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Do Social Engagement and Transnational Boards Matter in Home Market Environmental Engagement and Internationalization of BRICS MNEs to the Advanced Market Economies?

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The internationalization of emerging market multinational enterprises (EMNEs) into advanced markets is a critical area of research. However, limited attention has been paid to how domestic environmental engagement influences this process. This study addresses this gap by applying institutional and resource dependency theory perspectives to panel data from BRICS-based multinationals. The findings indicate a positive relationship between domestic environmental engagement and the degree of internationalization into advanced markets. Furthermore, the presence of a transnational board strengthens this relationship, while domestic social engagement negatively moderates it. The results suggest the crucial roles of transnational boards and domestic social engagement in shaping EMNEs' environmental strategies, which, in turn, influence their international expansion. This study contributes to institutional and resource dependency theory perspectives by demonstrating that local environmental innovations can help BRICS EMNEs to navigate the more demanding and complex institutional environments of advanced economies, where sustainability expectations are higher. It also highlights the importance of transnational boards, suggesting that EMNEs should consider appointing international board members to better align with the expectations of advanced market stakeholders and enhance their environmental engagement capabilities.

Introduction

Multinational enterprises from emerging economies (EMNEs), particularly those based in the BRICS countries, have become influential players in the global economy. As of 2024, 133 Chinese companies feature on the Fortune Global 500 list (Fortune, 2023), reflecting the rising prominence of BRICS MNEs. The World-Economic-Forum (2020) further highlights their growing global competitiveness and reach. These trends have motivated both scholars and practitioners to explore the mechanisms that drive the internationalization of BRICS-based MNEs. As these firms expand into advanced markets, they face increasing stakeholder expectations—not only for economic performance but also for environmental responsibility (Bueno-García *et al.*, 2022). Hence, understanding the impact of environmental innovation engagement on the internationalization of BRICS MNEs has become an area of growing interest for both scholars and practitioners. Accordingly, the first research question is: *To what extent does environmental engagement in their home markets positively influence the degree of internationalization of EMNEs into advanced markets?*

Answering this question is important because existing research on EMNEs internationalization has largely focused on resource availability and institutional environments (Buckley *et al.*, 2016; Wu *et al.*, 2022). However,

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there remains a gap in understanding the relationship between environmental innovation and internationalization. Most studies on environmental innovation have concentrated on firms from advanced economies, often overlooking the specific challenges faced by EMNEs—particularly those from BRICS countries—as they enter advanced markets. These markets are typically viewed as more environmentally responsible, due in part to stronger governance and stricter environmental regulations (Margaret, Schoubben and Verwaal, 2024). Although BRICS MNEs actively engage in environmental innovation, for example, Petrobras, a Brazilian oil and gas MNE, works to reduce and offset the environmental impact of its operations through various programmes (Pertrobras, n.d.). However, the relationship between such environmental engagement and internationalization remains largely underexplored.

In addition, the interaction between environmental and social engagement in facilitating internationalization has not been sufficiently addressed (Dionisio and de Vargas, 2020; Rousselière, Bouchard and Rousselière, 2024). This presents an important theoretical opportunity, as socially engaged firms can simultaneously integrate environmental actions with societal goals while pursuing financial sustainability (Bauwens, Huybrechts and Dufays, 2020; Huybrechts and Haugh, 2018; Vickers and Lyon, 2014). Yet, existing research has largely considered their impacts on firm outcomes independently (Dionisio and de Vargas, 2020; Rousselière, Bouchard and Rousselière, 2024). To address this gap, the second research question is: *To what extent does social engagement by EMNEs interact with environmental innovation to influence their internationalization into advanced markets?*

Beyond firm-level mechanisms, board members also play a significant role in enhancing the relationship between environmental innovation and internationalization. Environmental engagement is often embedded within a firm's strategic priorities, which are largely influenced by the board (Forbes, 2025). From a resource dependency perspective (Pfeffer and Salancik, 2015), boards provide access to key resources, especially when firms face institutional challenges that may hinder their international expansion (Haynes and Hillman, 2010). In the context of BRICS EMNEs, transnational board members may offer valuable human and social capital, enhancing strategic decision-making (Khanna and Palepu, 2010; Puthusserry *et al.*, 2021). Due to their international experience and institutional knowledge, they are often better positioned to understand and respond to the expectations of diverse national contexts. It is therefore plausible that firms with transnational boards are more likely to engage in addressing environmental concerns, which in turn facilitates their internationalization into advanced markets. Accordingly, the third research question is: *To what extent do transnational board members in EMNEs interact with environmental innovation to influence internationalization into advanced markets?*

The theoretical contributions of this study are significant for both institutional and resource dependency theories. First, we extend institutional theory by exploring how environmental engagement in the home market functions as a non-location bound, firm-specific asset that enhances internationalization, particularly in advanced markets. Second, we contribute to resource dependency theory (RDT) by highlighting the role of transnational board members in strengthening the impact of environmental innovation on internationalization. Transnational boards not only address traditional resource dependencies (Haynes and Hillman, 2010; Pfeffer and Salancik, 2015), but also act as legitimacy intermediaries, which in turn help EMNEs gain social legitimacy in advanced markets. Finally, we offer new insights into the complementary roles of environmental and social engagement in internationalization, thereby expanding our understanding of dual engagement strategies in EMNEs.

Theoretical background and hypotheses

Institutional theory (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1995) examines how social pressure toward conformity influences firm behaviour. It suggests that firms seek approval from stakeholders and are, therefore, vulnerable to social influences. A central argument of institutional theory is that firms strive to gain or maintain legitimacy (Scott, 1995; Zaheer, 1995), often by adopting practices perceived as socially desirable within their institutional environment. In this context, MNEs face increasing pressure from stakeholders to act responsibly, particularly through environmental innovation (De Marchi, Cainelli and Grandinetti, 2022). Environmental innovation refers to the development of 'new or modified processes, techniques, practices or systems to avoid environmental harms' (Beise and Rennings, 2005, p. 6)—has emerged as a critical organizational response to this pressure. As sustainability concerns gain prominence among diverse stakeholders, MNEs are increasingly expected to address these demands, especially as environmental issues become more central to corporate strategies (Gómez-Bolaños *et al.*, 2022). Accordingly, MNEs need to 'reconsider the balance between the dual objectives of short-term profitability and long-term sustainability' (OECD, 2012, p. 4). Within this context, environmental innovation is considered crucial, not only for advancing sustainability goals but also for maintaining competitive advantage (Husted and Allen, 2006; Qu *et al.*, 2024). Increasingly, MNEs are under intensified scrutiny in foreign markets, where proactive environmental innovation is increasingly expected as part

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of firms' efforts to meet legitimacy standards and stakeholder expectations (Bouguerra *et al.*, 2023).

However, the extent to which MNEs engage in environmental innovation is shaped by the home-country institutions. Home-country institutions, such as regulatory frameworks and environmental norms, influence firms' strategies, including their internationalization decisions (Chan and Pattnaik, 2021; Marano *et al.*, 2016). Global stakeholder pressure also drives MNEs to adopt higher environmental standards in foreign markets (Kawai, Strange and Zucchella, 2018). EMNEs, in particular, often pursue internationalization as an escape motive to overcome institutional voids in their home markets (Khanna and Palepu, 1997), where environmental regulations may be weak or poorly enforced due to opaque formal institutions (Liedong *et al.*, 2020; Zhao, Tan and Park, 2014). These voids push EMNEs to seek social acceptance in foreign markets (Kostova and Zaheer, 1999), particularly in advanced markets, where stakeholders demand more rigorous environmental standards (Wang *et al.*, 2023).

Environmental innovation serves as a reputational-building strategy for EMNEs, by signalling their commitment to sustainability in foreign markets. This is particularly important for EMNEs, which face significant legitimacy challenges when expanding into advanced economies due to liability of emergingness (Peng *et al.*, 2024; Yang, Zhang and Wu, 2025). In this regard, environmental innovation in the home market helps EMNEs establish ecological legitimacy, allowing them to gain credibility and access to international trade opportunities (Shu *et al.*, 2024). By engaging in environmental innovation in their home markets, EMNEs can build reputation capital and social acceptance that facilitates their rapid internationalization, signalling to stakeholders in advanced economies that they are committed to protecting their social reputation and aligning their corporate practices with their host country stakeholders' expectations (Z. Khan, Lew and Park, 2015).

