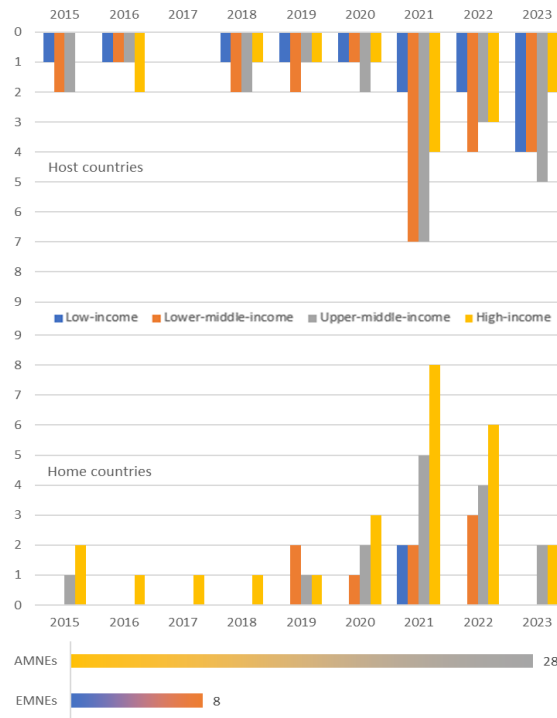


Note: Country classification based on current World Bank economic classification

**Figure 7.** Mapping the knowledge structure in the literature of MNEs' solutions to Grand Challenges

**Table 4** MNEs' solutions and mechanisms to mitigate Grand Challenges through SDG Transformations

| Aggregate dimensions | | Second order themes | | First order themes | | Overarching themes | |
|---|---|---|---|---|---|---|---|
| *Grand Challenges* | *SDG Transformations* | *Transformations' breakdown* | | *MNEs' solutions* | *Exemplary papers* | *MNEs' intervention mechanisms* | *MNEs' amplification mechanisms* |
| **Societal** | | 1 Early childhood development | | | | | |
| **Grand Challenges** | | 2 Primary and secondary education | | Partnerships with civil society organizations and the public sector | Van Zanten & Van Tulder, 2018 | Equal opportunities | Collaboration |
| SDG 1-7,11,16 | | 3 Vocational training and higher education | | Partnerships with civil society organizations and the public sector | Van Zanten & Van Tulder, 2018 | Equal opportunities | Collaboration |
| | Transformation 1: Education, Gender, and Inequality | 4 | Social protection system and labour standards | Demonstrating evolving societal norms | Fang et al., 2023 | Equal opportunities | Demonstration |
| | | | | Promotion of women to managerial positions | Fang et al., 2023 | Equal opportunities | Demonstration |
| | | | | Empowering local female entrepreneurs | Fang et al., 2023 | Equal opportunities | Demonstration |
| | | | | Upscale social and labor conditions through GVC | Goerzen et al., 2021 | GVC management | Demonstration |
| | | | | Employee empowerment | Mavroudi et al., 2023; Sambharya & Goll, 2021; | GVC management | Demonstration |
| | | | | Upscale social and labor conditions through GVC | Goerzen et al., 2021 | GVC management | Demonstration |
| | | 5 Research and development | | R&D across hosts | Mavroudi et al., 2023; Sambharya & Goll, 2021; | Political CSR | Dissemination |
| | | | | Joint R&D | Perez-Aleman & Ferretti, 2023 | Political CSR | Collaboration |
| | | | | Participation in multi-stakeholder consortia | Perez-Aleman & Ferretti, 2023 | Political CSR | Collaboration |
| | | | | Culture of inclusive/open innovation | Perez-Aleman & Ferretti, 2023 | Equal opportunities | Collaboration |
| | | | | Engagement with local entrepreneurial ecosystems to foster networking | Lorenzen et al., 2020 | Equal opportunities | Collaboration |

