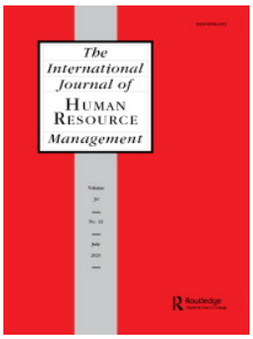

The International Journal of Human Resource Management

ISSN: 0958-5192 (Print) 1466-4399 (Online) Journal homepage: www.tandfonline.com/journals/rijh20

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To cite this article: Basil Al-Najjar, Aly Salama & Alaa Abed (2025) Gender and cultural diversity on boards: their impact on internationalisation, The International Journal of Human Resource Management, 36:13, 2305-2341, DOI: 10.1080/09585192.2025.2550765

To link to this article: https://doi.org/10.1080/09585192.2025.2550765

Published online: 28 Aug 2025.

THE INTERNATIONAL JOURNAL OF HUMAN RESOURCE MANAGEMENT
2025, VOL. 36, NO. 13, 2305–2341
https://doi.org/10.1080/09585192.2025.2550765

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Gender and cultural diversity on boards: their impact on internationalisation

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ABSTRACT

This study investigates whether—and how—board gender diversity, board cultural diversity, and their interaction shape the internationalisation of large U.S. firms. Drawing jointly on Upper Echelons, Resource Dependence and Human-Capital theories, we analyse 5,754 firm-year observations for 427 non-financial S&P 500 companies from 2007 to 2021. Internationalisation is gauged with three alternative proxies—foreign-sales ratio, foreign-assets ratio and foreign-operating-income ratio—and, for robustness, a stochastic–frontier estimate of technical efficiency abroad; gender diversity is measured by the share of female directors and, alternatively, by the share of female executives. Two-stage least-squares regressions mitigate endogeneity. Results reveal a positive but U-shaped relationship between gender diversity and international engagement, a consistently positive influence of cultural diversity, and a significant substitution effect whereby one dimension partly compensates for low levels of the other. These findings extend the three theoretical lenses by identifying boundary conditions under which diversity matters and suggest that simple numerical diversity targets may be less effective than aligning the combined gender-and-culture profile of the board with a firm's global ambitions.

KEYWORDS

Board gender diversity; board cultural diversity; human capital theory; internationalisation; resource dependence theory; substitution effect; technical efficiency; upper echelon theory

Introduction

Board diversity has drawn considerable scholarly attention in the management (Abed et al., 2025; Mínguez-Vera & Martin, 2011; Tran et al., 2024) and the finance (Farag & Mallin, 2017; Raddant & Takahashi, 2022) literatures, with a dominant focus on gender diversity. Researchers have investigated the importance of female directors for firm performance; however, organisations continue to face challenges in achieving

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gender balance at senior levels. The representation of women on boards and executive teams remains significantly lower than that of men worldwide (Gould et al., 2018). Chen and Kao (2022) highlight inconclusive evidence regarding female directors' impact on firm outcomes, as some studies report positive effects (e.g., Carter et al., 2003), while others find negative or negligible influences (e.g., Mínguez-Vera & Martin, 2011). Tran et al. (2024) also document that female board members are associated with improved performance outcomes following M&A decisions, emphasising the significance of women's leadership within organisations.

Cultural diversity is another dimension of board diversity that has received comparatively less attention. Directors from distinct cultural backgrounds can introduce new avenues for strategic deliberations (Dodd et al., 2022). Groves and Feyerherm (2011) suggest that cultural intelligence is particularly valuable for enhancing leadership in today's globalised and diverse workplace. Similarly, Rosenauer et al. (2016) contend that leaders with higher cultural intelligence are better equipped to optimise group processes and improve interdependent team performance, especially in internationally varied settings.

This study is motivated by two research gaps: first, the inconsistent findings regarding the influence of women directors on management and organisational outcomes, and second, the lack of research on how cultural diversity might shape that influence, particularly in the context of internationalisation. Aguilera et al. (2020) argue that more empirical work is needed to clarify how corporate governance mechanisms affect the international expansion of business groups, emphasising the importance of addressing diverse board attributes and their impact on a firm's global strategy.

From a management and human capital standpoint, many female directors—particularly those with comparatively strong international experience—bring a broader, often global, perspectives to corporate governance processes. Such directors can offer informed insights into emerging or overseas markets and contribute diverse perspectives to strategic decision-making. Women's presence at board level may also help foster inclusive, diverse organisational cultures; in turn enhancing creativity and engagement across the firm. Similarly, culturally diverse directors contribute knowledge, information, and networks that enrich board deliberations and strengthen monitoring and advisory functions (Dodd et al., 2022). Recognising this synergy, the central objective of this paper is to examine how cultural diversity on boards interacts with gender diversity to shape firms' strategic international decisions.

This study contributes to the literature in three main ways. First, whereas earlier work on board diversity frequently centres on firm performance or corporate social responsibility (e.g., Mínguez-Vera & Martin,

2011; Raddant & Takahashi, 2022), we provide the first large-sample evidence on how both gender and cultural diversity condition firms' internationalisation strategies. Second, by empirically modelling whether these two diversity dimensions operate as complements or substitutes, we illuminate the boundary conditions under which diversity matters to global strategy. Third, we incorporate a stochastic–frontier approach to measure technical efficiency abroad, thereby linking board composition to how well firms exploit foreign opportunities, not merely how much they invest overseas. Taken together, these contributions sharpen and extend the insights of Upper Echelons, Resource Dependence and Human Capital theories into the international arena.

The remainder of this paper is organised as follows. Section 2 reviews the relevant literature and develops hypotheses. Section 3 describes the data and outlines the research design, while Section 4 presents the empirical results. Section 5 concludes with managerial implications, policy recommendations, and avenues for future research.

Literature review and hypotheses development

Board diversity and internationalisation in multinational enterprises

Multinational enterprises (MNEs) face numerous international business challenges from operating across multiple countries (Meyer et al., 2020). They employ internationalisation strategies, including location decisions, global sourcing, foreign investment, strategic alliances, licensing and franchising, exports, and joint ventures to expand businesses, access resources, and compete globally. Successful MNEs possess expertise in economies of scale and scope, invest in marketing and management skills, leverage technology through R&D, and offer differentiated products (Oxelheim et al., 2001). Internationalisation involves recognising and exploiting foreign market opportunities (Chandra et al., 2009), collaborating with partners, like foreign intermediaries or customers (Ellis, 2011; Muzychenko & Liesch, 2015), and serves as a mechanism for product diversification or innovation (Aguilera et al., 2020).

The board of directors, particularly senior members including the CEO and executives, steer international growth and set strategic direction. Their experience and personal attributes, including gender and cultural background, profoundly influence strategic choices and outcomes (Carpenter et al., 2004; Gaganis et al., 2021; Hambrick & Mason, 1984; Richard et al., 2004). Leaders with diverse psychological and observable characteristics can improve firm performance in profitability, growth, and survival (Shahab et al., 2018). Boards diverse in both gender and cultural composition benefit from varied perspectives, generating creative solutions and enhanced decision-making (Adams et al., 2015), while helping

MNEs understand stakeholder needs across different markets and contributing to effective governance and oversight (Al-Najjar & Salama, 2022).

Women directors and those from diverse cultural backgrounds are particularly suited to handle complex international situations, attend to varied stakeholder needs, and engage in cross-cultural conflict resolution while building professional relationships, fostering balanced risk management, and bringing new strategic perspectives (Eckel & Grossman, 2008; Hao, 2019; Morris, 2021). However, Kakabadse et al. (2015) found that minority representation has limited impact on board performance when numbers remain small. Research shows women-led firms and those with higher board diversity display greater risk aversion and stronger earnings quality (Jalan et al., 2020). Firms with more women and cultural diversity in senior management tend to be more profitable with better stock returns due to higher-quality earnings and better understanding of international markets (Krishnan & Parsons, 2008). Female CFOs and executives from diverse backgrounds are associated with lower abnormal accruals and improved financial reporting quality, reflecting cautious and culturally informed management styles (Barua et al., 2010; Francis et al., 2015).

Women and directors from different cultural backgrounds generally display higher risk awareness (Fellner & Maciejovsky, 2007), reduced overconfidence in cross-cultural settings (Croson & Gneezy, 2009; Huang & Kisgen, 2013; Malmendier & Tate, 2005), and greater sensitivity to ethical and cultural considerations (Falconieri & Akter, 2023). They adopt more 'other-regarding' behaviours that consider diverse stakeholder perspectives (Bolton & Chen, 2018; Croson & Gneezy, 2009), leading to higher-quality monitoring across international operations (Malmendier & Tate, 2005). Directors of different genders and cultural backgrounds have distinct values and risk attitudes, with diverse boards showing more benevolence and multicultural stakeholder concern (Adams & Funk, 2012; De Amicis & Falconieri, 2023). Diverse boards demonstrate improved environmental and social performance through enhanced stakeholder awareness across cultures (Al-Najjar & Salama, 2022; Do et al., 2023). Female CEOs at microfinance institutions increase lending to poorer clients (Strøm et al., 2023), women investors emphasise risk reduction more than men (Olsen & Cox, 2001), and companies with diverse leadership have more stable earnings, lower debt, and stronger survival chances in international markets (Faccio et al., 2016).