At the intersection of environmental innovation and internationalization, scholarship suggests that as FDI and international trade accelerate, so does the international spread of environmental best practices (Cerdeira Bento and Moreira, 2019). However, EMNEs often face institutional duality, experiencing potentially conflicting institutional logics from both their home and host countries (Kostova and Zaheer, 1999). This duality is particularly significant when EMNEs expand into advanced economies, where they face more stringent environmental regulations and higher stakeholder expectations. By engaging in environmental innovation in home markets, firms enhance their reputation and signal their commitment to sustainability, which, in turn, influences the degree of internationalization (DOI) (Arora and De, 2020). Kumar, Mudambi and Gray (2013) highlight how Brazil's JBS SA became the world's largest beef processor within just 6 years. EMNEs' engagement in environmental innovation will support the DOI, as external stakeholders will be more responsive to firms' societal impact across their value chains (Paillé and Halilem, 2019). Yet, existing research has paid limited attention to how home-country environmental innovation influences the DOI of EMNEs into advanced markets, where expectations around sustainability are considerably higher (Margaret, Schoubben and Verwaal, 2024).

Drawing on institutional theory, we argue that EMNEs' exposure to diverse stakeholders and knowledge sources both pressures and enables them to develop environmental innovations (Horbach, Rammer and Rennings, 2012; North, 1990). Home-country institutions play a vital role in this process (Malen and Vaaler, 2017), shaping firms' strategic choices amid rapid institutional changes in emerging markets (Meyer *et al.*, 2009). Favourable market conditions in these markets further support innovation (Cuervo-Cazurra and Genc, 2008; Nuruzzaman, Singh and Pattnaik, 2019), as institutions provide necessary resources and conditions (Williamson, 2000), highlighting their significance (Gaur, Ma and Ding, 2018). By enacting environmental innovations at home, EMNEs gain stakeholder approval through positive environmental impact (Marano, Tashman and Kostova, 2017), which enhances their DOI. Therefore, the engagement of EMNEs in environmental innovation not only addresses home-country institutional pressures but also facilitates their social acceptance in international markets (cf. Shu *et al.*, 2024). Thus, we propose the following hypothesis:

H 1. *EMNEs' environmental innovation engagement in their home markets positively influences their DOI into advanced markets.*

The moderating role of social engagement at home. Voluntary corporate social engagement generally yields positive benefits to firms, such as achieving social legitimacy and building a favourable corporate image, which helps gain institutional support, despite requiring significant resource investment (Strike, Gao and Bansal, 2006; Sun *et al.*, 2021). However, for entrepreneurs of emerging markets, this engagement is often negatively associated with internationalization (Capelleras, Martin-Sanchez and Zhang, 2023). This may be due to the severe resource constraints many EMNEs face in their domestic markets, where institutional voids, such as imperfect capital and regulatory markets, hinder innovation and access to critical resources (Farndale *et al.*, 2022; Kumar *et al.*, 2019). Given these limitations, firms that prioritize addressing deeply rooted, complex societal challenges in emerging economies may find it difficult to balance social and environmental commitments with the demands of international expansion. Scholars suggest that social engagement can differently affect

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environmental innovation at home and the DOI, largely due to cost and efficiency considerations (Guo and Xie, 2025). In this context, scholars have documented that both internal and external social engagement can yield both positive and negative outcomes for firms (Hawn and Ioannou, 2016; Jin, Jiang and Hu, 2023).

A firm can be environmentally focused while paying less attention to societal concerns, or vice versa, due to resource limitations and the trade-offs between the two (Jayachandran, Kalaignanam and Eilert, 2013; Strike, Gao and Bansal, 2006). This dynamic is often driven by rising regulatory requirements in emerging markets, which require firms to engage in environmentally responsible practices as part of regulatory compliance. For example, China launched the Energy Efficiency Public Announcement System in 2006, and Brazil introduced the Atlantic Forest Restoration Pact in 2009. Such regulatory pressures often compel firms to prioritize environmental innovation and compliance, frequently taking precedence over voluntary social initiatives, which are typically seen as discretionary (Aragòn-Correa, Marcus and Vogel, 2020; Chang, Li and Lu, 2015).

Social and environmental engagements often require different resources, strategies and objectives (Cohen and Munoz, 2017; Haigh and Hoffman, 2014). Therefore, they may not be complementary but rather act as substitutes. Utilizing scarce resources for both regulatory compliance (environmental engagement) and voluntary initiatives can hinder internationalization, as it diverts critical resources and capabilities from key functions essential to international expansion (Strike, Gao and Bansal, 2006). Societal challenges are more prevalent in developing economies than in advanced markets (Konara, Lopez and Shirodkar, 2021), potentially limiting their complementarity with environmental engagement during expansion into advanced markets. Tong *et al.* (2018) argue that managing social initiatives is costly for EMNEs due to information asymmetry, higher operational costs, poor institutional quality and scarce resources. As a result, maintaining both social and environmental efforts places a dual burden on these firms, potentially undermining their ability to expand effectively into advanced economies (Wickert, Scherer and Spence, 2016).

A trade-off between environmental and social engagement is likely, especially in resource-constrained emerging markets (Bitzer and Hamann, 2014). The trade-off is particularly significant for EMNEs, where limited resources make balancing both engagements challenging (Guo and Xie, 2025). Addressing social issues in the home market may divert attention and resources from critical environmental innovation activities that support international expansion (Hawn and Ioannou, 2016; Strike, Gao and Bansal, 2006). Firms with limited resources may prioritize environmental engagement to meet regulatory compliance at home, often taking precedence over voluntary social initiatives (Aragòn-Correa, Marcus and Vogel, 2020; Chang, Li and Lu, 2015). Given that social engagement often demands significant investment, it may detract from, rather than, a firm's ability to pursue environmental innovation—critical for internationalization (Jeong and Kim, 2019). This raises an important, underexamined question: Does social engagement in the home market negatively moderate the effect of environmental innovation on EMNEs' DOI into advanced economies? Understanding this is crucial, as investing in social engagement can increase costs and strain resource allocation, limiting firms' ability to focus on environmental innovation—often more vital for meeting the demands of diverse stakeholders in advanced markets. Addressing this question can advance the literature on trade-offs between environmental and social engagement and offer important insights for managers balancing these priorities. Therefore, we propose the following:

H 2. *The positive effect of EMNEs' environmental innovation engagement in their home markets on their degree of internationalization into advanced markets is negatively moderated by social engagement in their home markets.*

The moderating role of transnational boards. The varying institutional environments in emerging and advanced markets present an opportunity to integrate RDT with institutional theory in the context of EMNEs' internationalization into advanced markets. Due to substantial differences—such as regulatory frameworks and resource dependencies—firms face distinct challenges in managing these dependencies (Davis and Adam Cobb, 2010; Jiang *et al.*, 2023). According to RDT (Pfeffer and Salancik, 2015), boards play a critical role in providing key resources and reducing uncertainty, especially when firms face institutional challenges that may hinder international expansion (Haynes and Hillman, 2010). Transnational board members contribute valuable human and social capital, helping firms overcome resource constraints and enhance their strategic decision-making, particularly in emerging markets with institutional voids (Khanna and Palepu, 2010; Puthusserry *et al.*, 2021).

Institutional theory suggests that a firm's engagement in environmental innovation is influenced by both domestic and foreign institutional environments—including international regulations, foreign clients and the firm's ability to collaborate and network with international institutions (Kim, Moon and Yin, 2016; Peñasco, del Río and Romero-Jordán, 2017). Recent research on BRICS economies highlights the need for strong policies and strategic guidance to support environmental innovation, mitigating the environmental

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and economic impacts of natural resource extraction (Udeagha and Ngepah, 2023). Consequently, firms from BRICS countries are increasingly focused on developing capabilities to address environmental challenges (Forbes, 2017, 2019, 2022).

In this context, the role of the top management team in internationalization is well established (Chittoor, Aulakh and Ray, 2019). Specifically, transnational individuals bring cultural knowledge, diverse skills and a global mindset—forming a distinctive human capital architecture that enhances MNE performance (Hong and Minbaeva, 2022; Yu *et al.*, 2024). These individuals bring essential human and social capital required for advancing in certain markets (Tasheva and Nielsen, 2022). Moreover, boards provide expertise critical for sustainable innovation; the transnational experience of board members has been shown to positively influence firms' sustainable innovation practices (Quan *et al.*, 2023; Uyar *et al.*, 2024). This is attributed to their exposure, positive attitudes, human and social capital and creativity, which collectively enable firms to engage more effectively in sustainability initiatives (Usman, Javed and Yin, 2020).

Resource dependence theory views transnational directors as boundary-spanners who apply their knowledge across firms (Pfeffer and Salancik, 2015). Their foreign market experience allows EMNEs to improve environmental engagement by helping firms meeting international standards, reducing dependence on local institutional knowledge (Quan *et al.*, 2023). Prior research has examined the role of transnational directors in influencing internationalization of emerging market firms (Puthusserry *et al.*, 2021). Building on this, we argue that the presence of transnational directors helps EMNEs demonstrate responsible practices—such as environmental engagement in their home markets—by providing strategic guidance aligned with internationalization goals. This strengthens firms' reputations and ability to meet advanced market institutional requirements, leading to greater internationalization.