| | | | Engagement with local entrepreneurial ecosystems to foster networking | Lorenzen et al., 2020 | Equal opportunities | Collaboration |
|---|---|---|---|---|---|---|
| **Societal Grand Challenges** SDG 1-7,11,16 | Transformation 2: Health, Wellbeing and Demography | 6 Universal health coverage | Codevelopment of new therapeutics and diagnostics | Perez-Aleman & Ferretti, 2023 | Equal opportunities | Collaboration |
| | | | Building JV with local companies | Fu et al., 2022; Montiel et al., 2021 | Equal opportunities | Collaboration |
| | | 7 Healthy behaviours and social determinants of health and well-being | Health investments in host | Fu et al., 2022; Montiel et al., 2021 | Political CSR | Demonstration |
| **Environmental Grand Challenges** SDG 13-15 | Transformation 3: Energy Decarbonisation and Sustainable Industry | 8 Access to clean energy | Foster electricity infrastructure | Garrone et al., 2019 | Political CSR | Advocacy |
| | | | Clean energy training programs to local entrepreneurs | Montiel et al., 2021 | Equal opportunities | Dissemination |
| | | 9 Zero-carbon electricity generation | | | | |
| | | 10 Energy efficiency | Leaders' green behaviour model | Bouguerra et al., 2021; Lasrado & Zakarias 2020 | Stewardship | Demonstration |
| | | 11 Electrification and zero-carbon fuels | | | | |
| | | 12 Curbing pollution | Blockchain for supplier CO2 emissions data sharing | Ciulli & Kolk, 2023 | GVC management | Collaboration |
| | | | Emission limits with incentives | Ciulli & Kolk, 2023 | GVC management | Collaboration |
| | | | Leaders' green behaviour model | Bouguerra et al., 2021; Lasrado & Zakarias 2020 | Stewardship | Demonstration |
| | | | Environmental shared goal-setting and planning | Bouguerra et al., 2021; Lasrado & Zakarias 2020 | Stewardship | Collaboration |
| | | | Consciousness of environmental impact and actions to minimize it | Maksimov et al., 2022 | Stewardship | Demonstration |
| | | | Leaders' green behaviour model | Bouguerra et al., 2021; Lasrado & Zakarias 2020 | Stewardship | Demonstration |
| | | | Environmental shared goal-setting and planning | Bouguerra et al., 2021; Lasrado & Zakarias 2020 | Stewardship | Collaboration |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Environmental Grand Challenges** SDG 13-15 | Transformation 4: Sustainable Food, Land, Water, and Oceans | 13 Efficient and resilient agricultural systems and fisheries that support healthy diets and farm livelihoods | | | | |
| | | 14 Protection of terrestrial and marine biodiversity, including forests | | | | |
| | | 15 Healthy food promotion and regulation | | | | |
| | | 16 Trade and supply chains consistent with sustainable development | Investments to reduce overconsumption in host | Montiel et al., 2021 | Stewardship | Demonstration |
| | | | Investments to reduce natural resource overuse in host | Montiel et al., 2021 | Stewardship | Demonstration |
| | | 17 Integrated land-use and water management | Partnerships with civil society organizations and the public sector | Van Zanten & Van Tulder, 2018 | Political CSR | Collaboration |
| **Economic Grand Challenges** SDG 8-12, 17 | Transformation 5: Sustainable Cities and Communities | 18 Urban access to water, sanitation and waste management | | | | |
| | | 19 Sustainable mobility and transport networks | | | | |
| | | 20 More compact settlements | | | | |
| | | 21 Urban adaptation and resilience | | | | |
| **Economic Grand Challenges** SDG 8-12, 17 | Transformation 6: Digital Revolution for Sustainable Development | 22 Universal broadband and information-technology infrastructure | | | | |
| | | 23 Digital inclusion, skills, privacy protection and universal identity | | | | |
| | | 24 Mobilizing digital technologies to achieve all SDGs | Oversee CO2 emission data in the GVC to address data quality | Srinivasan & Eden, 2021; Ciulli & Kolk, 2023 | GVC management | Demonstration |
| | | | MNEs' digitalization direct and indirect positive impact on society through GVC | Srinivasan & Eden, 2021; Ciulli & Kolk, 2023 | GVC management | Demonstration |
| | | | AI applied to solve GC | Srinivasan & Eden, 2021; Ciulli & Kolk, 2023 | Stewardship | Demonstration |

Note: The table shows a selection of solutions to Grand Challenges that MNEs can use to deliver the required Transformations for the SDG, and the mechanisms that allow these solutions to scale up to the macro level. However, due to the idiosyncrasies at each home and host country, the selection of examples is illustrative but not a comprehensive list of MNEs' solutions and mechanisms to solve the Grand Challenges.