A multi-theoretical framework integrating upper Echelons theory (UET), resource dependence theory (RDT), and human capital theory (HCT) is adopted to examine why and how board gender diversity influences internationalisation in MNEs. UET highlights how executives' demographic and psychological attributes, including cultural heritage and

gender, drive strategic choices including market entry and global expansion (Abatecola & Cristofaro, 2020; Finkelstein et al., 2009; Hambrick, 2007). RDT (Hillman & Dalziel, 2003; Pfeffer, 1972; Pfeffer & Salancik, 1978; Salancik, 1979) emphasises external resource acquisition and diverse boards' role in securing resources, building cross-cultural networks, and maintaining international legitimacy. HCT (Carter et al., 2010; Strober, 1990; Terjesen et al., 2009) elucidates how directors' varied skills, cultural knowledge, educational backgrounds, and experiences heighten innovative capacity and foreign market adaptability. Together, these theories demonstrate how gender and cultural diversity in corporate governance facilitates and motivates multinational enterprises' international expansion.

Board gender diversity and internationalisation

Board gender diversity, referring to the presence of women on corporate boards, has garnered significant attention due to its potential impact on firm performance and internationalisation strategies. Research suggests that women on boards bring diverse perspectives, experiences, and skills, which can enhance decision-making processes and overall board effectiveness (Adams et al., 2015; Terjesen et al., 2009). This diversity can lead to a more comprehensive understanding of international market dynamics, improved cross-border risk management, and better engagement with diverse stakeholders across different cultural contexts, all of which are crucial for successful international expansion. As MNEs navigate increasingly complex global markets, the unique contributions of female directors become particularly valuable in identifying international opportunities, understanding foreign consumer needs, and building relationships with stakeholders from varied cultural backgrounds.

Upper Echelons theory and board gender diversity

Upper Echelons Theory (UET) provides a theoretical lens for understanding how executive characteristics, particularly gender, shape a firm's strategic direction and success (Abatecola & Cristofaro, 2020; Finkelstein et al., 2009; Hambrick, 2007). UET posits that the values, beliefs, and experiences of top-level executives are the primary determinants of an organisation's strategies and outcomes. By incorporating gender diversity at senior levels, firms may be better positioned to navigate international markets (Maak et al., 2016; Sherman et al., 1998).

According to UET, executive teams that are attentive to diverse stakeholder needs (Everaert et al., 2019; Sajko et al., 2021) can more successfully devise and implement internationalisation strategies. Female executives often

play an instrumental role in this process: their varied perspectives and risk management approaches can lead to more balanced international decisions and ultimately foster stronger global performance. Women in upper echelons, with their distinct cognitive and ethical profiles, are hypothesised to support more rational decision-making and strengthen MNEs' international activities.

Gender diversity at both the board and executive levels helps organisations better understand and adapt to stakeholders' needs across countries, thereby guiding more effective internationalisation. UET implies that female executives' experiences, values, and beliefs can enhance the firm's global strategy, improving the likelihood of success in foreign markets (Gilley et al., 1970). Therefore, organisations that employ a higher proportion of women in top leadership positions may more readily craft and execute successful internationalisation strategies. This theoretical perspective emphasises how the presence of women in boardrooms directly influences strategic choices on market entry, resource allocation, and international expansion approaches.

Resource dependence theory and board gender diversity

Resource Dependence Theory (RDT) examines how companies manage dependencies on external resources to survive and prosper (Hillman & Dalziel, 2003; Pfeffer, 1972; Pfeffer & Salancik, 1978; Salancik, 1979). It primarily informs the strategy and service roles of the board of directors (Hillman & Dalziel, 2003). According to RDT, organisations are not self-sufficient: they rely on external entities for capital, labour, or information to secure critical resources (Pfeffer, 1982). Consequently, they must build and negotiate relationships with these entities to obtain resources while minimising vulnerabilities (Chen & Roberts, 2010).

Gender-diverse boards broaden the pool of available resources and channels, bringing more varied perspectives to board discussions and enabling more comprehensive decision-making (Harjoto et al., 2015). Briano-Turrent (2022) explores how female representation on corporate boards in four Latin American countries influences ethical conduct and finds that female directors positively affect corporate ethical behaviour by improving board ethical functioning and transparency in conflicts of interest. Women's presence on boards enhances stakeholder orientation, aligning with RDT's proposition that diverse boards elevate external legitimacy and facilitate access to critical resources.

RDT suggests that sound governance associated with diverse boards can exert pressure on organisations to adopt environmentally responsible practices and bolster corporate reputation (Nguyen et al., 2021). The appointment of women as directors provides firms with advantages

such as enhanced access to external resources, business contacts, and information channels, in addition to diverse perspectives, skills, and values (Amorelli & García-Sánchez, 2021; Nguyen et al., 2020). More heterogeneous boards can improve decision-making dynamics and encourage the adoption of environmental policies (Amorelli & García-Sánchez, 2021). Drawing on RDT, companies with higher levels of board gender diversity are better positioned to navigate international markets, where competition for resources and market share is intense. Greater female representation can strengthen a firm's strategic posture and expand the external resource base required for successful international expansion.

Human capital theory and board gender diversity

Human Capital Theory (HCT) is a foundational concept in economics and organisational management that emphasises the economic value of investing in people rather than physical assets (Carter et al., 2010; Strober, 1990; Terjesen et al., 2009). It posits that individuals possess intangible assets—such as knowledge, skills, education, and experience—that enhance their productivity and efficiency in the labour market (Becker, 1964; Schultz, 1961: Johnson, 1960). Sheridan et al. (1997) observe that upward mobility commonly reflects disparities in educational opportunities accessible to women and minority groups. However, in many male-dominated industries, unconscious biases can hinder women's career advancement despite their human capital investments (Brown et al., 2021).

Employers frequently draw on HCT to explain observed differences in achievements between male and female managers (Broadbridge & Hearn, 2008). In line with HCT, variations in individual abilities and educational investments predict corresponding differences in expected returns. Quintana-García and Elvira (2017) highlight how these differences materialise from diverse human capital attributes such as education and skills. This aligns with findings that female directors in the UK often possess higher qualifications and more international experience than their male counterparts, emphasising women's distinct human capital contributions (Singh et al., 2008).

HCT supports the argument that board gender diversity enhances corporate performance by capitalising on the unique human capital each member brings. Gender-diverse boards benefit from broader perspectives, enhanced creativity, and improved decision-making processes. Research has shown that gender-diverse boards positively influence financial performance (e.g., Isidro & Sobral, 2015). Diversity management initiatives informed by HCT aim to dismantle structural barriers and promote equitable opportunities for women to flourish in leadership roles. Recognising women's distinctive contributions—such as social

capital and decision-making expertise—can help organisations align talent pipelines with inclusive practices (Brown et al., 2021; Suau-Sanchez et al., 2025).

The application of HCT highlights the importance of investing in diverse human capital for organisational growth. Gender diversity in leadership enhances firm performance and helps dispel biases regarding women's competencies (Suau-Sanchez et al., 2025). As organisations increasingly prioritise diversity initiatives, leveraging HCT enables more equitable environments in which all individuals can maximise their potential. When applied to gender diversity and career progression, HCT fosters inclusive strategies that benefit both individuals and companies. Female directors bring valuable skills and social capital that improve board functions such as advising and communication. Consequently, women's contributions are integral to internationalisation and globalisation.

Hypothesis 1: board gender diversity and internationalisation

While existing research demonstrates that gender-diverse boards enhance firm performance through improved decision-making (Adams et al., 2015; Terjesen et al., 2009), risk management (Jalan et al., 2020), and stakeholder orientation (Hao, 2019; Morris, 2021), most studies focus on domestic performance metrics rather than international expansion outcomes. Although UET suggests that executive characteristics shape strategic choices (Hambrick, 2007), RDT emphasises resource acquisition through diverse networks (Hillman & Dalziel, 2003), and HCT highlights unique human capital contributions (Carter et al., 2010), these theories have rarely been integrated to explain how gender diversity specifically drives internationalisation strategies in MNEs. Moreover, limited empirical evidence links board gender diversity to internationalisation outcomes. While studies show female directors possess international experience (Singh et al., 2008) and enhance cross-cultural stakeholder engagement (Al-Najjar & Salama, 2022), the specific mechanisms through which gender diversity facilitates international expansion remain underexplored. Based on the theoretical frameworks and existing literature, we propose the following hypothesis regarding the impact of board gender diversity on internationalisation:

> **H1.** There is a positive association between board gender diversity and internationalisation in MNEs.

This hypothesis is rooted in UET, RDT, and HCT. UET suggests that diverse perspectives lead to better strategic decisions for international expansion. RDT implies that female directors provide access to broader networks and resources crucial for international markets. HCT highlights

the unique skills and experiences women bring, which are valuable for navigating global complexities.

Board cultural diversity and internationalisation

Board cultural diversity, encompassing differences in nationality, ethnicity, and cultural background among board members, is increasingly recognised as a critical factor influencing a firm's strategic decisions, particularly in the context of internationalisation. Culturally diverse boards can offer a broader range of perspectives, knowledge, and networks, which are invaluable for navigating the complexities of global markets (Maznevski, 1994; Richard et al., 2004). In today's global marketplace, the demand for cultural diversity has intensified, as leaders from multicultural backgrounds and experiences are poised to shape more innovative and comprehensive decisions (Lussier & Achua, 2016). MNEs are inherently collaborative and rely on coordinating diverse contributions to succeed (Maznevski, 1994). As such, a culturally diverse board is expected to outperform a homogeneous board—one in which members share similar national and ethnic backgrounds—in domains requiring varied perspectives and expertise (Watson et al., 1993).