Furthermore, transnational directors bring diverse skills that serve as strategic assets, offering firms a competitive advantage when pursuing environmental innovation and legitimacy in host markets (S. Chen, Hermes and Hooghiemstra, 2022; Haynes and Hillman, 2010). Boards with transnational members possess diverse knowledge of foreign markets, which is crucial for internationalization (Puthusserry *et al.*, 2021). Leveraging this expertise helps emerging market firms reduce psychic distance (Puthusserry *et al.*, 2021). It is well established that when board members possess greater experience and national diversity, this facilitates firms' internationalization (Baronchelli, Cassia and Piantoni, 2015; Segaro, Larimo and Jones, 2014). Their global networks and insights into host markets enhance the firms' internationalization and performance (Lu and Liang *et al.*, 2015), especially in advanced markets where stringent environmental regulations and sustainability expectations prevail (Margaret, Schoubben and Verwaal, 2024).

Transnational boards can also help overcome negative country-of-origin perceptions, building social legitimacy abroad (Lu and Liang *et al.*, 2015). Thus, when firms have transnational board members, environmental engagement at home is likely to have a stronger positive impact on internationalization into advanced markets. In contrast, without such members, this effect may be limited. The expertise of transnational directors in environmental innovation and navigating local complexities enables firms to meet advanced market standards, facilitating efficient entry and operation in those markets, where stakeholders expect high levels of sustainability engagement.

Foreign market knowledge significantly influences a firm's international behaviour (Pla-Barber and Alegre, 2014). Transnational board members provide crucial insights into foreign market practices and environmental regulations. Proactive corporate environmental practices—such as ISO14001certification, total quality environmental management and eco-auditing—are often driven by international institutional pressures, which can be even stronger than domestic ones (Kassolis, 2007). This makes board expertise particularly important for environmental engagement (Rodrigue, Magnan and Cho, 2013).

The presence of transnational board members acts as a conduit for transferring environmental innovation practices from foreign to home markets, enhancing their effectiveness and supporting international expansion. For example, after the US Environmental Protection Agency introduced stricter regulations in the 1990s, many US firms invested heavily in environmental management and appointed board members with relevant expertise. This enabled the development of innovations such as solar-powered homes and electric vehicles, enhancing global competitiveness (Kolk and Pinkse, 2008). An MNE's DOI is influenced by its internal institutions, particularly those ties to competitive advantages from environmental innovation (Konara, Lopez and Shirodkar, 2021). Similarly, transnational board members with environmental expertise and knowledge of advanced markets' stakeholder requirements strengthen the relationship between home market environmental innovation and internationalization into advanced markets. Thus, we propose the following hypothesis:

H 3. *The positive influence of EMNEs' environmental innovation engagement in their home markets on their DOI into advanced markets is positively moderated by the presence of transnational board members.*

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Table 1. Sample distribution across industries and countries

Sectors	Brazil	China	Russia	South Africa	India	Grand total
Communication services	1	6	2	4	2	15
Consumer discretionary	6	14	1	13	10	44
Consumer staples	10	4	0	9	2	25
Energy	3	4	7	1	1	16
Health care	0	18	0	4	9	31
Industrials	9	32	1	13	11	66
Information technology	1	33	0	2	5	41
Materials	10	16	6	18	13	63
Real estate	0	2	0	4	3	9
Utilities	0	4	1	0	1	6
Grand total	40	133	18	68	57	316

Data and methodology

The BRICS region has attracted significant attention in IB literature due to its growing global economic influence. Its share of global GDP based on purchasing power parity reached 35% in 2024 (Statista, 2025). Similarly, emerging economies' share of global outward foreign direct investment (OFDI) increased from 4% in 1995 to 20% in 2015, with BRICS countries contributing approximately 62% of this growth. By 2020, the BRICS countries collectively accounted for 20% of global OFDI (UNCTAD, 2023; World-Bank, 2018). Given the region's substantial impact, analysing the internationalization patterns of EMNEs from BRICS is particularly pertinent. For this study, firm-level data were collected from Thomson Reuters (Refinitiv), annual reports and company websites, while country-level data were sourced from the World Governance Indicators and World Bank databases. The sample covers 316 non-financial EMNEs from BRICS, operating in developed markets, over the period 2012–2021.

The sample selection began by identifying all publicly listed firms from BRICS countries, as they typically provide more reliable information than privately listed firms (Capron and Shen, 2007). The sample was then narrowed to multinationals meeting the following criteria: (a) foreign sales or foreign assets; (b) operations in developed markets, as classified by the FTSE Russell Country Classification (2023); (c) availability of ESG score; and (d) classification as non-financial firms. This process yielded a final sample of 316 EMNEs, forming an unbalanced panel due to some missing observations. Although missing data in panel datasets can introduce attrition or selection bias, potentially leading to inconsistent estimates and reduced generalizability (Roodman, 2009; Wooldridge, 2010), the missingness in this case is random. To address potential sample selection bias and unobserved heterogeneity, we apply a two-step system Generalized Method of Moment (GMM) estimator (Athreye, Saeed and Baloch, 2021). In addition, financial variables were winsorized at the 5th and 95th percentiles to mitigate the influence of outliers. Table 1 presents the sample distribution by country and industry.

Measures

The dependent variable of this study is the DOI, measured as the sum of two ratios: foreign sales to total sales and foreign assets to total assets. While prior studies often employe unidimensional measures for DOI such as the ratio of foreign sales to total sales (Pan *et al.*, 2014), foreign income to total income (Liu, He and Wang, 2023), or the geographic dispersion of foreign subsidiaries (Zhang, Zhong and Li, 2024), a multidimensional approach provides a more comprehensive perspective. By capturing market and asset-based international exposure, this method provides a broader analytical scope of a firm's internationalization activities (Vaněk, 2024).

The key independent variable is environmental engagement (*Env_Eng*) in the home country, measured by the Environmental Innovation Score (EIS) proposed by Wedari, Moradi-Motlagh and Jubb (2023). The EIS captures a firm's commitment to environmental responsibility and the adoption of innovative approaches to address environmental concerns. EMNEs often face institutional and regulatory pressures in host markets, partly due to environmental issues in their home markets (Shi *et al.*, 2023). Adopting innovative environmental strategies at home equips EMNEs with unique resources to overcome the liability of origin in developed markets (Albitar *et al.*, 2023). The EIS is thus an appropriate measure to assess corporate efforts in reducing carbon emissions and mitigating environmental impact (Wedari, Moradi-Motlagh and Jubb, 2023).

To determine boundary conditions, this study examines two moderating variables: social engagement and the presence of transnational board members. Social engagement (*Social_Eng*) is measured using the ESG social pillar score (0–100), following Huang *et al.* (2023) and Bissoondoyal-Bheenick, Brooks and Do (2023).

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This score reflects corporate efforts to create social impact, including initiatives related to racial diversity, gender equality, inclusive hiring practices, workforce management and other social programmes (Bissoondoyal-Bheenick, Brooks and Do, 2023). The presence of transnational board members (*Trans_Board*) is measured by the total number of foreign nationals on the board, representing board diversity (García-Meca, García-Sánchez and Martínez-Ferrero, 2015; Ruigrok, Peck and Tacheva, 2007). Board nationality data were manually collected from annual reports and company websites.

The empirical model also controls for several firm- and country-level factors. Firm-level controls include board size, board gender diversity (BGD), financial leverage, financial performance and firm size. Board size (*Board_Size*) is the total number of board members (Garg, Lin and Yang, 2023). BGD is the percentage of women on the board (Saeed, Baloch and Riaz, 2022). We also included board independence and board tenure,[1] given their strategic role in shaping internationalization through stronger monitoring, diverse perspectives, reduced conflict, enhanced consistency and long-term oversight (H. L. Chen, 2011; Rivas, 2012).

Financial leverage (*Leverage*) is calculated as total debt to total assets (Shahzad, Ali and Zhao, 2022), and financial performance is proxied by return on assets (*Profitability*), following Saeed, Baloch and Liedong (2025). Firm size (*Size*) is measured as the natural logarithm of total assets (González and González-Galindo, 2022). At the country level, regulatory quality (*Regulation*) is measured using the World Governance Indicators' Regulatory Quality index, which assesses the impact of governmental policies on private sector development (Pindado *et al.*, 2023). Gross Domestic Product (GDP) is measured as the natural logarithm of GDP (Fang and Li, 2024).