**Table 5** Mechanisms to scale up MNEs' solutions to Grand Challenges and their salience in management and organizational literature

| | Intervention mechanisms | | | | Amplification mechanisms | | | |
|---|---|---|---|---|---|---|---|---|
| | **Equal Opportunities** | **GVC Management** | **Political CSR** | **Stewardship** | **Advocacy** | **Dissemination** | **Demonstration** | **Collaboration** |
| **MNEs' role** | Provide opportunities to develop human capital, fostering innovation, education, and health initiatives | Coordination and oversight of value chain activities to ensure adherence to environmental, social, and ethical standards | Address societal needs and challenges through business operations, to supplement government services and institutional voids | Proactive role in responsible resource management | Providing public support and potentially influencing public opinion and future regulation | Distribution of knowledge and know-how to broader audiences, increasing awareness | Practical representation of a solution that may inspire others and stimulate their emulation | Participation in intra and inter industry actions and partnership with private and public entities |
| **Salience in the literature analyzed** | | | | | | | | |
| *Relative Salience within mechanisms* | A | B | B | A | B | B | A | A |
| *Absolute salience across mechanisms (ranking as per frequency in literature)* | TIER 2 | TIER 3 | TIER 3 | TIER 2 | TIER 4 | TIER 4 | TIER 1 | TIER 1 |
| **Illustrative examples** | Van Zanten & Van Tulder, 2018; Fang et al., 2023; Perez-Aleman & Ferretti, 2023; Lorenzen et al., 2020; Fu et al., 2022; Montiel et al., 2021 | Goerzen et al., 2021; Mavroudi et al., 2023; Sambharya & Goll, 2021; Ciulli & Kolk, 2023; Srinivasan & Eden, 2021 | Mavroudi et al., 2023; Sambharya & Goll, 2021; Perez-Aleman & Ferretti, 2023; Fu et al., 2022; Montiel et al., 2021; Garrone et al., 2019; Van Zanten & Van Tulder, 2018 | Bouguerra et al., 2021; Lasrado & Zakarias 2020; Maksimov et al., 2022; Montiel et al., 2021; Srinivasan & Eden, 2021; Ciulli & Kolk, 2023 | Garrone et al., 2019 | Mavroudi et al., 2023; Sambharya & Goll, 2021; Montiel et al., 2021 | Fang et al., 2023; Goerzen et al., 2021; Mavroudi et al., 2023; Sambharya & Goll, 2021; Fu et al., 2022; Montiel et al., 2021 ; Bouguerra et al., 2021; Lasrado & Zakarias 2020; Maksimov et al., 2022; Srinivasan & Eden, 2021; Ciulli & Kolk, 2023 | Van Zanten & Van Tulder, 2018; Perez-Aleman & Ferretti, 2023; Lorenzen et al., 2020; Fu et al., 2022; Montiel et al., 2021; Ciulli & Kolk, 2023; Bouguerra et al., 2021; Lasrado & Zakarias 2020 |

| Representative Research Question(s) | What innovative strategies do MNEs employ to actively promote equal opportunities for human capital development and advance innovation, education, and health initiatives within communities, and how do these strategies align with the MNEs' broader sustainability goals and global responsibilities? | How do MNEs adapt their Global Value Chain (GVC) management practices to ensure ethical sourcing and environmental sustainability in the context of Grand Challenges, and how do MNEs make them compatible with the goals and business dynamics? | How do MNEs navigate regulatory complexities and political challenges in regions with institutional voids while delivering essential goods and services, and what stakeholder engagements lead to effective political CSR efforts in these challenging environments? | What are the key factors influencing the success and impact of sustainable resource management initiatives on local communities and on Grand Challenges? | How do MNEs effectively provide public support and influence public opinion and future regulations in support of addressing Grand Challenges, and what advocacy strategies, partnerships, and ethical considerations are most influential in achieving their intended societal and environmental impacts? | What MNEs' dissemination methods, channels, and content approaches yield the most significant impact on public perception, behavior, and policy-making to increasing awareness and understanding of Grand Challenges? | How do MNEs represent solutions to Grand Challenges, inspiring emulation, and what specific elements of these demonstrations are most influential in motivating others to adopt similar solutions and practices for addressing these challenges? | How do MNEs navigate the complexities of working with governments, NGOs, and other stakeholders in collaborative efforts to address Grand Challenges effectively, and how do MNE manage competitive, reputational and imitation risks? |
|---|---|---|---|---|---|---|---|---|

Note: Relative salience calculated as proportion of papers using each mechanism over sample. The same paper can use various mechanisms. 'A' and 'B' denote above and below mean, respectively, within Intervention mechanisms and within amplification mechanism

Absolute salience shows the ranking of total count of the identified mechanism. Each TIER embeds 2 positions. For example, TIER 1 shows the mechanism that presents the first and second highest counts.