Upper Echelons theory and board cultural diversity

From the standpoint of the UET, executives' demographic and cultural characteristics drive their strategic choices; thus, culturally diverse upper-echelon teams are more inclined to question established norms and develop creative, forward-looking decisions. As corporations expand internationally, their boards naturally become more diverse, reflecting the demand for inclusive representation from multiple countries and cultural backgrounds. Research suggests that cultural diversity on boards fosters comprehensive decision-making, boosts cross-learning, and drives innovative problem-solving (Luo et al., 2021; Nederveen Pieterse et al., 2013; Shin et al., 2012). Having a range of values, ideals, and experiences within a board can lead to more thorough deliberations and, ultimately, more successful outcomes in foreign markets (Martínez-Ferrero et al., 2021). In alignment with UET's proposition that top management characteristics shape strategic choices, having a culturally diverse board can stimulate higher levels of internationalisation.

Resource dependence theory and board cultural diversity

In line with the RDT, board members from varied cultural backgrounds can tap into distinct networks, knowledge pools, and external

resources—essential for advancing international expansion. Board members with culturally heterogeneous backgrounds contribute role-related diversity through their ability to leverage personal networks, linguistic knowledge, and nuanced understandings of social attitudes in target markets (Maznevski, 1994). These factors help firms navigate complex international contexts more effectively (Frijns et al., 2016). Empirical evidence from Dodd and Zheng (2022) suggests that boards featuring foreign directors exhibit stronger firm performance, indicating that the advantages of cultural diversity outweigh any challenges associated with potential miscommunication. Consequently, diverse boards can positively shape corporate strategies and policies, including those related to social responsibility and environmental sustainability (Dodd et al., 2022; Valls Martínez et al., 2022).

Human capital theory and board cultural diversity

HCT emphasises how diverse directors contribute unique cognitive skills and experiences that strengthen a firm's innovation and competitiveness abroad. Board members with culturally heterogeneous backgrounds contribute both general and specific benefits to strategic decision-making processes (Frijns et al., 2016). General benefits revolve around cognitive conflict—when multiple perspectives spark broader discussions and analyses—while specific advantages derive from individuals' cultural familiarity with target markets, enabling more effective market entry and expansion strategies. As MNEs strive to remain competitive worldwide, embracing cultural diversity at the board level appears to be a critical and beneficial strategy for enhancing the human capital necessary for successful internationalisation.

Hypothesis 2: board cultural diversity and internationalisation

Research indicates that cultural diversity enhances creativity, problem-solving, and decision-making quality (Maznevski, 1994; Nederveen Pieterse et al., 2013). Studies show culturally diverse boards outperform homogeneous ones in complex international contexts (Dodd & Zheng, 2022; Watson et al., 1993). While the three theories acknowledge diversity's importance, they have primarily been applied to gender diversity. The specific application of UET, RDT, and HCT to explain how cultural diversity drives internationalisation strategies represents an underexplored theoretical extension. Despite evidence that foreign directors improve firm performance (Dodd & Zheng, 2022) and that cultural diversity enhances strategic outcomes (Martínez-Ferrero et al., 2021), direct empirical tests of the relationship between board cultural diversity and internationalisation intensity remain scarce. Most studies examine cultural diversity's impact

on overall performance rather than specific international expansion metrics. Based on the theoretical frameworks and existing literature, we propose:

> **H2.** There is a positive association between board cultural diversity and internationalisation in MNEs.

This hypothesis is supported by UET's emphasis on how cultural characteristics shape strategic choices, RDT's focus on accessing diverse networks and resources, and HCT's recognition of unique cognitive contributions from culturally diverse directors.

The substitution effect between board gender diversity and cultural diversity

Building on the preceding theoretical arguments, we extend our analysis by investigating the interaction effect of board cultural diversity and gender diversity on MNEs' internationalisation. From a multi-theoretical perspective, UET suggests that the demographic makeup of top executives critically shapes corporate outcomes; RDT highlights how diverse board members contribute varied networks and resources; and HCT highlights the importance of directors' collective skills and experiences. These perspectives jointly support the proposition that board diversity—across both cultural and gender dimensions—can significantly influence strategic choices in global markets.

Theoretical basis for substitution effect

From the perspective of UET, both gender and cultural diversity can broaden the cognitive base of the board, leading to a wider range of perspectives and more comprehensive strategic alternatives (Hambrick & Mason, 1984). If both types of diversity primarily contribute to this cognitive broadening, then a high level of one might reduce the marginal benefit of increasing the other. For instance, a board that is already highly culturally diverse might have already incorporated a wide array of viewpoints, making the additional cognitive benefits from increased gender diversity less pronounced, or vice versa.

RDT suggests that both gender-diverse and culturally diverse directors can provide access to critical external resources and networks (Pfeffer & Salancik, 1978). If these networks and resources overlap significantly, or if the firm has already secured necessary external linkages through one form of diversity, the need for additional external ties from the other form of diversity might be reduced. For example, if a culturally diverse board already provides strong connections to international markets, the

incremental value of gender-diverse directors for similar networking purposes might be limited.

HCT highlights the unique skills, knowledge, and experiences that diverse directors bring (Becker, 1964). If the human capital contributed by gender diversity (e.g., specific leadership styles, stakeholder orientation) and cultural diversity (e.g., international market knowledge, cross-cultural communication skills) are somewhat interchangeable or address similar strategic needs for internationalisation, then a substitution effect could occur. For instance, a board with strong cultural diversity might already possess sufficient international market insights, reducing the need for gender-diverse directors for similar expertise.

While cultural diversity on the board has been shown to facilitate broader discussion, creativity, and openness to new ideas (Nederveen Pieterse et al., 2013), it can also interact with other types of diversity, such as gender. Distinct cultural backgrounds might encourage or discourage different orientations—some cultures may prize harmony, whereas others focus on competition within the board (Dodd et al., 2022). Consequently, cultural diversity may moderate or even substitute the influence of more visible diversity attributes, such as gender. Because cultural diversity tends to be less immediately observable compared to gender differences (Dodd et al., 2022), the presence of diverse cultural norms may overshadow potential subgroup formation tied to gender or other salient demographic traits.

We therefore propose that, under certain conditions, the positive effect of board cultural diversity may reduce the necessity for gender diversity (and vice versa) regarding strategic decisions, including those related to internationalisation. Three scenarios illustrate this potential substitution effect: (1) If cultural diversity positively affects internationalisation, while gender diversity is negatively associated and their interaction is significantly negative, cultural diversity may override the need for higher gender representation; (2) If cultural diversity is significantly positive, gender diversity is insignificant, and their interaction is negative and significant, cultural diversity again appears to substitute the effect of gender diversity; and (3) If gender diversity positively affects internationalisation, cultural diversity has a negative effect, and their interaction is significantly negative, then gender diversity may compensate for weaker cultural diversity.

While both gender and cultural diversity independently show positive effects on various organisational outcomes, no studies have examined their potential interaction effects on internationalisation. The literature treats these diversity dimensions as independent rather than potentially interdependent factors. Existing applications of UET, RDT, and HCT assume additive effects of different diversity types. However, if both forms of diversity contribute to similar outcomes (cognitive broadening, resource

access, human capital), theoretical logic suggests potential substitution effects—a proposition unexplored in current diversity theories. No empirical studies have tested whether gender and cultural diversity might substitute for each other in driving internationalisation. This represents a critical gap, as firms need to understand whether investing in multiple diversity dimensions yields additive or diminishing returns for their global strategies. Based on the potential for overlapping benefits and strategic trade-offs, we propose the following hypothesis regarding the substitution effect between board gender diversity and cultural diversity:

H3. There is a substitution effect between board gender diversity and board cultural diversity in their impact on a firm's internationalisation performance.

This hypothesis suggests that while both gender and cultural diversity are beneficial, their combined effect might not be purely additive. Instead, there might be a point where increasing one type of diversity provides diminishing marginal returns if the other type is already sufficiently present, due to overlapping contributions to cognitive resources, external linkages, or human capital relevant for internationalisation.

Data and research method

Data

In line with the multi-theoretical perspective outlined above, we collected data on S&P 500 non-financial, publicly listed firms to investigate how board diversity—specifically cultural and gender diversity—shapes internationalisation. From the initial 436 qualifying firms outside the financial/insurance sector, we identified 427 firms for which gender data was available, yielding 5,754 firm-year observations. However, cultural diversity data was more limited, covering 381 of these 427 firms, which amounts to 1,245 firm-year observations. To mitigate survivorship bias, firms were permitted to enter or exit the sample freely between 2007 and 2021, reflecting a dynamic panel of company data.

Table 1 presents the descriptive statistics for the core variables. On average, foreign sales account for 32% of total sales across the sampled firms, though this ratio spans from 0% to 100%, indicating substantial variance in international engagement. Foreign assets comprise approximately 10% of total assets, signalling lower reliance on foreign asset holdings, while foreign operating income represents on average 0.03% of overall operating income (with a maximum of 76%).