Empirical strategy

To examine the impact of domestic environmental engagement on the DOI of EMNEs, as well as the moderating effects of transnational board members and domestic social engagement, this study estimates the following empirical Model 1 by using the two-step system GMM approach.

$$\begin{aligned} DOI_{i,t} = {} & \alpha_0 + \beta_1 DOI_{t-1,i} + \beta_2 Env\_Eng_{t-1,i} + \beta_3 Soc\_Eng_{t.1,i} \\ & + \beta_4 Trans\_Board_{t-1,i} + \beta_5 Env\_Eng_{t-1,i} \times Soc\_Eng_{t.1,i} \\ & + \beta_6 Env\_Eng_{t-1,i} \times Trans\_Board_{t-1,i} + \beta_7 Board\_Size_{t-1,i} \\ & + \beta_8 BGD_{t-1,i} + \beta_9 Leverge_{t-1,i} + \beta_{10} Profitability_{t-1,i} + \beta_{11} Size_{t-1,i} \\ & + \beta_{12} Regulation_{t-1,c} + \beta_{13} GDP_{t-1,c} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Equation (1) is dynamic in nature, where 'i' and 'c' represent firm- and country-level variables, respectively. All explanatory variables are lagged by one period. Diagnostic tests[2] indicate the presence of heteroskedasticity, but no significant issues of autocorrelation, endogeneity or multicollinearity. Accordingly, the two-step system GMM estimator is employed to address potential endogeneity bias may arise due to the dynamic nature of the model and the inclusion of a lagged dependent variable (Roodman, 2009).

Endogeneity bias may result from dynamic endogeneity—stemming from feedback effects between the dependent and independent variables—which traditional fixed-effects models cannot adequately address (Gormley and Matsa, 2014; Zaefarian *et al.*, 2017). Such bias can lead to inconsistent estimates and erroneous conclusions (Gormley and Matsa, 2014). The two-step system GMM mitigates these concerns by using lagged values of the dependent and explanatory variables as internal instruments (Saeed, Baloch and Liedong, 2025), providing consistent and asymptotically efficient estimates while accounting for both heteroskedasticity and potential endogeneity (Arellano and Bover, 1995; Blundell and Bond, 1998; Roodman, 2009; Shahgholian, 2019).

Moreover, compared to difference GMM, the system GMM is more appropriate for short panels, as it leverages both lagged differences and lagged levels of the explanatory variables as instruments and incorporates additional moment conditions, thereby improving efficiency and reliability (Blundell and Bond, 1998; Roodman, 2009). However, GMM estimation is not without limitations. In particular, it may suffer from weak instruments and instrument proliferation in short panels, potentially compromising its validity (Blundell and Bond, 1998).[3] To mitigate these concerns and assess model robustness, we conducted the Hansen test for instrument validity and the AR(2) test for second-order serial correlation. The insignificant *p*-values for both the Hansen and AR(2) tests confirm the absence of over-identification and second-order serial correlation issues.

Analysis and findings

Descriptive statistics

Table 2 presents the descriptive statistics for the key variables. The average value of DOI is 0.329 for our sample. The mean value of domestic environmental engagement (*Env_Eng*) is 24.59, while domestic social engagement

[1]Results are reported in supplementary file. Main findings remain consistent.

[2]Thanks to anonymous reviewers who suggested to run these diagnostic tests, such as Hausman test and for detection of potential heteroskedasticity, autocorrelation, endogeneity and multicollinearity issues. The results are reported in supplementary file.

[3]We are thankful to the anonymous reviewer for suggesting this.

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Table 2. Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
DOI	3152	0.329	0.362	0.000	1.440
Env_Eng	2174	24. 596	30.036	0.000	99.063
Soc_Eng	2174	49.094	22.960	0.689	96.407
Trans_Board	3152	0.985	1.284	0.000	8.000
Board_Size	3152	10.526	2.937	4.000	25.000
BGD	3152	15.701	13.057	0.000	75.000
Leverage	3152	1.172	3.011	0.000	63.142
Profitability	3152	0.081	0.088	−0.771	0.677
Size	3152	22.048	1.494	17.937	26.702
Regulation	3152	−0.204	0.213	−1.142	0.380
GDP	3152	8.758	0.641	7.268	9.679

(*Soc_Eng*) averages 49.094, indicating greater emphasis on social engagement. On average, firms have one foreign board member (*Trans_Board*) and a total of 10 board members (Board_Size). For BGD, the mean value is 15.71%, indicating the presence of one female board member. The mean values of leverage (Leverage) and profitability (Profitability) are 1.172 and 0.081, respectively, while firm size (Size) is 22.04. Regarding the regulatory quality index (Regulation), the average value is −0.204, consistent with institutional weaknesses in the BRICS. The close alignment of means and standard deviations suggests limited variation across the sample.

Correlation matrix

Table 3 presents the correlation matrix for the key variables. The relatively low correlation values suggest no concerns of multicollinearity. A positive correlation is observed between the DOI and domestic environmental engagement (*Env_Eng*). Similarly, both domestic social engagement (*Soc_Eng*) and the presence of a transnational board (*Trans_Board*) show positive correlations with DOI.

Regression estimates

Table 4 presents the regression estimates using system GMM through a hierarchical modelling approach, incorporating country, time and industry fixed effects. The AR(2) and Hansen tests confirm the validity of the model, with insignificant probabilities indicating no issues with serial correlation or over-identification.

Column 1 reports results for the key independent variable, environmental engagement (*Env_Eng*) and control variables. The coefficient of *Env_Eng* is positive and significant at the 1% level, supporting Hypothesis 1. Specifically, a one-unit increase in environmental innovation engagement in home markets is associated with an 8.90%[4] increase in the DOI. This finding supports

Table 3. Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) DOI	1.000											
(2) Lag_DOI	0.433	1.000										
(3) Env_Eng	0.014	−0.007	1.000									
(4) Soc_Eng	0.193	0.192	0.236	1.000								
(5) Trans_Board	0.192	0.199	−0.097	0.191	1.000							
(6) Board_Size	0.055	0.048	0.115	0.206	0.045	1.000						
(7) BGD	0.016	0.016	−0.013	0.206	0.194	0.058	1.000					
(8) Leverage	0.002	−0.020	0.097	0.037	0.018	0.012	−0.076	1.000				
(9) Profitability	−0.053	−0.034	−0.026	−0.021	0.043	−0.081	0.089	−0.154	1.000			
(10) Size	0.077	0.072	0.164	0.195	0.010	0.212	−0.301	0.127	−0.095	1.000		
(11) Regulation	0.096	0.092	−0.040	0.146	0.093	0.123	0.339	−0.079	−0.113	−0.138	1.000	
(12) GDP	−0.110	−0.109	−0.144	−0.187	−0.071	−0.095	−0.088	0.026	−0.007	0.220	0.007	1.000

[4]Following Athreye, S., A. Saeed and M. S. Baloch (2021). 'Financial crisis of 2008 and outward foreign investments from

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Table 4. Environmental innovation engagement and degree of internationalization

Variables	(1) Column	(2) Column	(3) Column	(4) Column	(5) Column
Lag.DOI	0.69900***	0.66400***	0.67700***	0.67400***	0.67600***
	(0.00657)	(0.00778)	(0.00850)	(0.00767)	(0.00811)
Env_Eng	0.00119***	0.00077***	0.00196***	0.00038***	0.00151***
	(0.00003)	(0.00003)	(0.00013)	(0.00012)	(0.00015)
Soc_Eng		0.00047***	0.00076***	0.00036***	0.00093***
		(0.00007)	(0.00010)	(0.00012)	(0.00008)
Trans_Board		0.04360***	0.04500***	0.03660***	0.02600***
		(0.00316)	(0.00394)	(0.00495)	(0.00475)
Env_Eng×Soc_Eng			−0.00001***		−0.00002***
			(0.000001)		(0.000002)
Env_Eng×Trans_Board				0.00027***	0.00039***
				(0.00004)	(0.00005)
Board_Size	0.01150***	0.01160***	0.01430***	0.01290***	0.01470***
	(0.00049)	(0.00072)	(0.00084)	(0.00073)	(0.00083)
BGD	0.00101***	0.00108***	0.00105***	0.00103***	0.00103***
	(0.00011)	(0.00008)	(0.00008)	(0.00011)	(0.00012)
Leverage	0.00605***	0.00713***	0.00710***	0.00747***	0.00777***
	(0.00020)	(0.00026)	(0.00015)	(0.00015)	(0.00016)
Profitability	0.40800***	0.44300***	0.43400***	0.42800***	0.46100***
	(0.02600)	(0.02010)	(0.02470)	(0.02070)	(0.02030)
Size	−0.01630***	−0.01590***	−0.01900***	−0.01400***	−0.01340***
	(0.00324)	(0.00206)	(0.00263)	(0.00259)	(0.00291)
Regulation	0.13600***	0.18200***	0.17200***	0.18300***	0.18000***
	(0.00852)	(0.00895)	(0.00936)	(0.00880)	(0.01090)
GDP	0.02590***	−0.01580*	−0.01870**	−0.02050**	−0.02400***
	(0.00714)	(0.00834)	(0.00948)	(0.00881)	(0.00815)
Constant	0.02430	0.16100	0.19300*	0.14400	0.14100
	(0.11000)	(0.0996)	(0.11300)	(0.11100)	(0.11500)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.186	0.154	0.147	0.161	0.152
Hansen	0.535	0.433	0.517	0.517	0.463

Note: Standard errors in parentheses. All explanatory variables are one period lagged. DOI, that is, degree of internationalization is dependent variable. Env_Eng, that is, environmental engagement is our independent variable. Social engagement (Soc_Eng) and presence of transnational board (Trans_Board) are moderating variables. Control variables include board size (Board_Size), board gender diversity (BGD), leverage (Leverage), profitability (Profitability), firm size (Size), regulatory quality index (Regulation) and Gross Domestic Production (GDP).
$^{*}p < 0.1$. $^{**}p < 0.05$. $^{***}p < 0.01$.

the theoretical argument that EMNEs address the liability of origin and align with host-country institutional expectations by engaging in environmental innovation at home (Carrillo-Hermosilla, Del Río and Könnölä, 2010; Konara, Lopez and Shirodkar, 2021; Liao and Tsai, 2019; Peng, 2003). To examine moderating effects, *Column 2* introduces domestic social engagement (*Soc_Eng*) and transnational board presence (*Trans_Board*) as individual terms. Both are positive and significant at the 1% level, indicating a positive influence on DOI.

In *Column 3*, the interaction term *Soc_Eng*×*Env_Eng* is negative and significant at the 1% level, indicating that a 1% increase in social engagement reduces the positive effect of domestic environmental engagement on DOI by 0.15%. This supports Hypothesis 2 and suggests a substitution effect: EMNEs that simultaneously pursue social and environmental initiatives may divert resources towards domestic opportunities, negatively affecting DOI. This aligns with Capelleras, Martin-Sanchez and Zhang (2023), Bissoondoyal-Bheenick, Brooks and Do (2023), Jayachandran, Kalaignanam and Eilert (2013), and Strike, Gao and Bansal (2006), who argue that resource constraints EMNEs can hinder their ability to pursue both initiatives effectively. Thus, from a strategic and resource allocation perspective, social and environmental initiatives by EMNEs may not be complementary but rather a substitution strategy when the goal is to enhance the DOI (Cohen and Munoz, 2017; Haigh and Hoffman, 2014).

Regarding the moderation effect of transnational boards, in *Column 4*, the coefficient for the interaction

China and India', *Journal of World Business*, **56,** p. 101190, ibid.
we calculated the percentage change as coefficient × (mean of independent variable / mean of dependent variable)

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term, such as *Trans_Board*×*Env_Eng* is positive and significant at the 1% level, indicating that each additional transnational board member enhances the positive effect of domestic environmental engagement on DOI by 0.08%. This supports Hypothesis 3 and is consistent with the theoretical perspectives of Quan *et al.* (2023) and Uyar *et al.* (2024), who suggest that transnational boards provide critical expertise for a firm's sustainable innovation practices, thereby enhancing its DOI (Pfeffer and Salancik, 2015). Transnational boards in EMNEs facilitate the internationalization process by offering diversified capabilities and knowledge, ensuring their engagement in environmentally innovative corporate practices (Baronchelli, Cassia and Piantoni, 2015). In *Column 5*, after including all variables, our results remain qualitatively unchanged.

Regarding the country and firm level control variables, the results are mixed. The coefficients of board size (*Board_Size*), BGD, leverage (*Leverage*), profitability (*Profitability*) and Regulatory quality (*Regulation*) are statistically positive and significant. This suggests that a large board size and higher BGD positively influence the DOI, as such boards offer more diversified, experienced, capable and skilled members (Lee and Park, 2006; Sanders and Carpenter, 1998). In line with Filatotchev and Piesse (2009), financial leverage has a positive effect on the DOI, as it signals access to critical financial resources that are vital for firm growth. Similarly, higher firm profitability facilitates operational expansion, providing more sales-based resources for internationalization (Song, Park and Lee, 2024). Regarding the regulatory quality, a better institutional environment offers firms support and access to critical resources, leading to improved performance and overseas economic growth, due to lower transaction costs and stronger governance mechanisms (Deng and Zhang, 2018; Kaufmann, Kraay and Mastruzzi, 2011). Finally, with respect to firm size, the findings are consistent with Park and Jang (2010), suggesting that as firms increase in size domestically, their international expansion may decrease due to a greater focus on the domestic market and the liability of foreignness.

Taken together, we find that EMNEs' engagement in environmental innovation in their home markets enhances their DOI into developed economies. This relationship is significantly moderated by domestic social engagement and the presence of a transnational board. Specifically, social initiatives in home markets by EMNEs weaken this relationship, suggesting a substitution effect and highlighting resource allocation trade-offs. In contrast, the positive association between environmental innovation and the DOI is stronger when EMNEs have a transnational board.

Robustness tests

To ensure the reliability and robustness of our findings, we conducted several tests. First, we employed an alternative measure of domestic environmental innovation engagement (*Env_Eng*), specifically the environmental expenses investment dummy, which is extracted from Thomson Reuters (Refinitiv). This variable takes 1 if the corresponding firm does make any environmental investment expenditures for that specific year and 0 otherwise. We then re-estimated the empirical model using the alternative measure of *Env_Eng*. The results, presented in Table 5, are consistent with those reported in Table 4. This consistency of results suggests that our findings are not influenced by measurement bias, reinforcing the robustness of the results.

Second, prior literature commonly uses the ratio of foreign sales to total sales to measure the DOI (Abdi and Aulakh, 2018; Ruigrok, Peck and Tacheva, 2007). Given the widespread acceptance of this unidirectional measure, we also employ the foreign sales to total sales ratio as an alternative measure of the DOI and re-estimate the empirical model. The results, presented in Table 6, show consistency with those reported in Table 4, further supporting our hypotheses.

Third, to examine and differentiate the environmental innovation engagement behaviour of EMNEs across industries in relation to their DOI, we segregate the sample into fast-growing and slow-growing industries. Using the GISC map sectors classification for 2023, as published by Thomson Reuters (Preston, 2023), we categorize sectors into fast-growing and slow-growing industries. Sectors such as Information Technology, Health Care, Consumer Discretionary, Industrials and Communication Services are classified as fast-growth industries, while sectors including Consumer Staples, Energy, Utilities, Materials and Real Estate are classified as slow-growth industries. We then re-estimate the model for both sub-samples, and the results are reported in Table 7. Panel A presents the estimates for slow-growth industries, whereas Panel B provides the results for fast-growth industries. The main results are consistent with earlier findings (Table 4), but the results are more pronounced for fast-growing sectors compared to slow-growing sectors. This suggests that EMNEs in fast-growing industries are more actively engaged in environmental innovation to enhance their DOI. In contrast, slow-growth sectors generally lack eco-innovation capabilities and require greater resources to engage in environmental innovation (Martínez-Martínez *et al.*, 2023).

Lastly, to examine differences in environmental innovation engagement among EMNEs across high- and low technology-intensity industries, we follow the approach suggested by Medcof and Lee (2017). First, we calculate each firm's R&D intensity by dividing its R&D expenditure by operating expenses. Then, we determine the

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Table 5. Environmental innovation engagement and DOI: Alternative measure of environmental engagement

Variables	(1) Column	(2) Column	(3) Column	(4) Column	(5) Column
Lag.DOI	0.39700***	0.42100***	0.81200***	0.43700***	0.79300***
	(0.00123)	(0.00250)	(0.00624)	(0.00233)	(0.00769)
Env_Eng	0.04600***	0.03820***	0.09810***	0.01880***	0.06740***
	(0.00170)	(0.00299)	(0.01310)	(0.00349)	(0.01330)
Soc_Eng		0.000641***	0.00055***	0.00054***	0.00039***
		(0.00015)	(0.00013)	(0.00012)	(0.00014)
Trans_Board		0.01160***	0.01940***	0.03150***	0.00995**
		(0.00245)	(0.00431)	(0.00422)	(0.00455)
Env_Eng×Soc_Eng			−0.00220***		−0.00202***
			(0.00024)		(0.00026)
Env_Eng×Trans_Board				0.00609**	0.01900***
				(0.00238)	(0.00591)
Board_Size	0.01080***	0.01280***	0.01050***	0.00462***	0.00945***
	(0.00029)	(0.00041)	(0.00104)	(0.00087)	(0.00110)
BGD	0.00064***	0.00066***	0.00218***	0.00034*	0.00222***
	(0.00019)	(0.00111)	(0.00018)	(0.00018)	(0.00016)
Leverage	0.00779***	0.00940***	−0.00559***	0.00789***	0.00525***
	(0.00006)	(0.00005)	(0.00185)	(0.00007)	(0.00167)
Profitability	0.28200***	0.24700***	0.14700***	0.31900***	0.09330**
	(0.01140)	(0.01640)	(0.03450)	(0.03050)	(0.04040)
Size	−0.03420***	−0.03500***	0.00663*	−0.04160***	0.00623*
	(0.00172)	(0.00313)	(0.0036)	(0.00398)	(0.00368)
Regulation	0.23700***	0.34000***	0.27900***	0.26500***	0.27800***
	(0.00589)	(0.00797)	(0.01330)	(0.01490)	(0.01340)
GDP	0.06840***	−0.00190	−0.04720***	0.04150***	−0.05630***
	(0.00376)	(0.01020)	(0.00960)	(0.01050)	(0.01130)
Constant	0.42600***	1.01000***	0.14300	0.74700***	0.25300**
	(0.06230)	(0.13300)	(0.11100)	(0.12200)	(0.12200)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.400	0.378	0.385	0.342	0.390
Hansen	0.253	0.954	0.860	0.998	0.895