Regarding board composition, female directors make up around 20% of board membership (with a maximum of 70%), and cultural diversity averages 15% across the sample. Female executives represent about 15% of executive-level roles, underscoring the continued underrepresentation

of women at senior managerial levels. For other corporate governance factors, the descriptive statistics indicate that 55% of board members possess academic or professional qualifications, the average board has ten directors, and board independence stands at roughly 80%. These figures suggest a commitment to stronger governance structures. In terms of firm-specific characteristics, firms maintain an average leverage ratio of 24%, a profitability ratio of 12%, and a liquidity ratio of 1.32.

Table 2 provides the correlation matrix, showing no problematic correlations among the independent variables. This finding is further reinforced by variance inflation factor (VIF) results of around 1 across all models, indicating an absence of severe multicollinearity. Taken together, these observations highlight the complexity inherent in studying the interplay between board gender and cultural diversity on MNEs' international strategies. The wide dispersion in both firm-level international activities and board characteristics sets the foundation for subsequent empirical tests of our three hypotheses, allowing us to assess the distinct and interactive effects of board-level diversity within a multi-theoretical framework.

Research design

we employ a range of statistical methods to assess how board diversity—both gender and cultural—affects MNEs' internationalisation. Our principal objective is to test the three hypotheses developed earlier by addressing firm-specific and time effects, potential endogeneity, and robustness checks. We begin with time-series cross-sectional models to examine how various dimensions of board diversity relate to internationalisation. Specifically, we estimate three baseline models, each

Table 1. Descriptive statistics.

Variable	Mean	Std. dev.	Min	Max
FSR	0.320949	0.284613	0	1
FAR	0.102076	0.165837	0	1
FOIR	0.000302	0.010587	−0.11879	0.764778
Diversity	0.198997	0.104665	0	0.692308
Executive diversity	0.148232	0.124876	0	1
Culture	0.149672	0.14501	0	1
Skills	0.554545	0.195298	0	1
Independence	0.824835	0.104283	0	1
Board size	10.73702	3.378792	1	138
ROA	0.092335	0.117549	−0.9998	0.879305
Size	23.25171	1.394044	15.01698	27.40508
Liq	1.835103	1.321693	0.13598	17.78686
Lev	0.303941	0.242286	0	0.99

where: FSR is foreign Sales Ratio, FAR foreign assets ratio; FOIR foreign operating income ratio; Diversity is board gender diversity; executive diversity is the percentage of female executives; Culture is board cultural diversity; Skills board skills ratio; Independence is board independence ratio; board size is the number of executive and independent director; ROA is profitability ratio; size is natural logarithm of total assets; Liq is the liquidity ratio and Lev is the leverage ratio. All these variables are defined in Table 3.

Table 2. Correlation matrix.

	Diversity	Executive diversity	Culture	Skills	Independence	Board size	ROA	Size	Liq	Lev
Diversity	1									
Executive diversity	0.3704	1								
culture	−0.0002	−0.1392	1							
Skills	0.0183	0.0126	−0.0489	1						
Independence	0.1387	0.1309	−0.0896	−0.1673	1					
Board size	0.1582	0.0744	−0.1064	−0.1618	−0.0497	1				
ROA	−0.0282	−0.018	0.1649	−0.0668	0.0707	0.0201	1			
Size	0.2721	0.153	−0.0545	−0.1313	0.1092	0.2585	−0.1648	1		
Liq	−0.2208	0.0386	−0.0096	0.1006	0.0269	−0.1554	0.051	−0.2678	1	
Lev	0.1052	−0.0002	0.0581	−0.0337	0.0205	0.0389	0.1053	0.0591	−0.2708	1

Variables are defined in Tables 1 and 3.

incorporating different measures of board diversity as the main independent variable(s):

$$\text{Internationalisation}_{it} = \beta_0 + \beta_1 \text{Board Diversity}_{i,t} + \beta_2\ \text{B.skills}_{i,t} + \beta_3 \text{B.Size}_{i,t} + \beta_4\ \text{B.indep}_{i,t} + \beta_5\ \text{firm-specific}_{i,t} + \varepsilon_{it}$$

$$\text{Internationalisation}_{,it} = \beta_0 + \beta_1 \text{Board Culture}_{,t} + \beta_2\ \text{B.skills}_{i,t} + \beta_3 \text{B.Size}_{i,t} + \beta_4 \text{B.indep}_{i,t} + \beta_5\ \text{firm-specific}_{i,t} + \varepsilon_{it}$$

$$\text{Internationalisation}_{it} = \beta_0 + \beta_1 \text{Board Diversity}_{i,t} + \beta_2\ \text{Board Culture}_{,t} + \beta_3\ \text{B.skills}_{i,t} + \beta_4 \text{B.Size}_{i,t} + \beta_5 \text{B.indep}_{i,t} + \beta_6\ \text{firm-specific}_{i,t} + \varepsilon_{it}$$

We measure internationalisation using three commonly employed proxies (e.g. Marshall et al., 2020; Sambharya, 1995):

- The ratio of foreign sales to total sales,
- The ratio of foreign assets to total assets, and
- The ratio of foreign operating income to total income.

Our key explanatory variables are:

- **Board gender diversity**, measured as the percentage of female directors relative to the total board membership (e.g. Abed et al., 2025; Aliani et al., 2024; Al-Najjar & Salama, 2022; Paolone et al., 2024), and
- **Board cultural diversity**, measured as the percentage of directors coming from cultural backgrounds different from the firm's headquarters location (e.g. Aliani et al., 2024; Paolone et al., 2024; Salem et al., 2025).

Our study employs Refinitiv Eikon/LSEG's Board Cultural Diversity index (TR.AnalyticBoardCulturalDiversity), which is officially defined as the 'percentage of board members that have a cultural background different from the location of the corporate headquarters' and serves as a proxy for identifying diversity in cultural backgrounds based on citizenship (Refinitiv, 2021). This metric aligns with what scholars term 'nationality diversity,' using directors' citizenship or country of origin as a proxy for cultural differences under the assumption that individuals from different countries bring distinct cultural perspectives shaped by their national contexts (Metwally, 2021). The index is particularly relevant for our dataset of multinational corporations, as diverse cultural perspectives can contribute to more informed decision-making and improved governance.

However, we acknowledge that this measure may partially overlap with gender diversity, particularly when female directors originate from

culturally diverse or international backgrounds, potentially introducing the possibility that a single individual contributes to both diversity dimensions and affecting their individual effects. To address this methodological concern, we implement a multi-model strategy by estimating models where each diversity dimension—gender and cultural—is included independently to isolate their respective effects, while also examining their combined impact in integrated models. This approach enables us to separate the contributions of each type of diversity, enhance the robustness of our empirical findings, and ensure the adequacy of our results. Finally, our interaction variable between the two diversities should also minimise such concern as it provides an interaction term of both types of diversity.

We include several control variables at the board level (e.g. Abed et al., 2025; Al-Najjar & Salama, 2022):

- Board skills: percentage of board members with academic and/or professional qualifications,
- Board size: total number of board members, and
- Board independence: percentage of independent (non-executive) directors on the board.
- Additionally, we control for firm-specific factors, including:
- Leverage: total debt over total assets,
- Profitability: net income over total assets,
- Firm size: the natural logarithm of total assets, and
- Liquidity: current assets over current liabilities.

$\varepsilon_{i,t}$ is the error term.

Because the observations for board cultural diversity are fewer than those for board gender diversity, we employ separate models: one set focusing on gender diversity, another on cultural diversity, and a combined model incorporating both.

A primary concern in this domain is reverse causality, a type of endogeneity that is a significant issue in the literature, as it can lead to biased regression estimates. To mitigate bias from such potential endogeneity, we adopt a two-stage regression approach (2SLS). Consistent with prior literature (e.g., Huang & Kisgen, 2013; Sila et al., 2016), we use lagged corporate governance variables (e.g., lagged board diversity, lagged board independence, and lagged profitability) as instruments. This approach follows Al-Najjar and Salama (2022), who note that finding purely exogenous factors can be challenging, making internal lags a practical choice. We validate these instruments *via* the Sargan test, which is insignificant across all models, confirming their suitability.

To explore whether board gender diversity and board cultural diversity act as complements or substitutes in shaping international expansion, we incorporate an interaction term:

$$\text{Internationalisation}_{,\,It} = \beta_0 + \beta_1 \text{Board Diversity}_{i,t} + \beta_2 \text{ Board Culture}_{,t} + \beta_3 \text{ Inter}_{i,t} + \beta_4 \text{ B.skills}_{i,t} + \beta_5 \text{B.Size}_{i,t} + \beta_6 \text{B.indep}_{i,t} + \beta_7 \text{ firm-specific}_{i,t} + \varepsilon_{it}$$

where $\text{Inter}_{i,t}$ is constructed by centering the values of board diversity and board culture (subtracting each from their respective mean) and then multiplying them. This helps mitigate potential multicollinearity while enabling a clearer interpretation of how the two dimensions of diversity interact.

Finally, we run two robustness checks. First, we replace overall board gender diversity with an alternative measure: the *percentage of female executives* relative to total executive directorships. We re-run the above models to verify that our findings hold when focusing on female representation in day-to-day leadership rather than among the broader board membership.

Second, we employ Technical Foreign Operating Efficiency (TFOE). Extending beyond traditional ratio matrics of internationalisation, we estimate a stochastic frontier (SF) model–a common approach used in operation management research–to compute firm-level technical efficiency in foreign operations. Our SF specification uses foreign operating income as the dependent variable, while the inputs include workforce size, capital expenditures, and cost of goods sold. The resulting efficiency scores (ranging from 0 to 1) serve as an additional dependent variable in subsequent regressions to gauge how board diversity influences efficiency in foreign markets. The full definitions of our variables are listed in Table 3. These sequential analytical steps and alternative model specifications collectively enhance the robustness of our results, offering comprehensive insights into the multi-dimensional role of board diversity in shaping MNEs' global strategies.

Recently, business studies have shown that technical efficiency in economics clearly reflects a firm's input–output production process, and therefore serves as an alternative performance indicator (Peng et al., 2021). In the context of internationalisation, we argue that a Technical Foreign Operating Efficiency score, derived *via* Stochastic Frontier Analysis, is particularly valuable because it moves beyond simple foreign-related ratios to assess how effectively firms convert inputs into successful overseas outputs.

Empirical results and discussion

The empirical findings from our baseline model are presented in Table 4, featuring nine regression specifications. The first three models employ the

Table 3. Variables definitions.

Variable	Definition	Code
	Dependent variables	
Foreign sales ratio	foreign sales to total sales ratio	Worldscope database: WC08731
Foreign assets ratio	Foreign assets to total assets ratio	Worldscope database: WC08736
Foreign operating income ratio	Foreign operating income ratio to operating income ratio	Worldscope database: WC07126/ WC01250
Operating technical efficiency	The technical efficiency from SF model	Based on cobb-Douglass equation of foreign operating income (WC07126)
	Independent variables	
Board diversity	The percentage of females appointed in the board	TR.ANALYTICBOARDFEMALE
Executive diversity	The percentage of female executives	TR.ANALYTICEXECUTIVEMEMBERSGENDERDIVERSITY
Board cultural diversity	The percentage of board members from different cultural backgrounds from the location of firm's headquarter	TR.ANALYTICBOARDCULTURALDIVERSITY
	Corporate governance-controlled variables	
Board skills	Percentage of board members of board members with financial or industry backgrounds	TR.ANALYTICBOARDSPECIFICSKILLS
Board size	Total number of board members	TR.BOARDSIZE
Board independence	Percentage of non-executive director to the total number of board members	TR.ANALYTICNONEXECBOARD
	Firm specific factors	
Leverage	Total debt to total assets ratio	TR.TOTALDEBTOUTSTANDING/ TR.TOTALASSETSREPORTED
Profitability	ROA (Net income divided by total assets)	TR.INVTRNETINCOME/ TR.TOTALASSETSREPORTED
Size	The natural logarithm of total assets	TR.TOTALASSETSREPORTED
Liquidity	Current assets to current liabilities	TR.TOTALCURRENTASSETS/ TR.TOTALCURRLIABILITIES

ratio of foreign sales to total sales as the dependent variable, Models 4–6 use the ratio of foreign assets to total assets, and Models 7–9 examine the ratio of foreign operating income to total income.

Overall, these results provide evidence of a negative association between board gender diversity and firms' internationalisation activities (Models 4 and 6). This finding diverges from our initial hypothesis (**H1**), suggesting that female directors may be more risk-averse (Fellner & Maciejovsky, 2007) and therefore inclined to limit international expansion. This result to some extent contradicts other studies emphasising the importance of female directors in possessing international experience (Singh et al., 2008) and fostering cross-cultural stakeholder engagement (Al-Najjar & Salama, 2022). Such risk aversion among female directors can lead to more cautious decision-making regarding international activities, which might be seen as uncertain and complex. Accordingly, greater gender diversity on boards has been associated with reduced firm risk-taking. Another perspective suggests that increased gender diversity may be linked to more disputes and less effective decision making (Lau

Table 4. Regression analysis.

	FSR			FAR			FOIR		
VARIABLES	M1	M2	M3	M4	M5	M6	M7	M8	M9
Diversity	−0.0433		−0.141	−0.112***		−0.279***	0.00150		−0.000397
	(0.0392)		(0.0920)	(0.0232)		(0.0702)	(0.00193)		(0.000287)
Culture		0.705***	0.707***		0.180***	0.184***		0.000134	0.000142
		(0.0425)	(0.0417)		(0.0429)	(0.0412)		(8.85e−05)	(8.81e−05)
Skills	0.0483**	−0.0237	−0.0153	−0.0199	0.0620*	0.0774**	−0.00152	0.000203**	0.000230**
	(0.0227)	(0.0401)	(0.0411)	(0.0141)	(0.0353)	(0.0359)	(0.00183)	(9.44e−05)	(0.000102)
Independence	0.0467	0.107	0.134*	−0.0544**	−0.241***	−0.199**	−0.000209	−7.58e−05	−6.56e−06
	(0.0390)	(0.0725)	(0.0756)	(0.0260)	(0.0807)	(0.0791)	(0.000661)	(0.000412)	(0.000450)
Board size	0.00120	0.00435**	0.00462**	0.00219	0.00417***	0.00497***	−0.00001	0.00008**	0.00009***
	(0.000872)	(0.00193)	(0.00205)	(0.00137)	(0.00134)	(0.00133)	(1.47e−05)	(3.64e−06)	(3.42e−06)
ROA	0.0250	0.161*	0.159	0.0767**	0.126	0.124	−0.00180	0.000822***	0.000822***
	(0.0466)	(0.0964)	(0.0969)	(0.0342)	(0.0879)	(0.0878)	(0.00239)	(0.000230)	(0.000229)
Size	0.0138***	−0.0183***	−0.0163***	0.0158***	0.00548	0.00982*	0.00008	−0.00006	0.00004
	(0.00366)	(0.00586)	(0.00592)	(0.00244)	(0.00570)	(0.00556)	(8.31e−05)	(0.0001)	(0,0001)
Liq	0.0521***	0.0274**	0.0257**	−0.00178	−0.0185***	−0.0230***	0.000188	0.0009	0.0004
	(0.00423)	(0.0107)	(0.0108)	(0.00158)	(0.00576)	(0.00600)	(0.000175)	(1.29e−05)	(1.46e−05)
Lev	−0.107***	−0.122**	−0.116**	0.000797	0.0989**	0.107**	−0.0004	0.0005	0.00034
	(0.0156)	(0.0509)	(0.0509)	(0.0112)	(0.0425)	(0.0417)	(0.000169)	(0.000210)	(0.000216)
Constant	−0.111	0.628***	0.583***	−0.211***	0.120	0.0286	−0.00105	−0.00001	−0.000177
	(0.0983)	(0.158)	(0.160)	(0.0576)	(0.150)	(0.147)	(0.000990)	(0.000600)	(0.000674)
Observations	5,141	1,212	1,212	4,637	1,090	1,090	4,641	1,080	1,080
R-squared	0.071	0.180	0.182	0.021	0.066	0.080	0.001	0.021	0.024
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%, 5%, 10%, respectively.

& Murnighan, 1998), or even that female representation could raise organisational costs (Cox & Blake, 1991). However, our findings align more closely with the view that a risk-averse attitude among female directors may explain the negative association with internationalisation in the context of uncertain global activities.

In contrast, board cultural diversity exhibits a positive effect on internationalisation across Models 2, 3, 5, and 6, consistent with our theoretical expectations (**H2**). It appears that directors hailing from diverse cultural backgrounds can broaden strategic perspectives, enhance discussions, and motivate further engagement in global ventures (Dodd et al., 2022). Our results are in line with the key role of cultural diversity in promoting strong governance structure enhancing performance and hence cultural diversity might promoting firm resilience and market confidence (Salem et al., 2025). Our finding might reflect that diverse boards bring more knowledge and global networks that are particularly valuable for international growth. This is in line with Miller and del Carmen Triana (2009) suggestion that board diversity, mainly racial and gender diversity, shape strategic social and human capital on the board, leading to diverse ideas and innovation. In addition, such racial diversity among the board can increase firm reputation. Moreover, culturally diverse boards (international board members) may facilitate better understanding of foreign markets and increased legitimacy in cross-border operations (Oxelheim & Randøy, 2003).

Turning to corporate governance–related control variables, we find that board skills significantly facilitate internationalisation, reflecting the value of relevant knowledge and expertise in guiding strategic decisions and the ability of the board to advice management will depend on their expertise and skills to understand the business (Castanias & Helfat, 2001). Board size also shows a positive association, indicating that large boards are are more able to obtain knowledge and skills if compared to their smaller counterparts (Van den Berghe & Levrau, 2004). The role of board independence is mixed, implying that different governance structures may either support or constrain global expansion, depending on other contextual factors. Hence, our results align with previous studies arguing that board skills reflect board capital, which encompasses both resource provision and monitoring functions. Skills and experience are therefore critical for organisations, as it is linked to effective oversight and access to valuable resources. However, the mixed role of board independence might suggest that, while independent directors can enhance objectivity and accountability, they may lack the international insight required for global engagement, potentially leading to more risk-averse strategic choice.

Table 5. IV regression models.