Note: Standard errors in parentheses. All explanatory variables are one period lagged. DOI, that is, degree of internationalization is dependent variable. Env_Eng, that is, environmental engagement is our independent variable. Social engagement (Soc_Eng) and presence of transnational board (Trans_Board) are moderating variables. Control variables include board size (Board_Size), board gender diversity (BGD), leverage (Leverage), profitability (Profitability), firm size (Size), regulatory quality index (Regulation) and Gross Domestic Production (GDP).
$^{*}p < 0.1$. $^{**}p < 0.05$. $^{***}p < 0.01$.

median R&D intensity across all industries and classify industries as high technology-intensity (coded as 1) if above the median, and low technology-intensity (coded as 0) if below. We re-estimate the model for each group separately. Table 8 presents the results: Panel A shows estimates for low technology-intensity industries, and Panel B for high technology-intensity industries. The findings are more pronounced for high-tech sectors, likely due to their advanced technologies and eco-friendly production practices, which reduce the liability of foreignness and enhance their DOI. These results align with prior tests, confirming the robustness of our findings and supporting all hypotheses.

Taken together, our main findings remain robust across multiple checks, with only minor variations. Notably, firms in high-technology and fast-growing sectors are more likely to engage in domestic environmental innovation to enhance their internationalization into advanced economies. The moderating effects of domestic social engagement and transnational boards are also stronger in these sectors. Including additional board variables, such as independence and tenure—yielded no significant new insights, their effects were generally positive but statistically insignificant, while the main findings remained consistent. Finally, our findings were stronger for a propensity score-matched[5] sample of high environmental engagement firms and when using an alternative measure of the DOI.

Discussion and implications

The present research investigates the direct relationship between EMNEs' domestic environmental engagement

[5]We are thankful to anonymous reviewer for this suggestion. The results are reported in supplementary file.

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Table 6. Environmental innovation engagement and DOI: Alternative measure of DOI

Variables	(1) Column	(2) Column	(3) Column	(4) Column	(5) Column
Lag.DOI	0.58000***	0.65900***	0.66700***	0.59200***	0.67100***
	(0.00073)	(0.00351)	(0.00682)	(0.00566)	(0.00710)
Env_Eng	0.00007***	0.00121***	0.00685***	0.00111**	0.00670***
	(0.000007)	(0.00006)	(0.00036)	(0.00008)	(0.00037)
Soc_Eng		0.00131***	0.00432***	0.00148***	0.00431***
		(0.00007)	(0.00015)	(0.00012)	(0.00016)
Trans_Board		0.03710***	0.04600***	0.07360***	0.04360***
		(0.00361)	(0.00724)	(0.00764)	(0.00700)
Env_Eng×Soc_Eng			−0.00012***		−0.00012***
			(0.000004)		(0.00005)
Env_Eng×Trans_Board				0.00017**	0.00035***
				(0.00008)	(0.00013)
Board_Size	0.00557***	0.00607***	0.00100	0.00568***	0.00095
	(0.00009)	(0.00059)	(0.00074)	(0.00078)	(0.00078)
BGD	0.00009***	0.00021**	0.00226***	0.00216***	0.00237***
	(0.00002)	(0.00009)	(0.00015)	(0.00013)	(0.00015)
Leverage	0.00239***	0.00015**	−0.00048	0.00305***	0.00009
	(0.00003)	(0.00007)	(0.00093)	(0.00053)	(0.0009)
Profitability	−0.00130	0.15100***	0.02840	0.10600***	0.02740
	(0.00445)	(0.02300)	(0.01760)	(0.01760)	(0.01800)
Size	−0.00043	−0.00951***	−0.0157***	0.00014	−0.01590***
	(0.00053)	(0.00224)	(0.00479)	(0.00364)	(0.00455)
Regulation	0.12300***	0.19800***	0.05240***	0.18300***	0.06300***
	(0.00198)	(0.01010)	(0.00871)	(0.00754)	(0.00892)
GDP	−0.00495**	−0.13200***	−0.17600***	−0.06380***	−0.18000***
	(0.00194)	(0.00798)	(0.01150)	(0.00910)	(0.01360)
Constant	0.15200***	1.40500***	1.51200***	0.40100***	1.55800***
	(0.02640)	(0.10200)	(0.15700)	(0.12800)	(0.16200)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.752	0.681	0.760	0.782	0.764
Hansen	0.830	0.532	0.306	0.997	0.291

Note: Standard errors in parentheses. All explanatory variables are one period lagged. DOI, that is, degree of internationalization is dependent variable. Env_Eng, that is, environmental engagement is our independent variable. Social engagement (Soc_Eng) and presence of transnational board (Trans_Board) are moderating variables. Control variables include board size (Board_Size), board gender diversity (BGD), leverage (Leverage), profitability (Profitability), firm size (Size), regulatory quality index (Regulation) and Gross Domestic Production (GDP).
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

and their DOI into advanced economies, with a focus on the moderating roles of transnational boards and social engagement in the home market. In resource-constrained emerging markets, there may be a trade-off between environmental and social engagement (Bitzer and Hamann, 2014). This is particularly relevant for EMNEs, where limited managerial and financial resources can hinder simultaneous investments in both environmental and social engagement initiatives (Guo and Xie, 2025). Consistent with this argument, our findings indicate that social engagement weakens the positive relationship between environmental engagement at home and the DOI. This contrasts with prior studies that have often treated CSR as a uniformly positive driver of global expansion (Shirodkar and Shete, 2021), highlighting instead the contextual nature of stakeholder engagement in emerging economies (e.g. Guo and Xie, 2025).

Furthermore, while recent research has suggested that transnational directors can positively influence the internationalization of emerging market firms (Puthusserry *et al.*, 2021), our findings extend this line of research by identifying their specific role in amplifying the benefits of environmental engagement and DOI. The presence of transnational board members appears to enhance EMNEs' ability to translate environmental commitments into social legitimacy and access in advanced markets—a mechanism not previously explored in detail (Shu *et al.*, 2024). Together, these findings contribute to a more nuanced understanding of how environmental and social engagement influence EMNE internationalization, emphasizing the strategic interplay between transnational board composition and stakeholder engagement. These findings have important implications for both theory and managerial practice, which we discuss in the following section.

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Table 7. Environmental engagement and DOI across fast- and slow-growing sectors