	FSR			FAR			FOIR		
VARIABLES	M1	M2	M3	M4	M5	M6	M7	M8	M9
Diversity	−0.934***		−1.641***	−0.730***		−1.286***	−0.00156*		−0.00226***
	(0.164)		(0.370)	(0.105)		(0.296)	(0.000913)		(0.000728)
Culture		0.910*	0.716***		−1.282*	0.0968***		0.00101	0.000203**
		(0.521)	(0.0438)		(0.711)	(0.0338)		(0.00184)	(0.000102)
Skills	0.0519**	−0.0331	0.0918	−0.00278	0.131	0.180***	−0.00177	0.000515***	0.000352***
	(0.0243)	(0.0823)	(0.0572)	(0.0164)	(0.101)	(0.0442)	(0.00209)	(0.000169)	(0.000130)
Boards size	0.00272**	0.000360	0.00728**	0.00295	−0.00945	0.00952***	−1.16e−05	0.00001	0.00001***
	(0.00117)	(0.00135)	(0.00320)	(0.00194)	(0.0118)	(0.00225)	(1.52e−05)	(5.01e−05)	(4.22e−06)
Independence	0.239***	0.389	0.287**	0.0677*	0.0707	−0.0117	0.000234	0.00195	0.000153
	(0.0571)	(0.247)	(0.122)	(0.0356)	(0.229)	(0.0943)	(0.000479)	(0.00126)	(0.000369)
Lev	−0.116***	−0.156	−0.0901	−0.0188	−0.249**	0.0949**	8.46e−07	−0.000132	9.49e−05
	(0.0185)	(0.112)	(0.0552)	(0.0126)	(0.125)	(0.0448)	(0.000204)	(0.000645)	(0.000151)
ROA	0.116**	0.614***	0.259**	0.133***	0.722***	0.125	−0.00195	0.00152***	0.000771***
	(0.0539)	(0.205)	(0.110)	(0.0406)	(0.265)	(0.0972)	(0.00264)	(0.000343)	(0.000193)
Size	0.0275***	−0.00408	0.00790	0.0286***	0.0493**	0.0279***	0.000167	−0.00006	0.00003*
	(0.00469)	(0.0132)	(0.00821)	(0.00379)	(0.0221)	(0.00790)	(0.000145)	(8.68e−05)	(1.69e−05)
Liq	0.0482***	−0.0272	0.0108	−0.007***	−0.05***	−0.0373***	0.000199	0.00001	−0.00001
	(0.00485)	(0.0216)	(0.0125)	(0.00224)	(0.0188)	(0.00782)	(0.000190)	(2.87e−05)	(1.70e−05)
Constant	−0.428***	0.152	0.124	−0.498***	−0.743**	−0.409**	−0.00250	−0.000449	−0.000631
	(0.112)	(0.384)	(0.212)	(0.0841)	(0.346)	(0.188)	(0.00189)	(0.00261)	(0.000545)
Observations	4,466	230	1,063	4,023	196	956	4,044	200	953
Saragn Test	1.4844	1.81583	2.80603	2.83523	1.104	6.431	5.0649	1.9730	2.8630
R-squared		0.119			0.005		0.001	0.098	
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%, 5%, 10%, respectively.

To account for reverse causality and potential endogeneity, we employ 2SLS and report these findings in Table 5. As in the baseline models, we again identify a strong negative relationship between board gender diversity and internationalisation, aligning with the results in Table 4. Similarly, board cultural diversity maintains its positive impact on international activities, reinforcing H2. The Sargan test confirms the validity of our lagged governance instruments (board diversity, independence, and profitability). Among our control variables, board skills, board size, and independence persist in demonstrating positive and significant links to internationalisation, while profitability and firm size also encourage greater foreign involvement. Conversely, the effects of leverage and liquidity remain somewhat inconclusive.

Given the contradictory findings on female directors, we probe the possibility of a non-linear relationship by including the squared term of board gender diversity (Table 6). The coefficient on gender diversity remains negative, but the squared term is positive and significant in several models (1, 2, 3, 6). Thus, the association between gender diversity and internationalisation appears to follow a U-shaped pattern: at lower levels of female representation, international activity is dampened, whereas beyond a certain threshold, additional female directors may begin to facilitate stronger engagement in global markets.

Table 6. IV non-linearity of board gender diversity.

	FSR		FAR		FOIR	
VARIABLES	M1	M2	M3	M4	M5	M6
Diversity	−3.932***	−6.179***	−2.749***	−1.464	−0.0290	−0.00816**
	(0.699)	(2.317)	(0.497)	(1.441)	(0.0245)	(0.00331)
Diversity^2	7.580***	11.70**	5.132***	2.303	0.0601	0.0151**
	(1.407)	(4.574)	(0.978)	(2.791)	(0.0521)	(0.00646)
Culture		0.692***		0.0763**		0.000166*
		(0.0598)		(0.0363)		(9.38e−05)
Skills	0.0198	0.0370	−0.0261	0.128***	−0.00191	0.000288**
	(0.0261)	(0.0560)	(0.0178)	(0.0373)	(0.00221)	(0.000119)
Independence	0.240***	0.360**	0.0683*	−0.0706	0.000831	0.000264
	(0.0554)	(0.145)	(0.0350)	(0.0988)	(0.000519)	(0.000354)
Board size	0.00433***	0.00479**	0.00469*	0.00685***	0.00001	0.00001*
	(0.00149)	(0.00224)	(0.00249)	(0.00244)	(1.92e−05)	(5.54e−06)
Lev	−0.124***	−0.118*	−0.0157	0.0667	−2.79e−05	7.32e−05
	(0.0206)	(0.0624)	(0.0143)	(0.0442)	(0.000203)	(0.000152)
ROA	0.109**	0.231**	0.138***	0.106	−0.00169	0.000688***
	(0.0549)	(0.112)	(0.0428)	(0.0931)	(0.00240)	(0.000206)
Size	0.0327***	0.00574	0.0311***	0.0150**	0.000276	0.00002
	(0.00563)	(0.0110)	(0.00428)	(0.00747)	(0.000245)	(1.76e−05)
Liq	0.0507***	0.0109	−0.0051**	−0.0273***	0.000202	−1.95e−05
	(0.00519)	(0.0132)	(0.00245)	(0.00790)	(0.000189)	(1.90e−05)
Constant	−0.341***	0.517**	−0.427***	−0.0895	−0.00331	−0.00003
	(0.114)	(0.221)	(0.0782)	(0.153)	(0.00272)	(0.000513)
Sargan test	3.5759	6.7607	5.140	2.120	4.395	4.776
Observations	4,466	1,063	4,023	956	4,044	953
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%. 5%, 10%, respectively.

This U-shaped relationship is in line with prior evidence suggesting that the impact of gender diversity on firm outcomes may depend on reaching a critical mass. Joecks et al. (2013) find that gender diversity only begins to positively influence firm performance once a sufficient number of women are present on the board, leading that nominal representation may limit the effectiveness of diverse perspectives. Applying this logic to internationalisation, it is reasonable that a minimal female presence may hinder bold strategic action due to risk aversion, while greater representation can lead to more balanced and effective international decision-making.

Board cultural diversity retains its positive and significant effect in Models 2, 4, and 6, while board size, skills, and independence continue to shape strategic choices. In terms of firm characteristics, profitability, size, and liquidity all prove beneficial to internationalisation, whereas higher leverage can negatively affect global expansion. Hence, our results are in line with the arguments that being a large firm enables the creation of global brand equity, which in turn enhances profitability (Chen & Hsu, 2010). This advantage stems from the accumulation of market power due to a broad international presence. Moreover, profitable firms both enhances internationalisation and may have a simultaneous relationship with it (Hong-Luan et al., 2013). Additionally, our results suggest that firms with greater liquidity are better positioned to access and engage in international activities, while firms with more debt are less inclined to engage in international activities.

Although board cultural diversity tends to promote international activities and gender diversity tends to hinder them (particularly at lower levels), we further explore whether these two dimensions might interact (Table 7). Centring both variables and incorporating their product term reveal a substitution effect in Models 2, 4, 5, and 6, where stronger cultural diversity reduces the need for female representation in international strategy decisions (and vice versa). Model 3 similarly shows that high levels of cultural diversity may offset gender diversity's impact when the interaction term is significant. These findings support H3, illustrating how diverse cultural perspectives can overshadow other diversity aspects in guiding international decisions.

Extending our analysis, we calculate a Technical Foreign Operating Efficiency (TFOE) score using a Stochastic Frontier (SF) model that regresses foreign operating income on labour, capital expenditures, and cost of goods sold. The resulting efficiency scores (0–1) become a new dependent variable in Table 8. Board cultural diversity positively influences TFOE, emphasising its importance in strengthening operational efficiency across international markets. Board gender diversity, however,

Table 7. Interaction effects.

	Panel regressions			IV		
	FSR	FAR	FOIR	FSR	FAR	FOIR
VARIABLES	M1	M2	M3	M4	M5	M6
Diversity	−0.140	−0.269***	−0.000391	−1.604***	−1.118***	−0.00221***
	(0.0922)	(0.0677)	(0.000285)	(0.368)	(0.291)	(0.000712)
Culture	0.712***	0.210***	0.000218**	0.767***	0.131***	0.000275**
	(0.0404)	(0.0438)	(0.000105)	(0.0559)	(0.0457)	(0.000128)
Inter	−0.257	−1.257**	−0.00240**	−1.518**	−1.086*	−0.00209*
	(0.574)	(0.540)	(0.00116)	(0.737)	(0.634)	(0.00115)
Skills	−0.0140	0.0856**	0.000236**	0.0939*	0.173***	0.000353***
	(0.0413)	(0.0358)	(0.000102)	(0.0562)	(0.0423)	(0.000129)
Indep	0.145*	−0.150**	6.38e−05	0.302**	−0.0142	0.000173
	(0.0808)	(0.0753)	(0.000463)	(0.120)	(0.0910)	(0.000366)
Board size	0.00460**	0.00488***	9.66e−06***	0.00710**	0.00896***	0.00001***
	(0.00205)	(0.00134)	(3.42e−06)	(0.00313)	(0.00225)	(4.18e−06)
Roa	0.156	0.107	0.000806***	0.253**	0.118	0.000765***
	(0.0969)	(0.0873)	(0.000227)	(0.109)	(0.0963)	(0.000193)
Size	−0.016***	0.00991*	0.00006	0.00849	0.0260***	3.20e−05*
	(0.00593)	(0.00549)	(1.52e−05)	(0.00825)	(0.00766)	(1.66e−05)
Liq	0.0256**	−0.0236***	4.22e−06	0.0113	−0.0348***	−0.00001
	(0.0108)	(0.00589)	(1.46e−05)	(0.0124)	(0.00764)	(1.68e−05)
Lev	−0.118**	0.0956**	0.00001	−0.108*	0.0775*	6.92e−05
	(0.0509)	(0.0421)	(0.000212)	(0.0567)	(0.0461)	(0.000152)
Constant	0.572***	−0.0179	−0.000276	0.0865	−0.392**	−0.000688
	(0.164)	(0.148)	(0.000686)	(0.212)	(0.182)	(0.000536)
Sargan test				4.028	4.514	2.454
Observations	1,212	1,090	1,080	1,064	957	954
R-squared	0.182	0.089	0.027			
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%. 5%, 10%, respectively.

shows no significant impact, although a substitution effect again emerges in Model 6.

To isolate the effect of women in direct managerial roles, we replace overall board gender diversity with the percentage of female executives (Tables 9–11). Consistent with our original findings, female executive diversity negatively correlates with internationalisation—except where the relationship becomes U-shaped at higher proportions of female executives. Similar patterns of substitution appear when cultural diversity interacts with executive diversity, implying that additional female representation can sometimes replace the influence of culturally diverse directors in shaping overseas ventures (and vice versa).

In additional robustness checks (e.g., industry dummies), none of the included industry-specific effects materially alter these core findings, indicating that the reported relationships persist across different sectors. Moreover, substituting non-executive female directors into the technical efficiency model yields results analogous to those involving board-level gender diversity.

In sum, our analyses consistently reveal that board cultural diversity drives firms' internationalisation more directly and positively. By contrast, board gender diversity—including female executives—initially

Table 8. Technical efficiency of foreign operation income.

	Panel			IV		
	FSR	FAR	FOIR	FSR	FAR	FOIR
Variables	M1	M2	M3	M4	M5	M6
Diversity	−0.303	0.297	0.350	−0.256	−1.164	−0.683
	(0.398)	(0.277)	(0.279)	(3.013)	(1.175)	(1.200)
Diversity^2	1.338			1.293		
	(0.928)			(6.258)		
Inter			−1.825			−2.533**
			(1.375)			(1.259)
Culture		0.276**	0.386**		0.411***	0.564***
		(0.118)	(0.167)		(0.121)	(0.147)
Skills	−0.0745	0.406***	0.418***	−0.0337	0.496***	0.491***
	(0.0713)	(0.154)	(0.155)	(0.0781)	(0.178)	(0.169)
Board size	−0.0112*	−0.00636	−0.00607	−0.0124	0.00671	0.00446
	(0.00624)	(0.0141)	(0.0141)	(0.00764)	(0.0181)	(0.0169)
Independence	−0.282**	−0.0890	0.00333	−0.197	−0.155	−0.122
	(0.123)	(0.256)	(0.268)	(0.178)	(0.345)	(0.317)
ROA	0.817***	1.572***	1.547***	0.844***	1.463***	1.387***
	(0.168)	(0.294)	(0.300)	(0.219)	(0.347)	(0.343)
Size	0.161***	0.155***	0.157***	0.163***	0.166***	0.165***
	(0.0107)	(0.0212)	(0.0207)	(0.0206)	(0.0256)	(0.0247)
Liq	0.0232**	−0.0403	−0.0436	0.0270**	−0.0360	−0.0432
	(0.00944)	(0.0347)	(0.0352)	(0.0108)	(0.0415)	(0.0407)
Lev	−0.0120	−0.166	−0.208	0.00265	−0.232*	−0.299**
	(0.0844)	(0.117)	(0.134)	(0.102)	(0.127)	(0.139)
Constant	−3.042***	−3.334***	−3.482***	−3.204***	−3.455***	−3.494***
	(0.275)	(0.555)	(0.541)	(0.409)	(0.653)	(0.629)
Sargan test				5.480	3.219	2.402
Observations	829	180	180	691	159	159
R-squared	0.237	0.323	0.328	0.240	0.211	0.276
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%. 5%, 10%, respectively.

appears to impede global expansion, likely due to heightened risk aversion. However, further investigation uncovers a non-linear (U-shaped) dynamic: above a certain point, having more female directors can enhance international engagement. Finally, we document a substitution effect wherein higher board cultural diversity lessens reliance on female directors for global strategies and vice versa. These insights hold valuable implications for both practitioners and policymakers seeking to optimise board composition in pursuit of international competitiveness.

Conclusion

This study addresses an under-explored area of corporate governance research by simultaneously examining how board gender diversity, board cultural diversity, *and their interaction* influence firms' internationalisation. Drawing on a large unbalanced panel of non-financial S&P 500 firms (2007–2021), we integrate insights from Upper-Echelons Theory (UET), Resource-Dependence Theory (RDT) and Human-Capital Theory (HCT) to theorise why diversity should matter for cross-border strategy, and we operationalise international engagement not only through foreign

Table 9. IV regression–executive diversity.

	FSR		FAR		FOIR	
Variables	M1	M2	M3	M4	M5	M6
Executive diversity	−1.629***	−1.300*	−1.475***	−0.975**	0.00233	−0.00341**
	(0.510)	(0.680)	(0.354)	(0.482)	(0.00530)	(0.00168)
Culture		0.558***		−0.0202		−0.000184
		(0.0807)		(0.0550)		(0.000223)
Skills	−0.0476	0.0163	−0.100***	0.132***	−0.00168	0.000304**
	(0.0400)	(0.0561)	(0.0329)	(0.0424)	(0.00185)	(0.000140)
Board size	0.00454***	0.00630**	0.00447*	0.00734***	−1.64e−05	1.54e−05***
	(0.00174)	(0.00258)	(0.00270)	(0.00165)	(2.08e−05)	(4.78e−06)
Independence	0.270***	0.267*	0.111**	−0.0331	−0.000293	0.000270
	(0.0745)	(0.139)	(0.0542)	(0.0986)	(0.00106)	(0.000319)
ROA	0.158**	0.328***	0.177***	0.131	−0.00228	0.000939***
	(0.0700)	(0.112)	(0.0608)	(0.102)	(0.00309)	(0.000230)
Size	0.0353***	0.00219	0.0386***	0.0224**	9.66e−05	4.34e−05
	(0.00976)	(0.0128)	(0.00753)	(0.00991)	(5.99e−05)	(2.94e−05)
Liq	0.0522***	0.0312**	−0.00384	−0.0137*	0.000216	3.87e−05
	(0.00547)	(0.0129)	(0.00326)	(0.00775)	(0.000200)	(2.37e−05)
Lev	−0.139***	−0.176***	−0.0371**	0.0547	0.00005	−0.00001
	(0.0242)	(0.0599)	(0.0175)	(0.0493)	(0.000294)	(0.000174)
Constant	−0.552***	0.197	−0.662***	−0.334	−0.00111	−0.000928
	(0.204)	(0.307)	(0.152)	(0.231)	(0.000974)	(0.000623)
Sargan test	0.0659	0.4561	3.805	5.974	4.384	0. .5663
Observations	4,463	1,063	4,020	956	4,041	953
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%, 5%, 10% respectively.

Table 10. IV executive diversity-nonlinear.

	FSR		FAR		FOIR	
VARIABLES	M1	M2	M3	M4	M5	M6
Executive diversity	−2.808***	−4.199***	−2.025***	−2.776***	−0.00489*	−0.00682***
	(0.626)	(1.394)	(0.383)	(0.834)	(0.00256)	(0.00258)
Executive diversity^2	4.608***	9.111***	3.314***	5.908***	0.00694*	0.0153***
	(1.260)	(3.050)	(0.796)	(1.834)	(0.00393)	(0.00557)
Culture		0.579***		0.00162		−0.00008
		(0.0711)		(0.0468)		(0.000147)
Skills	0.0551*	−0.00869	−0.00453	0.124***	−0.00179	0.000237**
	(0.0296)	(0.0564)	(0.0196)	(0.0405)	(0.00216)	(0.000115)
Indep	0.318***	0.296**	0.127***	−0.000127	0.000427	0.000170
	(0.0686)	(0.127)	(0.0442)	(0.0827)	(0.000457)	(0.000337)
Board size	0.00394***	0.00408	0.00401*	0.00709***	−0.00007	0.00001*
	(0.00138)	(0.00285)	(0.00224)	(0.00269)	(1.50e−05)	(5.79e−06)
ROA	0.161**	0.359***	0.158***	0.154	−0.00183	0.000904***
	(0.0636)	(0.116)	(0.0484)	(0.102)	(0.00260)	(0.000210)
Size	0.0365***	0.00007	0.0333***	0.0198***	0.000189	1.94e−05
	(0.00686)	(0.00953)	(0.00483)	(0.00724)	(0.000154)	(1.80e−05)
Liq	0.0546***	0.0243*	−0.000309	−0.0178**	0.000212	0.00007
	(0.00525)	(0.0126)	(0.00236)	(0.00739)	(0.000191)	(1.67e−05)
Lev	−0.140***	−0.214***	−0.0279*	0.0305	−0.00002	−0.00009
	(0.0225)	(0.0678)	(0.0151)	(0.0473)	(0.000196)	(0.000181)
Constant	−0.675***	0.375	−0.652***	−0.237	−0.00309	−0.000220
	(0.166)	(0.230)	(0.115)	(0.173)	(0.00206)	(0.000498)
Sargan test	0.5647	2.902	6.803	3.921	4.997	3.651
Observations	4,462	1,063	4,019	956	4,040	953
firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%, 5%, 10%, respectively.