Panel A	Slow-growing industries				
Variables	(1) Column	(2) Column	(3) Column	(4) Column	(5) Column
Lag.DOI	0.47000***	0.66200***	0.94800***	0.51300***	0.91600***
	(0.00774)	(0.03030)	(0.03150)	(0.03120)	(0.03020)
Env_Eng	0.00022*	0.00110***	0.00339***	0.00138**	0.00223**
	(0.00009)	(0.00033)	(0.00065)	(0.00051)	(0.00085)
Soc_Eng		0.00293***	0.00193***	0.00202***	0.00181***
		(0.00059)	(0.00057)	(0.00069)	(0.00068)
Trans_Board		0.09680***	0.04070***	0.08000***	0.02060**
		(0.02790)	(0.01060)	(0.01920)	(0.00995)
Env_Eng×Soc_Eng			−0.00003***		−0.00002*
			(0.00001)		(0.00001)
Env_Eng×Trans_Board				0.00167*	0.00060*
				(0.00068)	(0.00030)
Board_Size	0.00117	−0.01440***	0.00300	−0.01250	−0.00317
	(0.00148)	(0.00529)	(0.00386)	(0.00764)	(0.00402)
BGD	0.00112***	0.00114**	0.00299***	0.00288***	0.00334***
	(0.00012)	(0.00051)	(0.00047)	(0.00097)	(0.00047)
Leverage	0.01310***	0.00059	−0.01050***	0.00740**	−0.01190***
	(0.00072)	(0.00190)	(0.00229)	(0.00335)	(0.00255)
Profitability	0.18200***	0.09360	0.12400*	0.51900***	0.10000
	(0.02790)	(0.1510)	(0.06500)	(0.12000)	(0.08390)
Size	−0.01290***	−0.01991	−0.03500***	−0.01340	−0.03640***
	(0.00442)	(0.02791)	(0.01170)	(0.01690)	(0.01240)
Regulation	0.07210***	0.24800*	0.05790	0.96800***	0.02110
	(0.01880)	(0.13700)	(0.04890)	(0.11400)	(0.04590)
GDP	0.05810***	0.70500***	0.21700***	0.26200***	0.19200***
	(0.02070)	(0.08030)	(0.03480)	(0.09520)	(0.03980)
Constant	0.00786	5.89300***	1.37600***	2.01900*	1.00500**
	(0.17800)	(0.96900)	(0.39400)	(1.09000)	(0.49600)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.759	0.639	0.960	0.508	0.963
Hansen	0.952	0.450	0.982	0.427	0.999
Panel B	Fast-growing Industries				
Lag.DOI	0.56500***	0.23500***	0.51300***	0.52400***	0.50500***
	(0.00262)	(0.00774)	(0.01050)	(0.00896)	(0.01040)
Env_Eng	0.00095***	0.00181***	0.00262***	0.00067***	0.00288***
	(0.00006)	(0.00057)	(0.00019)	(0.00018)	(0.00025)
Soc_Eng		0.00577***	0.00308***	0.00069**	0.00325***
		(0.00040)	(0.00020)	(0.00026)	(0.00033)
Trans_Board		0.21700***	0.07890***	0.05680***	0.06450***
		(0.03310)	(0.00586)	(0.00591)	(0.00486)
Env_Eng×Soc_Eng			−0.00004***		−0.00005***
			(0.000003)		(0.000004)
Env_Eng×Trans_Board				0.00016*	0.00054***
				(0.00009)	(0.00004)
Board_Size	0.00789***	0.00343	0.00408***	0.00469***	0.00511***
	(0.00085)	(0.00301)	(0.00119)	(0.00128)	(0.00159)
BGD	0.00183***	0.00219*	0.00112*	0.00281***	0.00157**
	(0.00023)	(0.00121)	(0.00060)	(0.00028)	(0.00070)
Leverage	−0.00021	−0.04960***	−0.02990***	0.00722***	−0.02650***
	(0.00024)	(0.01230)	(0.00554)	(0.00039)	(0.00564)
Profitability	0.05471**	0.58800***	0.25200***	0.04430	0.29900***
	(0.02630)	(0.07820)	(0.03970)	(0.05120)	(0.04100)
Size	−0.01500***	−0.05190***	−0.07530***	−0.00081	−0.07670***
	(0.00304)	(0.01340)	(0.00724)	(0.00538)	(0.00702)

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Table 7. (Continued)

Panel B	Fast-growing Industries				
Regulation	−0.01170	0.85700***	−0.02420	0.11800***	0.00357
	(0.00791)	(0.09960)	(0.03060)	(0.02480)	(0.03180)
GDP	0.12500***	0.79400***	0.34200***	−0.02240	0.38200***
	(0.01430)	(0.08640)	(0.03210)	(0.01410)	(0.03550)
Constant	0.71600***	6.32800***	1.26100***	0.38900*	1.55600***
	(0.12200)	(0.76800)	(0.36100)	(0.20300)	(0.39200)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.208	0.188	0.140	0.164	0.143
Hansen	0.155	0.399	0.985	0.999	0.980

Note: Standard errors in parentheses. All explanatory variables are one period lagged. DOI, that is, degree of internationalization is dependent variable. Env_Eng, that is, environmental engagement is our independent variable. Social engagement (Soc_Eng) and presence of transnational board (Trans_Board) are moderating variables. Control variables include board size (Board_Size), board gender diversity (BGD), leverage (Leverage), profitability (Profitability), firm size (Size), regulatory quality index (Regulation) and Gross Domestic Production (GDP).
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Theoretical implications

First, prior studies have highlighted factors like technological proficiency, financial resources and external pressures—like regulations and institutional dynamics, as key drivers of internationalization (Dang, Gao and Yu, 2025; Z. Liao and Liu, 2022). In light of rising stakeholder pressure on MNEs to uphold environmental and social responsibilities, our first research question contributes to this literature by empirically demonstrating that domestic environmental engagements influence EMNEs' internationalization into advanced economies. This adds to the literature on the internationalization strategies of firms from emerging markets, particularly those entering institutionally different advanced markets (Khan, Khan and Knight, 2025). Our findings suggest that EMNEs can leverage non-location-bound advantages, especially environmental innovations—to overcome legitimacy challenges in unfamiliar institutional environments, thus facilitating their international expansion. This perspective broadens institutional theory, which has traditionally focused on host-country institutional pressures, by highlighting how domestic environmental innovation can be strategically employed to manage internationalization challenges in developed markets.

Our second research question examines whether dual engagement in social and environmental innovation enhances internationalization. Contrary to conventional expectations, we find that social engagement weakens the positive relationship between environmental engagement and internationalization, indicating that these two forms of corporate responsibility are not necessarily complementary. This challenges the prevailing assumption in the literature that firms can effectively balance social, environmental and economic goals (Bansal and Roth, 2000). Our findings suggest that firms proactive in one area—such as social issues—may be less committed or even negligent in another, such as environmental sustainability. This trade-off could stem from resource constraints or institutional burdens and offers a fresh perspective on the relationship between CSR and internationalization (Bansal and Roth, 2000). Rather than working in tandem, social and environmental engagements may conflict, prompting a re-evaluation of assumption around the synergistic effects of CSR activities and internationalization.

The third research question explores a novel boundary condition in the relationship between home market environmental engagement and internationalization, the role of transnational boards. While much of the literature on board governance emphasizes board composition and its impact on innovation (Adams *et al.*, 2023; Puthusserry *et al.*, 2021; Sierra-Morán *et al.*, 2024), the specific influence of transnational board members on the environmental engagement–internationalization relationship in EMNEs remains under-explored (Puthusserry *et al.*, 2021). This is an important contribution and addition to the literature on transnational board members (Puthusserry *et al.*, 2021), as they can serve as important conduits for key knowledge and resources (Haynes and Hillman, 2010). Their expertise supports EMNEs that may lack capabilities in environmental engagement while also facilitating their internationalization into advanced markets. This may be due to their familiarity with the expectations and norms of developed market stakeholders, particularly in areas like environmental governance. In this context, transnational board serves as legitimacy intermediaries, helping EMNEs establish social legitimacy in advanced markets and strengthening the impact of environmental engagement on their DOI. These insights contribute to RDT by demonstrating how EMNEs can manage cross-border dependencies through transnational boards (Haynes and Hillman, 2010; Pfeffer and Salancik, 2015).

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Table 8. Environmental engagement and DOI across high- and low technology-intensity sectors