Table 11. Executive diversity interaction effect.

	Panel			IV		
	FSR	FAR	FOIR	FSR	FAR	FOIR
VARIABLES	M1	M2	M3	M4	M5	M6
Executive diversity	0.0357	−0.0929*	0.000186	−1.390***	−0.848***	−0.00195***
	(0.0681)	(0.0474)	(0.000219)	(0.375)	(0.246)	(0.000671)
Culture	0.682***	0.165***	0.000172**	0.467***	−0.0530	−6.51e−05
	(0.0397)	(0.0439)	(8.52e−05)	(0.0787)	(0.0574)	(0.000154)
Inter	−1.543***	−0.423	0.000852	−3.197***	−1.659**	−0.00102
	(0.481)	(0.464)	(0.000782)	(0.945)	(0.680)	(0.00165)
Skills	−0.0247	0.0635*	0.000197**	0.0222	0.132***	0.000259**
	(0.0400)	(0.0355)	(9.51e−05)	(0.0542)	(0.0398)	(0.000117)
Independence	0.115	−0.227***	−0.000112	0.314***	−0.0292	0.000103
	(0.0737)	(0.0806)	(0.000387)	(0.119)	(0.0838)	(0.000369)
Board size	0.00398**	0.00412***	8.68e−06**	0.00584***	0.00668***	0.00001***
	(0.00186)	(0.00130)	(3.79e−06)	(0.00222)	(0.00155)	(3.30e−06)
ROA	0.147	0.125	0.000819***	0.307***	0.114	0.000854***
	(0.0967)	(0.0888)	(0.000225)	(0.108)	(0.0998)	(0.000209)
Size	−0.016***	0.00761	−0.00005	0.00748	0.0227***	0.00002
	(0.00599)	(0.00570)	(1.37e−05)	(0.0104)	(0.00799)	(1.70e−05)
Liq	0.0267**	−0.0182***	8.04e−06	0.0296**	−0.0158**	0.00002*
	(0.0106)	(0.00581)	(1.36e−05)	(0.0132)	(0.00721)	(1.41e−05)
Lev	−0.147***	0.0915**	3.39e−05	−0.231***	0.0239	−0.00002
	(0.0512)	(0.0434)	(0.000215)	(0.0621)	(0.0485)	(0.000159)
Constant	0.595***	0.0759	0.00006	0.0758	−0.345*	−0.000502
	(0.162)	(0.150)	(0.000556)	(0.270)	(0.195)	(0.000557)
Sargan test				4.248	4.759	2.742
Observations	1,212	1,090	1,080	1,064	957	954
R-squared	0.187	0.070	0.022			
Firm year-dummies	Yes	Yes	Yes	Yes	Yes	Yes

Variables are defined in Tables 1 and 3.
***, **,*Significant at 1%, 5%, 10%, respectively.

sales, assets and operating income but also *via* a stochastic-frontier estimate of technical efficiency abroad.

We find that gender diversity exhibits a U-shaped relationship with internationalisation: low to moderate female representation is associated with lower overseas activity, while higher representation reverses that effect. Cultural diversity exerts a consistently positive influence on all internationalisation proxies and on foreign operating efficiency. The two diversity dimensions partially substitute for one another—high levels of one compensate for low levels of the other. These relationships remain robust to 2SLS estimation, alternative diversity measures (female executives) and a set of additional checks.

Theoretical implications

Our study has a number of theoretical implications. First, by revealing a non-linear gender effect, we refine UET's prediction that demographic diversity broadens managerial cognition: only after a 'critical mass' of women is reached does that cognitive benefit outweigh heightened risk aversion. Second, documenting a substitution effect qualifies RDT's contention that each diversity attribute uniquely broadens external resource

networks; in fact, some diversity resources appear fungible across gender and culture. Third, our efficiency results extend HCT by showing that culturally heterogeneous boards do not merely expand activity abroad—they help firms convert inputs into foreign income more productively.

It is important to acknowledge that our findings reveal boundary conditions for each theoretical framework. UET's prediction of linear cognitive benefits from diversity is qualified by our U-shaped gender effect, suggesting cognitive gains may be offset by risk aversion until a critical mass is reached. RDT's assumption of additive resource benefits across diversity dimensions is challenged by our substitution effect, indicating that resource networks from different diversity types may overlap. HCT's emphasis on skill complementarity does not fully account for the diminishing returns we observe when both diversity types are present simultaneously.

Collectively, these insights move the internationalisation, gender and diversity literatures beyond measurement debates to specify how and when distinct diversity facets matter.

Practical implications and contemporary context

From a practical standpoint, our findings suggest valuable implications for policymakers, managers, and academics. Emphasising board members with diverse cultural backgrounds enriches strategic deliberation and fosters deeper engagement in global markets. Although female directors may initially display risk aversion, an optimal level of their representation can benefit international expansion, highlighting the strategic importance of gender diversity.

Our evidence suggests that simple numerical quotas may be insufficient unless they consider the combined gender-culture profile vis-à-vis the firm's global ambitions. This insight becomes particularly relevant in today's volatile geopolitical landscape, where current tensions such as US-China economic decoupling, supply-chain realignments following Brexit, and emerging trade conflicts sharpen the strategic premium on culturally diverse boards for risk navigation and legitimacy building in fragmented markets. Firms operating amid heightened geopolitical tensions—or facing legitimacy deficits in particular regions—may especially benefit from culturally diverse directors who bring location-specific networks and legitimacy.

Firm performance in global contexts depends on various governance factors—such as board size, directors' skills, and board independence—which collectively shape complex decisions related to overseas ventures. Regulators should likewise recognise that one-size-fits-all mandates could

unintentionally crowd out other forms of diversity that deliver comparable strategic value. Legislators and corporate governance bodies should encourage gender and cultural diversity on boards to promote innovation and competitiveness in international markets.

Future research directions

Scholars may expand on these results by examining cross-country samples, incorporating further governance attributes (e.g., the CEO's cultural background), and adopting finer measures of cultural diversity. Our diversity effects could differ significantly across various international entry modes, with acquisitions potentially requiring different board competencies compared to greenfield investments or joint ventures. Future research should unpack these contingencies to provide more nuanced guidance for firms pursuing different internationalisation strategies.

Upon methodological reflection, our use of Refinitiv's cultural diversity index captures nationality differences but cannot fully disentangle language, ethnicity, or sub-national identities. Nor can it separate deep-level cultural values from surface-level nationality cues. Future research should triangulate multiple diversity measures—such as linguistic distance or Hofstede scores—to parse the various dimensions of cultural heterogeneity.

Limitations and scope

Although this paper provides a robust empirical setting by focusing on S&P 500 firms, caution is warranted in extending these insights beyond the United States or large publicly listed corporations. Extending the analysis to emerging-market multinationals and privately held firms would test generalisability under varied institutional logics. We also acknowledge that our measure of cultural diversity may overlook important within-country (ethnic) heterogeneity at the headquarters location. Consequently, boards comprised of individuals sharing a common nationality but differing in regional or ethnic background could still display meaningful diversity that our analysis might not capture.

While our results show links between board gender diversity, cultural diversity, and internationalisation, it is important to note that 'internationalisation' in our models captures a range of activities such as foreign sales ratios, that may reflect different entry modes, geographic scopes, and market strategies across firms. Thus, the strength and nature of the diversity–internationalisation relationship could vary by host country institutional context, or the specific form of global engagement.

Disaggregating internationalisation into entry modes could reveal whether diversity effects differ across risk profiles. Additionally, qualitative work might unpack the boardroom processes that activate or mute the substitution effect we observe. Cross-country research would refine our understanding of how different forms of diversity drive global expansion under varied institutional conditions. By exploring these avenues, future studies can continue illuminating the intricate linkages between board diversity, strategic decision-making, and international growth.

Final reflections

In sum, the present study shows that what matters for global competitiveness is not simply 'more diversity,' but the right blend of gender and cultural perspectives matched to a firm's international trajectory. Gender diversity displays a U-shaped relationship with internationalisation, cultural diversity exerts a consistently positive influence, and the two dimensions partially substitute for each other—findings that remain robust across 2SLS estimation, alternative diversity measures and a stochastic–frontier efficiency test. Recognising and leveraging that optimal blend can help organisations navigate an increasingly fragmented geopolitical landscape while enhancing both strategic reach and operational efficiency.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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