Variables	(1) Column	(2) Column	(3) Column	(4) Column	(5) Column
Panel A Low technology-intensity sectors					
Lag.DOI	0.76300***	0.76400***	0.76300***	0.6460***	0.78100***
	(0.00957)	(0.01610)	(0.01080)	(0.0107)	(0.01080)
Env_Eng	0.00013***	0.00069***	0.00616***	0.00043*	0.00624*
	(0.00003)	(0.00007)	(0.00052)	(0.0021)	(0.00255)
Soc_Eng		0.00117***	0.00146***	0.0007***	0.00162***
		(0.00016)	(0.00034)	(0.0002)	(0.00054)
Trans_Board		0.0307***	0.02320***	0.0122**	0.01960***
		(0.00628)	(0.00495)	(0.0049)	(0.00539)
Env_Eng×Soc_Eng			−0.00003***		−0.00005***
			(0.00001)		(0.00001)
Env_Eng×Trans_Board				0.0002*	0.00046*
				(0.0001)	(0.00022)
Board_Size	0.00381***	0.00254*	0.00616***	0.0143***	0.00716***
	(0.00113)	(0.00130)	(0.00156)	(0.0011)	(0.00250)
BGD	0.00171***	0.00261***	0.00298***	0.0006***	0.00312***
	(0.00007)	(0.00016)	(0.00022)	(0.0001)	(0.00023)
Leverage	−0.00016	0.00447***	0.00167	−0.0845***	−0.00015
	(0.00039)	(0.00064)	(0.00122)	(0.0138)	(0.00147)
Profitability	0.23600***	0.27200***	0.27500***	0.2600***	0.28800***
	(0.01270)	(0.02590)	(0.03660)	(0.0220)	(0.02920)
Size	−0.01230***	−0.01490***	−0.02050***	−0.6830***	−0.02150***
	(0.00189)	(0.00468)	(0.00573)	(0.1070)	(0.00693)
Regulation	−0.16200***	−0.06280**	−0.13600***	−0.1550***	−0.12100***
	(0.01100)	(0.02500)	(0.02550)	(0.0174)	(0.03010)
GDP	0.33800***	0.31900***	0.21700***	−3.6250***	0.20000***
	(0.01660)	(0.02380)	(0.03390)	(0.1000)	(0.04390)
Constant	2.77200***	2.50300***	1.63400***	3.03301	1.48200***
	(0.17800)	(0.22800)	(0.33900)	(4.02401)	(0.48700)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.761	0.756	0.720	0.441	0.751
Hansen	0.423	0.827	0.878	0.325	0.924
Panel B High technology-intensity sectors					
Lag.DOI	0.39700***	0.35600***	0.29200***	0.22600***	0.29100***
	(0.01790)	(0.00891)	(0.00691)	(0.01480)	(0.00636)
Env_Eng	0.00139**	0.00290***	0.00167**	0.00170*	0.00826***
	(0.00056)	(0.00028)	(0.00074)	(0.00099)	(0.00068)
Soc_Eng		0.00175***	0.00457***	0.00319***	0.00441***
		(0.00046)	(0.00049)	(0.00056)	(0.00051)
Trans_Board		0.19800***	0.17800***	0.18400***	0.16000***
		(0.01060)	(0.01220)	(0.02660)	(0.01340)
Env_Eng×Soc_Eng			−0.00005***		−0.00008***
			(0.00001)		(0.000001)
Env_Eng×Trans_Board				0.00147***	0.00074***
				(0.000360)	(0.00018)
Board_Size	0.01220**	0.02390***	0.00099	−0.00188	−0.00087
	(0.00597)	(0.00310)	(0.00326)	(0.00822)	(0.00275)
BGD	0.00275*	−0.00373***	−0.00340***	−0.00399***	−0.00325***
	(0.00148)	(0.000454)	(0.000479)	(0.00140)	(0.000499)
Leverage	−0.01230***	−0.04300***	−0.02370	0.01620	−0.03540*
	(0.00201)	(0.01030)	(0.01600)	(0.01600)	(0.01950)
Profitability	−0.06950	0.4460***	0.6120***	−0.11900	0.61700***
	(0.2320)	(0.06940)	(0.04530)	(0.15200)	(0.05340)
Size	−0.02980	0.02810***	0.01240	0.08720***	0.02080*
	(0.02680)	(0.00668)	(0.01030)	(0.02020)	(0.01160)

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Table 8. (Continued)

Panel B High technology-intensity sectors					
Regulation	0.28900***	0.21900***	0.043100	0.20400	0.04430
	(0.1080)	(0.04670)	(0.03260)	(0.13500)	(0.03750)
GDP	0.04320	0.43900***	−0.04800	0.24300*	−0.02810
	(0.07030)	(0.04460)	(0.03980)	(0.13300)	(0.04750)
Constant	0.53100	4.78300***	0.36700	4.51500***	0.07530
	(1.00000)	(0.41200)	(0.50900)	(1.36700)	(0.57700)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
AR(2)	0.192	0.131	0.101	0.136	0.106
Hansen	0.236	0.500	0.470	0.435	0.467

Note: Standard errors in parentheses. All explanatory variables are one period lagged. DOI, that is, degree of internationalization is dependent variable. Env_Eng, that is, environmental engagement is our independent variable. Social engagement (Soc_Eng) and presence of transnational board (Trans_Board) are moderating variables. Control variables include board size (Board_Size), board gender diversity (BGD), leverage (Leverage), profitability (Profitability), firm size (Size), regulatory quality index (Regulation) and Gross Domestic Production (GDP).
$^{*}p < 0.1$. $^{**}p < 0.05$. $^{***}p < 0.01$.

Managerial and policy implications

The findings offer important takeaways for EMNE managers and policymakers. First, EMNEs managers seeking to internationalize into advanced market economies should prioritize environmental innovation within their domestic markets. Building capabilities in environmental practices can help position their firms as responsible actors, thereby easing their entry into institutionally demanding advanced markets. Developing internal expertise in environmental issues strengthens the firm's legitimacy and competitiveness in foreign markets, helping to mitigate the country-of-origin liability that EMNEs often face.

Second, EMNE decision-makers should view transnational board members as strategic assets who bring key external resources—particularly international knowledge and expertise in environmental engagement and global market entry. Transnational board members can promote international learning and provide strategic guidance on meeting international environmental standards, which is essential for navigating the complex and unfamiliar institutional environments of advanced markets. In recent years, there have been growing concerns in advanced markets about investments coming from emerging markets, particularly from China (Sierra-Morán *et al.*, 2024). To overcome such scepticism, having transnational boards can be important for EMNEs to establish legitimacy through environmental engagement, which can be crucial for international expansion. Therefore, appointing transnational board members can be a strategic move for EMNEs seeking international growth. EMNEs can foster transnational board recruitment by partnering with executive search firms with cross-border expertise (e.g. Spencer Stuart, Korn Ferry, Heidrick & Struggles). Leveraging ethnic and diaspora networks can also help identify candidates with global perspective and local insights—ties that have proven effective in supporting internationalization (Prashantham, Dhanaraj and Kumar, 2015; Su *et al.*, 2020). In addition, collaboration with local partners and universities can facilitate access to transnational board members. Furthermore, to ensure effective integration of transnational board members, EMNE managers can employ a combination of formal mechanisms—such as cultural training, structured onboarding and strategic workshops—and informal approaches, including peer mentoring and relationship-building immersion activities.

Third, EMNE managers should recognize that environmental and social engagements are resource-intensive and often require distinct strategies. Given the typically limited resources of EMNEs, managers should prioritize environmental engagement when the goal is to expand into advanced markets. Our findings show that social engagement in home markets does not enhance—and may even weaken—the effectiveness of environmental engagement in supporting internationalization. One possible explanation is that social issues are deeply embedded in local contexts and often require cross-sectoral collaboration that may not yield direct benefits in international markets. Therefore, EMNE managers should allocate resources strategically, focusing on environmental engagements that align more directly with internationalization goals. In this context, managers should establish cross-functional ESG task forces and sustainability committees (Gull *et al.*, 2023) to coordinate environmental and social priorities.

Fourth, while our findings were largely consistent across BRICS MNEs, we recognize that institutional differences among BRICS countries may influence how managers apply these insights. For example, Chinese EMNEs may face heightened scrutiny in advanced markets, making the role of transnational boards especially salient. Nonetheless, the strategic value of transnational

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boards and strong environmental engagement in home markets remains broadly relevant across BRICS MNEs seeking legitimacy and competitiveness in advanced economies.

Finally, policymakers can play a key role in supporting EMNEs' capacity for environmental engagement. This support can take the form of financial incentives, such as tax breaks for firms participating in international environmental innovation events, conferences and knowledge-sharing platforms. They should foster connections between EMNEs and stakeholders in advanced market economies. This can be done through non-financial support, such as linking EMNEs with key international partners, enabling them to better understand the institutional requirements for environmental innovation in advanced economies. Additionally, policymakers can create programmes that connect EMNE managers with global talent pools to facilitate transnationality in top management teams. Host international business forums that connect EMNE decision-makers with potential transnational board members can also support this goal.

Limitations and future research directions

The study has several limitations that suggest important directions for future research. Theoretically, we did not consider mechanisms such as board independence, gender diversity or firm reputation in shaping environmental and social engagement. With growing scholarly attention to geopolitical dynamics—such as climate change–induced regional instability, carbon border taxes and green transition–related multilateral and bilateral agreements (Gammeltoft and Panibratov, 2024), future research could explore how these factors affect EMNEs' social and environmental strategies and their internationalization patterns. Methodologically, although we used ESG data from a widely recognized source (Thomson Reuters), potential limitations include data coverage gaps and measurement errors in ESG indicators (de Villiers, Jia and Li, 2022; Linnenluecke, 2022), especially in emerging markets where disclosure standards are less harmonized. Future research could adopt multilevel longitudinal designs to better understand how ESG performance evolves and supports internationalization over time.

While our findings indicate social engagement weakens the impact of environmental engagement on internationalization, qualitative, interview-based research could help uncover the conditions under which both initiatives may work in tandem to support internationalization. Future studies should incorporate multi-level influences—firm, industry and institutional—to provide a more comprehensive understanding of how different contexts influence the evolution of ESG practices and internationalization outcomes. Finally, future studies could compare state-owned versus non-state-owned firms.

Conflict of Interest Statement

The authors have no competing interests or conflicts of interest to declare that are relevant to the content of this article.

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